

+GF+

Industry
Valves and Actuators

Plan, Build, Operate

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Industrial Piping Systems

Planning Fundamentals

Industrial Piping Systems

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Preface

GF Piping Systems is a major global provider of complete piping solutions for many demanding applications in various market segments. Founded in 1802, Georg Fischer started the first production of malleable iron fittings in 1864 and today is recognized as the pioneer in the development of corrosion-free plastic piping systems for the safe and reliable conveyance of liquids and gases. This technical handbook reflects more than 60 years of our experience and know-how in the designing and manufacturing of plastic piping systems. Today, our product portfolio consists of more than 60'000 products and we are supporting our customers with products and services day to day around the globe.

The scope of these planning fundamentals is to offer a valuable support in planning and selection of the proper materials and the most suitable product range for all main industrial applications. In addition, the handbook provides extensive information about all jointing technologies for plastic materials and gives technical advises in the installation of pipes, fittings, valves, measurements and control, as well as actuation.

We strongly believe that the professional planning and the proper use of our comprehensive product range are the base for reliability, safety and high quality.

We hope that, in this handbook, you will find the qualified support that you need for your daily work. In case of special applications our worldwide technical engineers will be glad to assist you.

We would like to thank everyone, who continues to support GF Piping Systems in its mission to delivering more value to customers, through superior piping systems.

Schaffhausen, 08/2025

Valves

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Introduction



Technologies for clean and corrosive environments

At GF Piping Systems, we provide comprehensive solutions tailored to meet your process requirements. Available in a wide range of material options, our sensors and valves are designed to support corrosive to ultrapure applications.

GF Piping Systems valve solutions are recognized as industryleading. Our extensive valve portfolio includes key types such as ball, butterfly, diaphragm, and process valves. Depending on your process needs, these valves can be manually operated or automated to integrate seamlessly with other system components, such as process sensors.

GF Piping Systems‘ factory in Seewis

GF Piping Systems Seewis (Switzerland) has established itself as a leading high-tech plastic valve and actuator manufacturer. Driven by passion and innovation, the factory‘s team has pioneered numerous industry firsts, continuously transforming and leading the plastic valve sector with a strong commitment to sustainability.

Valve Selection

☑ Recommended
☒ Not recommended
⊡ Conditionally suitable
Not possible/non existing





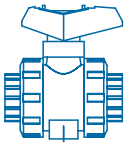




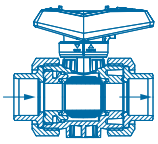



	Ball Valves	Butterfly Valves	Diaphragm Valves	Solenoid Valves	Pressure Control Valves	Angle Seat Valves	Cone Check Valves	Wafer Check Valves	Ventiating & Bleed Valves	Strainer
Application	Flow volume control			Flow on/off	Pressure control	Backflow prevention			Ventilating Bleeding	Filtering
	Linear flow control	End-of-line valve	Linear flow control		Pressure reduction				Venting	
	Mixing and distribution	Mixing and distribution	Mixing and distribution	Mixing and distribution	Pressure retention					
	Dosing		Dosing							
	Full port									
Medium	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles	☑Free of foreign particles
	⊡With particles/ cristalizing	⊡With particles/ cristalizing	☑With particles/ cristalizing	☒With particles/ cristalizing	⊡With particles/ cristalizing	⊡With particles/ cristalizing	⊡With particles/ cristalizing	⊡With particles/ cristalizing	⊡With particles/ cristalizing	⊡With particles/ cristalizing
	☑Viscous	⊡Viscous	☑Viscous	⊡Viscous	☒Viscous	⊡Viscous	⊡Viscous	⊡Viscous	⊡Viscous	☑Viscous
	☑Gaseous	⊡Gaseous	⊡Gaseous	☑Gaseous	☒Gaseous	⊡Gaseous	☑Gaseous	⊡Gaseous	☑Gaseous	☑Gaseous
	☑Vacuum	☑Vacuum	⊡Vacuum	⊡Vacuum	☒Vacuum	⊡Vacuum	☑Vacuum	⊡Vacuum	⊡Vacuum	⊡Vacuum
Diameter DN	<200	<600	<200	<100	<100	<100	<100	<600	<100	<100
Housing material	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U	PVC-U
	PVC-C	PVC-C	PVC-C	PVC-C	PVC-C		PVC-C		PVC-C	PVC-C
	PP-H	PP-H	PP-H		PP-H		PP-H	PP-H	PP-H	PP-H
			PP-N							
	PVDF	PVDF	PVDF	PVDF	PVDF		PVDF	PVDF	PVDF	PVDF
			PVDF-HP		PVDF-HP					
		PVDF-PA-GF								
	PE	PE								
	ABS	ABS				ABS	ABS		ABS	ABS
		Metal			Metal					
Actuation type	Manual	Manual	Manual							
		Gearbox								
	Electric	Electric	Electric	Electric						
	Pneumatic	Pneumatic	Pneumatic							
					Self-acting	Self-acting	Self-acting	Self-acting	Self-acting	Self-acting

Ball valves



The 2-way ball valves use a rotating ball with a bore that allows a straight-through flow in the open position. As soon as the ball is rotated by 90°, the bore is covered and the flow is shut off. These valves are used for OPEN/CLOSE functions and also for dosing applications.
The 3-way ball valves with L-, T- or tripod-ball are the perfect valves for all mixing and distribution processes.





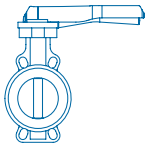






	Type 546 Pro	Type 546 Pro Linear	Type 542	Type 374-375	Type 523 Pro	Type 543 Pro	Type 522
Application	Industrial Ball Valve	Linear Ball Valve	Economy Ball Valve	Economy ball valve - water applications	Metering Ball Valve	3-Way Industrial Ball Valve	Laboratory Ball Valve
Size range	DN10 - 100	DN10 - 50	DN10 - 50	DN10 - 100	DN10 - 15	DN10 - 50	DN6
Housing material	PVC	PVC	PVC-U	PVC	PVC	PVC	PVC
	PP-H	PP-H	PP-H		PP-H	PP-H	
	PVDF	PVDF			PVDF	PVDF	PVDF
	ABS	ABS			ABS	ABS	
Sealing material	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM, FPM
	FKM	FKM	FKM	FKM	FKM	FKM	
Actuation type	Electric	Electric				Electric	
	Pneumatic	Pneumatic				Pneumatic	
Max.pressure rating	PN10	PN10	PN10	PN10	PN10	PN10	PN10
	PN16	PN16	PN16	PN16	PN16		
Connections	Fusion sockets	Fusion sockets	Fusion sockets		Fusion sockets	Fusion sockets	Threads
	Solvent cement sockets	Solvent cement sockets	Solvent cement sockets	Solvent cement sockets	Solvent cement sockets	Solvent cement sockets	
	Fusion spigots	Fusion spigots	Fusion spigots		Fusion spigots	Fusion spigots	
	Solvent cement spigots	Solvent cement spigots	Solvent cement spigots		Solvent cement spigots	Solvent cement spigots	
	Threaded sockets	Threaded sockets	Threaded sockets	Threaded sockets	Threaded sockets	Threaded sockets	
	Backing flange	Backing flange	Backing flange		Backing flange		
	Butt fusion spigots	Butt fusion spigots	Butt fusion spigots	Butt fusion spigots	Butt fusion spigots	Butt fusion spigots	
Standards	ISO	ISO	ISO	ISO	ISO	ISO	
	ANSI	ANSI	ANSI	ANSI	ANSI		
	ASTM	ASTM	ASTM	ASTM	ASTM	ASTM	
	JIS	JIS	JIS		JIS	JIS	
	BS	BS	BS	BS	BS	BS	
	Rp	Rp	Rp	Rp	Rp	Rp	
	NPT	NPT	NPT	NPT	NPT	NPT	NPT
	Rc	Rc	Rc		Rc	Rc	
							BSP

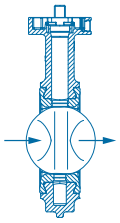
Butterfly valves



Butterfly valves are a type of quarter-turn valves used to control the flow of fluids. They consist of a disc which is mounted on a rotating shaft. When the valve is fully closed, the disc blocks the flow, and when it's fully open, it allows maximum flow through the pipe.

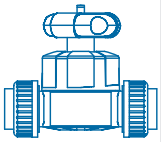
The disc of a butterfly valve is positioned perpendicular to the flow in the closed position, and parallel to the flow in the fully open position. The flow can be regulated smoothly and precisely by turning the disc.

They are commonly used in various industries including water treatment, HVAC systems, chemical processing, and food and beverage production due to their simple design, lightweight, and relatively low cost compared to other types of valves.

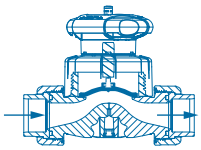


	 Type 567/578	 Type 565	 Type 038/039	 Type 065
Application	Double eccentric Plastic Butterfly Valve	Resilient Seated Plastic Butterfly Valve	Resilient Seated Metal Butterfly Valve	High Purity Metal Butterfly Valve
Size range	DN50 - 600	DN50 - 300	DN50 - 1200	DN50 - 350
Housing material	PP-GF	PA-GF	Ductile cast iron	Outside: PTFE Inside: Ductile iron
Disc material	PVC	PVDF		
	PP-H			
	PVDF			
	ABS	Outside: PVDF Inside: PA-GF	Rilsan/epoxy-coated, Aluminum bronze, stainless steel	Outside: PFA Inside: Ductile iron
Sealing material	EPDM	EPDM	EPDM	PTFE/PFA
	FKM	FKM	FKM	
	PTFE/FKM			
Actuation type	Electric	Electric	Electric	On request
	Pneumatic	Pneumatic	Pneumatic	
Max. pressure rating	PN10			
		PN16	PN16	PN16
Body types	Wafer	Wafer	Wafer	Wafer
	Lug	Lug	Lug	Lug
Standards	ISO	ISO	ISO	
	ANSI	ANSI	ANSI	ANSI
	ASME	ASME	ASTM	ASTM
	JIS	JIS		
	BS	BS	BS	

Diaphragm valves



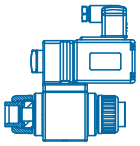
Diaphragm valves have a flexible diaphragm that is moved by means of a spindle. When the pressure pin is located in the lower position, the diaphragm is pushed onto a stage and the flow is interrupted. Diaphragm valves are well suited for corrosive, abrasive and dirty as well as for media containing solids. 3-way valves are used for all mixing and distribution processes.



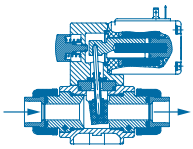


	Type 514	Type 515	Type 517	Type 519	Type 317
Application	Union version	Spigot version	Flange version	3-way branched valve	Flanged version big dimensions
Size range	DN15 - 50	DN15 - 50	DN15 - 50	DN15 - 50	DN65- 150
Housing material	PVC	PVC	PVC	PVC	PVC
	PP-H	PP-H	PP-H	PP-H	
		PP-N			
	PVDF	PVDF	PVDF	PVDF	
	PVDF-HP	PVDF-HP	PVDF-HP		
	ABS	ABS		ABS	
Sealing material	EPDM	EPDM	EPDM	EPDM	EPDM
	FKM	FKM	FKM	FKM	FKM
	PTFE	PTFE	PTFE	PTFE	PTFE
Actuation type	Manual	Manual	Manual	Manual	Manual
	Electric	Electric	Electric	Electric	
	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
Max.pressure rating	PN10	PN10	PN10	PN10	PN10
	PN16	PN16	PN16	PN16	
Connections	Fusion sockets				
	Solvent cement sockets				
		Fusion spigots			
		Solvent cement spigots			
	Threaded sockets				
			Backing flange		Backing flange
	Butt fusion spigots	Butt fusion spigots		Butt fusion spigots	
			Fixed flange		Fixed flange
Standards	ISO	ISO	ISO	ISO	ISO
	ANSI		ANSI		ANSI
	ASTM		ASTM		ASTM
	JIS		JIS		JIS
	BS		BS		BS

Solenoid valves



Solenoid valves are actuated by an electromagnetic coil. The media chamber and the electromagnetic coil are separated from each other by a separating diaphragm.
Solenoid valves are used to shut off, release, meter, distribute or mix gases and liquids. They can switch very quickly, guarantee high reliability and durability, and low actuation power.

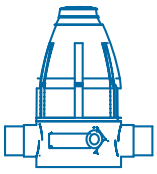







	Type 157	Type 160/161	Type 165	Type 166
Application	2/2-way	2/2-way 3/2-way	2/2-way	2/2 or 3/2-way
Size range	DN2 - 8	DN10 - 20	DN15 - 50	DN3 - 5
Housing material	PVC	PVC	PVC	
			PP-H	PP-H
			PVDF	PVDF
Sealing material		EPDM	EPDM	EPDM
	FKM	FKM	FKM	FKM
Actuation type	Magnetic	Magnetic	Magnetic	Magnetic
Max. pressure rating	0-4 bar	0-3 bar	0.5–6 bar	0 –10 bar
Connections	G ⅜"	Solvent cement sockets	Solvent cement sockets	G ¼"

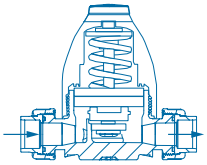
Pressure Control Valves



Pressure control valves are essential for maintaining stable pressure in fluid systems. These valves are divided into two main types: pressure reducing valves and pressure retaining valves.

Pressure reducing valves lower high inlet pressure to a stable outlet pressure, protecting downstream components and ensuring consistent operation.

Pressure retaining valves maintain minimum upstream pressure by closing when pressure drops below a set threshold, preventing backflow and maintaining system integrity





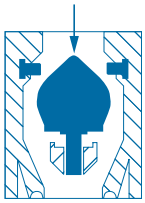



	Type 582	Type 586	Type V82	Type V86
Application	Pressure reducing valve	Pressure retaining valve	Pressure reducing valve	Pressure retaining valve
Size range	DN10- 50	DN10- 50	DN65 - 100	DN65 - 100
Housing material	PVC	PVC	PVC	PVC
	PP-H	PP-H	PP-H	PP-H
	PVDF	PVDF	PVDF	PVDF
Sealing material	EPDM	EPDM	EPDM	EPDM
	FKM	FKM		
Max. pressure rating	PN10	PN10	PN6	PN6
Connections	Fusion sockets	Fusion sockets		
	Solvent cement sockets	Solvent cement sockets		
	Fusion spigots	Fusion spigots	Fusion spigots	Fusion spigots
	Solvent cement spigots	Solvent cement spigots	Solvent cement spigots	Solvent cement spigots
	Backing flange	Backing flange		
Standards	ISO	ISO	ISO	ISO
	ASTM	ASTM		
	JIS	JIS		
	BS	BS		

Ventilating and bleed valves



For the ventilating and bleed valves, an innovative float provides a complete and reliable venting of piping systems and tanks. At the same time, the valves prevent a media overflow. The ventilating valves are used wherever a safe and controlled air supply must be ensured.





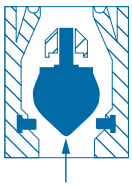


	Type 591	Type 595
Application	Ventilating and Bleed Valve	Ventilating Valve
Size range	DN10 – 100	DN10 – 100
Housing material	PVC	PVC
	PP-H	PP-H
	PVDF	PVDF
	ABS	ABS
Sealing material	EPDM	EPDM
	FKM	FKM
Max.pressure rating	PN10	PN10
	PN16	PN16
Connections	Fusion sockets	Fusion sockets
	Solvent cement sockets	Solvent cement sockets
	Fusion spigots	Fusion spigots
	Solvent cement spigots	Solvent cement spigots
	Threaded sockets	Threaded sockets
	Butt fusion spigots	Butt fusion spigots
Standards	ISO	ISO
	ASTM	ASTM
	BS	BS

Cone check valves



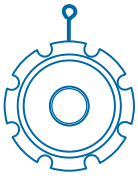
The core of the cone check valves is the unique check cone, which prevents the backflow of media. The optimized flow geometry reduces the flow resistance and the pressure loss to a minimum. Thanks to new sealing zone and specially designed profile seal, the valves are sealed, even during very fast closing movements.





	Type 561/562
Application	Backflow prevention
Size range	DN10 – 100
Housing material	PVC
	PP-H
	PVDF
	ABS
Sealing material	EPDM
	FKM
Max.pressure rating	PN10
	PN16
Connections	Solvent cement sockets
	Solvent cement spigots
	Threaded sockets
	Fixed flange
	Butt fusion spigots
Standards	ISO
	BS
	ASTM
	ANSI
	JIS

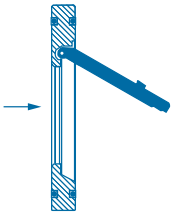
Wafer check valves



Wafer check valves are a type of check valve used to prevent backflow in pipelines. They are called „wafer“ check valves, because of their thin wafer-like design, which allows them to be installed between flanges in a pipeline without the need for additional pipe supports.

These valves consist of a flap, that is hinged at one end and positioned within the valve body. When there is forward flow in the pipeline, the pressure of the fluid opens the flap, allowing the fluid to pass through the valve. However, when the flow reverses, the flap is forced against the seat by the pressure of the backflow, preventing the fluid from returning upstream.

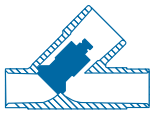
Wafer check valves are commonly used in applications where space is limited, such as in HVAC systems, water treatment plants, and process industries. They are known for their compact design, ease of installation, and reliable operation in preventing backflow.



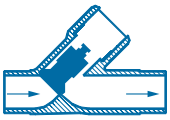


	Type 369
Application	Backflow prevention
Size range	DN32 - 300
Housing material	PVC
	PP-H
	PVDF
Sealing material	EPDM
	FKM
Max. pressure rating	PN10
Connections	Flange joints
Standards	ISO
	BS
	ANSI

Angle seat check valves



Angle seat check valves have a plunger, which is arranged in the middle of the valve and presses on a flat stamp or seat. The valve opens, as soon as the flow of the media lifts the cone.



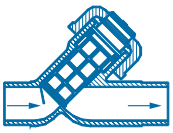


	Type 303/304
Application	Backflow prevention
Size range	DN10 - 80
Housing material	PVC
	PVC (transparent)
	ABS
Sealing material	EPDM
	FKM
Max.pressure rating	PN10
Connections	Solvent cement sockets
	Solvent cement spigots
	Fixed flange
Standards	ISO
	JIS

Line Strainer



Strainers are installed upstream of valves, sensors and pumps to protect them against contamination. The medium flow is directed through the strainer from the inside to the outside, whereby dirt particles are retained and collected.





	Type 305
Application	Filter
Size range	DN15 - 80
Housing material	PVC
	PVC (transparent)
	PP-H
Sealing material	EPDM
	FKM
Max.pressure rating	PN10
	PN16
Connections	Solvent cement sockets
	Solvent cement spigots
	Fusion sockets
Standards	ISO
	JIS
	ASTM

Types of connections

Different types of valve connections offer varying advantages and features that should be considered when selecting a valve connection type.

For more information, see Planning Fundamentals Industry, book „Design and Installation“, chapter "Jointing technology".

Spigot	Union	Flange
Permanent connection	Flexible	Non-permanent connection
Reduces potential of contaminates	Large variety of unions according to standards	Many standard parts from different suppliers available
Eliminates the need for eslatomeric joint seals	Non-permanent connection	Can be disassembled with standard tools
Reasonable price	Uniform surface pressure on jointing face	Variable in sealing materials
Decreased cost	Variable in sealing materials	Common jointing method in CPI and energy

The following tables list the different connection types with the respective materials.

Sockets

Name	Solvent cement socket	Threaded socket	Fusion socket
			
Standard	ASTM, BS, ISO,JIS	ISO, JIS/RC, brass, NPT, RP	ISO
Material	ABS, PVC-C, PVC-U	ABS, PVC-C, PVC-U, PVDF, PP-H, brass	PE100, PP-H, PVDF

Most common types of thermoplastic valve connections and the materials that each are offered on by GF Piping Systems as a standard.

Spigot

Name	Solvent cement spigot	Threaded spigot	Socket fusion spigot	Butt fusion spigot
				
Standard	ISO	R	ISO	ISO
Material	PVC-C, PVC-U	Brass	PP-H, PVDF	PE100, PP-H, PP-R, PVDF, PVC-U

Flanges

Name	Fixed flange	Backing flange
		
Standard	ANSI, ISO, JIS	ANSI, ISO, JIS
Material	PVC-U, PVC-C, PP-H, PVC-U, PVDF	PP-St, PVC-U, PP-H, PVDF

Union nuts

Name	Union nut
	
Material	PVC-C, PVC-U, ABS, PROGEF Standard, PP-H, PVDF, SYGEF Standard

Others

Name	Alternative end available upon request e.g. blind connection part
	
Material	Alternative materials available upon request

Material Selection

Thermoplastic and seal materials

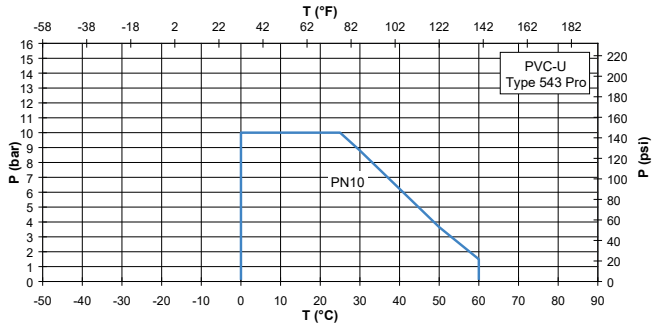
Abbreviation	Material
PVC	Polyvinyl Chloride
CPVC	Chlorinated Polyvinyl Chloride
PP-H	Polypropylene
PPn	Natural Polypropylene
ABS	Acrylonitrile Butadiene Styrene
PVDF	Polyvinylidenefluoride
EPDM	Ethylene Propylene Rubber
FKM	Fluorine Rubber
PTFE	Polytetrafluoroethylene

Pressure-temperature diagram

When making a material selection, the pressure-temperature (PT) curves must be considered. These curves show the corresponding rated pressure at a given temperature and can be beneficial in material selection because they can vary greatly between different thermoplastics. It is important to note that the PT curve of a valve can differ from those for pipe and fitting of like material and therefore the PT curves of valves, pipe and fittings should be considered together when making a material selection.

Detailed information is available in the different valve chapters.

Pressure-temperature diagram example:



Chemical resistance

Thermoplastic piping systems are used in a diverse array of applications, many of which include aggressive liquids and gases. The chemical resistance properties of a material must be considered when making a material selection and it is vital that the selected material is suitable for the intended application. Our online tool ChemRes PLUS can serve as a useful guide in this process. It contains information concerning the core thermoplastic and elastomeric materials that make up the GF Piping Systems product range and the media they directly contact either through their respective environments or through external influences.

For our online tool ChemRes PLUS, go to https://www.gfps.com/com/en/downloads-tools/online-tools/chemical-resistance.html

Other criteria for the selection of material

The following criteria must be taken into consideration when selecting the material:

- Internal pressure
- Ground and traffic loads
- Cold
- Heat
- UV radiation
- Chemical environment
- Vacuum
- Water hammer
- Steam pressure
- Diffusion
- Static electricity
- Flammable substances
- Explosive environment
- Corrosion
- Humidity
- Ambient temperature
- Medium temperature

⚠ Proper handling and regular maintenance of valves are important factors for maintaining their maximum service life.

Further selection criteria

Medium transported

Type	Free of foreign particles	Containing particles, crystallizing	Viscous	Gaseous
Ball valve	+	-	+	+
Diaphragm valve	+	+	+	0
Butterfly valve	+	0	+	+
Check valve	+	0	0	+
Wafer check valve	+	0	0	0
Angle seat check valve and angle seat valve	+	0	0	0
Pressure regulating valve	+	-	+	-
Ventilating and bleed valve	+	0	0	+
Solenoid valve	+	0	0	+
Strainer	+	0	0	0

+ Recommended
0 Conditionally suitable
- Not recommended
x Not possible / non-existing

Functional properties

Type	Adjustable	Position indicator	Full Port	Leakproof under vacuum	Water hammer
Ball valve	+	+	+	+	-[1)]
Diaphragm valve	+	+	-	0	+
Butterfly valve	+	+	-	0	-[1)]
Check valve	x	x	-	+	0
Wafer check valve	x	x	-	0	0
Angle seat check valve and angle seat valve	x	x	-	0	0
Pressure regulating valve	+	Z	-	0	0
Ventilating valve and ventilating and bleed valve	x	x	-	0	0
Solenoid valve	x	+	-	0	0
Strainer	x	x	-	0	+

+ Recommended
0 Conditionally suitable
- Not recommended
Z Available for accessories
x Not possible / non-existing
1) Ensure that actuation is slow (valve, pneumatic valve with throttle)

Nominal pressure

Nominal pressure describes the standard pressure level for a system or component to design for safe and effective operation.

Type	PN
Ball valve	PN16
Diaphragm valve	PN16
Butterfly valve	PN10
Check valve	PN16
Wafer check valve	PN10
Angle seat check valve	PN10
Pressure regulating valve	PN10
Ventilating valve and ventilating and bleed valve	PN16
Solenoid valve	PN16
Strainer	PN10

PWIS (LABS) -compliancy vs. silicone free

Paint wetting impairment substances (PWIS / LABS) can disrupt a surface's complete and uniform coating, resulting in lacquer errors and defects of the final products. To prevent PWIS from getting into the application, all the necessary components need to be exceptionally clean. More than 30 years of experience and our in-house testing capabilities enable us to supply every application with the required product giving our customers peace of mind and a well-trusted partner on their side. To achieve LABS-compliancy, products need to be silicone free, but there are many more requirements than this. Products used in lacquering applications also need to be oil- and grease-free as well as free of PTFE-abrasion. Equating "LABS-compliancy" with "silicone-free" is a common misconception resulting from years of uncertainty and unclear definitions. As soon as silicone-free valves are ordered from GF Piping Systems, they are also PWIS(LABS)-compliant according VDMA 24364 B2.

Oil-free products

For water application in the microelectronic industry, contamination through installed products must be avoided. Exceptional surface finish and excellent leach-out characteristics are as important as choosing the suitable lubricants for valves. For oil-free products, only lubricants that do not significantly influence the water quality are used.

High-Purity (HP)

High-purity stands for the highest levels of purity and quality in industrial applications where contamination-free media is crucial.

GF Piping Systems SYGEF Plus system, developed for demanding high-purity applications in the semiconductor, pharmaceutical, and biotechnology industries, meets the strict requirements of the International Roadmap for Devices and Systems (IRDS) by exceeding industry leading SEMI standards (F40, F48, and F57).

Made from premium PVDF materials processed without additives, SYGEF Plus supports various sterilization and cleaning methods, including steam, hot water, ozone, and chemicals.

The smooth surface of PVDF components, combined with precise manufacturing, ensures safe, contamination-free media flow, enhancing process reliability and efficiency.

SYGEF Plus products are produced in cleanrooms with rigorous internal and external audits, reflecting GF's commitment to quality and continuous improvement, ultimately boosting customers' efficiency and product yield.



Actuated valves

		Electric actuators	Pneumatic actuators		
					
					
	Valve type	**EA15-250 dEA25-250**	**PPA04 – PPA80**	**PA30 – 90**	**DIASTAR**
Ball valves	Typ 546 Pro 	DN10 - 100	DN10 - 100	DN65 - 100	
	Typ 543 Pro 	DN10 - 50	DN10 - 100	DN65 - 100	
Butterfly valves	Typ 565 	DN50 - 300	DN50 - 80	DN50 - 300	
	Typ 567/578 	DN50 - 300	DN50 - 125	DN50 - 300	
	Typ 038/039 	DN50 - 300		DN50 - 300	
Diaphragm valves	Typ 514-517 	DN25 - 50			DN15 - 150

Services

Valve Automation Center

GF Piping Systems' Valve Automation Centers deliver customized automation solutions for the water treatment and chemical process industries. Our experts provide extensive support – from sizing valves and actuators to helping design integrated control systems – ensuring reliable, efficient, and safe operation tailored to your specific applications.





Customized Solutions

We offer comprehensive piping systems, including pipes, valves, and actuation. Our expertise extends to automating your systems by seamlessly integrating third-party actuation solutions designed to meet your exact specifications, ensuring optimal operation and reliability. As your automation partner, we provide this service at various locations worldwide, delivering reliable, efficient, and safe valve automation solutions you can depend on.

Unmatched Expertise

GF's Valve Automation Centers combine engineering expertise with precision manufacturing to deliver unmatched valve actuation solutions. Our skilled engineers design custom systems tailored to your needs while expert technicians assemble and rigorously test every solution for flawless performance.
We ensure the perfect solution based on your specific application. We help you select and dimension the best actuation configuration, including integrating a wide range of accessories.

Your Dedicated Automation Partner

Streamlined Communication	A single point of contact ensures smoother coordination, saving you time and effort.
Fast Turnaround	Accelerated quoting, specification, assembly, testing, and delivery of automated solutions.
Advanced Capabilities	Cutting-edge tools, technology, and equipment for superior results.
Simplified Supply Chain	Partnering with GF minimizes supplier complexity, streamlining procurement for efficiency and cost reduction.

Term definition for technical data

Pressure-temperature diagram

The following conditions must be fulfilled in order for the data contained in the pressure-temperature (PT) curves, specific to respective valve types, to remain accurate.

Low-stress valve installation

The valve must be installed in the piping system in such a manner that the system does not apply any additional stress on the valve, which can have a negative effect on the valve operation.

Fixed points before and after the valve

When thermoplastics are heated/ cooled they will expand/ contract, this phenomenom is called thermal expansion. The effects of thermal expansion should be mitigated in the portions of a piping systemin direct prosimity of the valve. GF Piping Systems recommends mounting fixed points both before andafter the valve.

Technical data

Operating torque

These diagrams indicate the required torque to fully open/ close a given valve. These are always reference values.

For select valve types, data is also provided to define how much higher the initial breakaway torque can be compared to the operating torque. This occurs when a valve sits in the same position for a long period of time. Breakaway torque is defined as the required torque to start a valve's movement from a stationary position and is especially important to take into account when selecting actuators from other suppliers. Breakaway torque has already been taken into consideration for all GF Piping Systems automatic valves.

Pressure loss

The pressure loss, which occurs when a medium flows through a valve, is required for the hydraulic dimensioning of a piping system. The respective pressure loss for the individual valve types in the completely opened position is given in the pressure loss diagrams in relation to the desired flow rate. Please note the logarithmic axis scale of the flow rate and pressure loss.

The k_v factor is a convenient means of calculating the hydraulic flow rates for valves. It allows for all internal resistances and for practical purposes is regarded as reliable. It is defined as the flow rate of water in liters per minute with a pressure drop of 1 bar across the valve. The technical data of the GF Piping Systems valves contains the k_v values as well as pressure loss charts. The latter make it possible to read off the pressure loss directly. But the pressure loss can also be calculated from the k_v value according to the following formula:

$$\Delta p_{Ar} = \left(\frac{Q}{k_v}\right)^2 \cdot \frac{\rho}{1000}$$

Δp_{Ar}	Pressure loss of valve (bar)
Q	Flow rate (m^3/h)
ρ	Density of the medium transported (kg/m^3) (1 g/cm^3 = 1,000 kg/m^3)
k_v	Valve flow characteristic (m^3/h)

Flow characteristics

These curves indicate the percentage Kv or Cv relative to the percent of a valve's stroke, with 0% being fully closed and 100% being fully open. The flow characteristics curves, which are specific to each individual valve type, are also given in graph form.

Flow coefficients

Flow coefficients are characteristic values for the flow rate through a valve at a specific pressure loss over the valve. These values are indicated in tables specific to the different valve types and are only applicable to valves that are fully open.

They are given in the following units:

- Kv 100 value in l/min at 1 bar pressure loss
- Kv 100 value in m3/h at 1 bar pressure loss
- Cv 100 value in US gal/min at 1 psi pressure loss

The flow rate for any intermediate position of the valve is determined by multiplying the flow coefficient and the percentage of the flow coefficient from the flow characteristics curve.

Tightening torques

For valves with flange connections, the recommended bolt torque and the number of bolts are given. Suggested bolt lengths are also given but note that these values can change depending on the flange adapters and rings used for the connection. Required bolt torque can also varywith seal type, with profile gaskets and o-rings seals requiring less torque than flat gaskets.

Conversion factors

Kv - Cv

In Europe, the kv value is measuerd in m^3/h at 16°C and a pressure loss of 1 bar. In the US the Cv value is measured in US gal/min at a temperature of 60°F and a pressure loss of 1 psi. The conversion equation between these two values is as follows:

$$Cv = \frac{264.1722}{60} \cdot \sqrt{\frac{1}{14.50377}} \cdot kv = 1.15761 \cdot kv$$

C_v	Value (US gal/min)
k_v	Value (Europe m^3/h)
1 m^3	264.1722 (US gal)
1 bar	14.50377 (psi)

	Kv (m^3/h)	Kv (l/min)	Cv (gal/min)	Cv (m^3/h)
Kv	1	16.67	1.1561	1
Kv	0.06	1	0.069	0.06
Cv	0.865	14.42	1	0.865

Planning Fundamentals

of Valves and Automation

Ball Valves

Content

Ball Valve type 546 Pro 32
Vented Ball Valve type 546 Pro V 75
Linear Ball Valve type 546 Pro 80
Metering Ball Valve type 523 Pro 91
Ball Valve type 542 100
3-way Ball Valve type 543 Pro 107
Quick Connect Valve 700 142
Laboratory Ball Valve type 522 151
Ball Valves type 374-375 155

Ball Valve type 546 Pro

Ball Valve type 546 Pro, manually operated



Type 546 Pro
manually operated

Product description

The Ball Valve type 546 Pro is the ideal valve for use in applications ranging from simple water applications right up to demanding chemical processes. Its modular construction guarantees simple operation, flexibility, universal automation options and the greatest possible process safety.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90°. This valve is mainly used for open/close functions, and for regulating applications.

Benefits/features

The Ball Valve type 546 Pro modular design always adapts the actual requirements. Whether electric, pneumatic or manual operation, including optional accessories, it flexibly meets all requirements.

- Lockable lever equipped as standard
- Manual valve or actuated valve with/without electrical position feedback
- Ergonomic hand lever with integrated tool to open the union bushing
- Labeling in lever (optional)
- Integrated fixation system with mounted threaded inserts as standard
- Spacers keep the line of the piping system and simplify installation
- Individual online configuration is possible
- Unique Data Matrix Code for traceability
- Oil-free and LABS-cleaned version
- Very high flow rate
- Universal interface makes a combination with all actuators possible
- Manual spring return unit (dead man lever)
- Relief well to avoid gas accumulation possible (e.g. for H2O2)
- Version with linear flow characteristic available due to special ball (opening angle scaled in 0 % - 100 % on index plate)

Applications

- Chemical process industry
- Water treatment
- Microelectronics
- Measurement and control
- Shipbuilding
- Food & beverage

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

Transport of compressed air

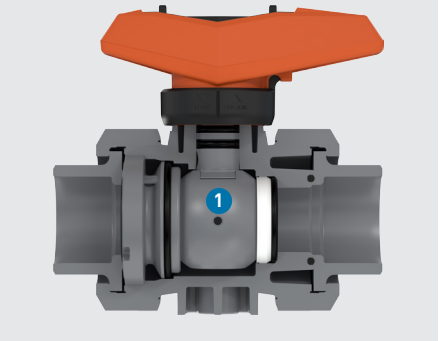
Ball valves type 546 Pro are suitable for compressed air regulation up to 10 bar (at 20 °C). The compressed air must be dry and free of oil. For this application PP-H is recommended as valve body material and FKM* for the gaskets.

Suitable piping systems are ecoFIT (PE) or INSTAFLEX (PB). The ball valve type 546 Pro is available with suitable connection parts.

*FKM is suitable for compressed air containing mineral oil. Some ester oils can attack the material FKM, in such cases the use of EPDM gaskets is recommended.

Special types

Vented Ball Valve type 546 Pro V

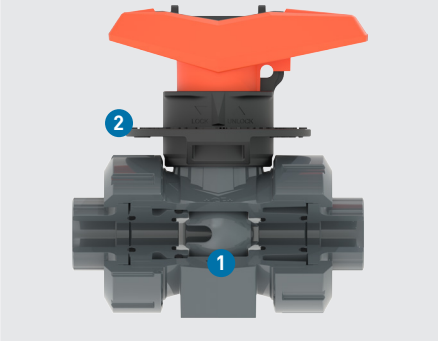


1 Ball with vent hole

The type 546 Pro V Ball Valve equalizes the pressure between the ball cavity and the housing. This eliminates overpressure, increases operational reliability and is particularly suitable for applications with gas release or pressure fluctuations.

Vented Ball Valve Type 546 Pro

Linear Ball Valve type 546 Pro

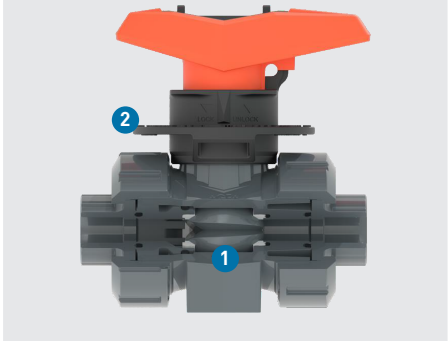


1 Ball with linear flow characteristic
2 Special index plate with opening angle in %

The type 546 Pro Linear Ball Valve provides a specially designed ball shape, which enables a linear flow, even at small opening angles. The flow characteristic is linear over the entire opening angle.

Linear Ball Valve Type 546 Pro

Metering Ball Valve type 523 Pro

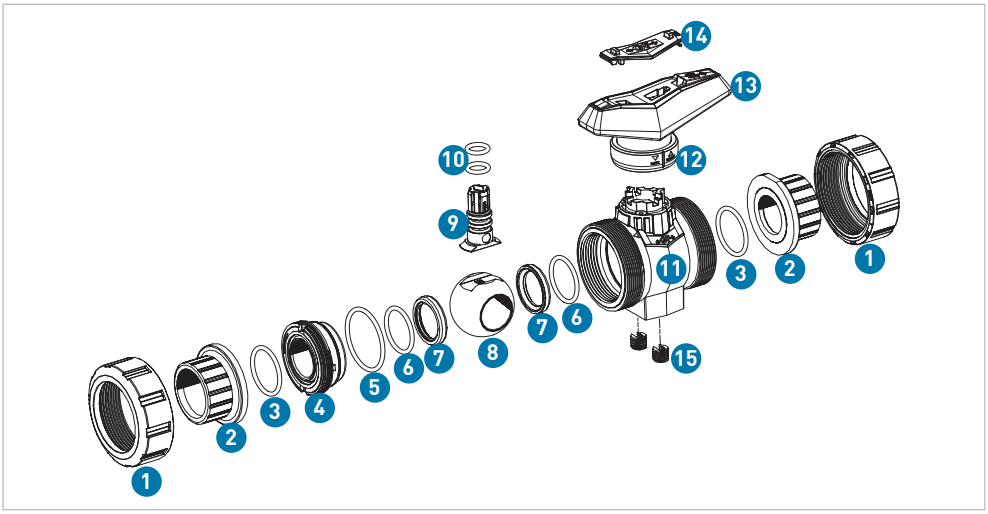


1 Ball with metering characteristic
2 Special index plate with opening angle in °

The strength of the type 523 Pro Metering Ball Valve is its ability to reliably control flow even at very low flowrates. The easy to read indicator and uniquely notched ball make precisely controlling media possible.

Metering Ball Valve Type 523 Pro

Technical data



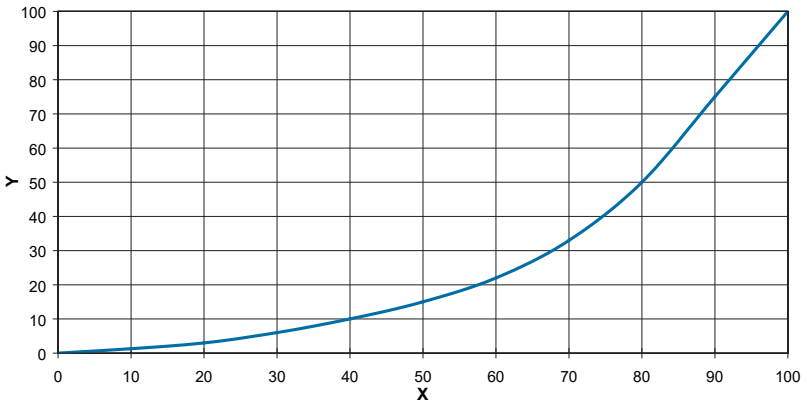
1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball
9 Stem
10 Stem seals
11 Body
12 Locking ring
13 Lever (lockable)
14 Lever clip
15 Threaded insert

Specification		
Dimensions	d16/DN10 – d110/DN100 (d160/DN150), ⅜" – 4" (6")	
Materials	Valve body	PVC-U, PVC-C, ABS, PP-H, PVDF
	Lever	PP-GF30
Gasket materials	O-rings	EPDM, FKM, FFKM
	Ball seat	PTFE, PVDF
Pressure levels	ABS / PP-H	PN10
	PVC-U / PVC-C / PVDF	PN16
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigot	ISO
	Threaded socket	Rp, NPT, Rc
	Backing flange	ISO, ANSI, BS, JIS
	Butt fusion spigots	SDR11 and SDR17.6
	PE100 electrofusion spigot or butt fusion spigot	SDR11 and SDR17.6
Actuation variants	Manually operated (lockable hand lever)	
	Pneumatic FC, FO, DA with and without manual override	
	Electrical AC: 100 – 230 V, AC/DC: 24 V, with / without manual override	
Flange standards	EN 1092 PN 10, ASME B16.5 Class 150, BS 1560-3.2 Class 150, JIS B2220 10K	
Third-party actuators	EN ISO 5211	
Marking	DataMatrix-Code with production data	
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, D.M. 174, DNV, FDA, QAP/ITP, NSF/ANSI, SIL, WRAS, ABS, BV, DiBT, RINA, LR	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Type 546 Pro		
			Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	70	4.9	4
15	½	20	185	12.9	11
20	¾	25	350	24.5	21
25	1	32	700	49.0	42
32	1 ¼	40	1000	70.0	60
40	1 ½	50	1600	112.0	96
50	2	63	3100	217.1	186
65	2 ½	75	5000	350.0	300
80	3	90	7000	490.0	420
100	4	110	11000	770.0	660

Flow characteristics type 546 Pro



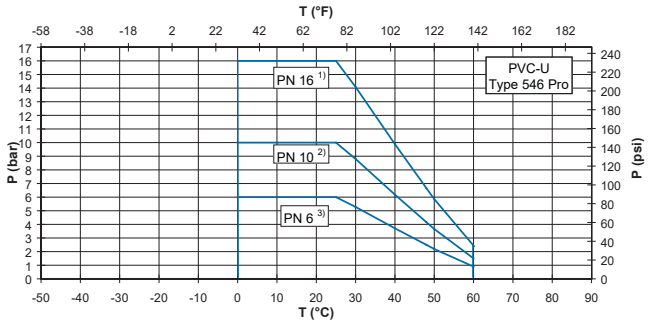
X Opening angle (%)
Y Kv, Cv value (%)

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

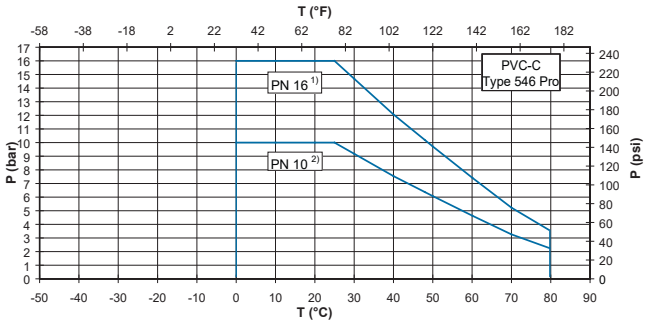
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



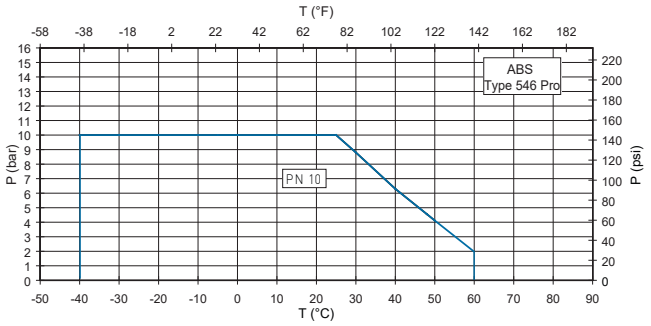
1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10
3) Depending on the connection, the nominal pressure is reduced to PN6

PVC-C

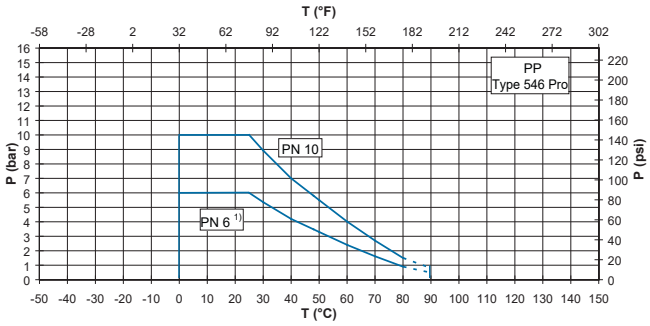


1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10

ABS

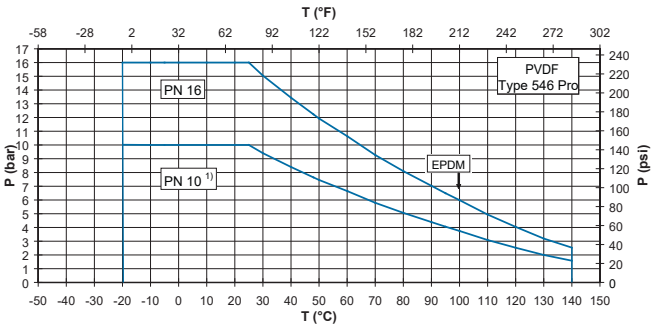


PP



1) For example, ball valve with butt fusion spigot PP or PE100, SDR 17

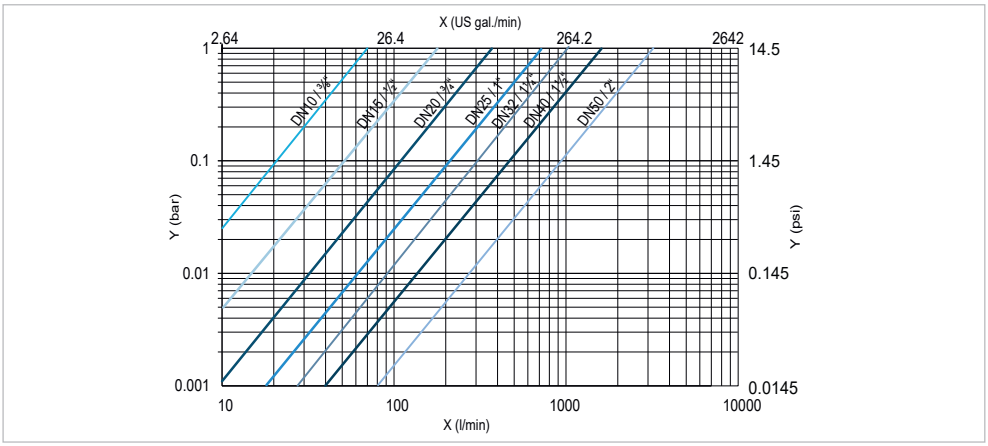
PVDF



1) For example, ball valve with threaded socket EPDM gasket up to max. 100 °C

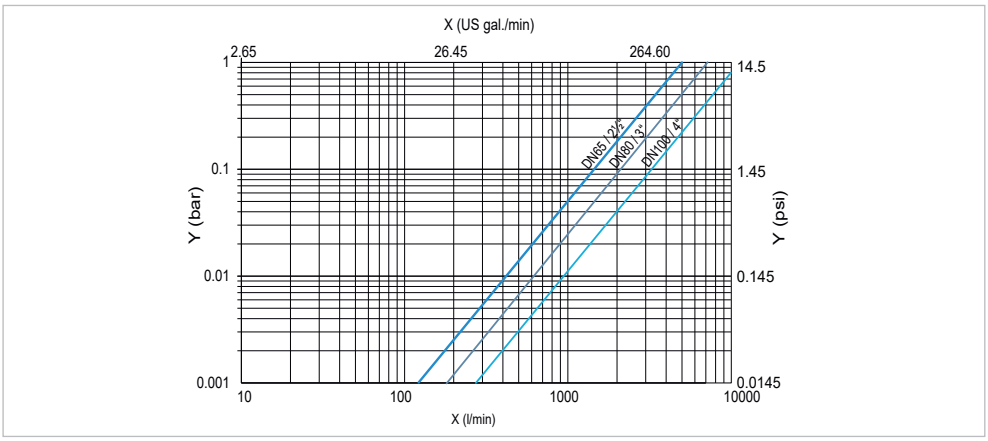
Pressure losses

d16/DN10 – d63/DN50



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

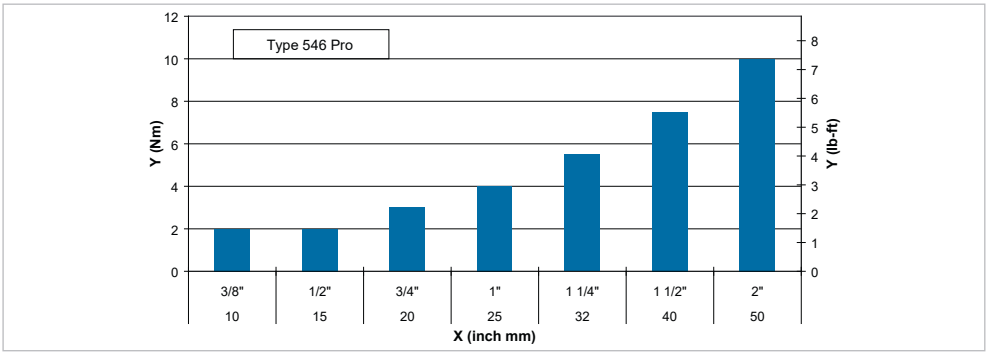
d75/DN65 – DN/100



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Operating torque

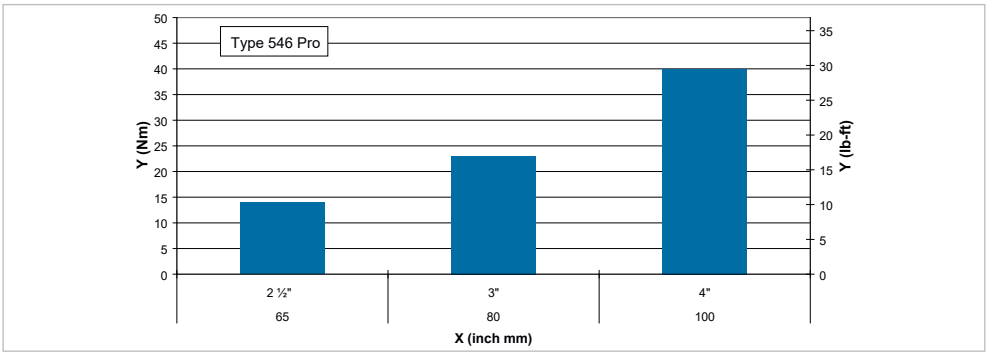
DN10 – DN50



X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Average values at nominal pressure. Depending on the application (e.g. operating speed, fluid, temperature, etc.) about 2 times the operating torque should be taken for sizing actuators.

DN65 – DN100



X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Average values at nominal pressure. Depending on the application (e.g. operating speed, fluid, temperature, etc.) about 2 times the operating torque should be taken for sizing actuators.

Reference values for tightening torque of screws

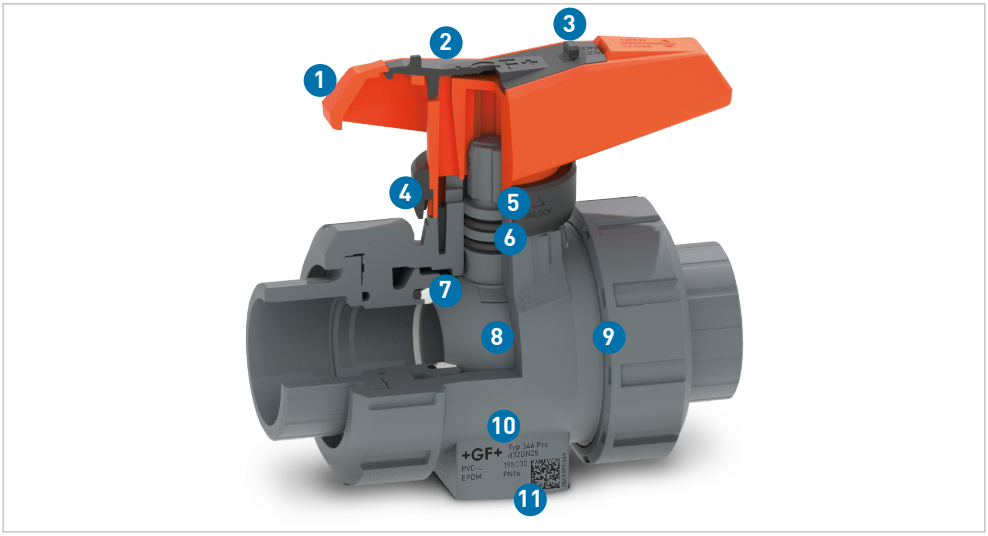
Flange connections with profile flange seal or flat gaskets

d	DN	Inch	Total number of screws (for 2 flange connections) standard nut [1]	Torque (Reference values) Profile flange gasket[2]		Torque (Reference values) Flat gasket	
(mm)	(mm)	(inch)		(Nm)	(lb-ft)	(Nm)	(lb-ft)
20	15	½	8 x M12 x 50	10	7.4	10	7.4
25	20	¾	8 x M12 x 55	10	7.4	10	7.4
32	25	1	8 x M12 x 60	10	7.4	15	11
40	32	1 ¼	8 x M16 x 70	15	11	20	15
50	40	1 ½	8 x M16 x 70	15	11	25	18
63	50	2	8 x M16 x 80	20	15	35	26
75	65	2 ½	8 x M16 x 90	25	18	50	37
90	80	3	16 x M16 x 100	15	11	30	22
110	100	4	16 x M20 x 130	20	15	35	26

[1] For Type 546 Pro connecting parts made of PP in combination with backing flanges, use half of the standard nut height

[2] Preferred gasket Type (suited for plastics)

Technical basics



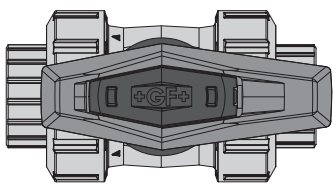
1 Ergnomic lever, lockable as standard
2 Quick-label on request
3 Integrated union bush tool
4 Interface for flexible automation and accessories
5 Reinforced security break point in the stem interface
6 Double stem seals
7 Dynamic backing seal
8 Smooth spherical surface
9 Saw tooth thread suitable for plastics
10 Fastening system with integrated threaded bushes
11 Data-Matrix-Code

With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM or FKM.

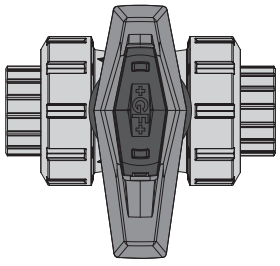
The stems with predefined break point above the upper O-ring help prevent leaks to the outside in case of damage for manual valves. The new designed security break point in the interface allows the user to replace the coupling piece within a few minutes and without interruption if an automated valve is subject to wear.

All ball valves in DN10 – 100 are available as radially removable valves with two threaded connections according to EN ISO 16135.

Valve in open position

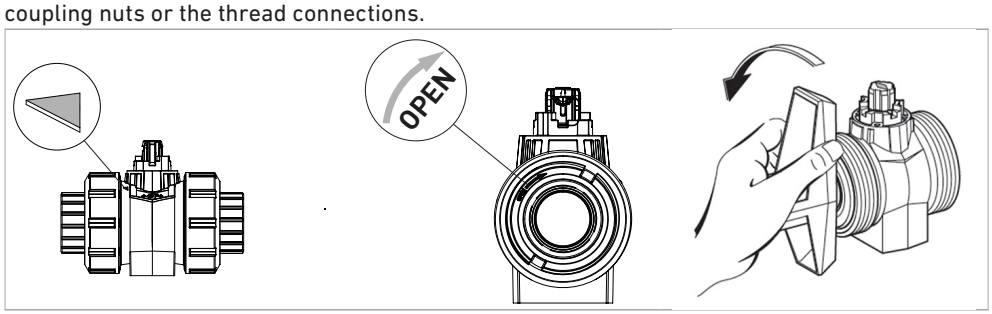


Valve in closed position



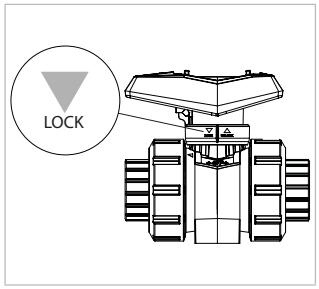
Union bushing

The design of the hand lever serves as a tool for installing the union bushings. The union bushing has a reverse thread in order to avoid unintentional opening when removing the coupling nuts or the thread connections.



Locking function

Move the ball valve to the desired open or closed position and press down the locking ring. Attach lock to eye to protect lever from unauthorized actuation.



Valve handling

Removing the lever

When removing the lever, the locking ring must be in the open position (top).

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.
- For silicone-free ball valves, please consult the special manufacturer's instructions.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

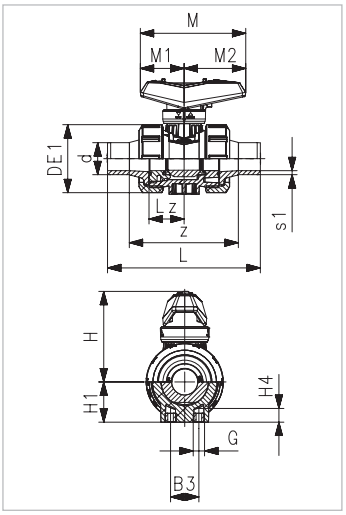
⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Dimensions

Ball Valve type 546 Pro with solvent cement spigots, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	s1 (mm)	z (mm)
16	10	⅜	50	82	35	47	25	M6	12	60.5	27	114	28	3	88
20	15	½	50	82	35	47	25	M6	12	60.5	27	124	28	3	96
25	20	¾	58	106	44	62	25	M6	12	74	30	144	33	3	112
32	25	1	68	106	44	62	25	M8	12	80	36	154	36	4	118
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	174	43	4	134
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	194	45	5	148
63	50	2	124	152	66	86	45	M8	15	116.5	64	224	51	7	170
75	65	2 ½	166	270	64	205	70	M8	15	169	85	284	68	8.5	194
90	80	3	200	270	64	205	70	M8	15	180	105	300	71	10	196
110	100	4	238	326	71	255	120	M12	22	194	123	340	82	12	212

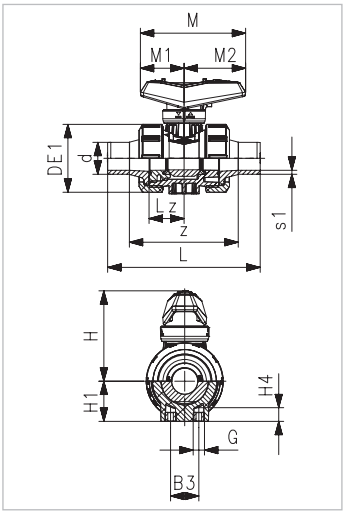
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with socket fusion spigots, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	s1 (mm)	z (mm)
16	10	⅜	50	82	35	47	25	M6	12	60.5	27	110	28	3	84
20	15	½	50	82	35	47	25	M6	12	60.5	27	120	28	3	92
25	20	¾	58	106	44	62	25	M6	12	74	30	139	33	3	107
32	25	1	68	106	44	62	25	M8	12	80	36	150	36	4	114
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	170	43	4	130
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	190	45	5	144
63	50	2	124	152	66	86	45	M8	15	116.5	64	220	51	7	166
75	65	2 ½	166	270	64	205	70	M8	15	169	85	280	68	8.5	190
90	80	3	200	270	64	205	70	M8	15	180	105	196	71	10	92
110	100	4	238	326	71	255	120	M12	22	194	123	336	82	12	208

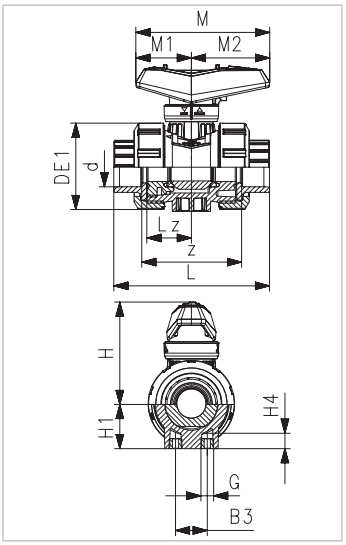
Dimensions based on configuration with PP-H ball valve



Ball Valve type 546 Pro with solvent cement sockets, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	z (mm)
16	10	⅜	50	82	35	47	25	M6	12	60.5	27	92	28	64
20	15	½	50	82	35	47	25	M6	12	60.5	27	95	28	64
25	20	¾	58	106	44	62	25	M6	12	74	30	110	33	72
32	25	1	68	106	44	62	25	M8	12	80	36	123	36	79
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	146	43	94
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	157	45	95
63	50	2	124	152	66	86	45	M8	15	116.5	64	183	51	107
75	65	2 ½	166	270	64	205	70	M8	15	169	85	233	68	144
90	80	3	200	270	64	205	70	M8	15	180	105	254	71	151
110	100	4	238	326	71	255	120	M12	22	194	123	301	82	174

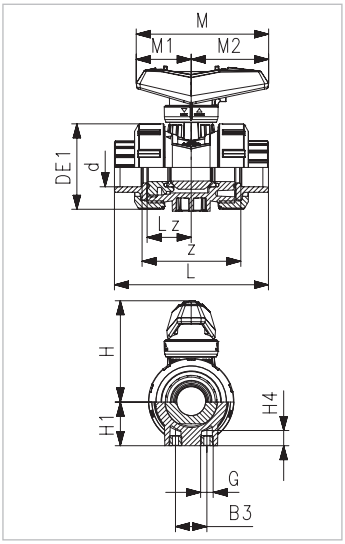
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with fusion sockets, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	z (mm)
16	10	⅜	50	82	35	47	25	M6	12	60.5	27	93	28	67
20	15	½	50	82	35	47	25	M6	12	60.5	27	95	28	66
25	20	¾	58	106	44	62	25	M6	12	74	30	109	33	77
32	25	1	68	106	44	62	25	M8	12	80	36	119	36	83
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	135	43	99
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	147	45	105
63	50	2	124	152	66	86	45	M8	15	116.5	64	168	51	117
75	65	2 ½	166	270	64	205	70	M8	15	169	85	233	68	167
90	80	3	200	270	64	205	70	M8	15	180	105	254	71	180
110	100	4	238	326	71	255	120	M12	22	194	123	301	82	215

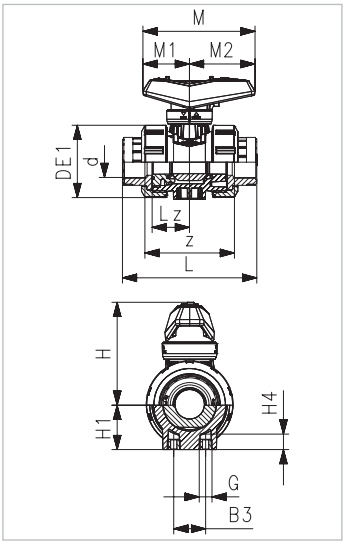
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with threaded sockets, ISO, JIS, ASTM

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	z (mm)
16	10	⅜	50	82	35	47	25	M6	12	60.5	27	95	28	69
20	15	½	50	82	35	47	25	M6	12	60.5	27	100	28	67
25	20	¾	58	106	44	62	25	M6	12	74	30	114	33	78
32	25	1	68	106	44	62	25	M8	12	80	36	127	36	85
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	146	43	100
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	152	45	106
63	50	2	124	152	66	86	45	M8	15	116.5	64	177	51	121
75	65	2 ½	166	270	64	205	70	M8	15	169	85	233	68	144
90	80	3	200	270	64	205	70	M8	15	180	105	254	71	151
110	100	4	238	326	71	255	120	M12	22	194	123	301	82	174

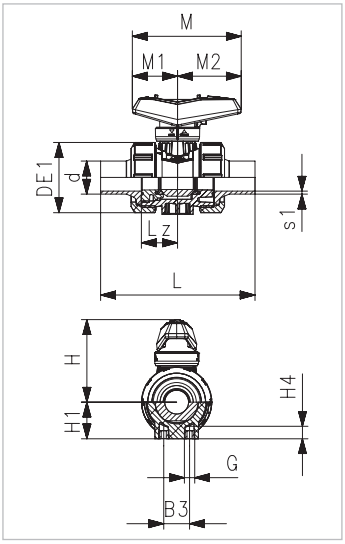
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with butt fusion spigots short, SDR11, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	s1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	1.9
25	20	¾	58	106	44	62	25	M6	12	74	30	143	33	2.3
32	25	1	68	106	44	62	25	M8	12	80	36	150	36	3
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	171	43	3.7
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	191	45	4.6
63	50	2	124	152	66	86	45	M8	15	116.5	64	220	51	5.8
75	65	2 ½	166	270	64	205	70	M8	15	169	85	266	68	8.2
90	80	3	200	270	64	205	70	M8	15	180	105	264	71	10
110	100	4	238	326	71	255	120	M12	22	194	123	301	82	12

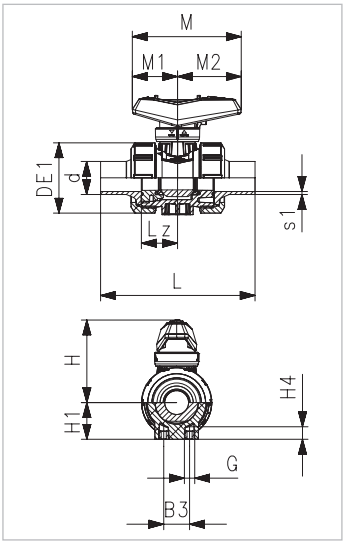
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with butt fusion spigots short, SDR17.6, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	s1 (mm)
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	191	45	2.9
63	50	2	124	152	66	86	45	M8	15	116.5	64	220	51	3.6
75	65	2 ½	166	270	64	205	70	M8	15	169	85	266	68	4.6
90	80	3	200	270	64	205	70	M8	15	180	105	264	71	5.5
110	100	4	238	326	71	255	120	M12	22	194	123	301	82	6.7

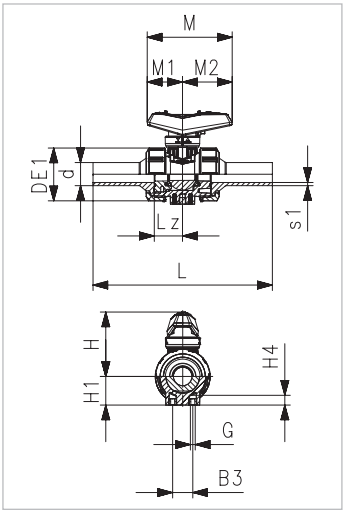
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with butt fusion spigots long, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	s1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	193	28	1.9
25	20	¾	58	106	44	62	25	M6	12	74	30	216	33	2.3
32	25	1	68	106	44	62	25	M8	12	80	36	223	36	3
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	249	43	3.7
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	271	45	4.6
63	50	2	124	152	66	86	45	M8	15	116.5	64	321	51	5.8
75	65	2 ½	166	270	64	205	70	M8	15	169	85	386	68	6.8
90	80	3	200	270	64	205	70	M8	15	180	105	421	71	8.2
110	100	4	238	326	71	205	120	M12	22	194	123	484	82	10.0

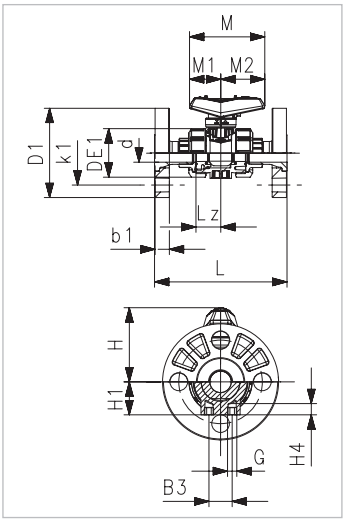
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with backing flanges, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	56
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	75
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	85
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	100
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	110
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	125
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	145
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	160
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	180

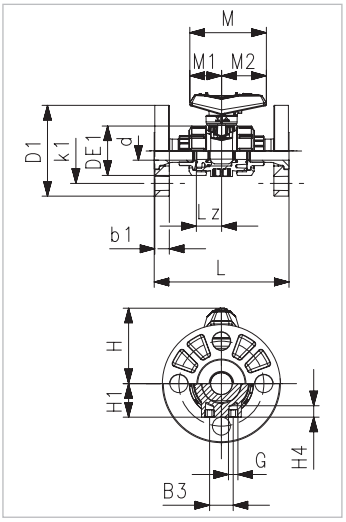
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with backing flanges, ANSI

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	60
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	70
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	79
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	89
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	98
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	121
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	140
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	152
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	190

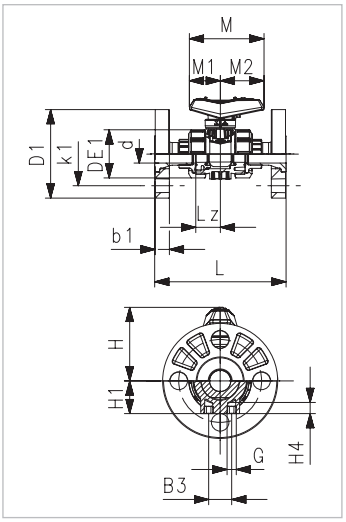
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with backing flanges, JIS

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	70
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	75
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	90
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	100
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	105
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	120
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	140
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	150
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	175

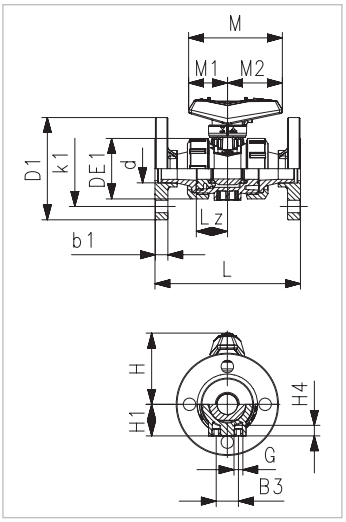
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with fixed flanges serrated, metric

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	56
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	75
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	85
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	100
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	110
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	125
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	145
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	160
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	180

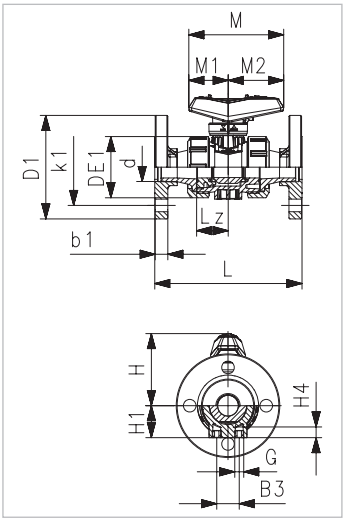
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with fixed flanges serrated, ANSI

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	60
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	70
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	79
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	89
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	98
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	121
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	140
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	152
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	190

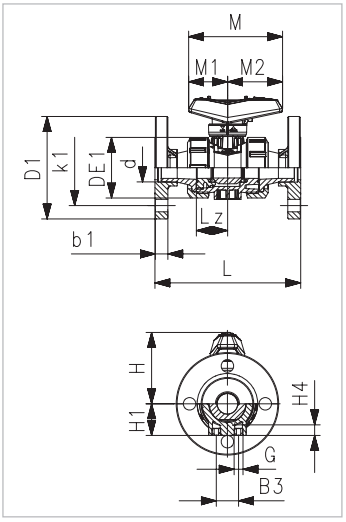
Dimensions based on configuration with PVC-U ball valve



Ball Valve type 546 Pro with fixed flanges serrated,JIS

d (mm)	DN (mm)	Size (inch)	DE1 (mm)	M (mm)	M1 (mm)	M2 (mm)	B3 (mm)	G (mm)	H4 (mm)	H (mm)	H1 (mm)	L (mm)	Lz (mm)	D1 (mm)	k1 (mm)
20	15	½	50	82	35	47	25	M6	12	60.5	27	130	28	95	70
25	20	¾	58	106	44	62	25	M6	12	74	30	150	33	105	75
32	25	1	68	106	44	62	25	M8	12	80	36	160	36	115	90
40	32	1 ¼	84	131	57	74	45	M8	15	95	44	180	43	140	100
50	40	1 ½	97	131	57	74	45	M8	15	101.5	51	200	45	150	105
63	50	2	124	152	66	86	45	M8	15	116.5	64	230	51	165	120
75	65	2 ½	166	270	64	205	70	M8	15	169	85	290	68	185	140
90	80	3	200	270	64	205	70	M8	15	180	105	310	71	200	150
110	100	4	238	326	71	255	120	M12	22	194	123	350	82	238	175

Dimensions based on configuration with PVC-U ball valve



Accessories

Double sensor for electrical position feedback

After being mounted in the valve or in the interface module, the double sensor is used to signal the CLOSED or OPEN position of the valve via an electric signal to a controller, supplied by the customer. The switching states are also output optically via two integrated LEDs.

LED signal color	Function	Code
Closed: Green / Open: Red	PNP	198546001
Closed: Red / Open: Green	PNP	198546002
Closed: Green / Open: Red	NPN	198546005
Closed: Red / Open: Green	NPN	198546006
Closed: Green / Open: Red	NAMUR	198546003
Closed: Red / Open: Green	NAMUR	198546004



Suitable connection cables available as accessories

Spring reset unit, manual actuation (dead man's switch)

The spring reset unit (dead man's switch) is installed onto the ball valve type 546 Pro or type 543 Pro and ensures that the ball valve is closed automatically as soon as the handle is released. It is opened against the spring force.

DN (mm)	Code
DN10/15	198546082
DN20/25	198546083



Interface module, manual actuated

With the manually actuated interface module the open or closed position of the ball valve type 546 Pro or type 543 Pro can be transmitted via an electric signal to a customer control.

DN (mm)	Code	DN10-50	DN65-100
DN10/15	198546102		
DN20/25	198546103		
DN32/40	198546105		
DN50	198546107		
DN65/80	198546108		
DN100	198546109		



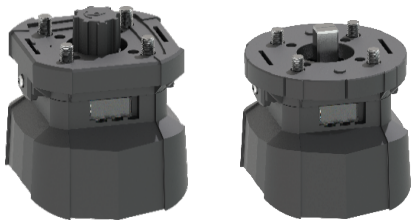


Interface module, automatic actuated

With the help of the automatically actuated interface module, electric or pneumatic actuators can be attached on the ball valve type 546 Pro or type 543 Pro, which allows the automation of the ball valve's change of position. In addition, an interface is available for the installation of an electrical position feedback indicator.

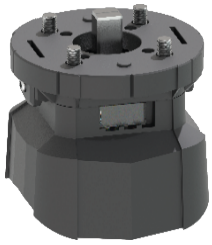
DN (mm)	Code Pneumatic GF actuators PPA	Code Electric GF actuators EA/dEA
DN10/15	198546162	198546142
DN20	198546163	198546143
DN25	198546164	198546144
DN32	198546135	198546145
DN40	198546136	198546146
DN50	198546137	198546147
DN65/80	PPA40 198546165 PPA80 198546166	198546148
DN100	198546167	198546149





DN (mm)	SW	Code Norm actuators according to ISO 5211	DN10-50	DN65-100
DN10/15	SW09	198546122		
DN10/15	SW11/14	198546123		
DN20/25	SW09	198546124		
DN20/25	SW11/14	198546125		
DN32-40	SW11/14	198546126		
DN50	SW11/14	198546127		
DN65/80	SW11	198546128		
DN100	SW14	198546129		





Transparent lever clip

Type 546 Pro or type 543 Pro ball valves can be quickly and easily labelled with the most important information. Operation and maintenance can thus be made safer, faster and clearer. In addition, there are various standards which prescribe a clear marking of the pipeline.

DN (mm)	Pcs.	Code
DN10/15	10 Stk.	198807221
DN20/25	10 Stk.	198807222
DN32/40	5 Stk.	198807223
DN50	5 Stk.	198807224
DN65/80	5 Stk.	198807225
DN100	5 Stk.	198807226







Printed sheets for ball valve lever

Dimension	Code	Quantity	Picture
DN10/15	198 807 231	25 sheets with 48 labels each	
DN10/15	198 807 241	100 sheets with 48 labels each	
DN20/25	198 807 232	25 sheets with 24 labels each	
DN20/25	198 807 242	100 sheets with 24 labels each	
DN32/40	198 807 233	25 sheets with 18 labels each	
DN32/40	198 807 243	100 sheets with 18 labels each	
DN50	198 807 234	25 sheets with 11 labels each	
DN50	198 807 244	100 sheets with 11 labels each	
DN65/80	198 807 235	25 sheets with 6 labels each	
DN100	198 807 236	25 sheets with 4 labels each	

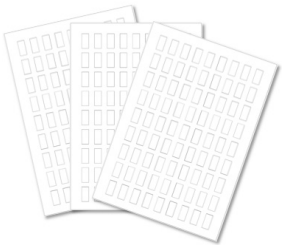


Printed sheets for interface modules

The transparent labeling clips are supplied with the interface modules.

The labeling can be used with hand operated valves with a manual interface as well as with automatically powered ball valves.

Dimension	Code	Quantity	Picture
DN10 - DN100	198 807 230	25 sheets with 81 labels each	



Further accessories

- Hand lever extension
- Adapter for padlocks
- Tool for disassembling interface modules
- Additional limit switches

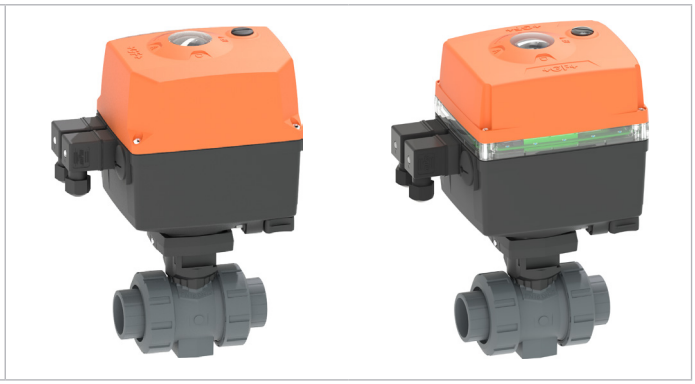
i For further information on accessories, refer to the online product catalogue at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Ball Valve type 546 Pro, electric actuated (Type 127, 179–184)



Type 127
With electric actuator EA15



Type 179 – 184
With electric actuators EA and dEA

Product description

Type 127

The type 127 is designed for automated standard applications with no special demands. The Ball Valve type is based on the Ball Valve type 546 Pro and the electric actuator EA15.

Type 179 – 184

The 179 – 184 series is designed as modular adjustable ball valves for applications which demand special process requirements. Ball valves are based on the Ball Valve type 546 Pro and the electric actuators EA or the smart electric actuator dEA.

Applications

- Chemical process industry
- Water treatment
- Microelectronics
- Measurement and control
- Ship building
- Food & beverage

Benefits/features

Type 127

- Electrical feedback with additional limit switches of different designs integrated into the actuator or interface module
- Integrated emergency manual override
- Optional: Fail-safe return unit with or without integrated battery pack

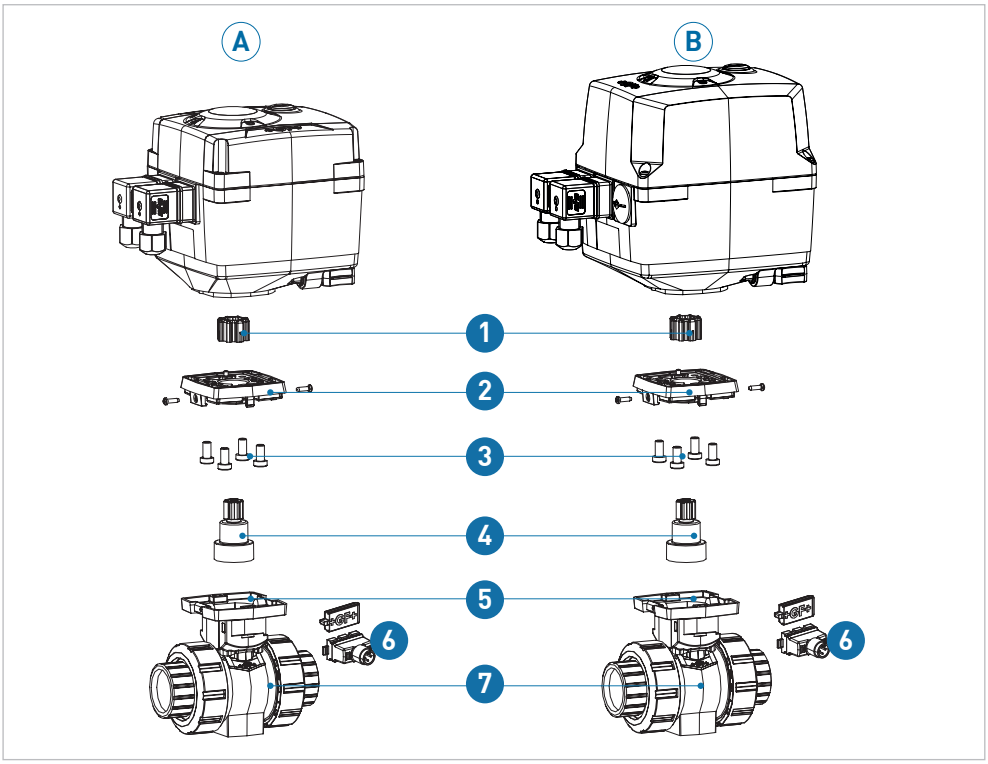
Type 179 – 184

- Electrical feedback with additional limit switches of different designs integrated into the actuator or in the interface module (optional 4-20 mA with Positioner)
- Rotation angle up to 355°; Preset to 0°-90°
- Up to 3 freely selectable stop positions (open/middle/close)
- Integrated emergency manual override
- Optional: Fail-safe return unit with or without integrated battery pack
- Optional: Cycle time monitoring
- Optional: Cycle counter
- Optional: Cycle time extension
- Optional: Motor current monitoring
- Optional: Positioner

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

Technical Data



A Actuator Type EA15
B Actuator Type EA25/EA45/EA120
1 Adapter
2 Adapter plate
3 PT screws
4 Coupling piece
5 Interface housing
6 Labelling clip or double sensor for electrical position feedback (custom versions only)
7 Ball Valve Type 546 Pro

Specification			
Dimensions	Type 127	EA15	d16/DN10 – d63/DN50
	Type 179-184	EA25	d16/DN10 – d63/DN50
		EA45	d75/DN65
		EA120	d90/DN80 – d110/DN100
Base type	Type 546 Pro		
Materials	Type 127, 179-184	PVC-U, PVC-C, ABS, PP-H, PVDF	
Seal materials		EPDM, FKM, FFKM, NBR	
Pressure levels		PN10	
Connections		Socket, spigot, flanges, threaded socket	
Connection standards	ISO, BS, ASTM, JIS		

The following technical data can be found in the Planning Fundamentals under "Ball Valve type 546 Pro, manually operated":

- Pressure-temperature diagram
- Pressure loss
- Flow characteristics
- Kv values
- Reference values for fastening screws

Technical basics

Differences between types 127 and 179 – 184

	Type 127	Type 179	Type 180	Type 181	Type 182	Type 183	Type 184
PVC-U	x	x			x	x	x
PVC-C	x	x			x		x
ABS	x	x				x	
PP-H	x		x				x
PVDF				x			x
ISO	x	x	x	x			
ASTM	x		x	x	x		
BS	x					x	
JIS	x						x

- The actuators are manufactured according to the specification of EN 61010-1, EC 89/336/EEC-EMV 73/23/EEC, LVD.
- All actuators have the CE marking.
- The actuator housings are made of PPGF (fiberglass-reinforced polypropylene) and external, stainless steel screws with low flammability.
- All electric actuators have an emergency manual override and an optical position indicator.

Properties of electric actuators

Actuator	Cycle time	Nominal torque	Actuating cycles at 20 °C	Duty cycle at 25 °C/15min
EA15	5s/90°	10Nm	150 000	40%
EA25 / dEA25	5s/90°	10 Nm	250 000	100%
EA45 / dEA45	6s /90°	20 Nm	100 000	50%
EA120 / dEA120	15s/90°	60 Nm	100 000	50%
EA250 / dEA250	20s/90°	100 Nm	75 000	35%

i All electric actuators have an IP67 rating in accordance with EN 60529 (with vertical installation and appropriate cable connection).

Valve handling

Installation notes

During installation, ensure that the actuator is correctly built onto and connected to the correct valve. In order to guarantee control provided on the customer side, the following points must be observed:

- Actuate valves with 90° rotary movement.
- Indicate the previously calibrated end positions of the valve via an electrical signal to the aforementioned system control.
- If the supply voltage fails, the actuator should remain in its current position. For this purpose, the installation of the manual override or the position reset unit is recommended (see accessories).

In case of interruption in the supply voltage, ensure that the actuator remains in the current position. For this, installation of an emergency manual override or reset unit is recommended (refer to "Accessories").

Maintenance notes

Set maintenance intervals as per the conditions of use (e.g., actuating cycles, medium, ambient temperature). As part of the regular system inspection, carry out the following maintenance activities:

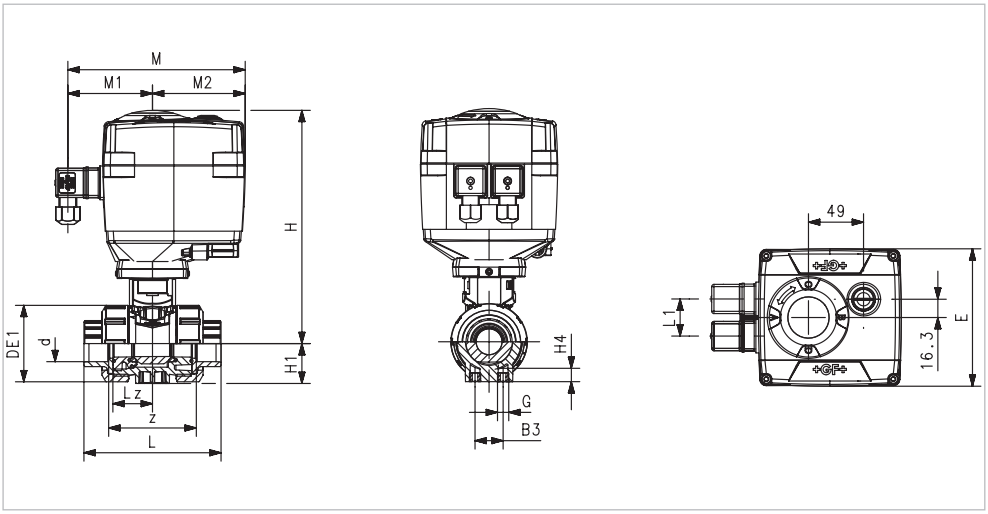
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.
- Check that cover of the emergency manual override is correctly fitted. If necessary, fit cover.
- Check that housing cover of the actuator is fitted with 4 screws. Insert screws if necessary.
- Check if grating noises are coming from the actuator. Replace actuator, see assembly instructions for building valve with actuator.
- Check that position display matches signal of the control. If necessary, adjust limit switches.

For frequent control operations or due to chemical attack on the sealing material, it may become necessary to replace parts inside the valve.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

Type 127 (EA15), solvent cement sockets

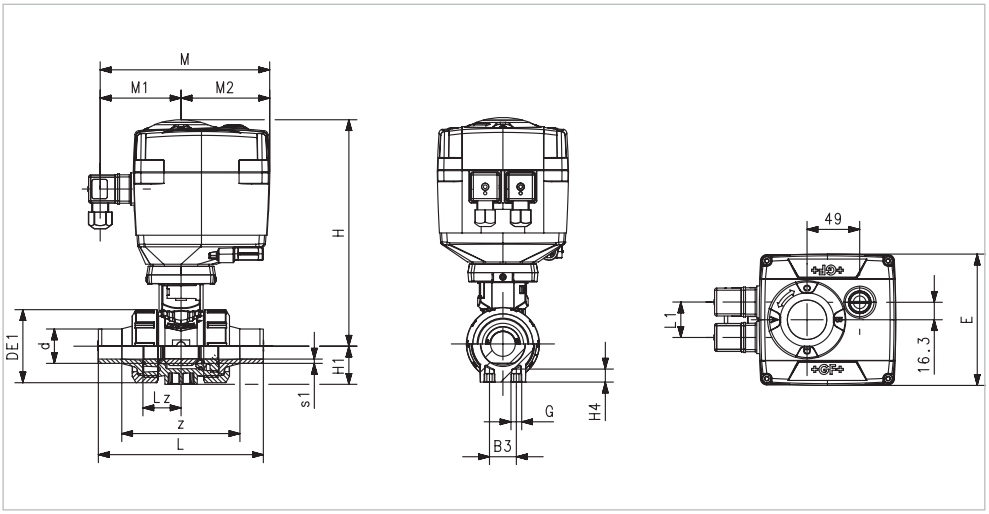


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
16	10	⅜	EA15	25	50	122	M6	197	27	12
20	15	½	EA15	25	50	122	M6	197	27	12
25	20	¾	EA15	25	58	122	M6	201	30	12
32	25	1	EA15	25	68	122	M8	207	36	12
40	32	1 ¼	EA15	45	84	122	M8	213	44	15
50	40	1 ½	EA15	45	97	122	M8	219	51	15
63	50	2	EA15	45	124	122	M8	234	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	z (mm)
16	10	⅜	92	33	28	161	77	83	64
20	15	½	95	33	28	161	77	83	64
25	20	¾	110	33	33	161	77	83	72
32	25	1	123	33	36	161	77	83	79
40	32	1 ¼	146	33	43	161	77	83	94
50	40	1 ½	157	33	45	161	77	83	95
63	50	2	183	33	51	161	77	83	107

Dimensions based on configuration with PVC-U ball valve, metric

Type 127 (EA15), solvent cement spigots

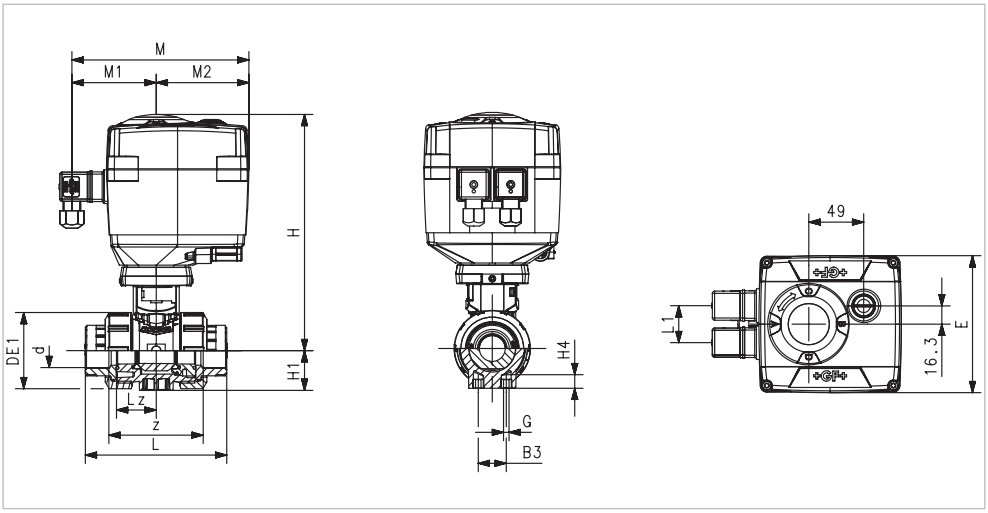


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
16	10	⅜	EA15	25	50	122	M6	197	27	12
20	15	½	EA15	25	50	122	M6	197	27	12
25	20	¾	EA15	25	58	122	M6	201	30	12
32	25	1	EA15	25	68	122	M8	207	36	12
40	32	1 ¼	EA15	45	84	122	M8	213	44	15
50	40	1 ½	EA15	45	97	122	M8	219	51	15
63	50	2	EA15	45	124	122	M8	234	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	z (mm)	s1 (mm)
16	10	⅜	114	33	28	161	77	83	88	3.0
20	15	½	124	33	28	161	77	83	96	3.0
25	20	¾	144	33	33	161	77	83	112	3.0
32	25	1	154	33	36	161	77	83	118	4.0
40	32	1 ¼	174	33	43	161	77	83	134	4.5
50	40	1 ½	194	33	45	161	77	83	148	5.5
63	50	2	224	33	51	161	77	83	170	7.0

Dimensions based on configuration with PP-H ball valve, metric

Type 127 (EA15), threaded sockets, Rp

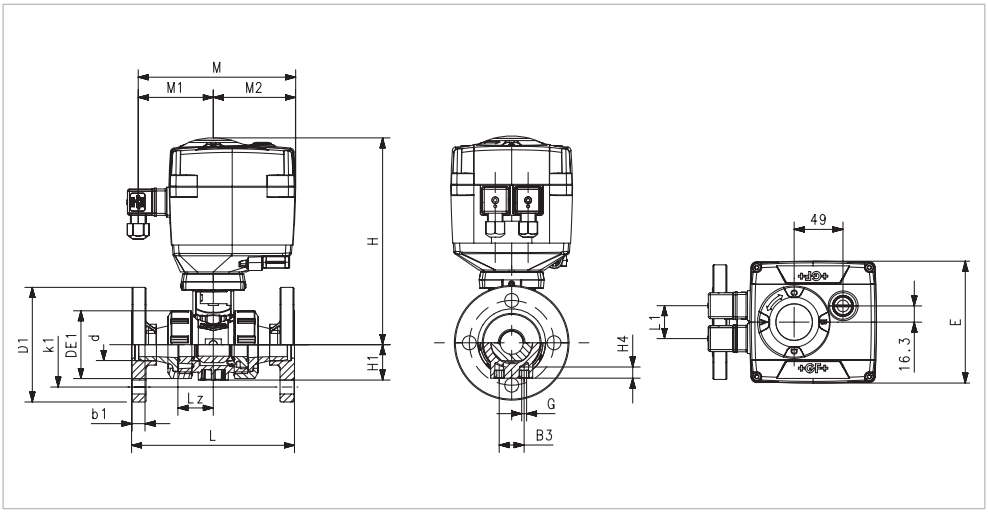


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
16	10	⅜	EA15	25	50	122	M6	197	27	12
20	15	½	EA15	25	50	122	M6	197	27	12
25	20	¾	EA15	25	58	122	M6	201	30	12
32	25	1	EA15	25	68	122	M6	207	36	12
40	32	1 ¼	EA15	45	84	122	M8	213	44	15
50	40	1 ½	EA15	45	97	122	M8	219	51	15
63	50	2	EA15	45	124	122	M8	234	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	z (mm)
16	10	⅜	95	33	28	161	77	83	88
20	15	½	100	33	28	161	77	83	96
25	20	¾	114	33	33	161	77	83	112
32	25	1	127	33	36	161	77	83	118
40	32	1 ¼	146	33	43	161	77	83	134
50	40	1 ½	152	33	45	161	77	83	148
63	50	2	177	33	51	161	77	83	170

Dimensions based on configuration with PVC-U ball valve, Rp

Type 127 (EA15), fixed flanges

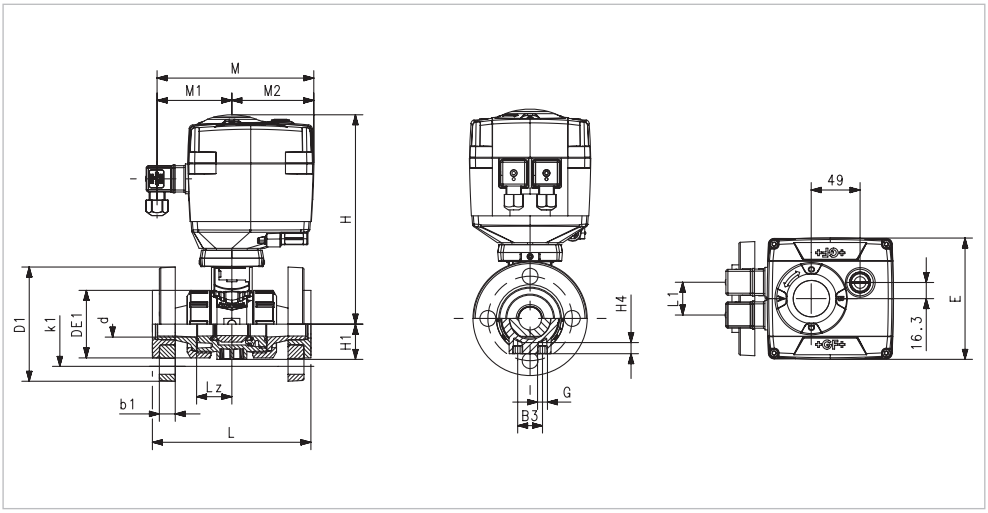


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
20	15	½	EA15	25	50	122	M6	197	27	12
25	20	¾	EA15	25	58	122	M6	201	30	12
32	25	1	EA15	25	68	122	M6	207	36	12
40	32	1 ¼	EA15	45	84	122	M8	213	44	15
50	40	1 ½	EA15	45	97	122	M8	219	51	15
63	50	2	EA15	45	124	122	M8	234	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	b1 (mm)	D1 (mm)	k1 (mm)
20	15	½	100	33	28	161	77	83	12	95	56
25	20	¾	114	33	33	161	77	83	12	105	75
32	25	1	127	33	36	161	77	83	14	115	85
40	32	1 ¼	146	33	43	161	77	83	16	140	100
50	40	1 ½	152	33	45	161	77	83	16	150	110
63	50	2	177	33	51	161	77	83	18	165	125

Dimensions based on configuration with PVC-U ball valve, metric

Type 127 (EA15), backing flanges

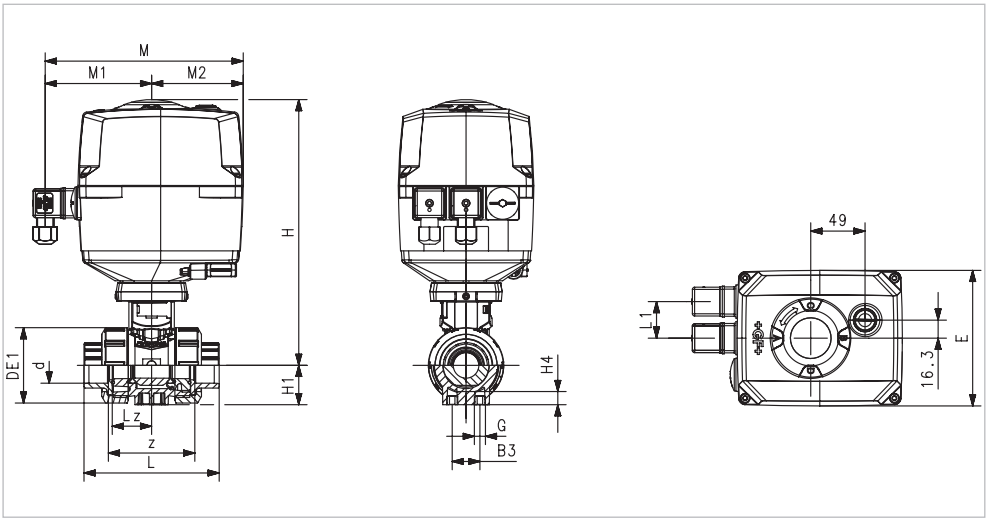


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
20	15	½	EA15	25	50	122	M6	197	27	12
25	20	¾	EA15	25	58	122	M6	201	30	12
32	25	1	EA15	25	68	122	M6	207	36	12
40	32	1 ¼	EA15	45	84	122	M8	213	44	15
50	40	1 ½	EA15	45	97	122	M8	219	51	15
63	50	2	EA15	45	124	122	M8	234	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	b1 (mm)	D1 (mm)	k1 (mm)
20	15	½	130	33	28	161	77	83	12	95	60
25	20	¾	150	33	33	161	77	83	12	105	70
32	25	1	160	33	36	161	77	83	14	115	79
40	32	1 ¼	180	33	43	161	77	83	16	140	89
50	40	1 ½	200	33	45	161	77	83	16	150	98
63	50	2	230	33	51	161	77	83	18	165	121

Dimensions based on configuration with PVC-U ball valve, metric

Type 179 – 184 (EA25-250), solvent cement sockets

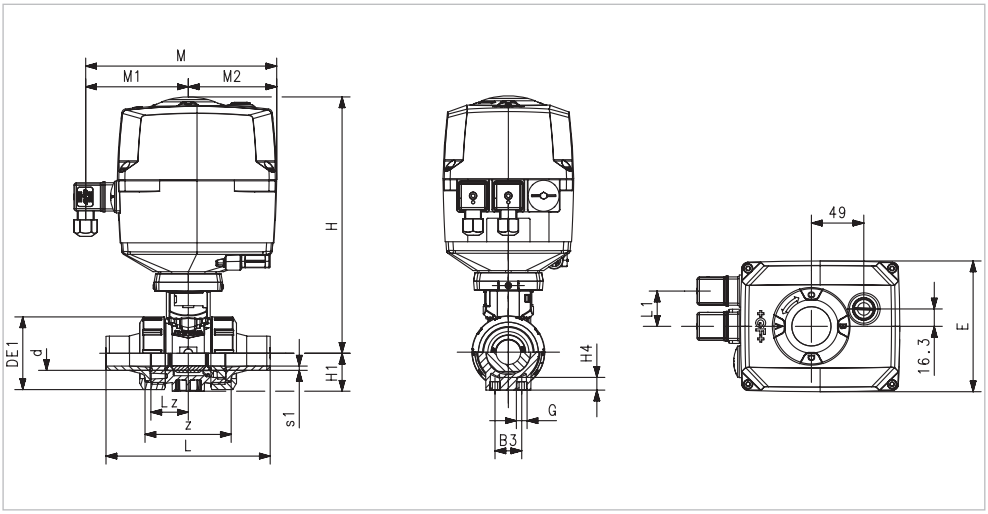


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
16	10	⅜	EA25	25	50	122	M6	227	27	12
20	15	½	EA25	25	50	122	M6	227	27	12
25	20	¾	EA25	25	58	122	M6	231	30	12
32	25	1	EA25	25	68	122	M8	237	36	12
40	32	1 ¼	EA25	45	84	122	M8	243	44	15
50	40	1 ½	EA25	45	97	122	M8	249	51	15
63	50	2	EA25	45	124	122	M8	264	64	15
75	65	2 ½	EA45	70	166	122	M8	313	85	15
90	80	3	EA45	70	200	122	M8	325	105	15
110	100	4	EA120	120	128	122	M12	363	123	22

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	z (mm)
16	10	⅜	92	33	28	180	97	83	64
20	15	½	95	33	28	180	97	83	64
25	20	¾	110	33	33	180	97	83	72
32	25	1	123	33	36	180	97	83	79
40	32	1 ¼	146	33	43	180	97	83	94
50	40	1 ½	157	33	45	180	97	83	95
63	50	2	183	33	51	180	97	83	107
75	65	2 ½	233	33	68	180	98	83	144
90	80	3	254	33	71	180	98	83	151
110	100	4	301	33	82	180	98	83	174

Dimensions based on configuration with PVC-U ball valve, metric

Type 179 – 184 (EA25-250), fusion spigots

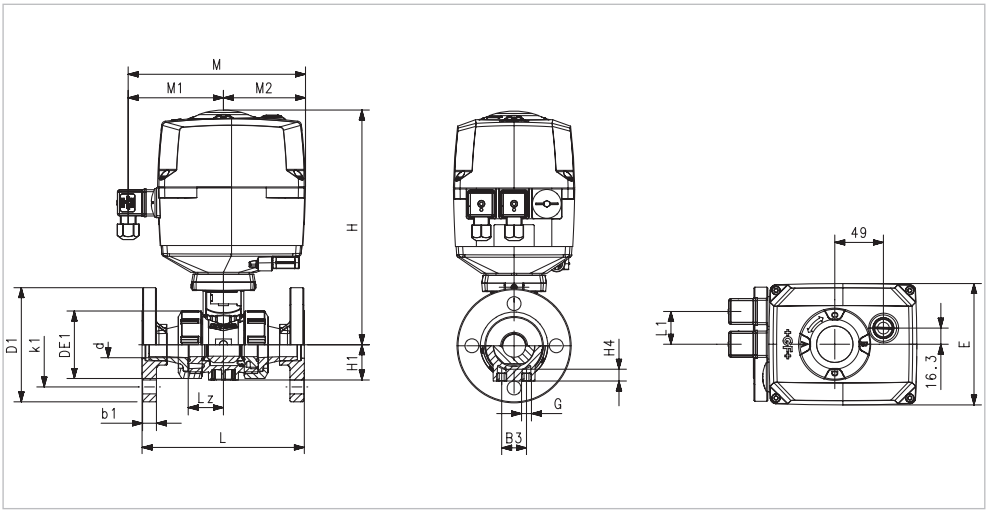


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
20	15	½	EA25	25	50	122	M6	227	27	12
25	20	¾	EA25	25	58	122	M6	231	30	12
32	25	1	EA25	25	68	122	M8	237	36	12
40	32	1 ¼	EA25	45	84	122	M8	243	44	15
50	40	1 ½	EA25	45	97	122	M8	249	51	15
63	50	2	EA25	45	124	122	M8	264	64	15
75	65	2 ½	EA45	70	166	122	M8	313	85	15
90	80	3	EA45	70	200	122	M8	325	105	15
110	100	4	EA120	120	238	122	M12	363	123	22

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	z (mm)	s1 (mm)
20	15	½	130	33	28	180	97	83	92	1.9
25	20	¾	143	33	33	180	97	83	107	2.3
32	25	1	150	33	36	180	97	83	114	3
40	32	1 ¼	171	33	43	180	97	83	130	3.7
50	40	1 ½	191	33	45	180	97	83	144	4.6
63	50	2	220	33	51	180	97	83	166	5.8
75	65	2 ½	266	33	68	180	98	83	190	8.2
90	80	3	264	33	71	180	98	83	192	10
110	100	4	301	33	82	180	98	83	208	12

Dimensions based on configuration with PP-H ball valve, metric

Type 179 – 184 (EA25-250), fixed flanges

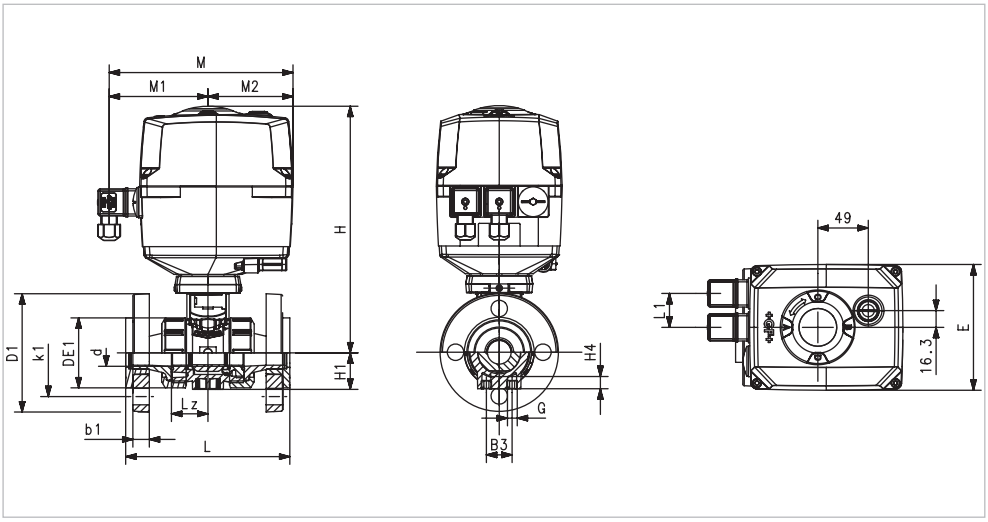


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
20	15	½	EA25	25	50	122	M6	227	27	12
25	20	¾	EA25	25	58	122	M6	231	30	12
32	25	1	EA25	25	68	122	M6	237	36	12
40	32	1 ¼	EA25	45	84	122	M8	243	44	15
50	40	1 ½	EA25	45	97	122	M8	249	51	15
63	50	2	EA25	45	124	122	M8	264	64	15

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	b1 (mm)	D1 (mm)	k1 (mm)
20	15	½	130	33	28	180	97	83	12	95	70
25	20	¾	150	33	33	180	97	83	12	105	75
32	25	1	160	33	36	180	97	83	14	115	90
40	32	1 ¼	180	33	43	180	97	83	16	140	100
50	40	1 ½	200	33	45	180	97	83	16	150	105
63	50	2	230	33	51	180	97	83	18	165	120

Dimensions based on configuration with PVC-U ball valve, metric

Type 179 – 184 (EA25-250), backing flanges



d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	DE1 (mm)	E (mm)	G (mm)	H (mm)	H1 (mm)	H4 (mm)
75	65	2 ½	EA45	70	166	122	M8	313	85	15
90	80	3	EA45	70	200	122	M8	325	105	15
110	100	4	EA120	120	238	122	M12	363	123	22

d (mm)	DN (mm)	Size (inch)	L (mm)	L1 (mm)	Lz (mm)	M (mm)	M1 (mm)	M2 (mm)	b1 (mm)	k1 (mm)
75	65	2 ½	290	33	68	180	98	82	18	140
90	80	3	310	33	71	180	98	82	20	150
110	100	4	350	33	82	180	98	82	20	175

Dimensions based on configuration with PVC-U ball valve

Accessories

EA15 / EA25 / EA45 / EA120 / EA250:

- Fail-safe return unit with or without integrated battery package
- AS-interface plug on module
- Limit switch assembly kits for multi function module AgNi, Au, NPN, PNP

EA25 / EA45 / EA120 / EA250:

- Monitoring board with cycle time extension, cycle time monitoring, cycle cycle time monitoring, cycle counter and motor current monitoring
- Positioner board for modulating operation with 4-20 mA Feebback and integrated motor current monitoring
- Profibus DP V0 plug-on module

For further information on accessories, refer to the online product catalog at www.gfps.com

Ball Valve type 546 Pro, electric actuated (Type 104)



Type 104

With electric actuator EA04

Product description

Available in PVC-U, PVC-C and PP-H, the Ball Valve type 104 from GF Piping Systems is an efficient solution for less demanding applications. type 104 is based on the same industrial ball type valve that GF Piping Systems utilizes in other applications. This means that the valve can be removed and serviced. With a duty cycle of 75 %, the valve is suited for a low to median number of actuations.

Applications

- Chemical process industry
- Microelectronics
- Measurement and control
- Shipbuilding
- Food & beverage

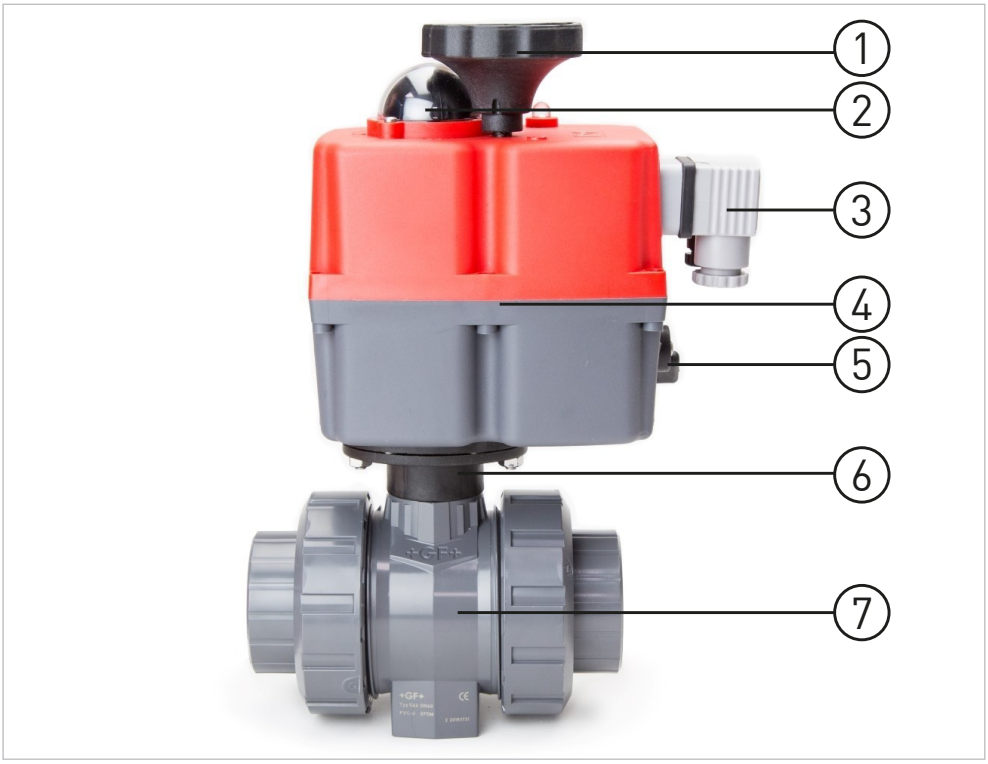
Benefits/features

- Optical position indicator
- Integrated emergency manual override
- Multi-colour led status light as standard
- Integrated mounting inserts for attaching the valve
- All actuators have the CE marking.

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data



1 Eemergency manual override
2 Position indicator
3 Connection for control voltage/feedback
4 Electric actuator EA04
5 Switch emergency manual override
6 Assembly kit
7 Ball Valve Type 546 Pro

Specification			
Dimensions	Type 104	EA04	d16/DN10 – d63/DN50
Ball valve	Type 546 Pro		
Materials	PVC-U, PVC-C, PP-H		
Gasket materials	EPDM, FKM		
Pressure rating	PN10		
Connections	Socket, Spigot, NPT thread		
Nominal torque	20Nm		
Voltage	85 - 240 V AC/DC		
Standards	ISO, BS, ASTM, JIS		

The following technical data can be found in the Planning Fundamentals under "Ball Valve type 546 Pro, manually operated":

- Pressure-temperature diagram
- Pressure loss
- Flow characteristics
- Kv values
- Reference values for screw fastenings

Technical basics

Valve handling

Installation notes

During installation, ensure that the actuator is correctly built onto and connected to the correct valve.

The following points must be observed:

- Actuate valves with 90° rotary movement
- Indicate the previously calibrated end positions of the valve via electrical signal to the aforementioned system control
- In case of interruption in the power supply, ensure that the actuator remains in the current position. For this, installation of an emergency manual override or reset unit is recommended

Maintenance notes

Set maintenance intervals as per the conditions of use (e. g. actuating cycles, medium, ambient temperature). As part of the regular system inspection, carry out the following maintenance activities:

- Regularly check that no medium escapes to the outside
- We recommend a function test for ball valves that are kept permanently in the same position 1 – 2 times per year to check functionality
- Check that cover of the emergency manual override is correctly fitted. If necessary, fit cover
- Check that housing cover of the actuator is fitted with all screws. Insert screws if necessary
- Check if grating noises are coming from the actuator. Replace actuator, see assembly instructions for installing ball valve with electric actuator
- Check that position display matches signal from the controller
- If necessary, adjust limit switches

For frequent control operations or due to chemical attack on the sealing material, it may become necessary to replace parts inside the valve.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Ball Valve type 546 Pro P, pneumatic actuated



Type 546 Pro P, DN10-DN50
with pneumatic actuator PPA08-40,
without manual override



Type 546 Pro P, DN10-DN50
with pneumatic actuator PPA08-40,
with manual override



Type 546 Pro P, DN65-DN100
with pneumatic actuator PPA80,
without manual override

Product description

The pneumatic actuated ball valve series is modularly configurable and designed for applications that require special process requirements. It is based on the ball valve 546 Pro and the pneumatic actuators PPA08, PPA15, PPA40 and PPA80.

Applications

- Chemical process industry
- Water treatment
- Microelectronics
- Measurement and control
- Shipbuilding
- Cooling

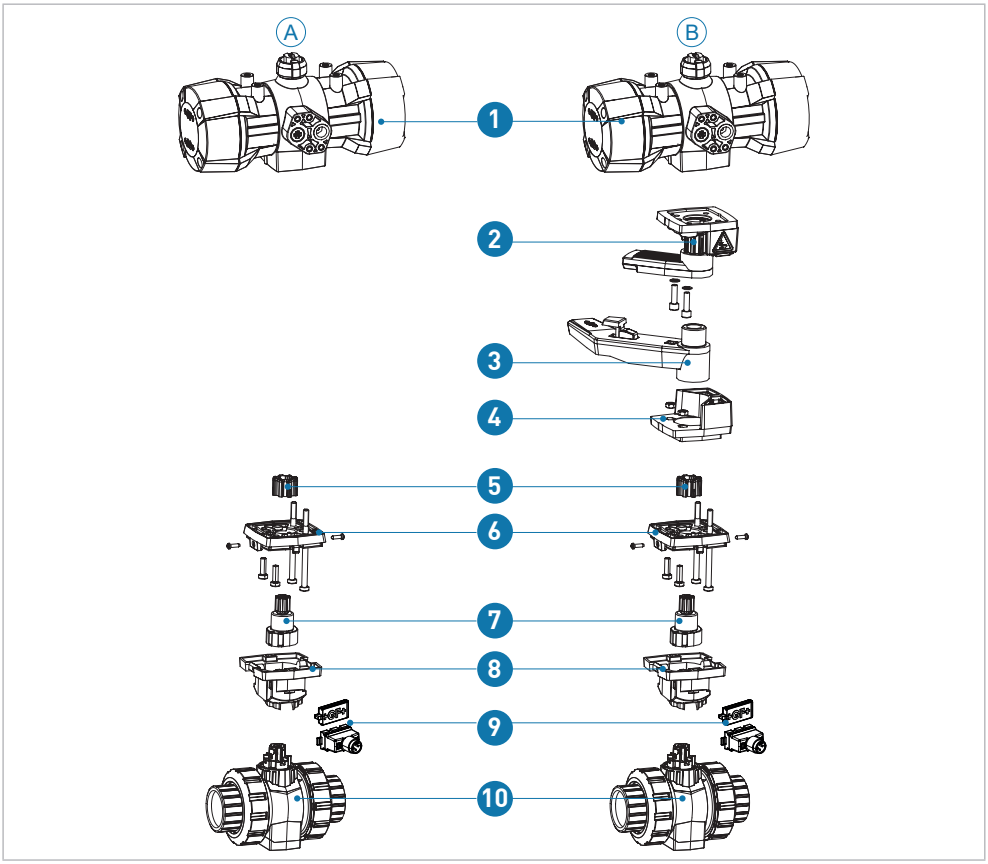
Benefits/features

- Electrical position feedback at the stem of the valve (via optional PNP or NPN double sensor)
- Full plastic solution (housing of PPA actuator made of PP-GF)
- Long service life with more than 50,000 cycles
- Pressure control connection based on NAMUR standard
- Optional with emergency manual override
- Compact design
- Optional positioner and solenoid valve

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is dependent on the selected valve material (see online tool ChemRes PLUS).

Technical data



A Type 546 Pro P, with pneumatic actuator type PPA, without manual override
B Type 546 Pro P, with pneumatic actuator type PPA, with manual override
1 Actuator type PPA
2 Coupling lever with upper intermediate element
3 Control lever
4 Lower intermediate element
5 Adapter
6 Adapter plate
7 Coupling piece
8 Interface housing
9 Labelling clip or double sensor for electrical position feedback
10 Ball Valve Type 546 Pro

Specification		
Dimensions (standard 5.6 bar)	PPA08	DN10 – DN20
	PPA15	DN25 – DN32
	PPA40	DN40 – DN50
	PPA80	DN65 – DN100
Base type	546 Pro	
Materials	PVC-U, PVC-C, ABS, PP-H, PVDF	
Gasket materials	O-rings	EPDM, FKM (other sealings on request)
	Ball seat	PTFE, PVDF
Pressure rating	PN10	
Connections	Socket, spigot, flanges, threaded socket	
Standards	ISO, BS, ASTM, JIS	

The following technical data can be found in the Planning Fundamentals under Ball Valve type 546 Pro, manually operated:

- Pressure-temperature diagram
- Pressure loss
- Flow characteristics
- Kv values
- Reference values for fastening screws

Technical basics

- The actuators are available with the functions fail-safe to close (FC), fail-safe to open (FO) or double-acting (DA) and are provided with an optical position indicator.
- The housing of the actuator is made of fiberglass-reinforced polypropylene (PP-GF) and therefore has low flammability.
- For simple installation of positioners, limit switches and accessories, the actuators have an integrated NAMUR interface. For reliable electrical feedback, the valves are equipped with a interface module that is installed between valve body and actuator.

Valve handling

Installation notes

- The type 546 Pro P ball valves can be controlled to the OPEN and CLOSED positions via a built-on solenoid valve. The solenoid valve is either supplied ex GF works or installed by the customer.
- The OPEN and CLOSED positions can be indicated by the double sensor (available as an accessory), which send an electric signal to the plant control system or optically output the valve position (red/green LED).

Maintenance notes

Ball valves require few maintenance under normal operating conditions (clear water). However, the following measures must be considered:

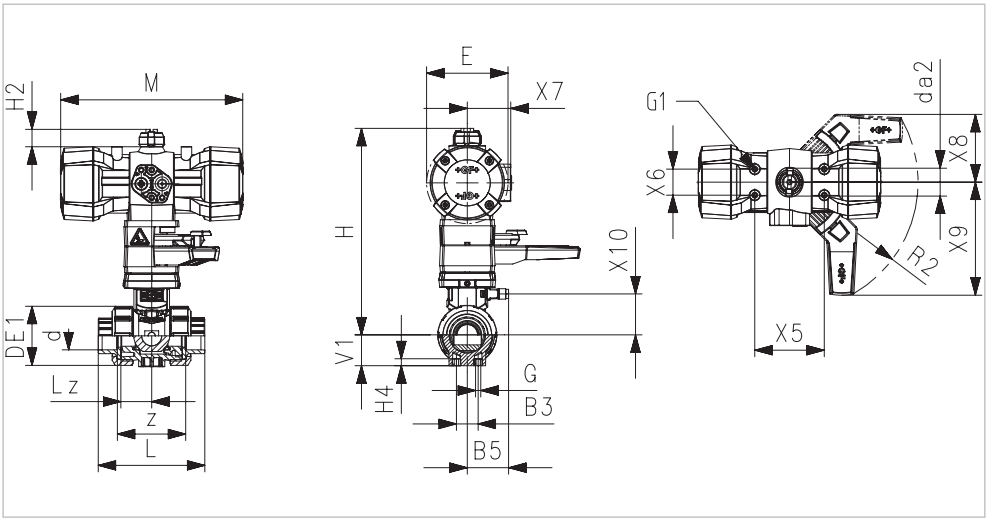
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

For frequent control operations or due to chemical attack on the sealing material, it may become necessary to replace parts inside the valve or the complete valve/ central part. For this purpose, the valve must be removed from the piping system.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is part of the product, see also the online product catalog at www.gfps.com

Dimensions

Type 546 Pro P, FC, with manual override, solvent cement sockets

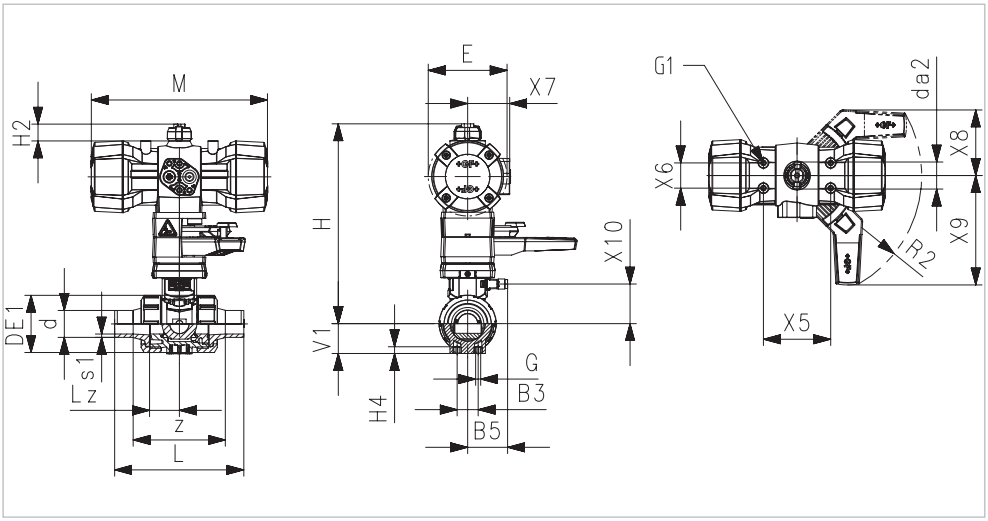


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)	L (mm)	Lz (mm)
16	10	⅜	PPA08	25	25	50	74	M6	M5	215	20	12	92	28
20	15	½	PPA08	25	25	50	74	M6	M5	215	20	12	95	28
25	20	¾	PPA08	25	25	58	74	M6	M5	219	20	12	110	33
32	25	1	PPA15	25	25	68	94	M8	M5	238	20	12	123	36
40	32	1 ¼	PPA15	45	45	84	94	M8	M5	244	20	15	146	43
50	40	1 ½	PPA40	45	45	97	120	M8	M5	273	20	15	157	45
63	50	2	PPA40	45	45	124	120	M8	M5	288	20	15	183	51

d (mm)	DN (mm)	Size (inch)	M (mm)	R2 (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X8 (mm)	X9 (mm)	X10 (mm)	da2 (mm)	z (mm)
16	10	⅜	159	R150	27	80	30	43	78	132	38.0	33	64
20	15	½	159	R150	27	80	30	43	78	132	38.0	33	64
25	20	¾	159	R150	30	80	30	43	78	132	41.9	33	72
32	25	1	211	R150	36	80	30	51	78	132	47.0	33	79
40	32	1 ¼	211	R150	44	80	30	51	78	132	53.5	33	94
50	40	1 ½	246	R150	51	80	30	62	78	132	62.75	33	95
63	50	2	246	R150	64	80	30	62	78	132	77.0	33	107

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, with manual override, solvent cement spigots

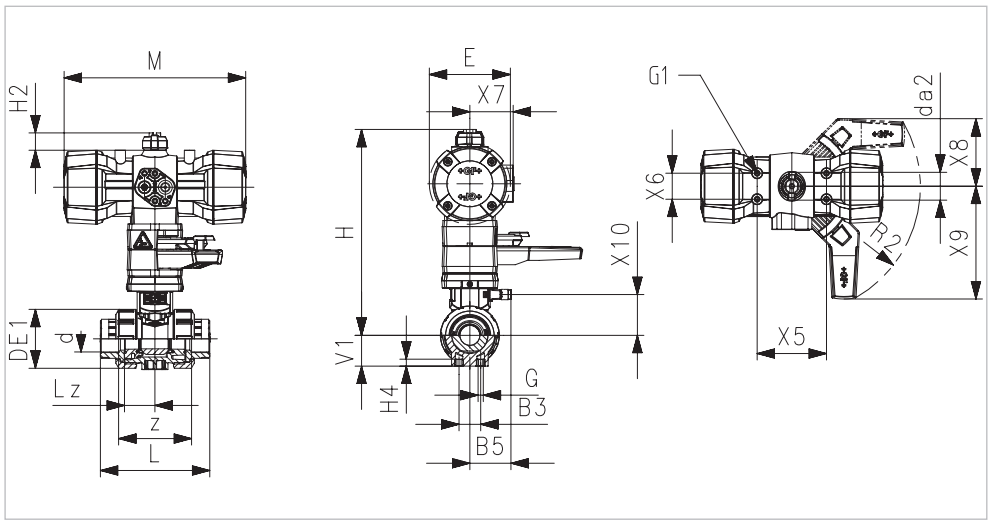


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)	L (mm)	Lz (mm)
16	10	⅜	PPA08	25	16.2	50	74	M6	M5	215	20	12	114	28
20	15	½	PPA08	25	16.2	50	74	M6	M5	215	20	12	124	28
25	20	¾	PPA08	25	17.5	58	74	M6	M5	219	20	12	144	33
32	25	1	PPA15	25	17.5	68	94	M8	M5	238	20	12	154	36
40	32	1 ¼	PPA15	45	23.3	84	94	M8	M5	244	20	15	174	43
50	40	1 ½	PPA40	45	23.3	97	120	M8	M5	273	20	15	194	45
63	50	2	PPA40	45	24.3	124	120	M8	M5	288	20	15	224	51

d (mm)	DN (mm)	Size (inch)	M (mm)	R2 (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X8 (mm)	X9 (mm)	X10 (mm)	da2 (mm)	s1 (mm)	z (mm)
16	10	⅜	159	R150	27	80	30	43	78	132	38.0	33	3.0	88
20	15	½	159	R150	27	80	30	43	78	132	38.0	33	3.0	96
25	20	¾	159	R150	30	80	30	43	78	132	41.9	33	3.0	112
32	25	1	211	R150	36	80	30	51	78	132	47.0	33	4.0	118
40	32	1 ¼	211	R150	44	80	30	51	78	132	53.5	33	4.5	134
50	40	1 ½	246	R150	51	80	30	62	78	132	62.75	33	5.5	148
63	50	2	246	R150	64	80	30	62	78	132	77.0	33	7.0	170

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, with manual override, threaded sockets, Rp

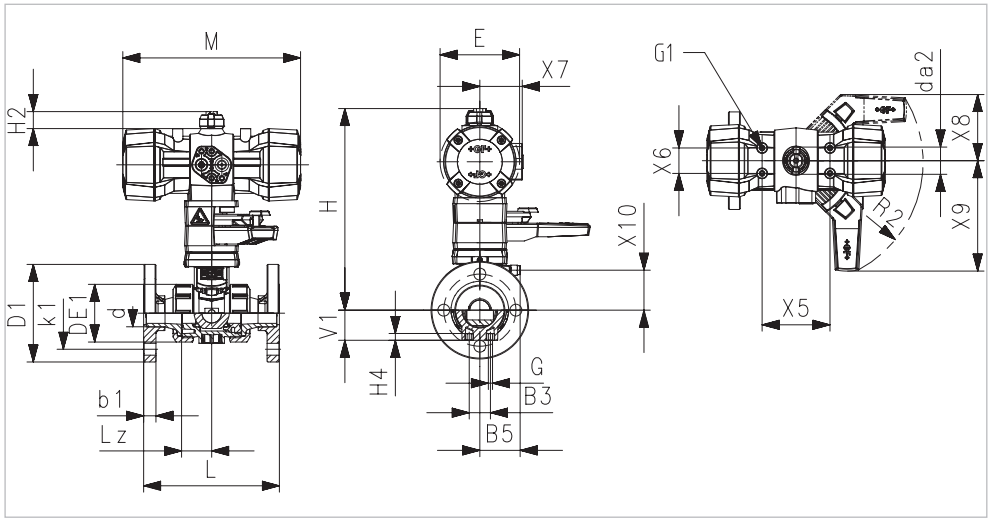


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)	L (mm)	Lz (mm)
16	10	⅜	PPA08	25	16.2	50	74	M6	M5	215	20	12	95	28
20	15	½	PPA08	25	16.2	50	74	M6	M5	215	20	12	100	28
25	20	¾	PPA08	25	17.5	58	74	M6	M5	219	20	12	114	33
32	25	1	PPA15	25	17.5	68	94	M8	M5	238	20	12	127	36
40	32	1 ¼	PPA15	45	23.3	84	94	M8	M5	244	20	15	146	43
50	40	1 ½	PPA40	45	23.3	97	120	M8	M5	273	20	15	152	45
63	50	2	PPA40	45	24.3	124	120	M8	M5	288	20	15	177	51

d (mm)	DN (mm)	Size (inch)	M (mm)	R2 (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X8 (mm)	X9 (mm)	X10 (mm)	da2 (mm)	z (mm)
16	10	⅜	159	R150	27	80	30	43	78	132	38.0	33	69
20	15	½	159	R150	27	80	30	43	78	132	38.0	33	67
25	20	¾	159	R150	30	80	30	43	78	132	41.9	33	78
32	25	1	211	R150	36	80	30	51	78	132	47.0	33	85
40	32	1 ¼	211	R150	44	80	30	51	78	132	53.5	33	100
50	40	1 ½	246	R150	51	80	30	62	78	132	62.75	33	106
63	50	2	246	R150	64	80	30	62	78	132	77.0	33	121

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, with manual override, fixed flanges

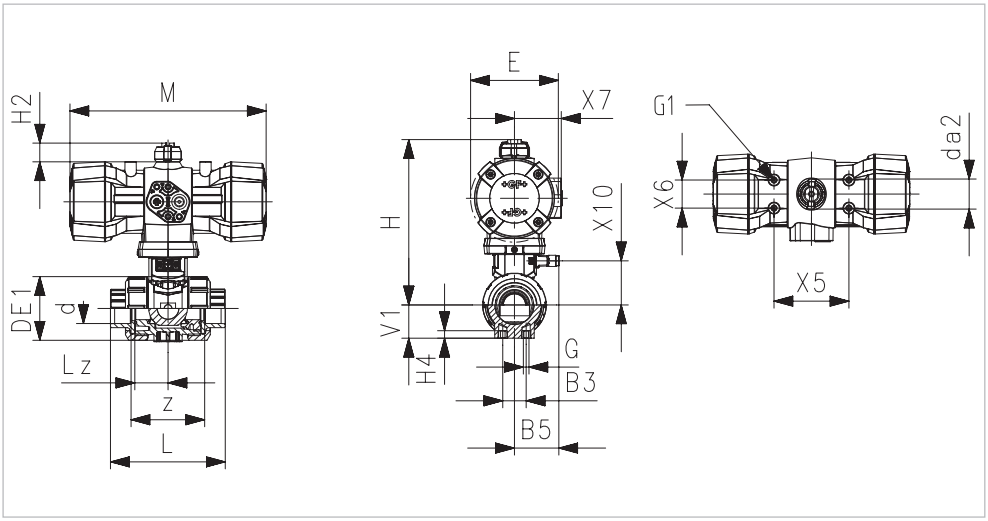


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	D1 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)	L (mm)	Lz (mm)
20	15	½	PPA08	25	16.2	95	50	74	M6	M5	215	20	12	130	28
25	20	¾	PPA08	25	17.5	105	58	74	M6	M5	219	20	12	150	33
32	25	1	PPA15	25	17.5	115	68	94	M8	M5	238	20	12	160	36
40	32	1 ¼	PPA15	45	23.3	140	84	94	M8	M5	244	20	15	180	43
50	40	1 ½	PPA40	45	23.3	150	97	120	M8	M5	273	20	15	200	45
63	50	2	PPA40	45	24.3	165	124	120	M8	M5	288	20	15	230	51

d (mm)	DN (mm)	Size (inch)	M (mm)	R2 (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X8 (mm)	X9 (mm)	X10 (mm)	b1 (mm)	da2 (mm)	k1 (mm)
20	15	½	159	R150	27	80	30	43	78	132	38.0	12	33	56
25	20	¾	159	R150	30	80	30	43	78	132	41.9	12	33	75
32	25	1	211	R150	36	80	30	51	78	132	47.0	14	33	85
40	32	1 ¼	211	R150	44	80	30	51	78	132	53.5	16	33	100
50	40	1 ½	246	R150	51	80	30	62	78	132	62.75	16	33	110
63	50	2	246	R150	64	80	30	62	78	132	77.0	18	33	125

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, without manual override, solvent cement sockets

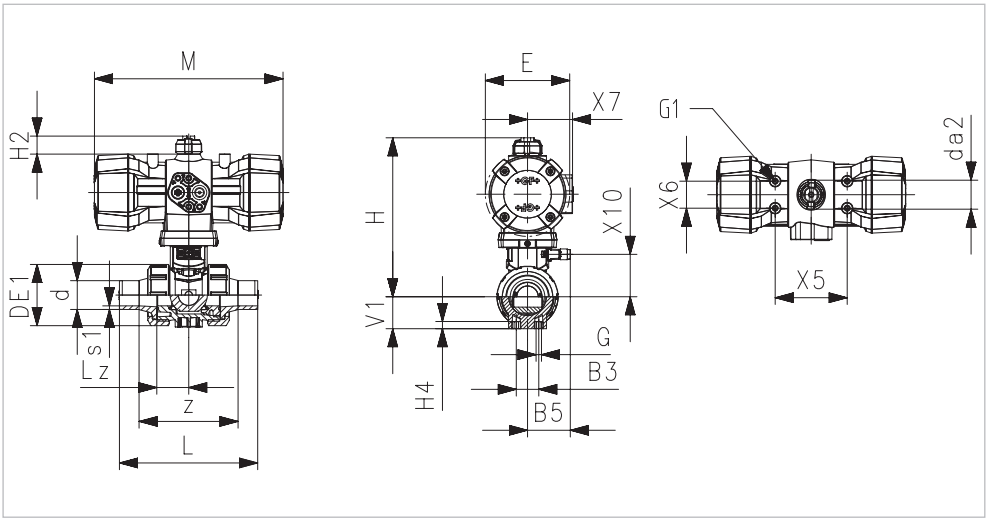


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)
16	10	⅜	PPA08	25	16.2	50	74	M6	M5	155	20	12
20	15	½	PPA08	25	16.2	50	74	M6	M5	155	20	12
25	20	¾	PPA08	25	17.5	58	74	M6	M5	159	20	12
32	25	1	PPA15	25	17.5	68	94	M8	M5	178	20	12
40	32	1 ¼	PPA15	45	23.3	84	94	M8	M5	184	20	15
50	40	1 ½	PPA40	45	23.3	97	120	M8	M5	213	20	15
63	50	2	PPA40	45	24.3	124	120	M8	M5	228	20	15
75	65	2 ½	PPA80	70	28.5	166	142	M8	M5	277	20	15
90	80	3	PPA80	70	28.5	200	142	M8	M5	289	20	15
110	100	4	PPA80	120	28.5	238	142	M12	M5	324	20	22

d (mm)	DN (mm)	Size (inch)	L (mm)	Lz (mm)	M (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X10 (mm)	da2 (mm)	z (mm)
16	10	⅜	92	28	159	27	80	30	43	38.0	33	64
20	15	½	95	28	159	27	80	30	43	38.0	33	64
25	20	¾	110	33	159	30	80	30	43	41.9	33	72
32	25	1	123	36	211	36	80	30	51	47.0	33	79
40	32	1 ¼	146	43	211	44	80	30	51	53.5	33	94
50	40	1 ½	157	45	246	51	80	30	62	62.75	33	95
63	50	2	183	51	246	64	80	30	62	77.0	33	107
75	65	2 ½	233	68	343	85	80	30	74	119.0	33	144
90	80	3	254	71	343	105	80	30	74	131.0	33	151
110	100	4	301	82	343	123	80	30	74	145.0	33	174

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, without manual override, solvent cement spigots

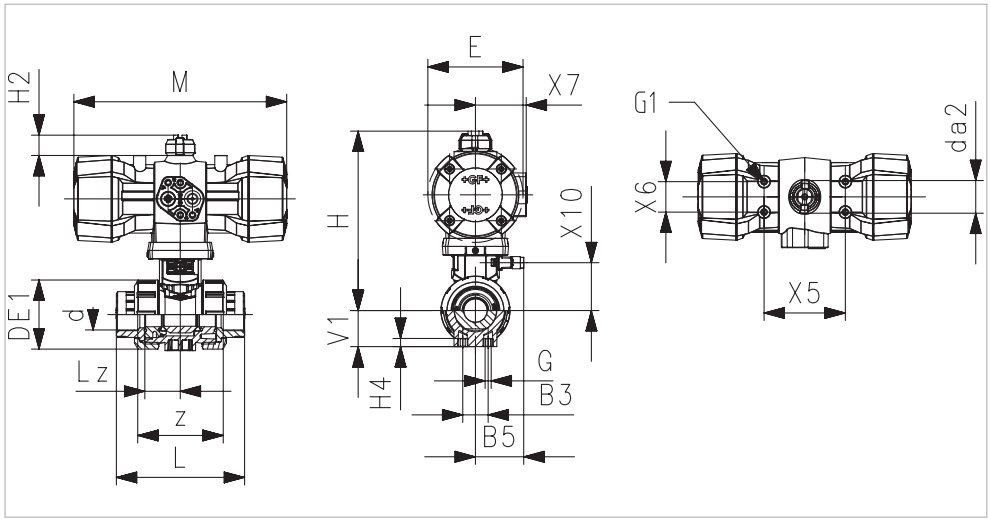


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)
16	10	⅜	PPA08	25	16.2	50	74	M6	M5	155	20	12
20	15	½	PPA08	25	16.2	50	74	M6	M5	155	20	12
25	20	¾	PPA08	25	17.5	58	74	M6	M5	159	20	12
32	25	1	PPA15	25	17.5	68	94	M8	M5	178	20	12
40	32	1 ¼	PPA15	45	23.3	84	94	M8	M5	184	20	15
50	40	1 ½	PPA40	45	23.3	97	120	M8	M5	213	20	15
63	50	2	PPA40	45	24.3	124	120	M8	M5	228	20	15
75	65	2 ½	PPA80	70	28.5	166	142	M8	M5	277	20	15
90	80	3	PPA80	70	28.5	200	142	M8	M5	289	20	15
110	100	4	PPA80	120	28.5	238	142	M12	M5	324	20	22

d (mm)	DN (mm)	Size (inch)	L (mm)	Lz (mm)	M (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X10 (mm)	da2 (mm)	s1 (mm)	z (mm)
16	10	⅜	114	28	159	27	80	30	43	38.0	33	3.0	64
20	15	½	124	28	159	27	80	30	43	38.0	33	3.0	64
25	20	¾	144	33	159	30	80	30	43	41.9	33	3.0	72
32	25	1	154	36	211	36	80	30	51	47.0	33	4.0	79
40	32	1 ¼	174	43	211	44	80	30	51	53.5	33	4.5	94
50	40	1 ½	194	45	246	51	80	30	62	62.75	33	5.5	95
63	50	2	224	51	246	64	80	30	62	77.0	33	7.0	107
75	65	2 ½	284	68	343	85	80	30	74	119.0	33	8.5	144
90	80	3	300	71	343	105	80	30	74	131.0	33	10.0	151
110	100	4	340	82	343	123	80	30	74	145.0	33	12.0	174

Dimensions based on configuration with PP-H ball valve, metric

Type 546 Pro P, FC, without manual override, threaded sockets, Rp

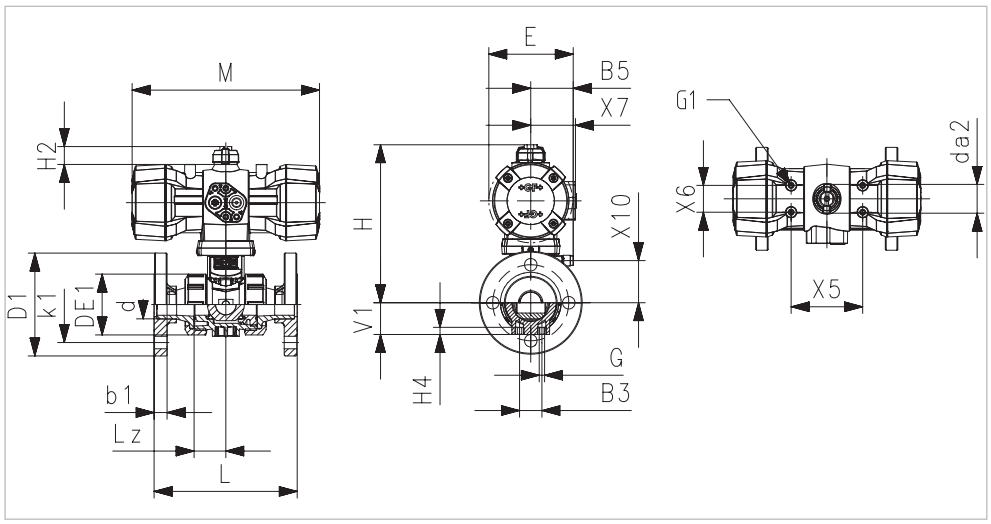


d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)
16	10	⅜	PPA08	25	16.2	50	74	M6	M5	155	20	12
20	15	½	PPA08	25	16.2	50	74	M6	M5	155	20	12
25	20	¾	PPA08	25	17.5	58	74	M6	M5	159	20	12
32	25	1	PPA15	25	17.5	68	94	M8	M5	178	20	12
40	32	1 ¼	PPA15	45	23.3	84	94	M8	M5	184	20	15
50	40	1 ½	PPA40	45	23.3	97	120	M8	M5	213	20	15
63	50	2	PPA40	45	24.3	124	120	M8	M5	228	20	15
75	65	2 ½	PPA80	70	28.5	166	142	M8	M5	277	20	15
90	80	3	PPA80	70	28.5	200	142	M8	M5	289	20	15
110	100	4	PPA80	120	28.5	238	142	M12	M5	324	20	22

d (mm)	DN (mm)	Size (inch)	L (mm)	Lz (mm)	M (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X10 (mm)	da2 (mm)	z (mm)
16	10	⅜	95	28	159	27	80	30	43	38.0	33	69
20	15	½	100	28	159	27	80	30	43	38.0	33	67
25	20	¾	114	33	159	30	80	30	43	41.9	33	78
32	25	1	127	36	211	36	80	30	51	47.0	33	85
40	32	1 ¼	146	43	211	44	80	30	51	53.5	33	100
50	40	1 ½	152	45	246	51	80	30	62	62.75	33	106
63	50	2	177	51	246	64	80	30	62	77.0	33	121
75	65	2 ½	233	68	343	85	80	30	74	119.0	33	144
90	80	3	254	71	343	105	80	30	74	131.0	33	151
110	100	4	301	82	343	123	80	30	74	145.0	33	174

Dimensions based on configuration with PVC-U ball valve, metric

Type 546 Pro P, FC, without manual override, backing flanges



d (mm)	DN (mm)	Size (inch)	Actua-tor	B3 (mm)	B5 (mm)	D1 (mm)	DE1 (mm)	E (mm)	G (mm)	G1 (mm)	H (mm)	H2 (mm)	H4 (mm)
75	65	2 ½	PPA80	70	28.5	166	166	142	M8	M5	277	20	15
90	80	3	PPA80	70	28.5	200	200	142	M8	M5	289	20	15
110	100	4	PPA80	120	28.5	238	238	142	M12	M5	324	20	22

d (mm)	DN (mm)	Size (inch)	L (mm)	Lz (mm)	M (mm)	V1 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	X10 (mm)	b1 (mm)	da2 (mm)	k1 (mm)
75	65	2 ½	290	68	343	85	80	30	74	119.0	18	33	140
90	80	3	310	71	343	105	80	30	74	131.0	20	33	150
110	100	4	350	82	343	123	80	30	74	145.0	20	33	175

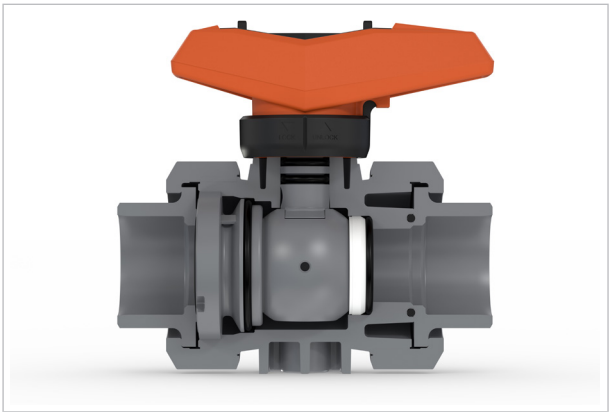
Dimensions based on configuration with PVC-U ball valve, metric

Accessories

- Emergency manual override -10 up to +50 °C
- Double sensor for electrical position feedback
- 3/2-way pilot solenoid valve type PV94/95
- 3/2 – 5/2-way pilot solenoid valve type MNL532
- 4/2-way pilot solenoid valve type 5470
- Pilot valve cluster type PV2000
- Digital positioner type RPC
- Position indicator – Feedback box
- AS-Interface
- See accessories for pneumatic actuator PPA

For further information on accessories, refer to the online product catalog at www.gfps.com

Vented Ball Valve type 546 Pro V



Vented Ball Valve type 546 Pro V
Ball with a vent hole

Product description

The Vented Ball Valve type 546 Pro V features a ball with a precision vent hole.
This internal vent equalizes pressure between the ball cavity and the valve body, matching system pressure to prevent over-pressurization and improve operational safety.
For correct installation, the valve body is marked with a flow direction per ISO 16135, and an orange arrow sticker indicates the correct orientation of the vent hole toward the upstream side for optimal performance and safety.

Function

This critical safety featured Ball Valve is designed for applications where trapped media may release gas or undergo pressure fluctuations due to temperature changes or chemical reactions within the ball cavity.

Benefits/features

The Ball Valve type 546 Pro modular design always adapts the actual requirements. Whether electric, pneumatic or manual operation, including optional accessories, it flexibly meets all requirements.

- Vented Ball – for outgassing media
- Lockable lever equipped as standard
- Manual valve or actuated valve with/without electrical position feedback
- Ergonomic hand lever with integrated tool to open the union bushing
- Labeling in lever (optional)
- Integrated fixation system with mounted threaded inserts as standard
- Spacers keep the line of the piping system and simplify installation
- Individual online configuration is possible
- Unique Data Matrix Code for traceability
- Oil-free version
- Very high flow rate
- Universal interface makes a combination with all electric or pneumatic actuators possible
- Manual spring return unit (dead man lever)

Applications

Vented Ball Valve type 546 Pro V is suitable for handling media that may outgas or evaporate due to temperature fluctuations or chemical reactions. With its vented 3mm hole in the Ball, safety is remarkably improved.

- Chemical Process Industry
- Life Science Industry
- Microelectronics
- Water treatment
- Food & beverage

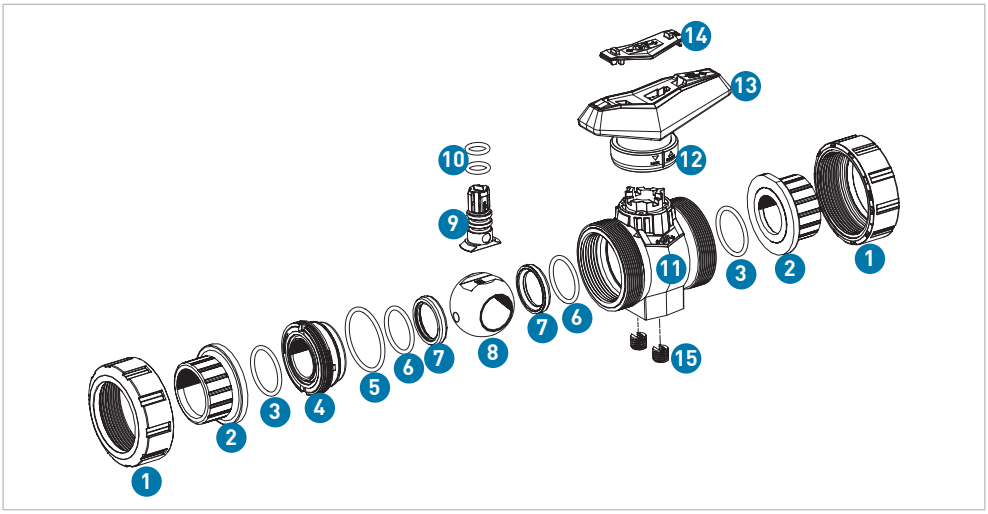
Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

Examples of media of interest

- **Sodium Hypochlorite (NaOCl)** - Unstable in heat and light; decomposes to release chlorine gas (Cl_2) and oxygen.
- **Hydrogen Peroxide (H_2O_2)** – Releases oxygen when exposed to heat, UV light, or catalysts.
- **Organic Peroxides (e.g., Benzoyl Peroxide, Dibenzoyl Peroxide, Methyl Ethyl Ketone Peroxide)** – Used in plastics and coatings and can decompose explosively.
- **Peracetic Acid (PAA, CH_3CO_3H)** – A mixture of acetic acid and hydrogen peroxide that can release oxygen.
- **Sodium Percarbonate ($2Na_2CO_3 \cdot 3H_2O_2$)** – Used as a bleaching agent and releases oxygen upon de-composition.
- **Potassium & Sodium Peroxide (K_2O_2, Na_2O_2)** – React with water to produce oxygen gas.
- **Barium Peroxide (BaO_2)** – Can release oxygen when heated.
- **Chlorine (Cl_2)** – Can liquefy and outgas under certain conditions.
- **Liquefied Petroleum Gas (LPG, Propane, Butane)** – Can evaporate when heated.
- **Ammonia (NH_3)** – Can vaporize and build up pressure.
- **Carbon Dioxide (CO_2)** in liquid form – Can expand and evaporate when warmed, leading to pressure.
- **Liquid Nitrogen (LN_2)** or other cryogenic liquids – Evaporate when warmed, leading to extreme pres-sure buildup.
- **Solvents (e.g., Acetone, Methanol, Ethanol)** – Can evaporate and create pressure in enclosed spaces.
- **Sulfur Dioxide (SO_2)** – Can outgas under certain conditions.

Technical data Type 546 Pro V

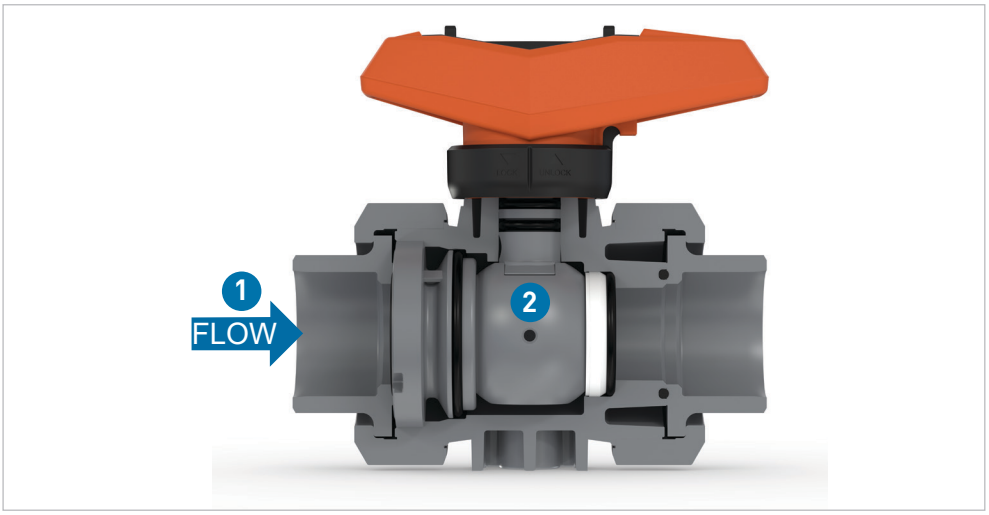


1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball with vent hole
9 Stem
10 Stem seals
11 Body
12 Locking ring
13 Lever (lockable)
14 Lever clip
15 Threaded insert

Specification		
Dimensions	d16/DN10 – d110/DN100, ⅜" – 4"	
Materials	Valve body	PVC-U, PVC-C
	Lever	PP-GF30
Gasket materials	O-rings	EPDM, FKM
	Ball seat	PTFE
Pressure levels	PVC-U / PVC-C	PN16
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigot	ISO
	Threaded socket	Rp, NPT, Rc
	Backing flange	ISO, ANSI, BS, JIS
	Butt fusion spigots	SDR11 and SDR17.6
	PE100 electrofusion spigot or butt fusion spigot	SDR11 and SDR17.6
Actuation variants	Manually operated (lockable hand lever)	
	Pneumatic FC, FO, DA with and without manual override	
	Electrical AC: 100 – 230 V, AC/DC: 24 V, with / without manual override	
Flange standards	EN 1092 PN 10, ASME B16.5 Class 150, BS 1560-3.2 Class 150, JIS B2220 10K	
Third-party actuators	EN ISO 5211	
Marking	DataMatrix-Code with production data	
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, D.M. 174, DNV, FDA, QAP/ITP, NSF/ANSI, SIL, WRAS, ABS, BV, DiBT, RINA, LR	

Technical basics

Design type 546 Pro V - ball with a vent hole



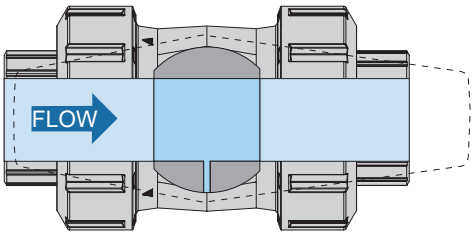
1 Flow direction
2 Ball with a vent hole



Functionality

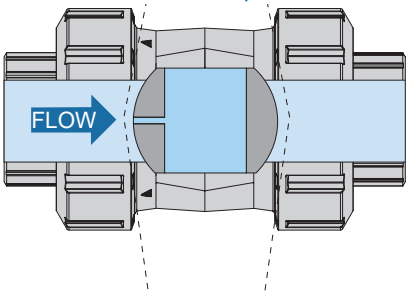
The vented ball valve contains a small hole (3 mm) drilled through the ball into the valve's upstream/inlet side when closed. This prevents pressure build up inside the ball cavity.

Valve in open position



When the valve is open, the media flows freely through the valve and the ventilation hole does not interfere with normal operation.

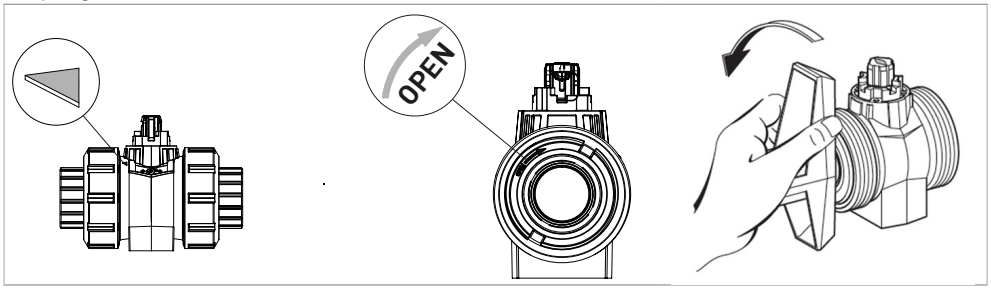
Valve in closed position



When the valve is closed, the vent hole is directed to the inlet side. The vent equalizes me-dia pressure inside the ball cavity to that of the upstream system. As a result, it prevents overpressurization and protects the valve.

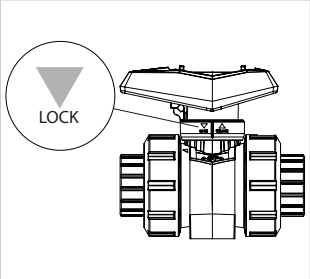
Union bushing

The design of the hand lever serves as a tool for installing the union bushings. The union bushing has a reverse thread in order to avoid unintentional opening when removing the coupling nuts or the thread connections.



Locking function

Move the ball valve to the desired open or closed position and press down the locking ring. Attach lock to eye to protect lever from unauthorized actuation.



Valve handling

Removing the lever

When removing the lever, the locking ring must be in the open position (top).

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.
- For silicone-free ball valves, please consult the special manufacturer's instructions.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

Installation and maintenance must be carried out in accordance with the relevant installation instructions. See the online product catalog at www.gfps.com

For further technical data and variants, refer to type 546 Pro

All technical data, diagrams, and dimensions of the Type 546 Pro V ball valve are identical to those of the Type 546 Pro.

For detailed information on kV values, flow characteristics, pressure-temperature diagrams, pressure losses, operating torque, tightening torques, dimensions, accessories, and actuation options (electric or pneumatic), please refer to the Type 546 Pro datasheet.

For further information, visit: Datasheet type 546 Pro

Linear Ball Valve type 546 Pro

Linear Ball Valve type 546 Pro, manually operated



Linear Ball Valve type 546 Pro
with linear flow characteristics

Product description

In addition to all the familiar details of the 546 series, the Linear Ball Valve type 546 Pro also provides a specially designed ball shape. This enables a linear flow, even at small opening angles. The flow characteristic is linear over the entire opening angle. Thanks to its combinability with an electric actuator, it is the perfect valve for use in demanding control loops.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90° to block the flow passage.

Benefits/features

The Ball Valve type 546 Pro modular design always adapts the actual requirements. Whether electric, pneumatic or manual operation, including optional accessories, it flexibly meets all requirements.

- Special ball design enables high flow rates with linearly increasing flow behavior
- Opening angle in % stamped in the multifunction module
- Minimal dead space
- Ideal control valve
- Dimension range DN15 to DN50
- Lockable lever as standard
- Ergonomic hand lever with integrated tool for opening the union bushing
- Lever labeling (optional)
- Low maintenance
- Spacers keep the level of the piping system constant and facilitate installation
- Integrated fastening system with threaded inserts fitted as standard
- Automation possible with electric or pneumatic actuator
- Manual or automatic valve with/without electrical position indicator
- Individual online configuration possible
- Unique Data Matrix code for traceability
- Oil-free and LABS-cleaned version
- Universal interface makes a combination with all actuators possible

- Manual spring return unit (dead man lever)
- Relief well to avoid gas accumulation possible (e.g. for H2O2)

Applications

The Linear Ball Valve type 546 Pro is suitable for use as a control valve. With its linearly increasing flow rate, it simplifies the setting and control of processes.

- Chemical Process Industry
- Life Science Industry
- Microelectronics
- Measurement and control
- Water treatment
- Food & beverage
- Shipbuilding

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

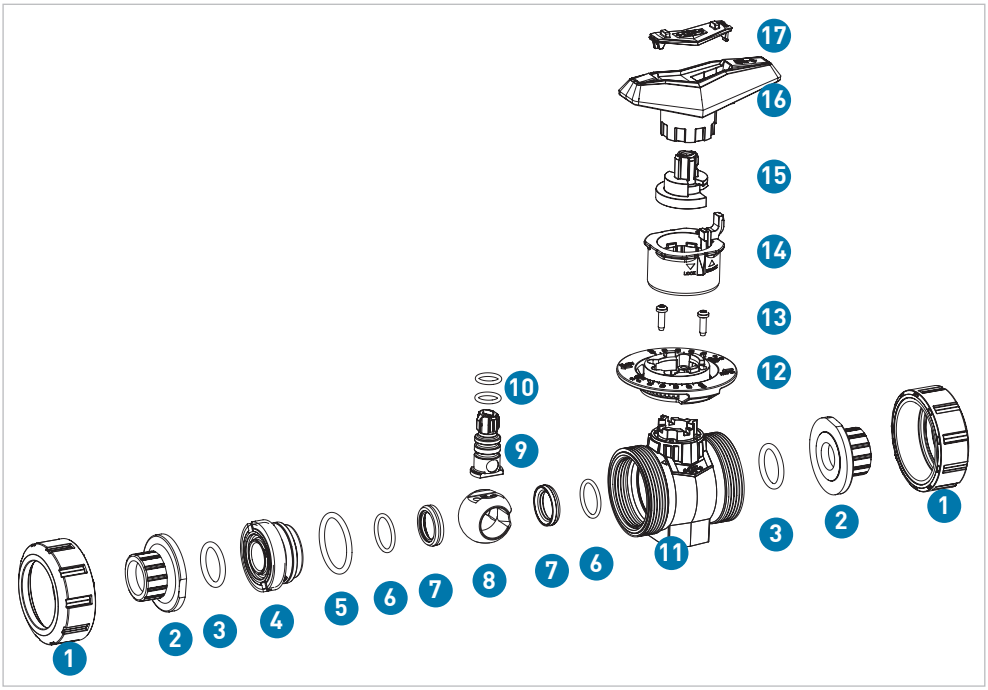
Transport of compressed air

Ball valves type 546 Pro are suitable for compressed air regulation up to 10 bar (at 20 °C). The compressed air must be dry and free of oil. For this application PP-H is recommended as valve body material and FKM* for the gaskets.

Suitable piping systems are ecoFIT (PE) or INSTAFLEX (PB). The ball valve type 546 Pro is available with suitable connection parts.

*FKM is suitable for compressed air containing mineral oil. Some ester oils can attack the material FKM, in such cases the use of EPDM gaskets is recommended.

Technical data



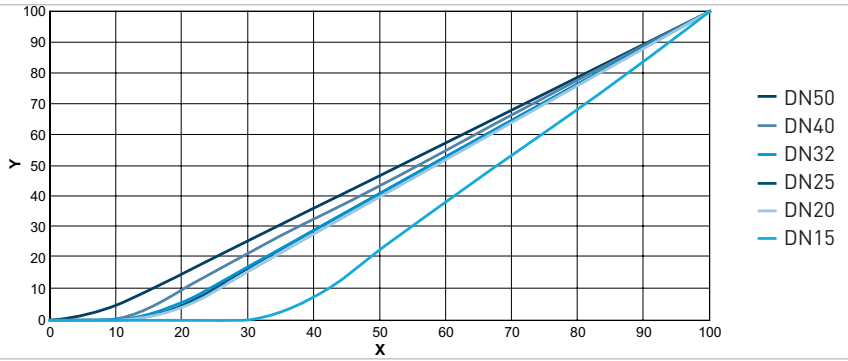
1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball (linear version)
9 Stem
10 Stem seals
11 Body
12 Index plate
13 Screws
14 Adapter with locking function
15 Position indicator
16 Lever (lockable)
17 Lever clip

Specification		
Dimensions	d20/DN15 – d63/DN50	
Materials	Valve body	PVC-U, PVC-C, ABS, PP-H, PVDF
	Lever	PP-GF30
Gasket materials	O-rings	EPDM, FKM, FFKM
	Ball seat	PTFE, PVDF
Pressure levels	ABS / PP-H	PN10
	PVC-U / PVC-C / PVDF	PN16
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigot	ISO
	Threaded socket	Rp, NPT, Rc
	Backing flange	ISO, ANSI, BS, JIS
	Butt fusion spigots	SDR11 and SDR17.6
	PE100 electrofusion spigot or butt fusion spigot	SDR11 and SDR17.6
Actuation variants	Manually operated (lockable hand lever)	
	Pneumatic FC, FO, DA with and without manual override	
	Electrical AC: 100 – 230 V, AC/DC: 24 V, with / without manual override	
Flange standards	EN 1092 PN 10, ASME B16.5 Class 150, BS 1560-3.2 Class 150, JIS B2220 10K	
Third-party actuators	EN ISO 5211	
Marking	DataMatrix-Code with production data	
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, D.M. 174, DNV, FDA, QAP/ITP, NSF/ANSI, SIL, WRAS, ABS, BV, DiBT, RINA, LR	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Linear Ball Valve type 546 Pro		
			Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16			
15	½	20	90	6	5
20	¾	25	166	12	10
25	1	32	235	16	14
32	1 ¼	40	417	29	25
40	1 ½	50	626	44	38
50	2	63	781	55	47

Flow characteristics for Linear Ball Valve type 546 Pro



X Opening angle (%)
Y Kv, Cv value (%)

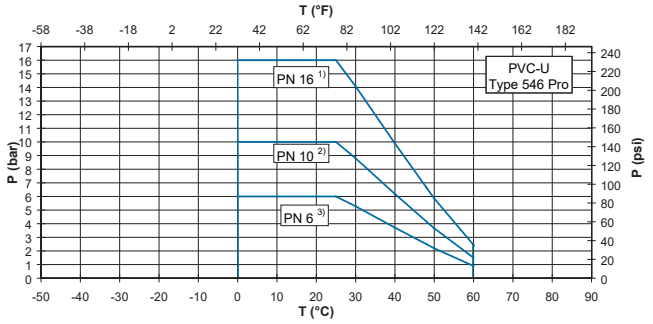
For dimensions d20/DN15, d25/DN20, d32/DN25, d40/DN32, d50/DN40 and d63/DN50, a special ball with linear flow characteristics is available.

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

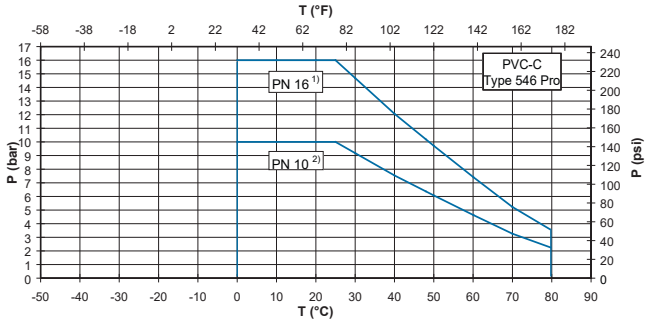
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



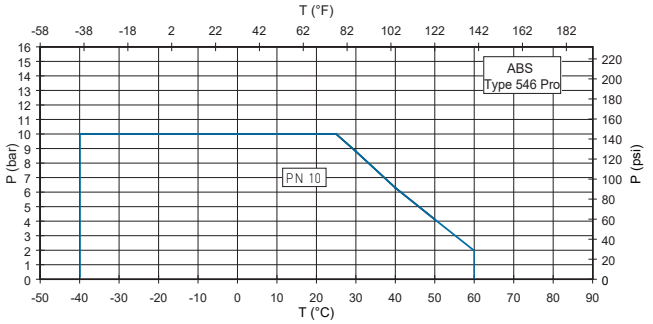
1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10
3) Depending on the connection, the nominal pressure is reduced to PN6

PVC-C

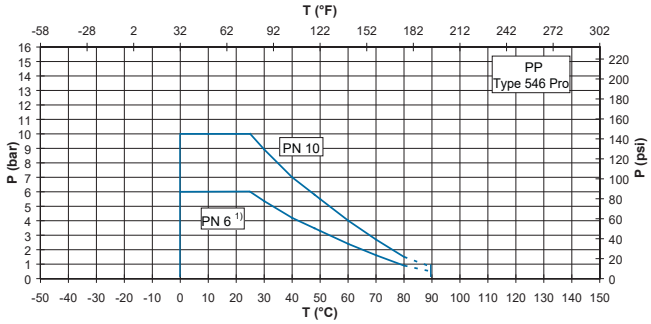


1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10

ABS

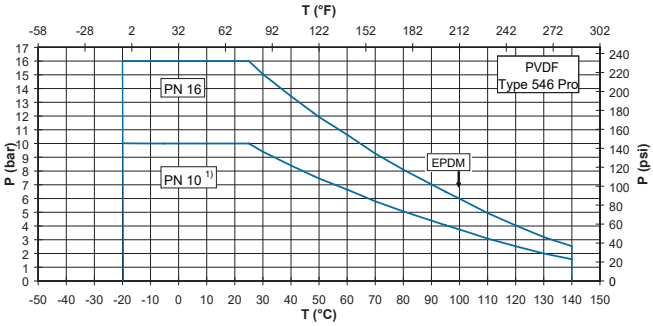


PP



1) For example, ball valve with butt fusion spigot PP or PE100, SDR 17

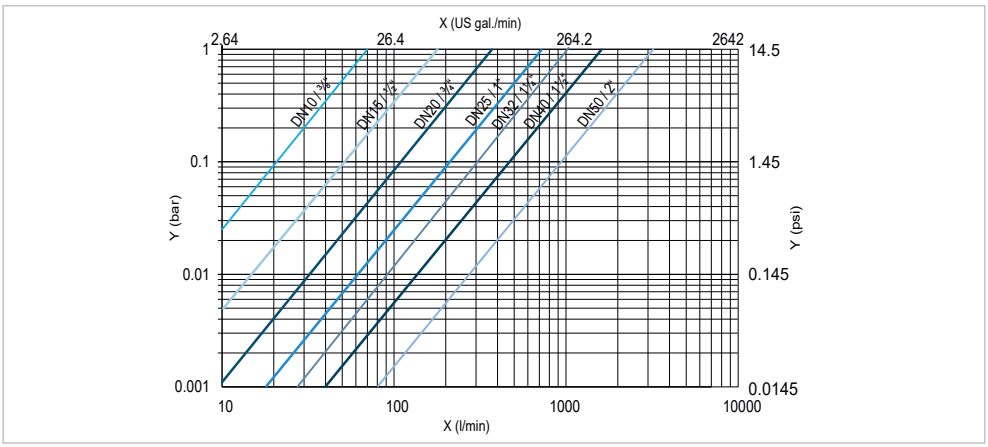
PVDF



1) For example, ball valve with threaded socket EPDM gasket up to max. 100 °C

Pressure losses

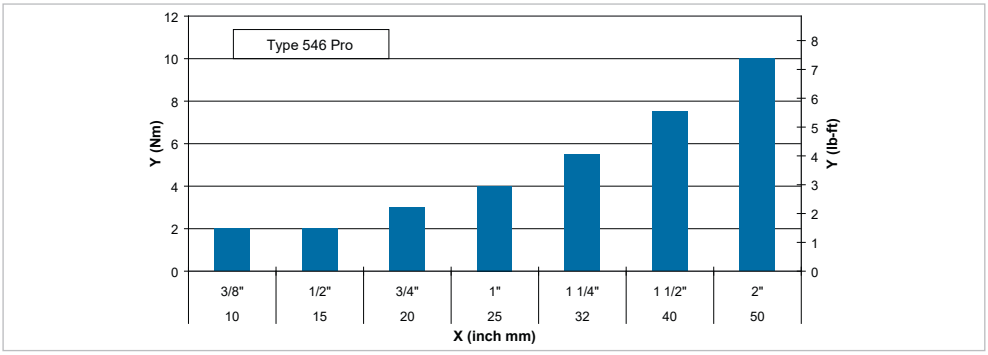
d16/DN10 – d63/DN50



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Operating torque

DN10 – DN50



X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Average values at nominal pressure. Depending on the application (e.g. operating speed, fluid, temperature, etc.) about 2 times the operating torque should be taken for sizing actuators.

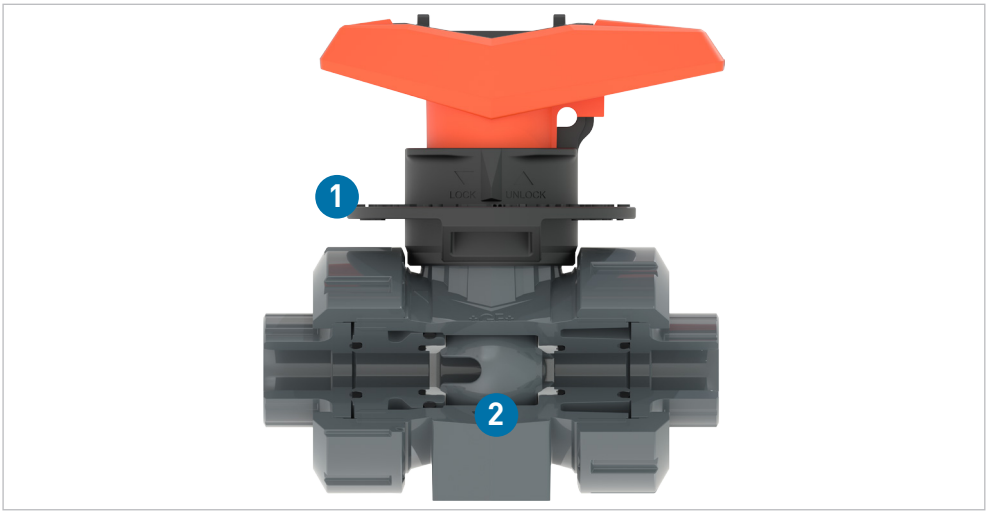
Reference values for tightening torque of screws

Flange connections with profile flange seal or flat gaskets

d	DN	Inch	Total number of screws (for 2 flange connections) standard nut [1]	Torque (Reference values) Profile flange gasket[2]		Torque (Reference values) Flat gasket	
(mm)	(mm)	(inch)		(Nm)	(lb-ft)	(Nm)	(lb-ft)
20	15	½	8 x M12 x 50	10	7.4	10	7.4
25	20	¾	8 x M12 x 55	10	7.4	10	7.4
32	25	1	8 x M12 x 60	10	7.4	15	11
40	32	1 ¼	8 x M16 x 70	15	11	20	15
50	40	1 ½	8 x M16 x 70	15	11	25	18
63	50	2	8 x M16 x 80	20	15	35	26

1) For valve ends type 546 Pro made of PP in combination with backing flanges, use half of the standard nut height
2) Preferred gasket type (suited for plastics)

Technical basics



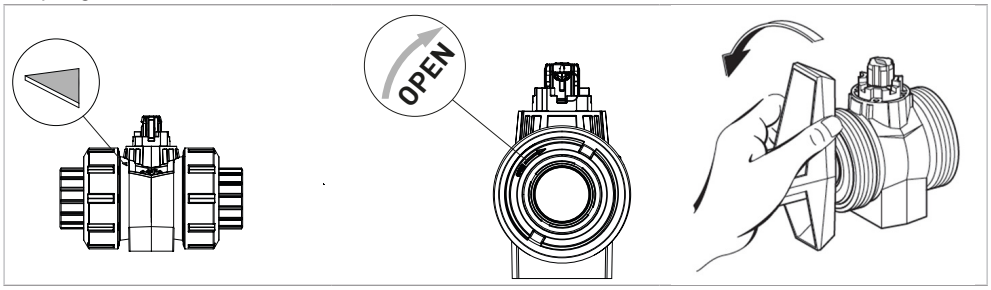
1 Special index plate with opening angle in %
2 Ball with linear flow characteristic



- With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM or FKM.
- The stems with rated break point above the upper O-ring help prevent leaks to the outside in case of damage.

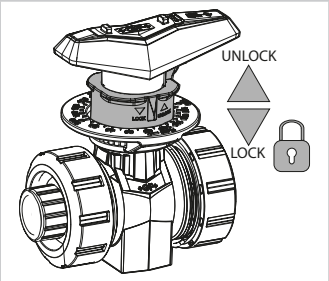
Union bushing

The design of the hand lever serves as a tool for installing the union bushings. The union bushing has a reverse thread in order to avoid unintentional opening when removing the coupling nuts or the thread connections.



Locking function

Move the ball valve to the desired open or closed position and press down the locking ring. Attach lock to eye to protect lever from unauthorized access.



Valve handling

Removing the lever

When removing the lever, the locking ring must be in the open position (top).

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.
- For silicone-free ball valves, please consult the special manufacturer's instructions.

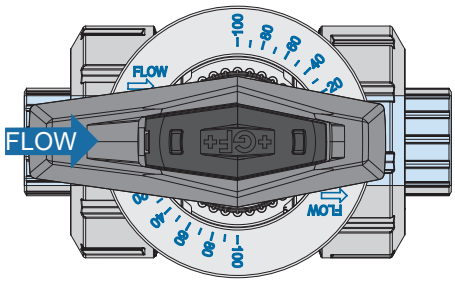
Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

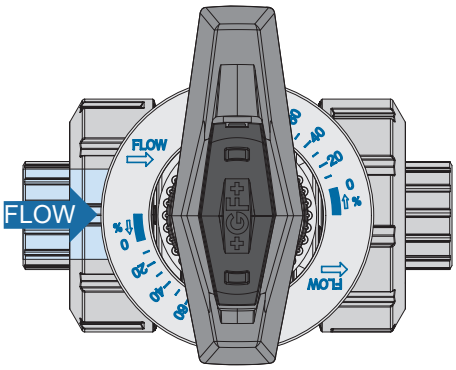
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

Installation and maintenance must be carried out in accordance with the relevant installation instructions. See the online product catalog at www.gfps.com

Valve in open position

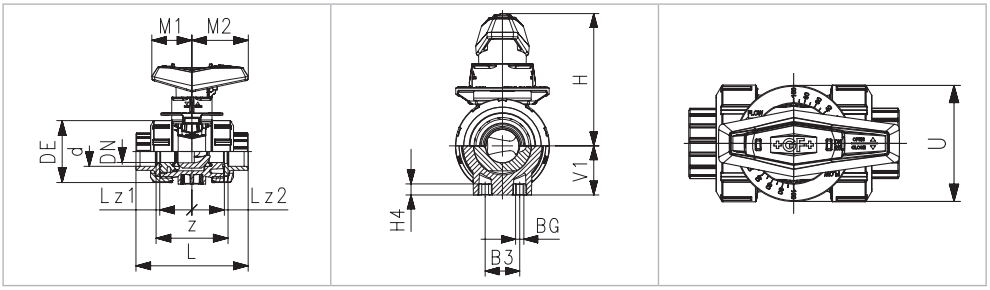


Valve in closed position



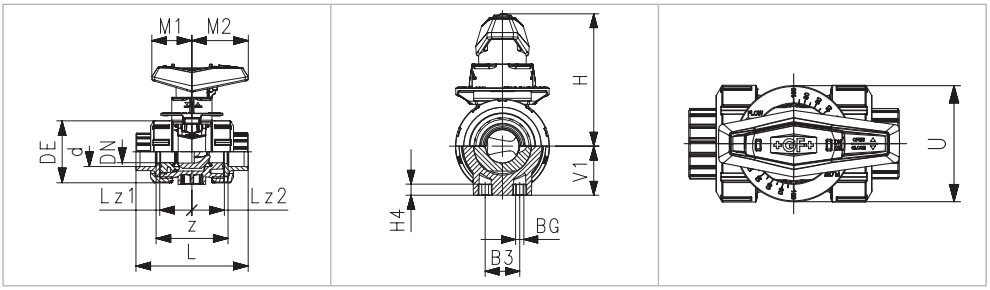
Dimensions

Linear Ball Valve type 546 Pro with solvent cement sockets, metric



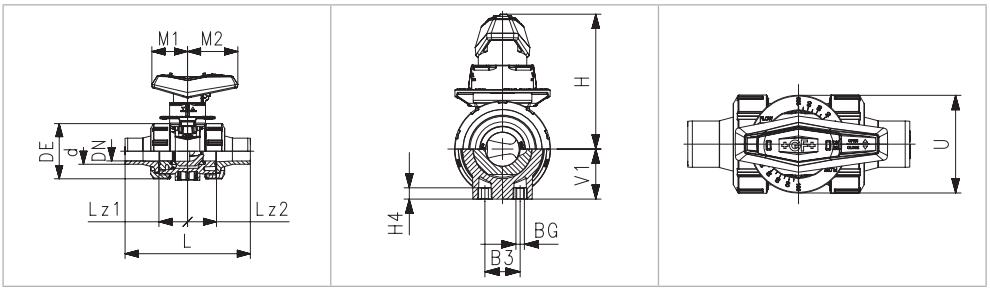
d (mm)	DN (mm)	Size (inch)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
20	15	½	35	47	28.0	28.0	95	27	72	99	50	M6	25	12	59	67
25	20	¾	44	62	32.5	32.5	110	30	91	121	25	M6	25	12	68	76
32	25	1	44	62	35.5	35.5	123	36	96	132	68	M6	25	12	68	82
40	32	1 ¼	57	74	42.5	42.5	146	44	116	160	84	M8	45	15	81	98
50	40	1 ½	57	74	44.5	44.5	157	51	122	173	97	M8	45	15	81	99
63	50	2	66	86	50.5	50.5	183	64	141	205	124	M8	45	15	91	111

Linear Ball Valve type 546 Pro with fusion sockets, metric



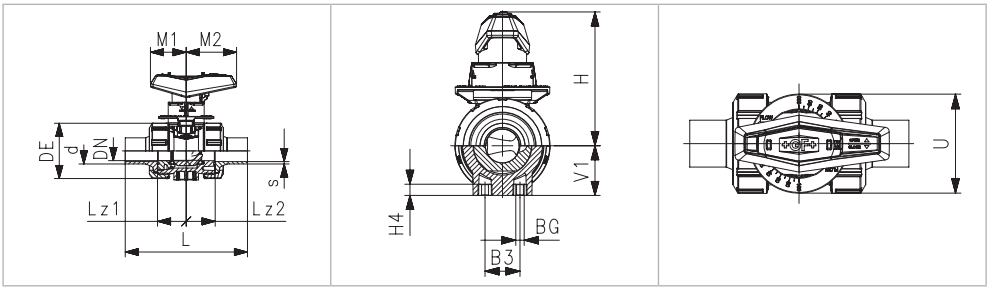
d (mm)	DN (mm)	Size (inch)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
20	15	½	35	47	28.0	28.0	95	27	72	99	50	M6	25	12	59	67
25	20	¾	44	62	32.5	32.5	108	30	91	121	25	M6	25	12	68	76
32	25	1	44	62	35.5	35.5	118	36	96	132	68	M6	25	12	68	82
40	32	1 ¼	57	74	42.5	42.5	136	44	116	160	84	M8	45	15	81	96
50	40	1 ½	57	74	44.5	44.5	147	51	122	173	97	M8	45	15	81	101
63	50	2	66	86	50.5	50.5	168	64	141	205	124	M8	45	15	91	114

Linear Ball Valve type 546 Pro with solvent cement spigots or socket fusion spigots, metric



d (mm)	DN (mm)	Size (inch)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)
20	15	½	35	47	28.0	28.0	95	27	72	99	50	M6	25	12	59
25	20	¾	44	62	32.5	32.5	110	30	91	121	25	M6	25	12	68
32	25	1	44	62	35.5	35.5	123	36	96	132	68	M6	25	12	68
40	32	1 ¼	57	74	42.5	42.5	146	44	116	160	84	M8	45	15	81
50	40	1 ½	57	74	44.5	44.5	157	51	122	173	97	M8	45	15	81
63	50	2	66	86	50.5	50.5	183	64	141	205	124	M8	45	15	91

Linear Ball Valve type 546 Pro with butt fusion spigots short, metric



d (mm)	DN (mm)	Size (inch)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	s (mm)
20	15	½	35	47	28.0	28.0	130	27	72	99	50	M6	25	12	59	1.9
25	20	¾	44	62	32.5	32.5	143	30	91	121	25	M6	25	12	68	2.3
32	25	1	44	62	35.5	35.5	150	36	96	132	68	M6	25	12	68	2.9
40	32	1 ¼	57	74	42.5	42.5	171	44	116	160	84	M8	45	15	81	3.7
50	40	1 ½	57	74	44.5	44.5	191	51	122	173	97	M8	45	15	81	4.6
63	50	2	66	86	50.5	50.5	220	64	141	205	124	M8	45	15	91	5.8

Actuated versions

Linear ball valves type 546 Pro are available as electric actuated and pneumatic actuated versions.

For dimensions and accessories, see ball valve type 546 Pro.

For further information, visit: Datasheet type 546 Pro

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



Metering Ball Valve type 523 Pro



Product description

The strength of the metering Ball Valve type 523 Pro is its ability to reliably control flow even at very low flowrates. The easy to read indicator and uniquely notched ball make precisely controlling media possible.

Applications

- Chemical process
- Life science
- Microelectronics
- Measurement and control
- Water treatment
- Shipbuilding
- Food & beverage

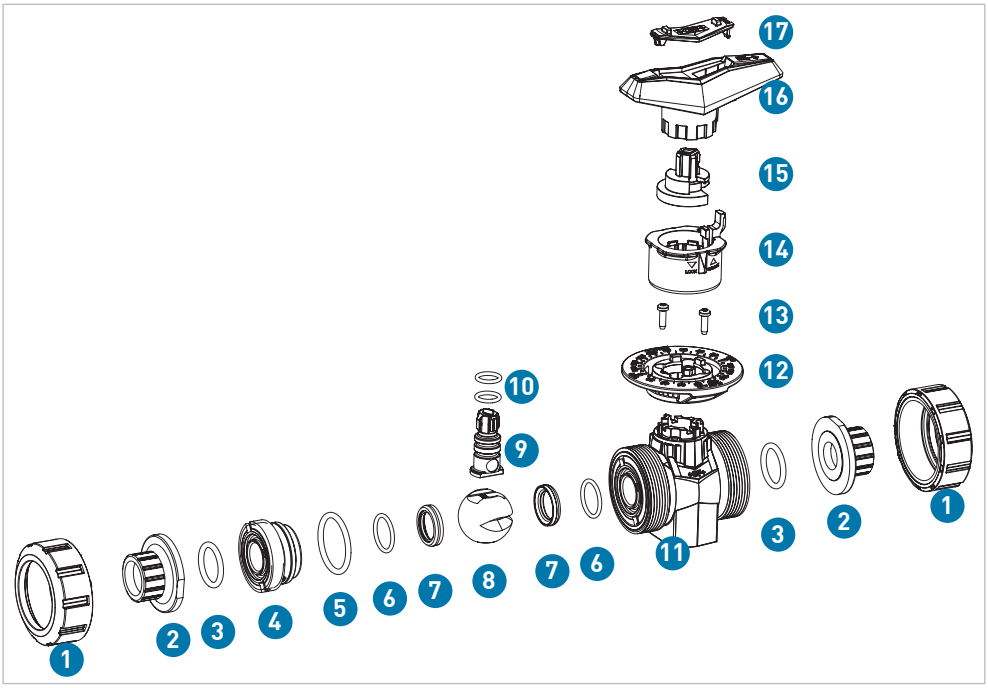
Benefits/features

- Fine adjustment of the dosage by special V-notch ball
- Opening angle scaled in 0° - 180° on the index plate
- Specially designed for flow control
- True union for easy installation and removal
- Lockable lever equipped as standard
- Ergonomic hand lever with integrated tool to open the union bushing
- Labeling in lever (optional)
- Integrated fixation system with mounted threaded inserts as standard
- Spacers keep the level of the piping system constant and simplify installation
- Unique Data Matrix Code for traceability

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is dependent on the selected valve material (see online tool ChemRes PLUS).

Technical data



1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball (metering version)
9 Stem
10 Stem seals
11 Body
12 Index plate
13 Screws
14 Adapter with locking function
15 Position indicator
16 Lever (lockable)
17 Lever clip

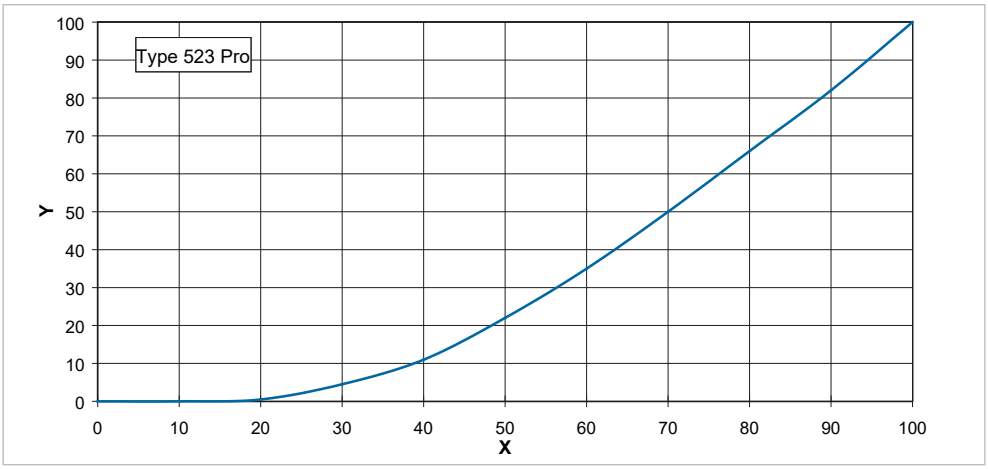
Specification		
Dimensions	d16/DN10 – d20/DN15, ⅜“ – ½“	
Materials	Valve body	PVC-U, PVC-C, PP-H, PVDF
	Lever	PP-GF30
Seal materials	O-rings	EPDM, FKM
	Ball seat	PTFE
Rated pressure	PN16/10	
Actuation variants	Manually operated	
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigots	ISO
	Threaded socket	Rp, NPT, Rc
	Backing flange	ISO, ANSI, BS, JIS
	Butt fusion spigots	ISO
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	FDA, QAP/ITP; RINA, LR	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 US (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	11	0.8	0.7
15	½	20	20	1.4	1.2

The kv values for each intermediate valve position can be determined by using the flow value characteristics and the kv 100 values.

Flow characteristics



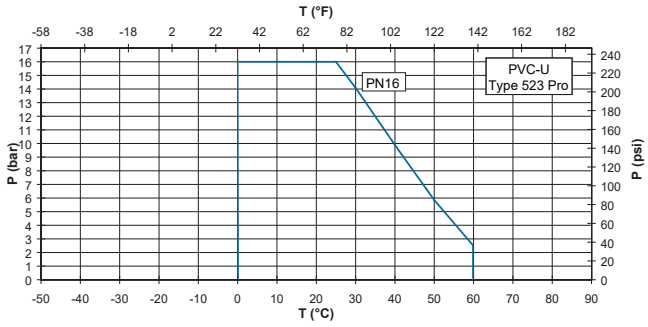
X Opening angle (%)
Y Kv, Cv value (%)

Pressure-temperature diagrams

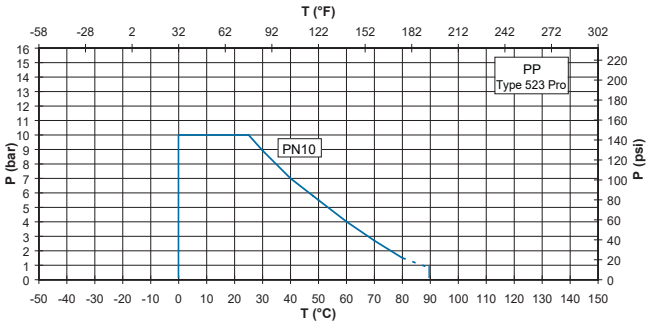
The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

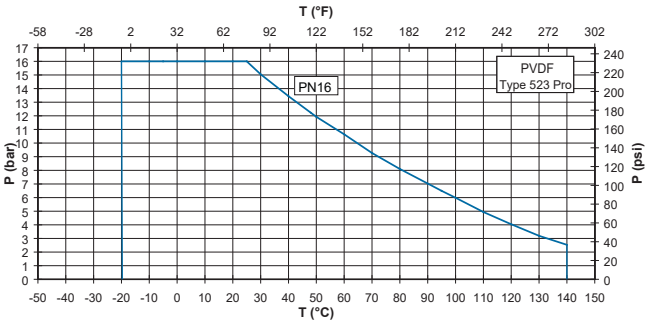
PVC-U



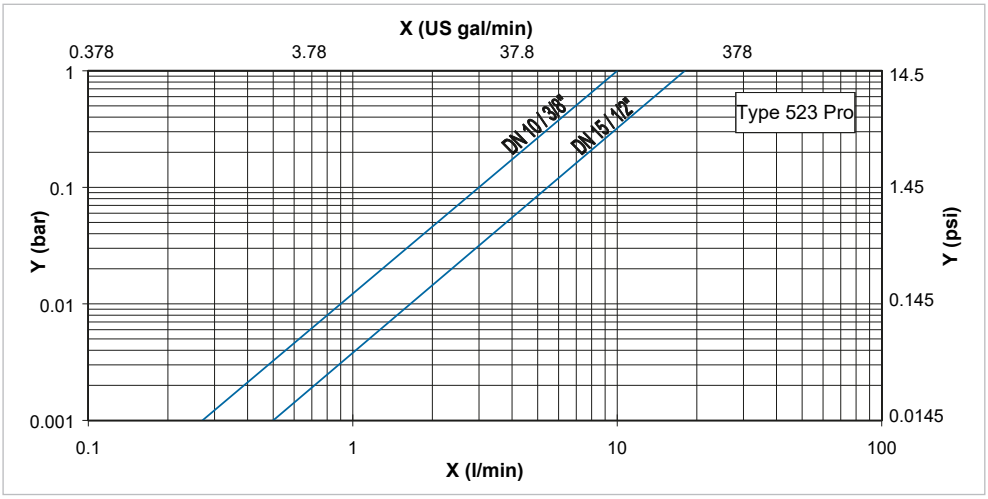
PP



PVDF

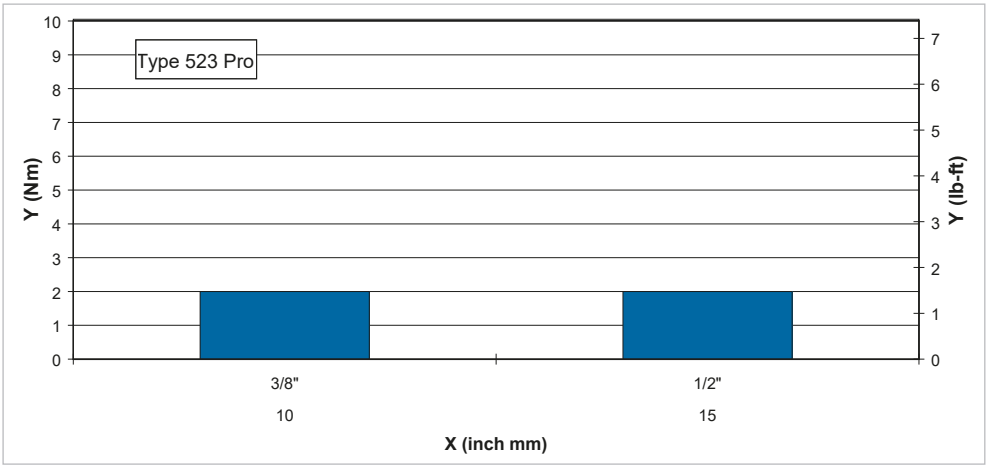


Pressure losses



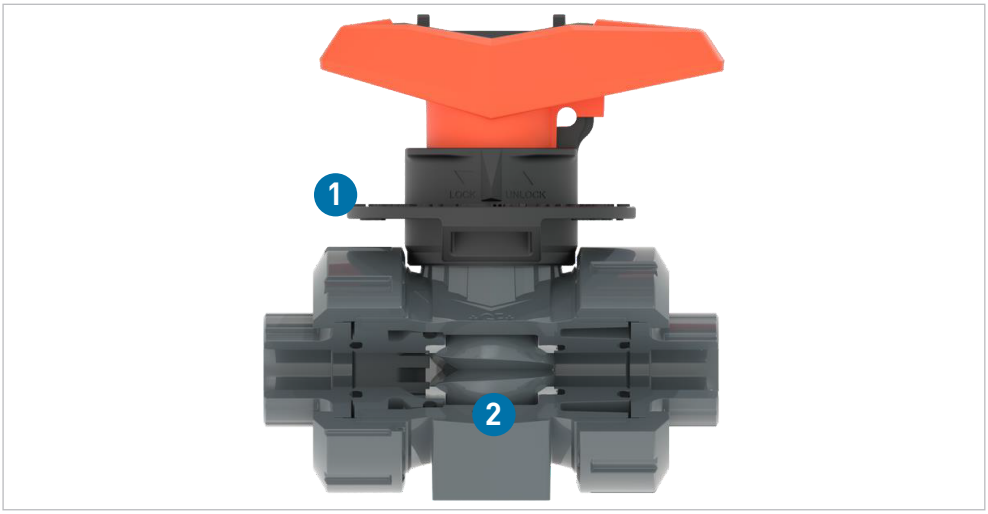
X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Operating torque



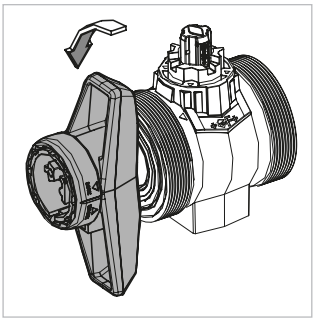
X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)
Average values at nominal pressure. Depending on the application (e.g. operating speed, fluid, temperature, etc.) about 2 times the operating torque should be taken for sizing actuators.

Technical basics



1 Special index plate with opening angle in °
2 Ball with metering characteristic

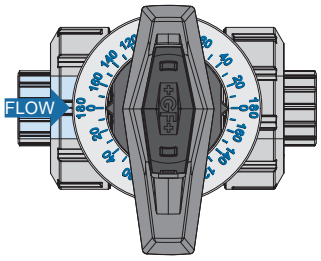
- With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM or FKM.
- The stems with rated break point above the upper O-ring help prevent leaks to the outside in case of damage.
- The design of the hand lever serves as a tool for installing the screw-in fitting. Screw-in fittings have a reverse thread in order to avoid unintentional opening when removing the coupling nuts or the thread connections.



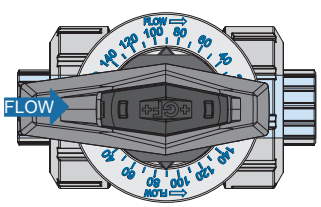
All ball valves in DN10–15 are true union according to EN ISO 16135 for simple installation and removal from the piping system.

Reading the current flow is possible in all positions, thanks to the new circular scale, which is reflected in the center. The arrows on the scale indicate the direction of flow.

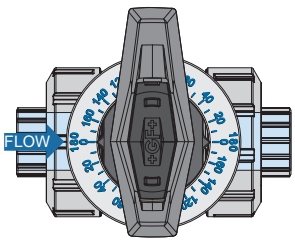
Opening angle 0°
Valve in closed position



Opening angle 90°
Valve half open



Opening angle 180°
Valve fully open



Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.
- For silicon-free ball valves, please consult the special manufacturer‘s instructions.

Maintenance notes

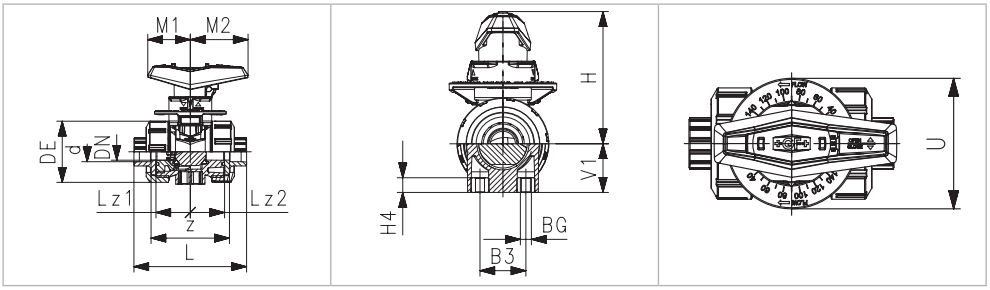
Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend cycling valves 1-2 times per year that are permanently kept in the same position to check for functionality.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

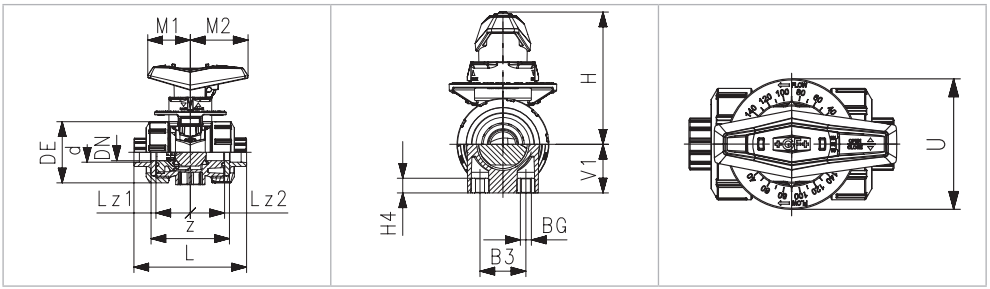
Dimensions

Metering Ball Valve type 523 Pro with solvent cement sockets



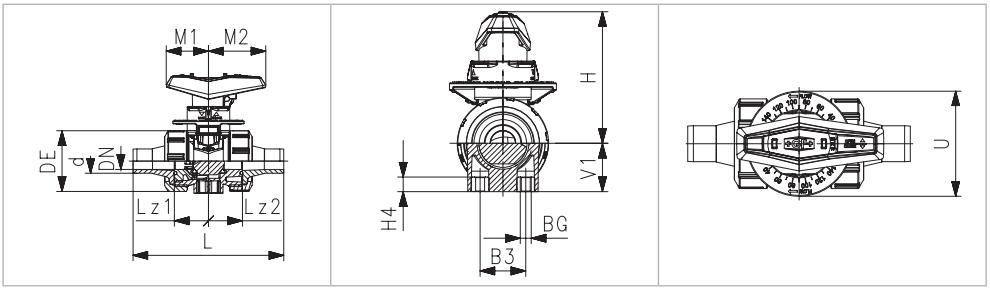
d (mm)	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
16	10	35	47	28	28	92	27	72	99	50	M6	25	12	59	64
20	15	35	47	28	28	95	27	72	99	50	M6	25	12	59	64

Metering Ball Valve type 523 Pro with fusion sockets, metric



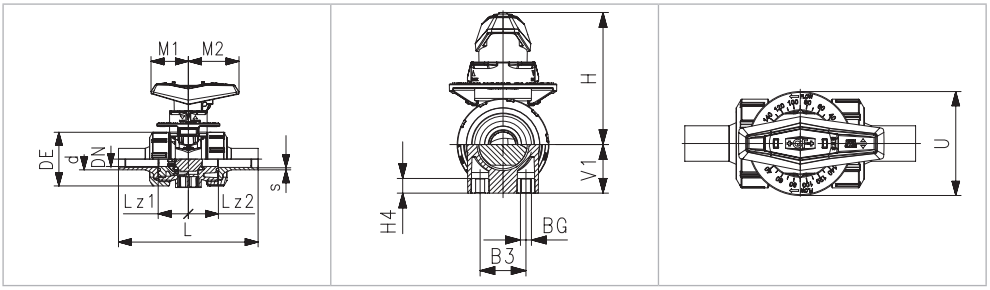
d (mm)	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
16	10	35	47	28	28	92	27	72	99	50	M6	25	12	59	67
20	15	35	47	28	28	95	27	72	99	50	M6	25	12	59	67

Metering Ball Valve type 523 Pro with solvent cement spigots or socket fusion spigots, metric



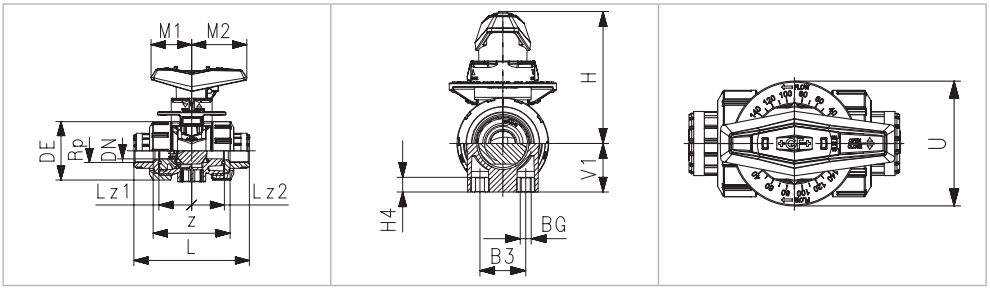
d (mm)	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)
16	10	35	47	28	28	110	27	72	99	50	M6	25	12	59
20	15	35	47	28	28	120	27	72	99	50	M6	25	12	59

Metering Ball Valve type 523 Pro with butt fusion spigots short, metric



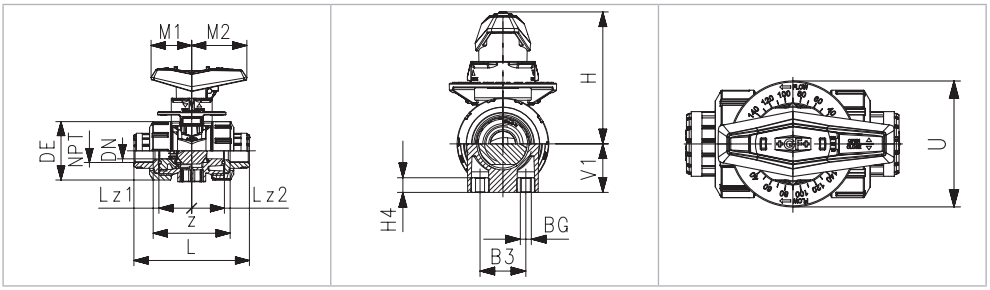
d (mm)	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	s (mm)
20	15	35	47	28	28	130	27	72	99	50	M6	25	12	59	1.9

Metering Ball Valve type 523 Pro with threaded sockets, Rp



Inch (")	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
⅜	10	35	47	28	28	92	27	72	99	50	M6	25	12	59	73
½	15	35	47	28	28	95	27	72	99	50	M6	25	12	59	71

Metering Ball Valve type 523 Pro with threaded sockets, NPT



Inch (")	DN (mm)	M1 (mm)	M2 (mm)	Lz1 (mm)	Lz2 (mm)	L (mm)	V1 (mm)	H (mm)	Hmax (mm)	DE (mm)	BG (mm)	B3 (mm)	H4 (mm)	U (mm)	z (mm)
⅜	10	35	47	28	28	92	27	72	99	50	M6	25	12	59	73
½	15	35	47	28	28	95	27	72	99	50	M6	25	12	59	71

Actuated versions

Metering ball valves type 523 Pro are available as electric actuated and pneumatic actuated versions.

For dimensions and accessories, see ball valve type 546 Pro.

For further information, visit: Datasheet type 546 Pro

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



Ball Valve type 542



Product description

The manual Ball Valve type 542 offers uncompromising quality and is available in various materials and connection variants.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90° to block the flow passage. This valve is primarily used for open/close functions and for throttling services.

Applications

From simple water to manual applications in demanding processes.

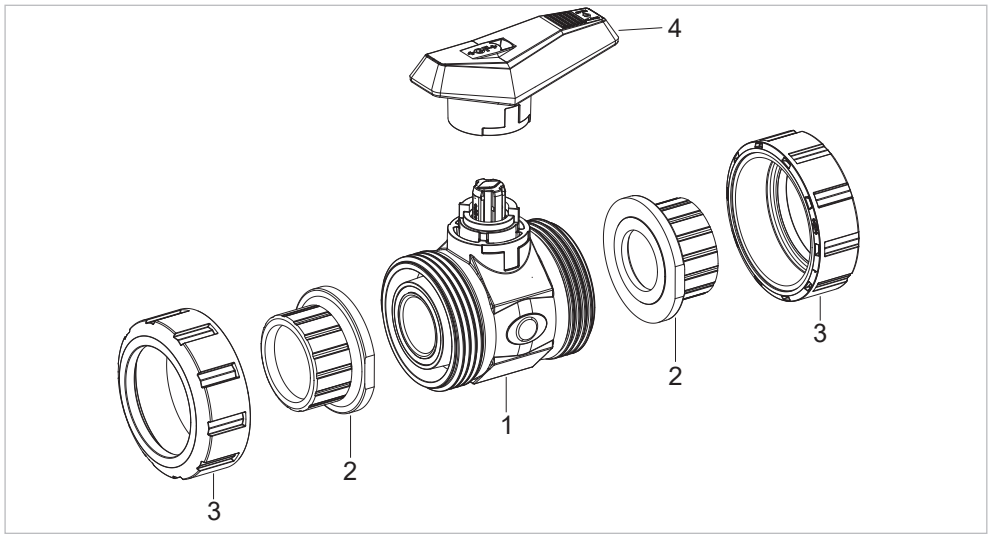
Benefits/features

- Ball seats: PE (blue lever) / PTFE (red lever)
- Very high flow rate
- Same installation length as Ball Valve type 546 Pro
- Possibility of attaching a valve marking

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

Technical data



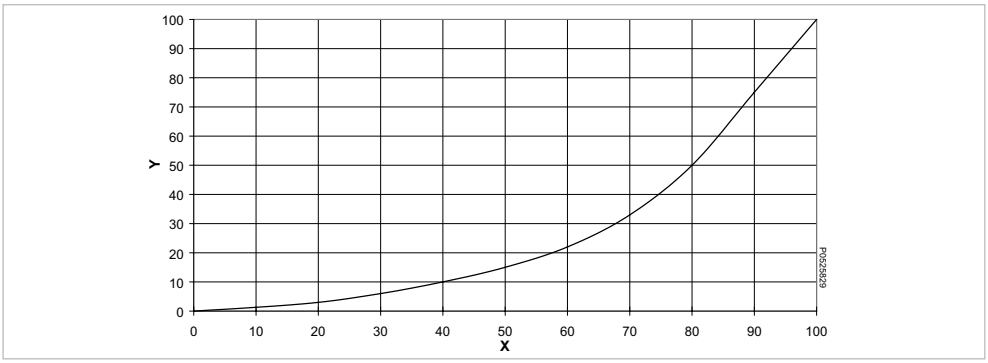
1 Housing
2 End connection
3 Union nut
4 Hand lever

Specification		
Dimensions	d16/DN10 – d63DN50, ⅜" – 2"	
Materials	Central part	PVC-U, PVC-C, PP-H
	Lever	PP-GF30
Gasket materials	O-rings	EPDM, FKM
	Ball seat	PTFE, PE
Pressure levels	PP	PN10
	PVC-U, PVC-C	PN16
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigot	ISO
	Threaded socket	Rp, NPT, Rc
	Backing flange	ISO, ANSI, BS, JIS
	Butt fusion spigots	SDR11 and SDR17.6
	PE100 electrofusion spigot or butt fusion spigot	SDR11 and SDR17.6
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, QAP/ITP, ABS, BV; RINA, LR	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	70	4.9	4
15	½	20	185	12.9	11
20	¾	25	350	24.5	21
25	1	32	700	49.0	42
32	1 ¼	40	1'000	70.0	60
40	1 ½	50	1'600	112.0	96
50	2	63	3'100	217.1	186
65	2 ½	75	5'000	350.0	300
80	3	90	7'000	490.0	420
100	4	110	11'000	770.0	660

Flow characteristics



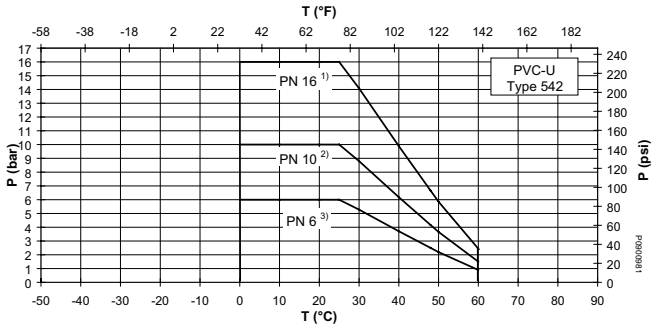
X Opening angle (%)
Y Kv, Cv value (%)

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

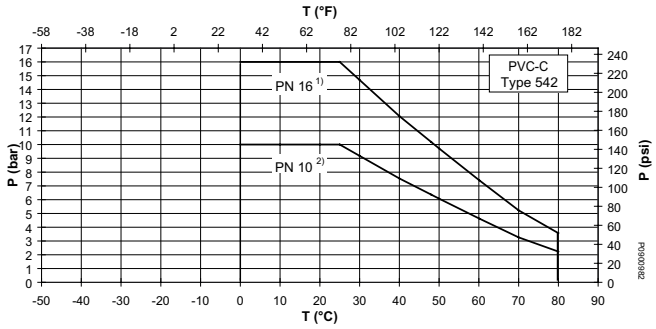
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



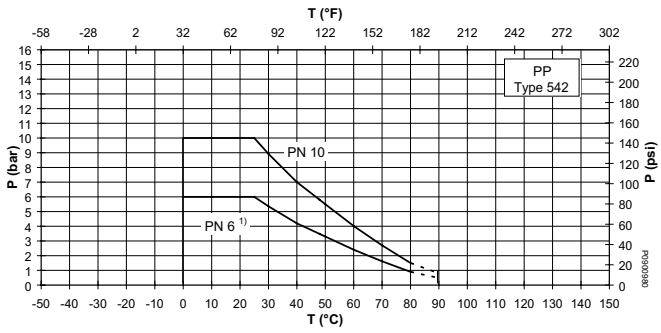
1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10
3) Depending on the connection, the nominal pressure is reduced to PN6

PVC-C



1) The central part of the ball valve is designed for the nominal pressure PN16
2) Depending on the connection, the nominal pressure is reduced to PN10

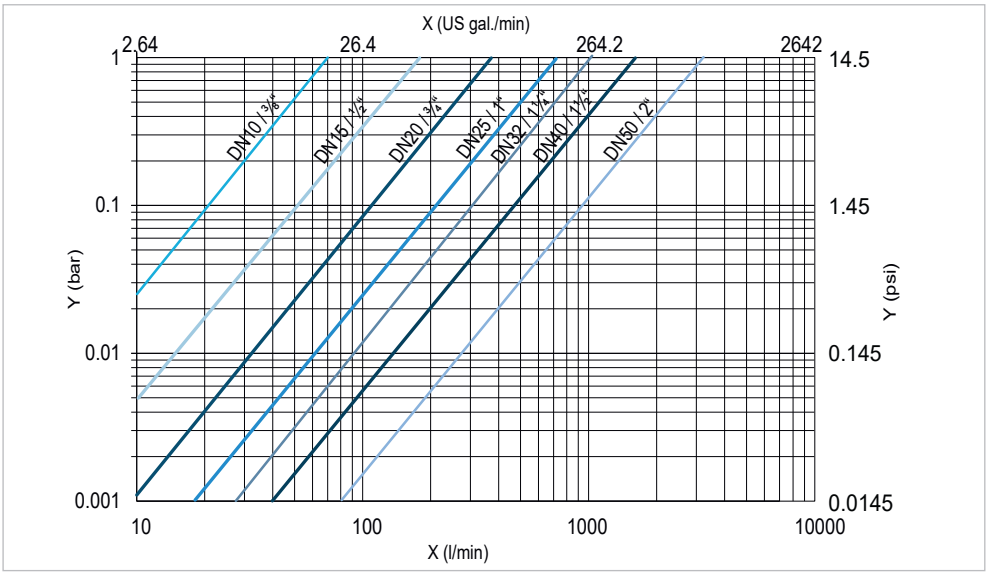
PP



1) For example, ball valve with butt fusion spigot PP or PE100, SDR 17

Pressure losses

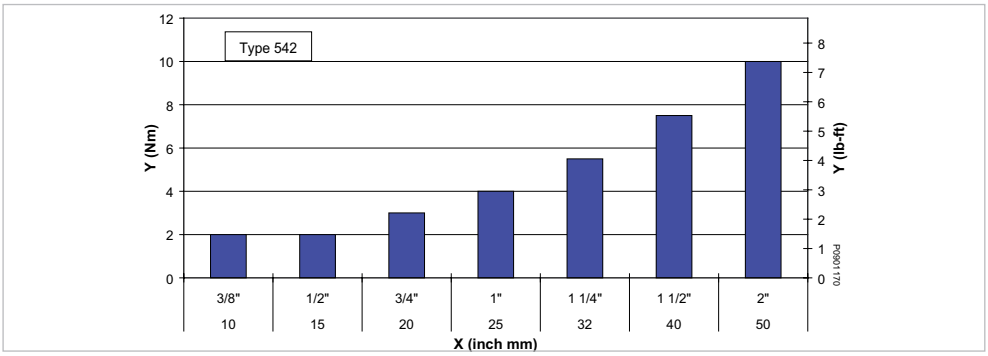
d16/DN10 – d63/DN50



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Operating torque

DN10 – DN50



X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Reference values for tightening torque of screws

Flange connections with profile flange seal or flat gaskets

d	DN	Inch	Total number of screws (for 2 flange connections) standard nut [1]	Torque (Reference values) Profile flange gasket[2]		Torque (Reference values) Flat gasket	
(mm)	(mm)	(inch)		(Nm)	(lb-ft)	(Nm)	(lb-ft)
20	15	½	8 x M12 x 50	10	7.4	10	7.4
25	20	¾	8 x M12 x 55	10	7.4	10	7.4
32	25	1	8 x M12 x 60	10	7.4	15	11
40	32	1 ¼	8 x M16 x 70	15	11	20	15
50	40	1 ½	8 x M16 x 70	15	11	25	18
63	50	2	8 x M16 x 80	20	15	35	26

[1] For valve ends type 542 made of PP in combination with backing flanges, use half of the standard nut height
[2] Preferred gasket type (suited for plastics)

Technical basics



1 Ergnomic lever
2 Reinforced security break point in the stem interface
3 Double stem seals
4 Dynamic backing seal
5 Smooth spherical surface
6 Saw tooth thread suitable for plastics

With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM or FKM.

Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

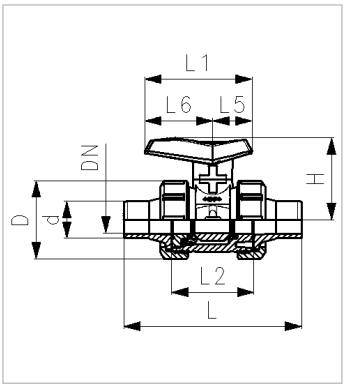
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Dimensions

Ball Valve type 542 with cemented spigots, metric

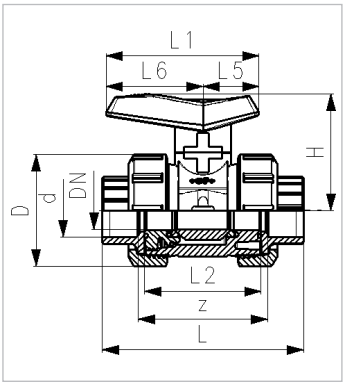
d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)
16	10	50	54	114	72	56	26	46
20	15	50	54	124	72	56	26	46
25	20	58	66	144	93	65	34	59
32	25	68	71	155	93	71	34	59
40	32	84	85	175	110	85	41	69
50	40	97	92	193	110	89	41	69
63	50	124	108	224	128	101	49	79



Ball Valve type 542 with cemented sockets, fusion sockets or threaded sockets*

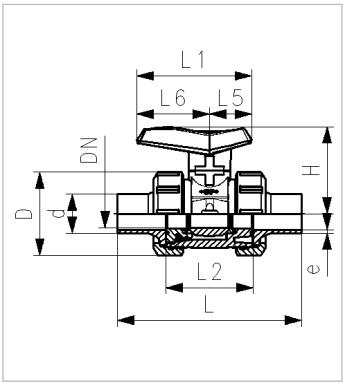
d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	z (mm)
16	10	50	54	92	72	56	26	46	64
20	15	50	54	95	72	56	26	46	53
25	20	58	66	110	93	65	34	59	73
32	25	68	71	124	93	71	34	59	79
40	32	84	85	147	110	85	41	69	94
50	40	97	92	157	110	89	41	69	95
63	50	124	108	184	128	101	49	79	108

*example PVC-U with cemented sockets



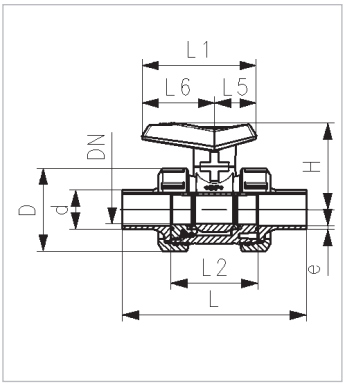
Ball Valve type 542 with butt fusion spigots, metric

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	e (mm)
20	15	50	54	130	72	56	26	46	1.9
25	20	58	66	144	93	65	34	59	2.3
32	25	68	71	151	93	71	34	59	2.9
40	32	84	85	171	110	85	41	69	3.7
50	40	97	92	189	110	89	41	69	4.6
63	50	124	108	220	128	101	49	79	5.8



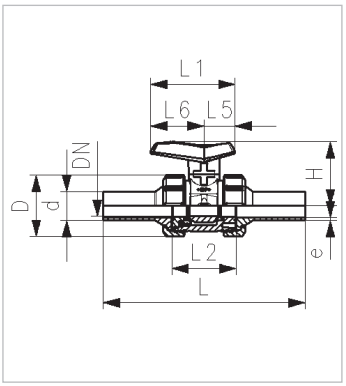
Ball Valve type 542 with PE butt fusion spigots short, metric

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	e (mm)
20	15	50	54	130	72	56	26	46	1.9
25	20	58	66	144	93	65	34	59	2.3
32	25	68	71	151	93	71	34	59	2.9
40	32	84	85	171	110	85	41	69	3.7
50	40	97	92	189	110	89	41	69	4.6
63	50	124	108	220	128	101	49	79	5.8



Ball Valve type 542 with PE butt fusion spigots long, metric

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	e (mm)
20	15	50	54	193	72	56	26	46	1.9
25	20	58	66	218	93	65	34	59	2.3
32	25	68	71	224	93	71	34	59	2.9
40	32	84	85	250	110	85	41	69	3.7
50	40	97	92	271	110	89	41	69	4.6
63	50	124	108	321	128	101	49	79	5.8



Further accessories

For further information on accessories, refer to the online product catalogue at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

3-way Ball Valve type 543 Pro

3-way Ball Valve type 543 Pro, manually operated



Horizontal



Vertical

Product description

Ball Valve type 543 Pro is the perfect valve for all mixing and diverting processes. The availability in horizontal design with L or T-ball and vertical design with L or tripod ball makes many application options possible. Diverting, mixing, distributing or even shutting off a medium are only a few possibilities.

Applications

- Chemical process industry
- Seawater desalinization systems
- Life science industry
- Microelectronics
- Measurement and control
- Water treatment
- Diverting function in shipbuilding

Benefits/features

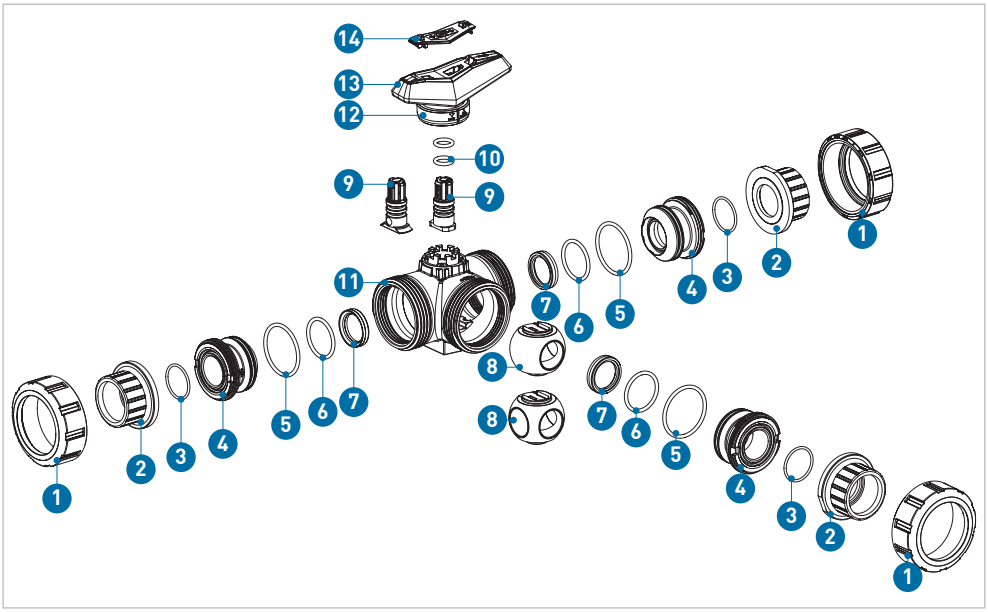
- Lockable lever as standard (lockable every 90°)
- Electric position feedback via NPN/PNP/Namur Sensor
- Data Matrix Code on every valve
- Ideal diverting and mixing fitting
- Ball with L-port / T-port
- Dimension range DN10 – DN50
- Lever material made of fiberglass-reinforced polypropylene (PP-GF)
- 90° end stop standard, 180° end stop on request
- Tool integrated into lever
- Very good flow properties
- Long service life
- Automation with electrical or pneumatic actuator possible

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

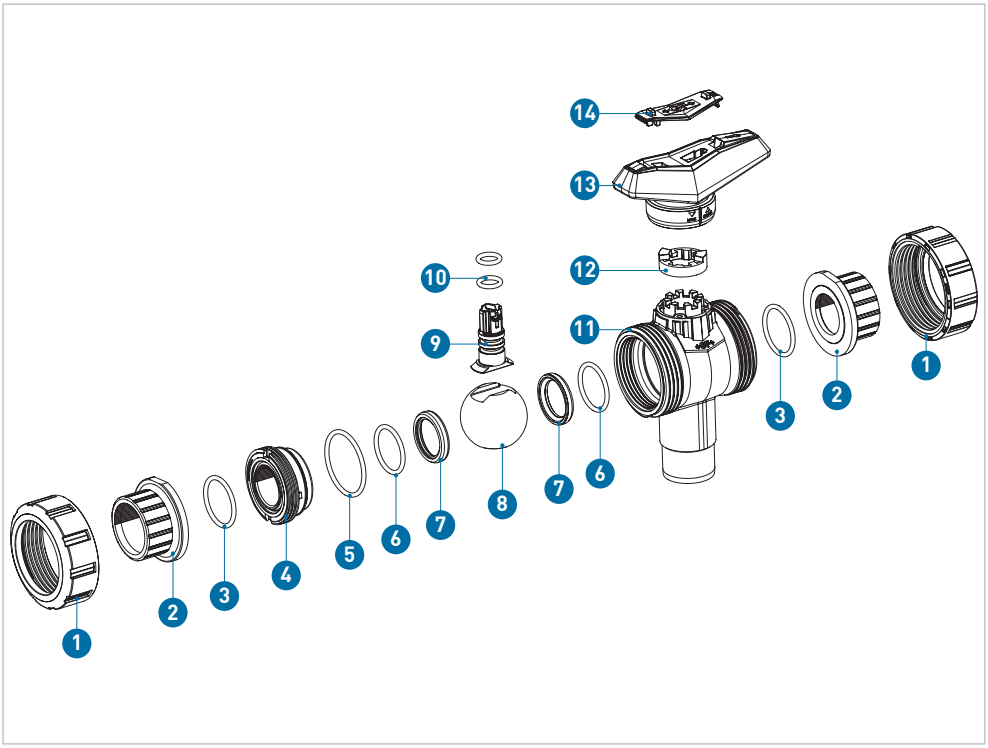
Technical data

Ball valve type 543 Pro, horizontal



1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball (L-or T-bore)
9 Stem
10 Stem seals
11 Body
12 Locking ring
13 Lever (lockable)
14 Lever clip

Ball valve type 543 Pro, vertical



1 Union nut
2 Connecting part
3 Union seal
4 Union bush
5 Body seal
6 Backing seal
7 Ball seat
8 Ball
9 Stem
10 Stem seals
11 Body
12 Locking ring
13 Lever (lockable)
14 Lever clip

Specification		
Dimensions	d16/DN10 – d63/DN50, ⅜"– 2"	
Materials	Valve body horizontal	PVC-U, PVC-C, ABS, PP-H, PVDF
	Valve body vertical	PVC-U, ABS
	Lever	PP-GF 30
Gasket materials	O-rings	EPDM, FKM, FFKM
	Ball seat	PTFE, PVDF
Pressure levels	PN10	
Actuation variants, horizontal	Manually operated	
	Pneumatically or electrically actuated	
	Ball with L/T port 180° end stop on request	
Actuation variants, vertical	Manual; electric and pneumatic (only with tripod ball) actuation	
	Ball with L-Port and tripod port	
Connections	Fusion / solvent cement sockets	ISO, ASTM, JIS, BS
	Fusion / solvent cement spigot	ISO
	Threaded socket	Rp, NPT, Rc
	PE100 electrofusion spigot or butt fusion spigot in SDR11	
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, QAP/ITP; DiBT, RINA, LR	

Pressure-temperature diagrams

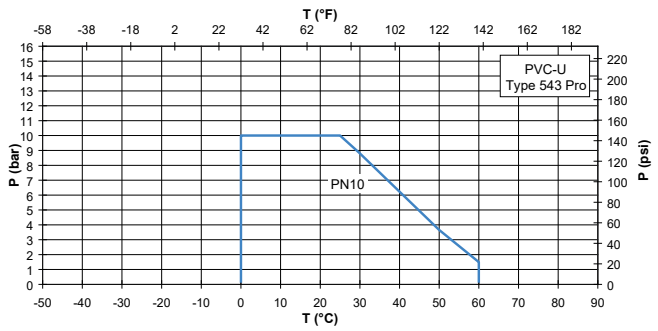
The pressure-temperature diagram is based on a service life of 25 years using water or similar media.

T Temperature (°C, °F)

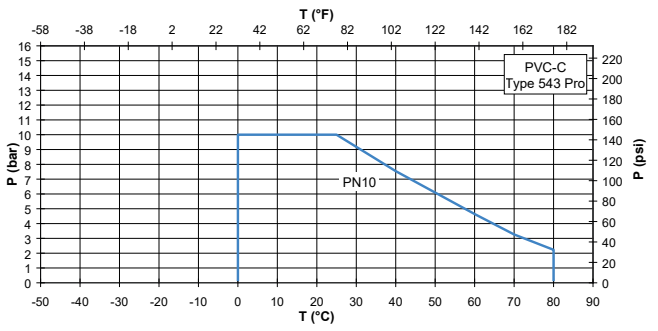
P Permissible pressure (bar, psi)

EPDM sealing to max. 100 °C

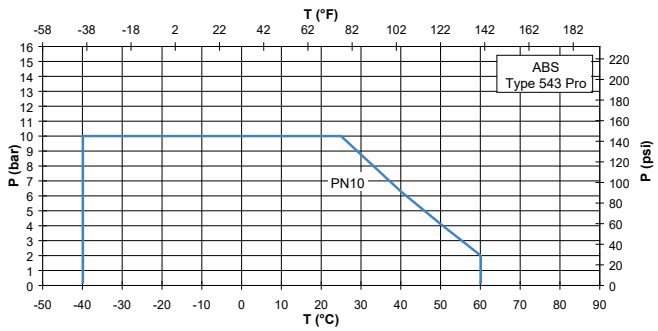
PVC-U



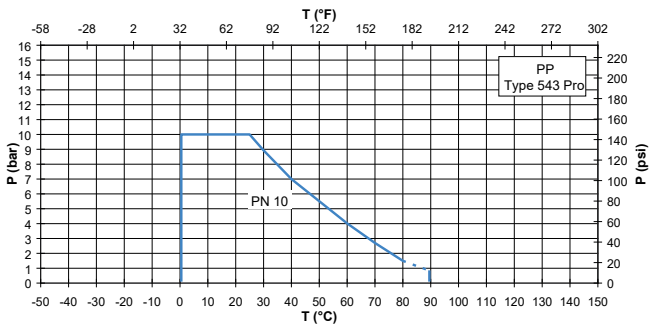
PVC-C



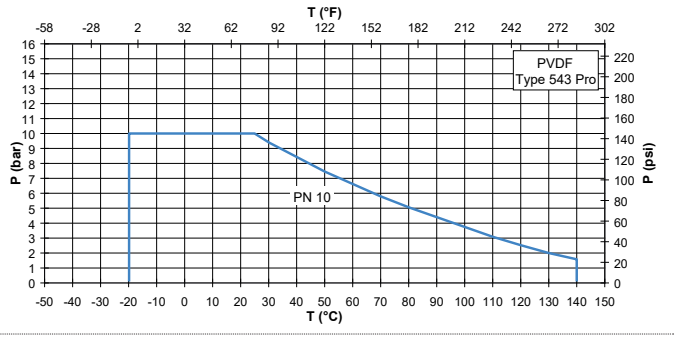
ABS



PP



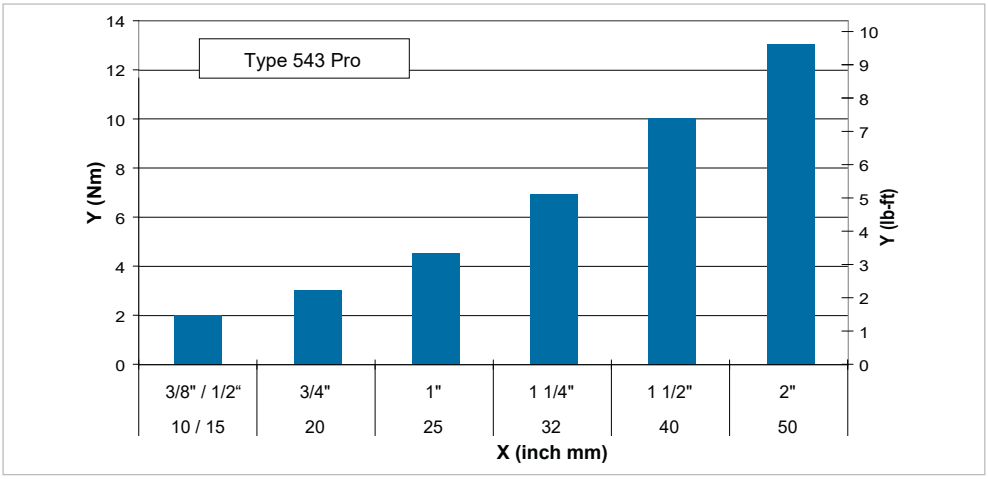
PVDF



Pressure losses and flow characteristics

X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)
a Opening angle (°)
kv kv, Cv value (%)

Operating torque



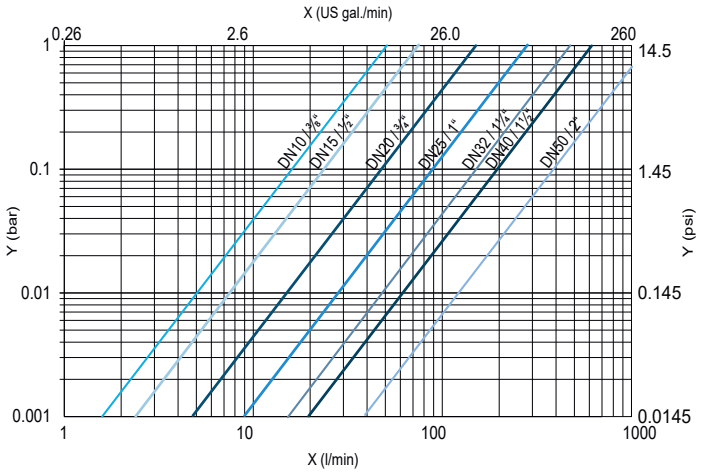
X Nominal diameter DN (mm, inch)
Y Torque (Nm, lb-ft)

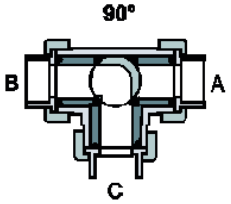
Average values at nominal pressure. Depending on the application (e.g. operating speed, fluid, temperature, etc.) about 2 times the operating torque should be taken for sizing actuators.

Characteristics – Ball Valve type 543 Pro horizontal: Ball with L-port

Flow direction C → B, B → C, A → C, C → A

Pressure loss



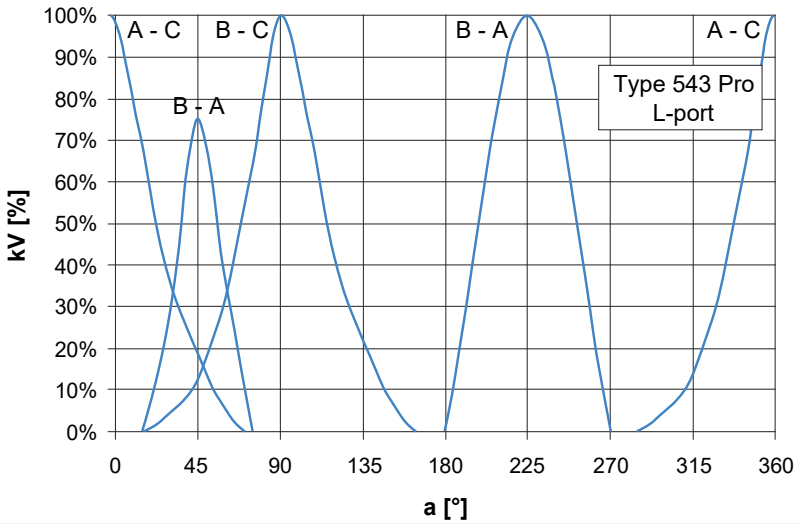


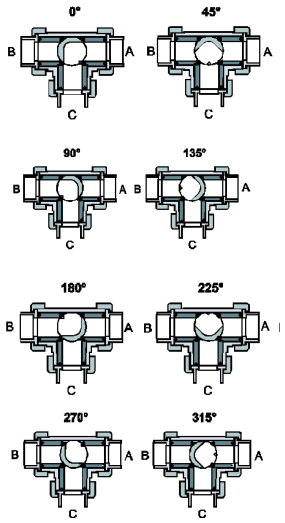
Medium: Water, 20 °C
X Flow rate (l/min, US-gal/min)
Y Pressure loss Δp (bar, psi)

Kv 100 Values

DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	50	3.5	3
15	½	20	75	5.3	4.5
20	¾	25	150	10.5	9
25	1	32	280	19.6	16.8
32	1 ¼	40	480	33.6	28.8
40	1 ½	50	620	43.4	37
50	2	63	1'230	86.1	74

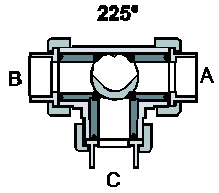
Flow characteristics





Flow direction B → A

Ball position



Medium: Water, 20 °C
X Flow rate (l/min, US-gal/min)
Y Pressure loss Δp (bar, psi)

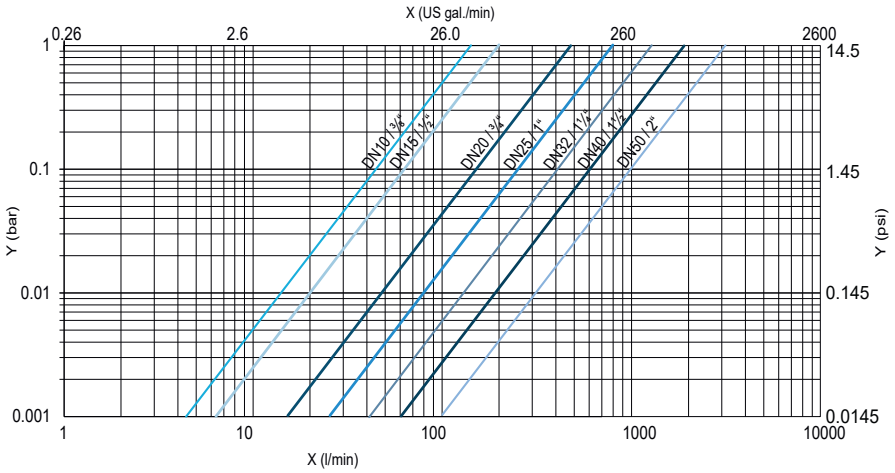
Kv 100 values

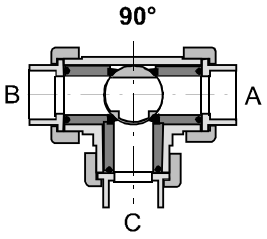
DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	10	0.7	0.6
15	½	20	15	1.1	0.9
20	¾	25	30	2.1	1.8
25	1	32	50	3.5	3
32	1 ¼	40	90	6.3	5.4
40	1 ½	50	110	7.7	6.6
50	2	63	220	15.4	13.2

Characteristics – Ball Valve type 543 Pro horizontal: Ball with T-port

Flow direction B → A

Pressure loss





Medium: Water, 20 °C

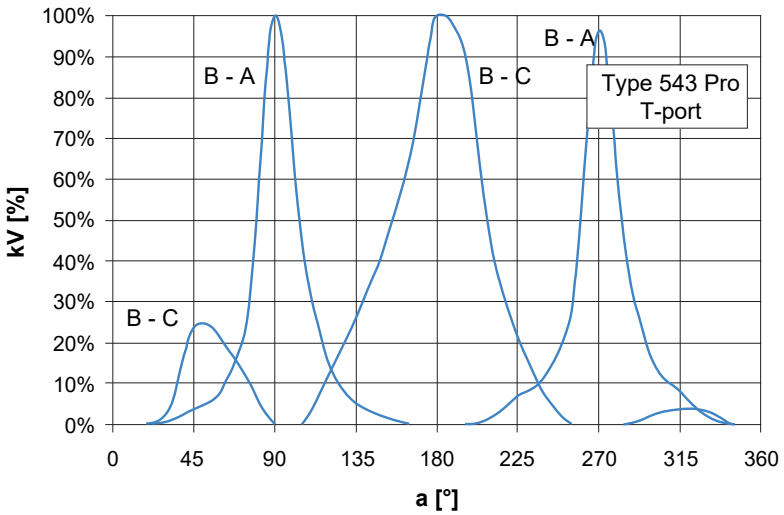
X Flow rate (l/min, US-gal/min)

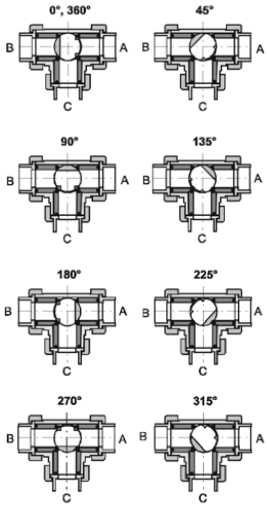
Y Pressure loss Δp (bar, psi)

Kv 100 values

DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	140	9.8	8.4
15	½	20	200	14	12.0
20	¾	25	470	32.9	28.2
25	1	32	793	55.5	47.8
32	1 ¼	40	1'290	90.3	77.4
40	1 ½	50	1'910	133.7	115
50	2	63	3'100	217	186

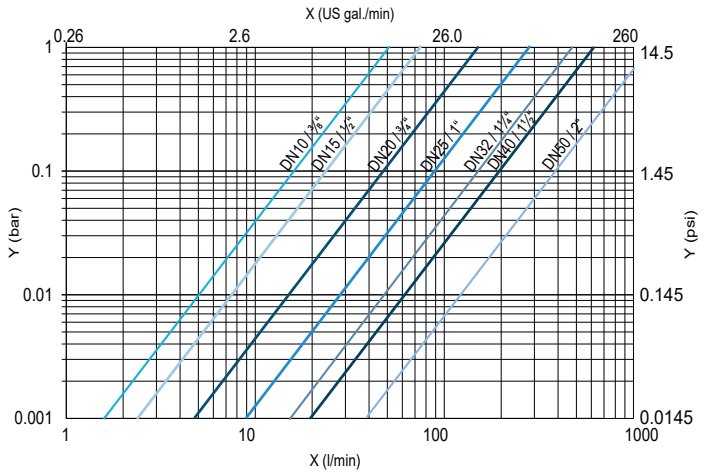
Flow characteristics

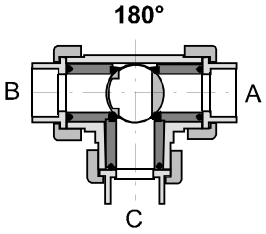




Flow direction B → C

Pressure loss





Medium: Water, 20 °C

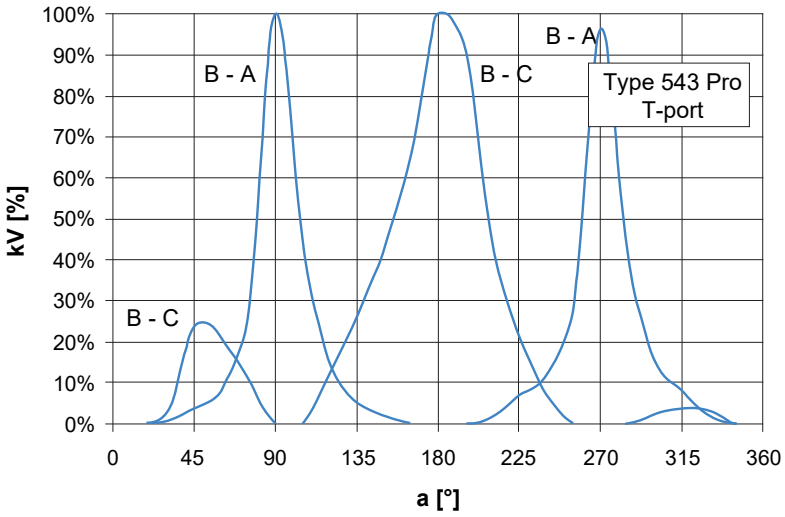
X Flow rate (l/min, US-gal/min)

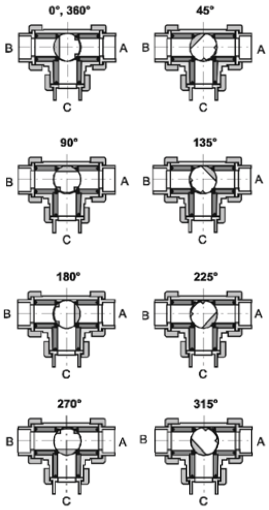
Y Pressure loss Δp (bar, psi)

Kv 100 values

DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	40	2.8	2.4
15	½	20	70	4.9	4.2
20	¾	25	150	10.5	9
25	1	32	250	17.5	15
32	1 ¼	40	470	32.9	28
40	1 ½	50	600	42	36
50	2	63	1'210	84.7	73

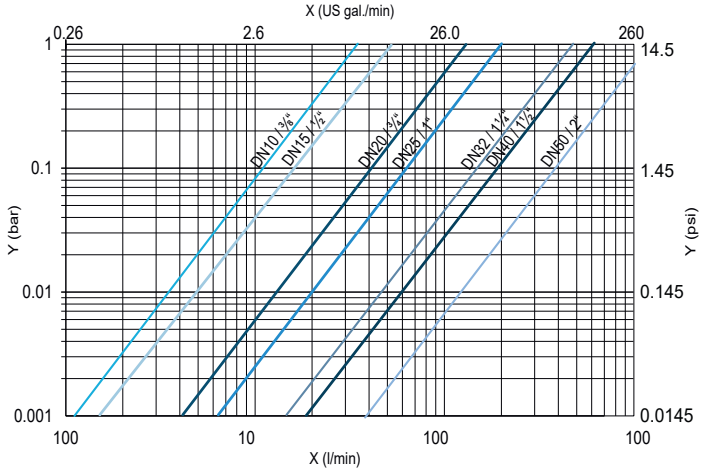
Flow characteristics

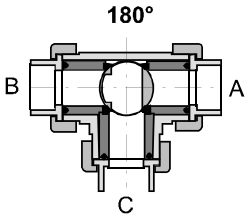




Flow direction C → A and C → B

Pressure loss



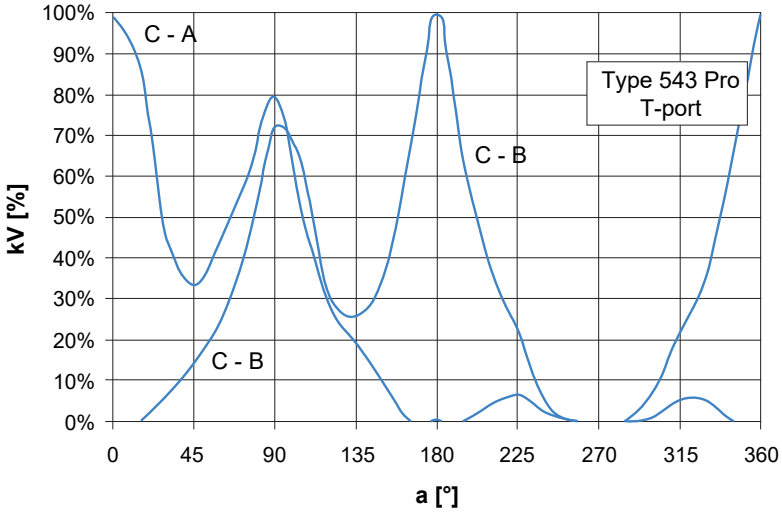


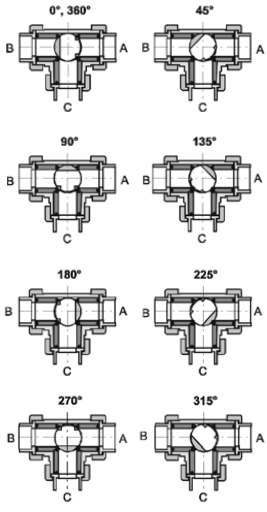
Medium: Water, 20 °C
X Flow rate (l/min, US-gal/min)
Y Pressure loss Δp (bar, psi)

Kv 100 values

DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	35	2.5	2.1
15	½	20	50	3.5	3
20	¾	25	130	9.1	7.8
25	1	32	200	14	12
32	1 ¼	40	380	26.6	23
40	1 ½	50	470	32.9	28
50	2	63	890	62.3	53

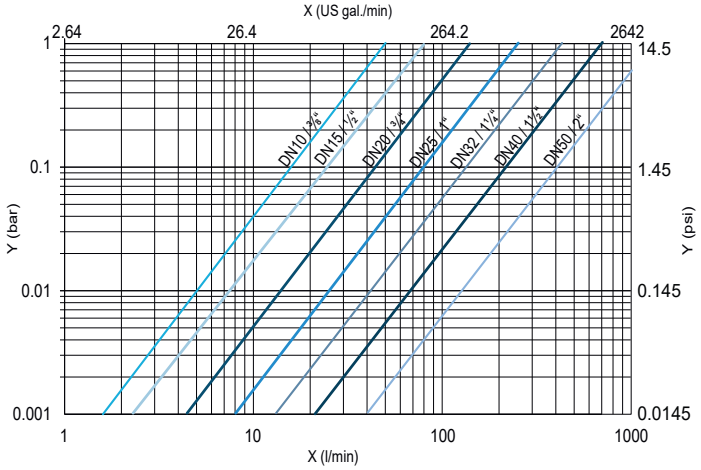
Flow characteristics





Characteristics – Ball Valve type 543 Pro vertical: Ball with L-port

Pressure loss

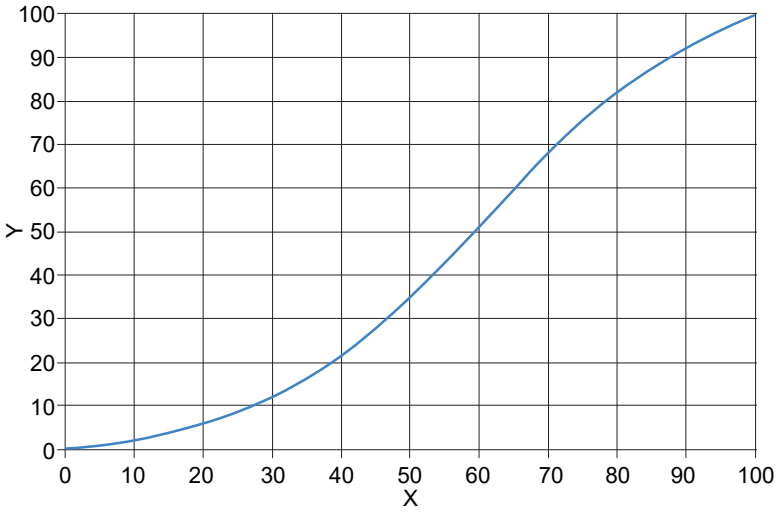


Medium: Water, 20 °C
X Flow rate (l/min, US-gal/min)
Y Pressure loss Δp (bar, psi)

Kv 100 values

DN (mm)	Inch "	d (mm)	Kv 100 (l/min)	Kv 100 (m^3/h)
10	⅜	16	50	3
15	½	20	80	4.8
20	¾	25	140	8.4
25	1	32	250	15
32	1 ¼	40	430	26
40	1 ½	50	700	42
50	2	63	1'300	78

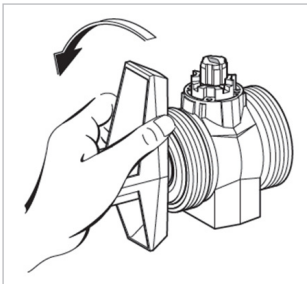
Flow characteristics



X Opening angle (%)
Y Kv, Cv value (%)

Technical basics

- With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, housing and connection seals are made of EPDM or FKM.
- The stems with rated break point above the upper O-ring help prevent leaks to the outside in case of damage.
- The design of the hand lever serves as a tool for installing the screw-in fitting. Screw-in fittings have a reverse thread in order to avoid unintentional opening when removing the coupling nuts or the thread connections.



All ball valves in DN10 – 50 are available as radially removable fittings with two threaded connections according to EN ISO 16135.

Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.
- For silicone-free ball valves, please consult the special manufacturer's instructions.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves which are kept permanently in the same position 1 – 2 times per year to check functionality.

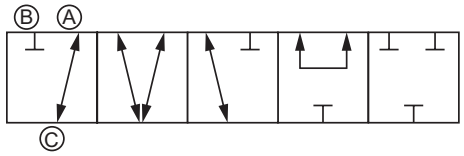
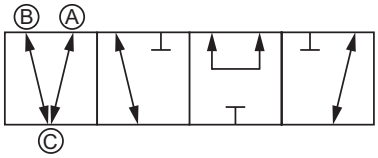
Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Versions

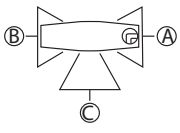
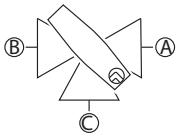
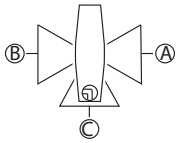
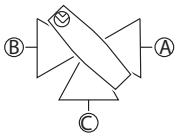
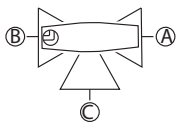
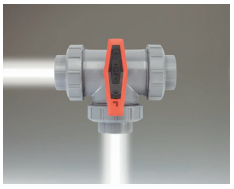
The Ball Valve type 543 Pro is available as a horizontal and vertical version. The horizontal valve can be ordered with L- or T-port ball. The vertical fitting comes in the L-port configuration or with a optional tripod ball.

Type 543 Pro, horizontal

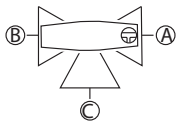
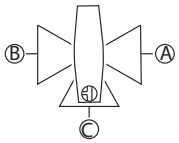
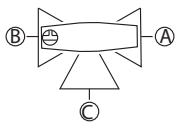
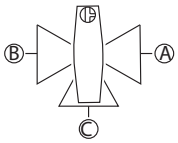
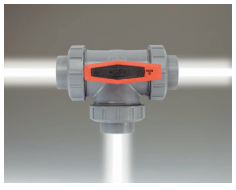
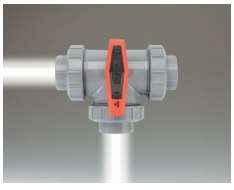
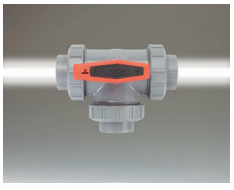
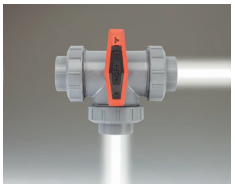
The decision whether to use a 3-way ball valve with L-port or-T-port depends on the desired functions the valve has to perform:

	
L-port: diverting, shutting off (two inputs closed)	T-port: diverting function, mixing function, throughput

L-port

				
A-C open	A-B-C open	B-C open	A-B open	Closed
				
Diverting function in the base position	Mixing function with decreased flow	Diverting function	Outlet closed, passage open with decreased flow	Shutting off function

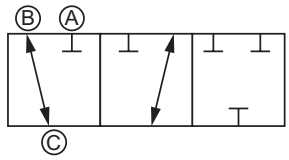
T-port

			
A-B-C open	B-C open	A-B open	A-C open
			
Diverting function in the base position	Diverting function	Outlet closed, passage opened	Diverting function

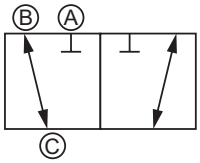
Type 543 Pro, vertical

The decision whether to use a 3-way ball valve with L- or tripod-port depends on the desired functions the valve has to perform:

- L-port: diverting function, closing (two ports closed)
- Tripod port: diverting, change from B-C open to A-C open with 90° turn of the lever

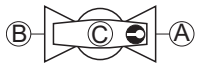


L-port: diverting, shutting off

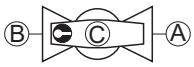


Tripod: diverting

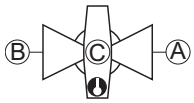
L-port



B-C open*

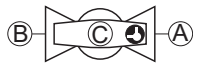


A-C open

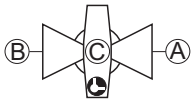


closed

Tripod-port



B-C open*



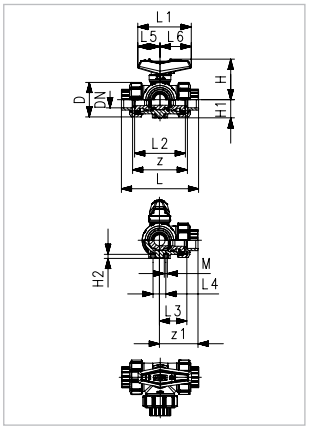
A-C open

*Normal position

Dimensions – Ball Valve type 543 Pro, horizontal

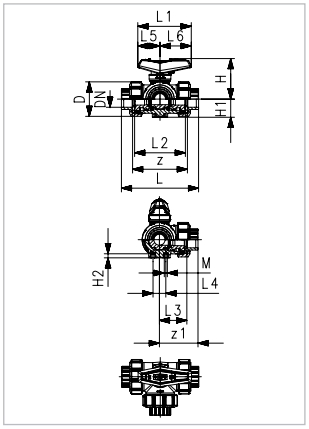
Ball valve type 543 Pro horizontal with solvent cement sockets, metric or JIS

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	z1 (mm)	closest inch
16	50	109	82	73	36	25	35	47	61	28	8	6	81	40	⅜
20	50	112	82	73	36	25	35	47	61	28	8	6	81	40	½
25	58	131	106	86	43	25	44	62	74	32	8	6	94	47	¾
32	68	151	106	99	50	25	44	62	80	36	8	6	107	54	1
40	84	181	131	120	60	45	57	74	95	45	9	8	130	65	1 ¼
50	97	205	131	137	69	45	57	74	102	51	9	8	143	72	1 ½
63	124	261	152	179	89	45	66	86	117	65	9	8	185	92	2



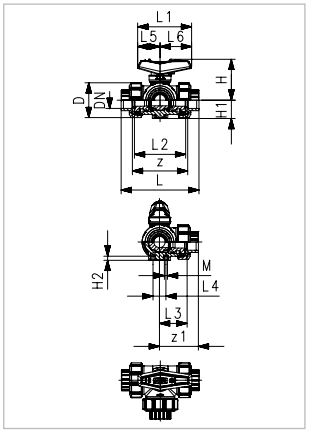
Ball valve type 543 Pro horizontal with solvent cement sockets, ASTM or BS

Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	z1 (mm)
⅜	50	123	82	73	36	25	35	47	61	28	8	6	85	42
½	50	122	82	73	36	25	35	47	61	28	8	6	77	38
¾	58	141	106	86	43	25	44	62	74	32	8	6	92	46
1	68	161	106	99	50	25	44	62	80	36	8	6	105	53
1 ¼	84	187	131	120	60	45	57	74	95	45	9	8	126	63
1 ½	97	213	131	137	69	45	57	74	102	51	9	8	143	72
2	124	261	152	179	89	45	66	86	117	65	9	8	185	92



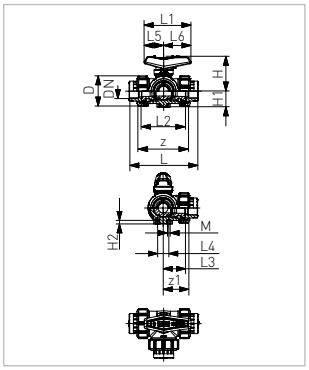
Ball valve type 543 Pro horizontal with fusion sockets, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	z1 (mm)	closest inch
16	50	110	82	72	36	25	35	47	61	28	8	6	82	41	⅜
20	50	112	82	72	36	25	35	47	61	28	8	6	82	41	½
25	58	129	106	85	43	25	44	62	74	32	8	6	97	49	¾
32	68	146	106	98	49	25	44	62	80	36	8	6	110	55	1
40	84	170	131	118	59	45	57	74	95	45	9	8	132	66	1 ¼
50	97	193	131	135	68	45	57	74	102	51	9	8	151	76	1 ½
63	124	244	152	176	88	45	66	86	117	65	9	8	188	94	2



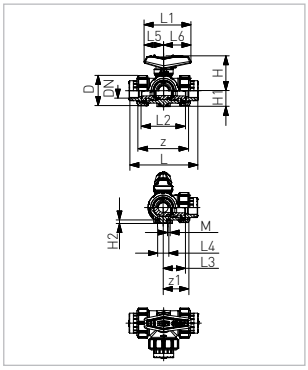
Ball valve type 543 Pro horizontal with threaded sockets (reinforced), Rp

Rp Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	z1 (mm)
⅜	50	113	82	73	36	25	35	47	61	28	8	6	87	43
½	50	117	82	73	36	25	35	47	61	28	8	6	85	42
¾	58	135	106	86	43	25	44	62	74	32	8	6	100	50
1	68	155	106	99	50	25	44	62	80	36	8	6	113	57
1 ¼	84	179	131	120	60	45	57	74	95	45	9	8	134	67
1 ½	97	201	131	137	69	45	57	74	102	51	9	8	155	78
2	124	255	152	179	89	45	66	86	117	65	9	8	199	99



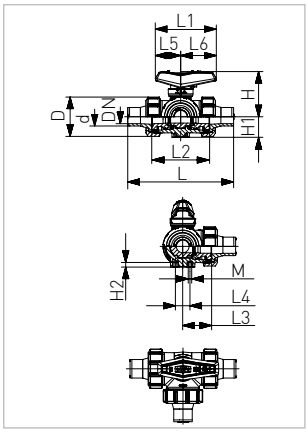
Ball valve type 543 Pro horizontal with threaded sockets (reinforced), NPT

Rp Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	z1 (mm)
⅜	50	112	82	72	36	25	35	47	61	28	8	6	86	43
½	50	114	82	72	36	25	35	47	61	28	8	6	80	40
¾	58	131	106	85	43	25	44	62	74	32	8	6	95	48
1	68	154	106	98	49	25	44	62	80	36	8	6	110	55
1 ¼	84	180	131	118	59	45	57	74	95	45	9	8	132	66
1 ½	97	203	131	135	68	45	57	74	102	51	9	8	157	79
2	124	258	152	176	88	45	66	86	117	65	9	8	210	105



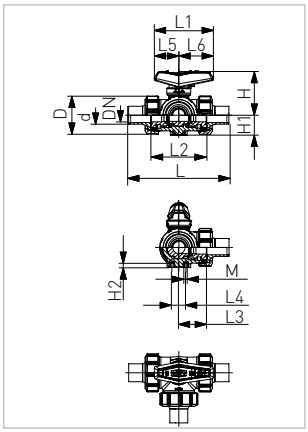
Ball valve type 543 Pro horizontal with solvent cement sockets or socket fusion spigots, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	closest inch
16	50	126	82	72	36	25	35	47	133	61	28	8	6	⅜
20	50	136	82	72	36	25	35	47	144	61	28	8	6	½
25	58	159	106	85	43	25	44	62	170	74	32	8	6	¾
32	68	178	106	98	49	25	44	62	191	80	36	8	6	1
40	84	204	131	118	59	45	57	74	223	95	45	9	8	1 ¼
50	97	237	131	135	68	45	57	74	256	102	51	9	8	1 ½
63	124	296	152	176	88	45	66	86	319	117	65	9	8	2



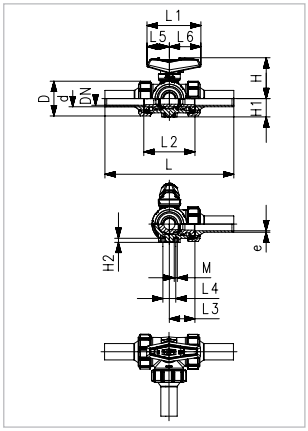
Ball valve type 543 Pro horizontal with butt fusion spigots short, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	e (mm)	closest inch
20	50	146	82	72	36	25	35	47	61	28	8	6	2	½
25	58	163	106	85	43	25	44	62	74	32	8	6	2	¾
32	68	178	106	98	49	25	44	62	80	36	8	6	2	1
40	84	204	131	118	59	45	57	74	95	45	9	8	2	1 ¼
50	97	237	131	135	68	45	57	74	102	51	9	8	3	1 ½
63	124	296	152	176	88	45	66	86	117	65	9	8	3	2



Ball valve type 543 Pro horizontal with butt fusion spigots long, metric

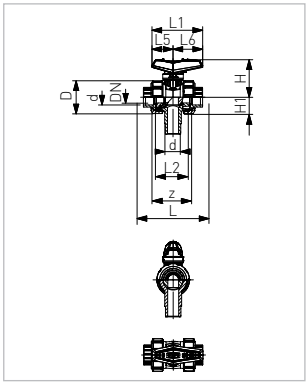
d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	e (mm)	closest inch
20	50	210	82	73	36	25	35	47	61	28	8	6	1.9	½
25	58	237	106	86	43	25	44	62	74	32	8	6	2.3	¾
32	68	251	106	99	50	25	44	62	80	36	8	6	2.9	1
40	84	283	131	120	60	45	57	74	95	45	9	8	3.7	1 ¼
50	97	319	131	137	69	45	57	74	102	51	9	8	4.6	1 ½
63	124	399	152	179	89	45	66	86	117	65	9	8	5.8	2



Dimensions – Ball Valve type 543 Pro, vertical

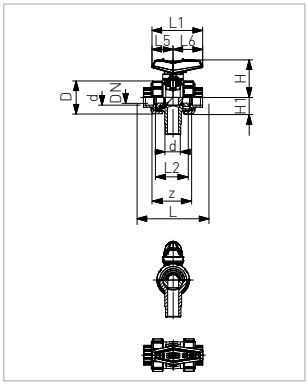
Ball valve type 543 Pro vertical with solvent cement sockets, metric or JIS

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	z (mm)	closest inch
16	50	92	82	56	35	47	61	62	64	⅜
20	50	95	82	56	35	47	61	62	64	½
25	58	111	106	66	44	62	74	72	74	¾
32	68	123	106	71	44	62	80	77	79	1
40	84	146	131	85	57	74	95	87	95	1 ¼
50	97	157	131	89	57	74	102	97	95	1 ½
63	124	183	152	101	66	86	117	112	107	2



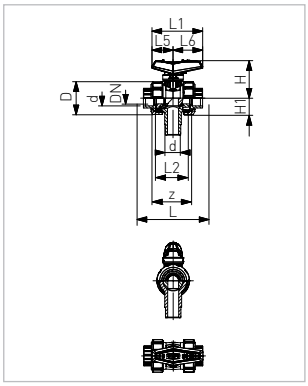
Ball valve type 543 Pro vertical with solvent cement sockets, ASTM or BS

Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	z (mm)
⅜	50	106	82	56	35	47	61	62	67
½	50	105	82	56	35	47	61	62	61
¾	58	121	106	66	44	62	74	72	70
1	68	133	106	71	44	62	80	77	76
1 ¼	84	152	131	85	57	74	95	87	90
1 ½	97	165	131	89	57	74	102	97	94
2	124	183	152	101	66	86	117	112	107



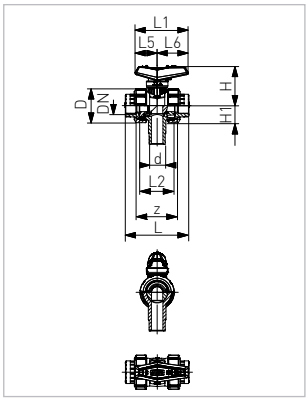
Ball valve type 543 Pro vertical with fusion sockets, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	z (mm)	closest inch
16	50	92	82	56	35	47	61	62	64	⅜
20	50	95	82	56	35	47	61	62	64	½
25	58	111	106	66	44	62	74	72	74	¾
32	68	123	106	71	44	62	80	77	79	1
40	84	146	131	85	57	74	95	87	95	1 ¼
50	97	157	131	89	57	74	102	97	95	1 ½
63	124	183	152	101	66	86	117	112	107	2



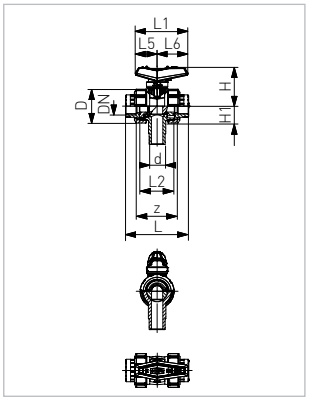
Ball valve type 543 Pro vertical with threaded sockets (reinforced), Rp

Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	z (mm)
⅜	50	96	82	56	35	47	61	62	69
½	50	99	82	56	35	47	61	62	67
¾	58	115	106	66	44	62	74	72	78
1	68	127	106	71	44	62	80	77	85
1 ¼	84	144	131	85	57	74	95	87	100
1 ½	97	153	131	89	57	74	102	97	106
2	124	177	152	101	66	86	117	112	121



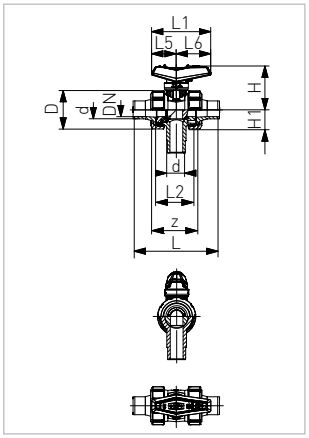
Ball valve type 543 Pro vertical with threaded sockets (reinforced), NPT

Rp Inch	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	z (mm)
⅜	50	98	82	56	35	47	61	62	70
½	50	98	82	56	35	47	61	62	64
¾	58	112	106	66	44	62	74	72	76
1	68	127	106	71	44	62	80	77	83
1 ¼	84	146	131	85	57	74	95	87	99
1 ½	97	157	131	89	57	74	102	97	111
2	124	183	152	101	66	86	117	112	135



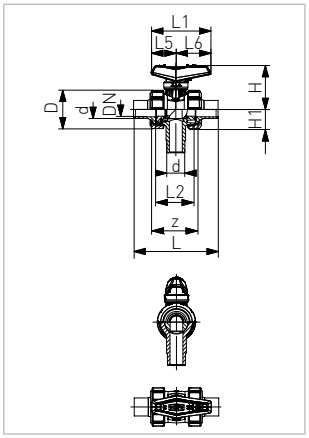
Ball valve type 543 Pro vertical with solvent cement or socket fusion spigots, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	closest inch
16	50	114	82	56	35	47	61	62	⅜
20	50	124	82	56	35	47	61	62	½
25	58	144	106	66	44	62	74	72	¾
32	68	154	106	71	44	62	80	77	1
40	84	174	131	85	57	74	95	87	1 ¼
50	97	194	131	89	57	74	102	97	1 ½
63	124	224	152	101	66	86	117	112	2



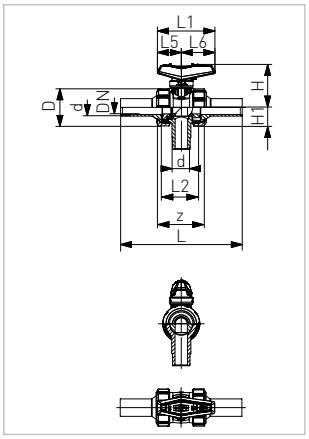
Ball valve type 543 Pro vertical with butt fusion spigot short, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	closest inch
16	50	114	82	56	35	47	61	62	⅜
20	50	124	82	56	35	47	61	62	½
25	58	144	106	66	44	62	74	72	¾
32	68	154	106	71	44	62	80	77	1
40	84	174	131	85	57	74	95	87	1 ¼
50	97	194	131	89	57	74	102	97	1 ½
63	124	224	152	101	66	86	117	112	2



Ball valve type 543 Pro vertical with butt fusion spigots long, metric

d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	H (mm)	H1 (mm)	closest inch
16	50	114	82	56	35	47	61	62	⅜
20	50	124	82	56	35	47	61	62	½
25	58	144	106	66	44	62	74	72	¾
32	68	154	106	71	44	62	80	77	1
40	84	174	131	85	57	74	95	87	1 ¼
50	97	194	131	89	57	74	102	97	1 ½
63	124	224	152	101	66	86	117	112	2



Accessories

Double sensor for electrical position feedback

After being mounted in the valve or in the interface module, the double sensor is used to signal the CLOSED or OPEN position of the valve via an electric signal to a controller, supplied by the customer. The switching states are also output optically via two integrated LEDs.

DN (mm)	LED signal color	Function	Code
10 - 50	Closed: Green / Open: Red	PNP	198546001
10 - 50	Closed: Red / Open: Green	PNP	198546002
10 - 50	Closed: Green / Open: Red	NPN	198546005
10 - 50	Closed: Red / Open: Green	NPN	198546006
10 - 50	Closed: Green / Open: Red	NAMUR	198546003
10 - 50	Closed: Red / Open: Green	NAMUR	198546004



Suitable connection cables available as accessories

Spring reset unit, manual actuation (dead man's switch)

The spring reset unit (dead man's switch) is installed onto the ball valve type 546 Pro or type 543 Pro and ensures that the ball valve is closed automatically as soon as the handle is released. It is opened against the spring force.

DN (mm)	Code
DN10/15	198546082
DN20/25	198546083



Interface module, manual actuated

With the manually actuated interface module the open or closed position of the ball valve type 546 Pro or type 543 Pro can be transmitted via an electric signal to a customer control.

DN (mm)	Code
DN10/15	198546102
DN20/25	198546103
DN32/40	198546105
DN50	198546107



Interface module, automatic actuated

With the help of the automatically actuated interface module, electric or pneumatic actuators can be attached on the ball valve type 546 Pro or type 543 Pro, which allows the automation of the ball valve's change of position. In addition, an interface is available for the installation of an electrical position feedback indicator.

DN (mm)	Code Pneumatic GF actuators PPA	Code Electric GF actuators EA15/EA25/dEA	Code Ring for type 543 Pro
DN10/15	198546162	198546142	198543000
DN20	198546163	198546143	198543001
DN25	198546164	198546144	198543001
DN32	198546135	198546145	198543002
DN40	198546136	198546146	198543002
DN50	198546137	198546147	198543003



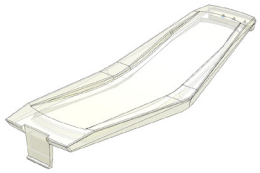
DN (mm)	SW	Code Norm actuators according to ISO 5211
DN10/15	SW09	198546122
DN10/15	SW11/14	198546123
DN20/25	SW09	198546124
DN20/25	SW11/14	198546125
DN32-40	SW11/14	198546126
DN50	SW11/14	198546127



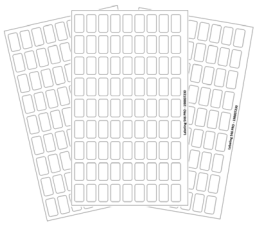
Transparent lever clip

Type 546 Pro or type 543 Pro ball valves can be quickly and easily labelled with the most important information. Operation and maintenance can thus be made safer, faster and clearer. In addition, there are various standards which prescribe a clear marking of the pipeline.

DN (mm)		Code
DN10/15	10 Stk.	198807221
DN20/25	10 Stk.	198807222
DN32/40	5 Stk.	198807223
DN50	5 Stk.	198807224



Printing sheets for ball valve labelling	Printing sheets for ball valve labelling





Further accessories

- Hand lever extension
- Adapter for padlocks

- Tool for disassembling interface modules
- Additional limit switches

For further information on accessories, refer to the online product catalogue at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



3-way Ball Valve type 543 Pro, electric actuated (Type 167-170)



Type 543 Pro horizontal, electric actuated (Type 167-169)
With electric actuator EA or smart electric actuator dEA



Type 543 Pro vertical, electric actuated (Type 170)
With electric actuator EA or smart electric actuator dEA, horizontal

Product description

The types 167-170 pneumatic actuated 3-way ball valves consist of the ball valve type 543 Pro and the elektric actuator EA or smart electric actuator dEA. The modular expandable 3-way ball valve type 543 Pro is designed for mixing and diverting applications which demand special process requirements.

Applications

- Chemical process industry
- Seawater desalinization systems
- Life science industry industry
- Microelectronics
- Measurement and control
- Water treatment
- Diverting function in shipbuilding

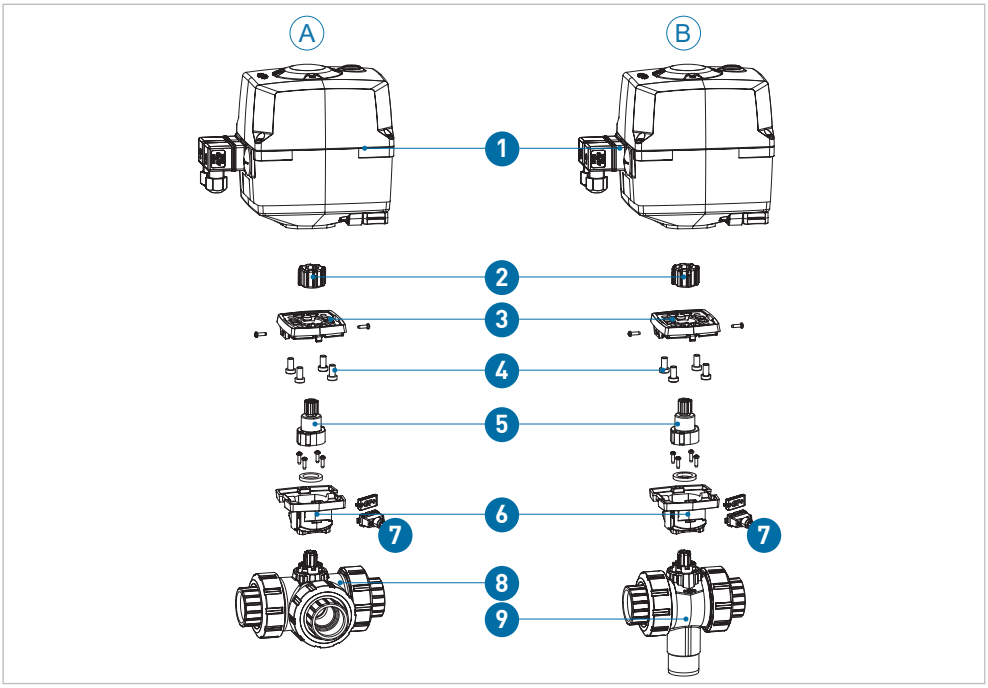
Benefits/features

- Electrical feedback with additional limit switches of different designs integrated into the actuator or in the multifunction module (optional 4-20 mA with Positioner)
- Rotation angle up to 355°; Preset to 0°-90°
- Up to 3 freely selectable stop positions (open/middle/close)
- Integrated emergency manual override
- Optional: Fail-safe return unit with or without integrated battery pack
- Optional: Cycle time monitoring
- Optional: Cycle counter
- Optional: Cycle time extension
- Optional: Motor current monitoring

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

Technical data



A Type 167-169: Type 543 Pro horizontal, with electric actuator EA
B Type 170: Type 543 Pro vertical, with electric actuator EA
1 Actuator type EA
2 Adapter
3 Adapter plate
4 Screws
5 Coupling piece
6 Interface housing
7 Labelling clip or double sensor for electrical position feedback (custom versions only)
8 Ball Valve type 543 Pro horizontal
9 Ball Valve type 543 Pro vertical

Spezification			
Dimensions	DN10 - DN50	EA15/EA25/dEA25	
Type 543 Pro	Types	Horizontal, vertical	
	Housing materials	PVC-U, PVC-C, ABS, PP-H, PVDF	
	Gasket materials	O-ring gasket	EPDM ,FKM
		Ball gasket	PTFE, PVDF
	Pressure rating	PN10	
	Connections	Sockets, spigots, threaded sockets	
	Standards	ISO, BS, ASTM, JIS	
Accessories	Double sensor for electrical position feedback, manual override		

The following technical data can be found in the Planning Fundamentals under "Ball Valve type 543 Pro, manually operated":

- Pressure-temperature diagram
- Pressure loss
- Flow characteristics
- Kv values
- Reference values for screw fastenings

Technical basics

Differences between types 167 – 170

	Type 167, horizontal	Type 168, horizontal	Type 169, horizontal	Type 170, vertical
PVC-U	x			x
PVC-C	x			
ABS	x			x
PP-H		x		
PVDF			x	
ISO	x	x	x	x
ASTM	x	x	x	
BS	x			
JIS	x			x

- The actuators are manufactured according to the specification of EN 61010-1, EC 89/336/EEC-EMV 73/23/EEC, LVD.
- All actuators have the CE marking.
- The actuator housings are made of PPGF (fiberglass-reinforced polypropylene) and external, stainless steel screws with low flammability.
- All electric actuators have an emergency manual override and an optical position indicator.

Properties of electric actuators

Actuator	Cycle time	Nominal torque	Actuating cycles at 20 °C	Duty cycle at 20 °C
EA15/EA25/ dEA25	5 s/90°	10 Nm	250'000	100 %

Also, the electric actuators have a protection rating 65 as per EN 60529 – IP67 (with vertical cable connection and wall bushing) at a voltage of 100 – 230 V, 50 – 60 Hz or 24 V, 50 – 60 Hz.

- The actuators are manufactured according to the specification of EN 61010-1, EC 89/336/EEC-EMV 73/23/EEC, LVD.
- All actuators have the CE marking.
- The actuator housings are made of PPGF (fiberglass-reinforced polypropylene) and external, stainless steel screws with low flammability.
- All electric actuators have an emergency manual override and an optical position indicator.

Valve handling

Installation notes

During installation, ensure that the actuator is correctly built onto and connected to the correct valve. In order to guarantee control provided on the customer side, the following points must be observed:

- Actuate valves with 90° rotary movement.
- Indicate the previously calibrated end positions of the valve via an electrical signal to the aforementioned system control.
- In case of interruption in the supply voltage, ensure that the actuator remains in the current position. For this, installation of an emergency manual override or reset unit is recommended (refer to "Accessories").

Maintenance notes

Set maintenance intervals as per the conditions of use (e.g., actuating cycles, medium, ambient temperature). As part of the regular system inspection, carry out the following maintenance activities.

- Regularly check that no medium escapes to the outside.

- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.
- Check that cover of the emergency manual override is correctly fitted. If necessary, fit cover.
- Check that housing cover of the actuator is fitted with 4 screws. Insert screws if necessary.
- Check if grating noises are coming from the actuator. Replace actuator, see assembly instructions for building valve with actuator.
- Check that position display matches signal of the control. If necessary, adjust limit switches.

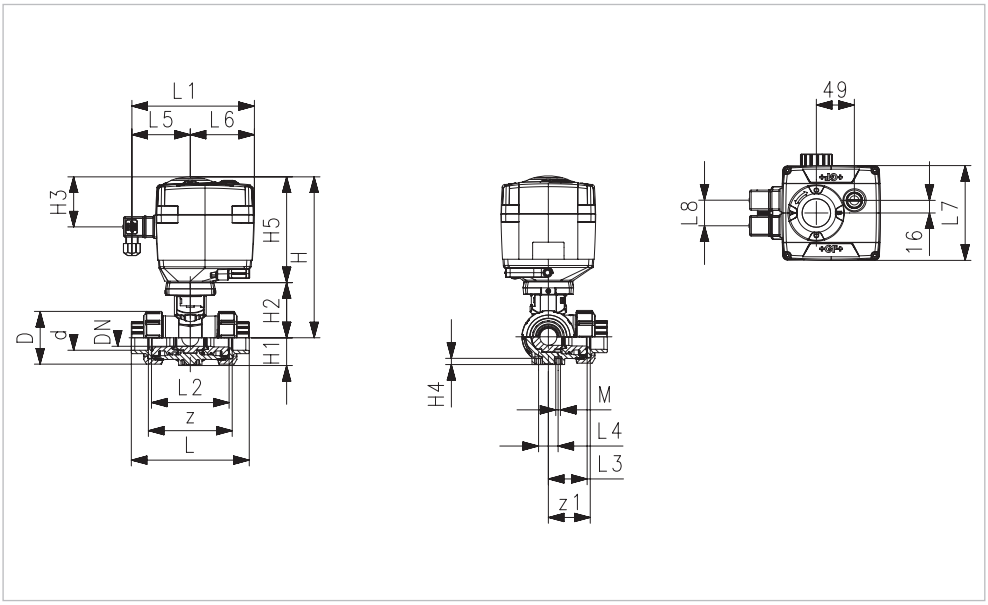
For frequent control operations or due to chemical attack on the sealing material, it may become necessary to replace parts inside the valve.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

Type 543 Pro horizontal, solvent cement sockets metric

Ball valve type 543 Pro horizontal, with solvent cement sockets metric, with electric actuator EA/dEA

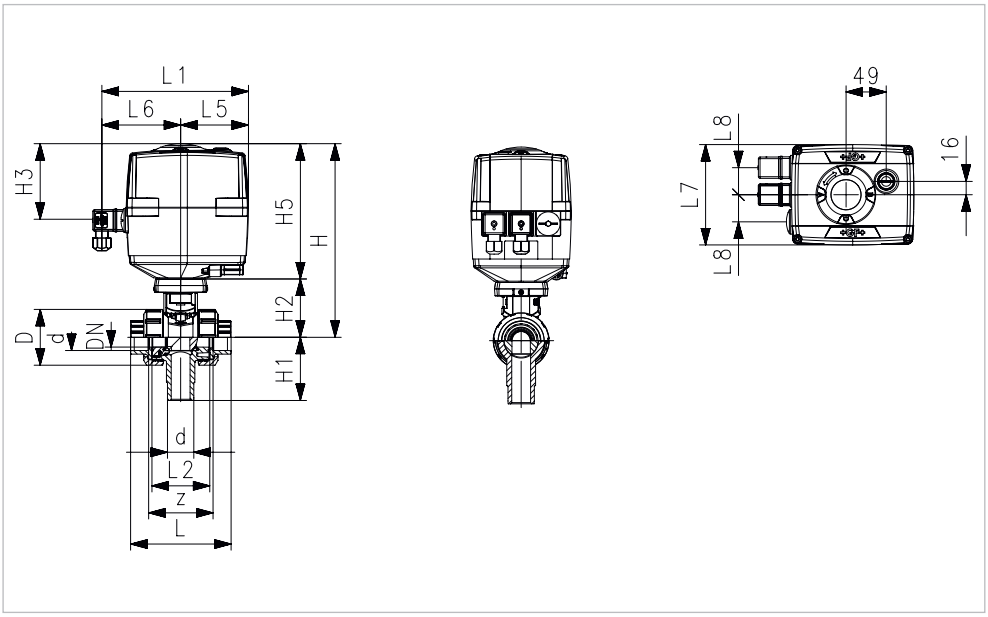


d (mm)	DN (mm)	D (mm)	EA dEA	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)
16	10	50	25	231	28	64	94	8	167
20	15	50	25	231	28	64	94	8	167
25	20	58	25	240	32	73	94	8	167
32	25	68	25	240	36	73	94	8	167
40	32	84	25	251	45	84	94	9	167
50	40	97	25	251	51	84	94	9	167
63	50	124	25	273	65	106	94	9	167

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	M	z (mm)	z1 (mm)	closest inch
16	109	180	73	36	25	97	83	122	33	6	81	40	⅜
20	112	180	73	36	25	97	83	122	33	6	81	40	½
25	131	180	86	43	25	97	83	122	33	6	94	47	¾
32	151	180	99	50	25	97	83	122	33	6	107	54	1
40	181	180	120	60	45	97	83	122	33	8	130	65	1 ¼
50	205	180	137	69	45	97	83	122	33	8	143	72	1 ½
63	261	180	179	89	45	97	83	122	33	8	185	92	2

Type 543 Pro vertical, solvent cement sockets, metric

Ball valve type 543 Pro vertical, with solvent cement sockets metric, with electric actuator EA/dEA



d (mm)	DN (mm)	D (mm)	EA dEA	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)
16	10	50	25	231	62	64	94	167
20	15	50	25	231	62	64	94	167
25	20	58	25	240	72	73	94	167
32	25	68	25	240	77	73	94	167
40	32	84	25	251	87	84	94	167
50	40	97	25	251	97	84	94	167
63	50	124	25	273	112	106	94	167

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	z (mm)	closest inch
16	92	180	56	97	83	122	33	64	⅜
20	95	180	56	97	83	122	33	64	½
25	111	180	66	97	83	122	33	74	¾
32	123	180	71	97	83	122	33	79	1
40	146	180	85	97	83	122	33	95	1 ¼
50	157	180	89	97	83	122	33	95	1 ½
63	183	180	101	97	83	122	33	107	2

Accessories

- Fail-safe return unit with or without integrated battery package
- AS-interface plug on module
- Limit switch assembly kits for multi function module AgNi, Au, NPN, PNP
- Monitoring board with cycle time extension, cycle time monitoring, cycle cycle time monitoring, cycle counter and motor current monitoring
- Positioner board for modulating operation with 4-20 mA Feebback and integrated motor current monitoring
- Profibus DP V0

i For further information on accessories, refer to the online product catalog at www.gfps.com

3-way Ball Valve type 543 Pro P, pneumatic actuated



Type 543 Pro P horizontal, pneumatic actuated
With pneumatic actuator PPA



Type 543 Pro P vertical, pneumatic actuated
With pneumatic actuator PPA

Product description

The pneumatic 3-way ball valves consist of the ball valve type 543 Pro and the pneumatic actuator PPA. The modular expandable 3-way ball valve type 543 Pro is designed for mixing and diverting applications which demand special process requirements.

Applications

- Chemical process industry
- Seawater desalinization systems
- Life science industry industry
- Microelectronics
- Measurement and control
- Water treatment
- Diverting function in shipbuilding

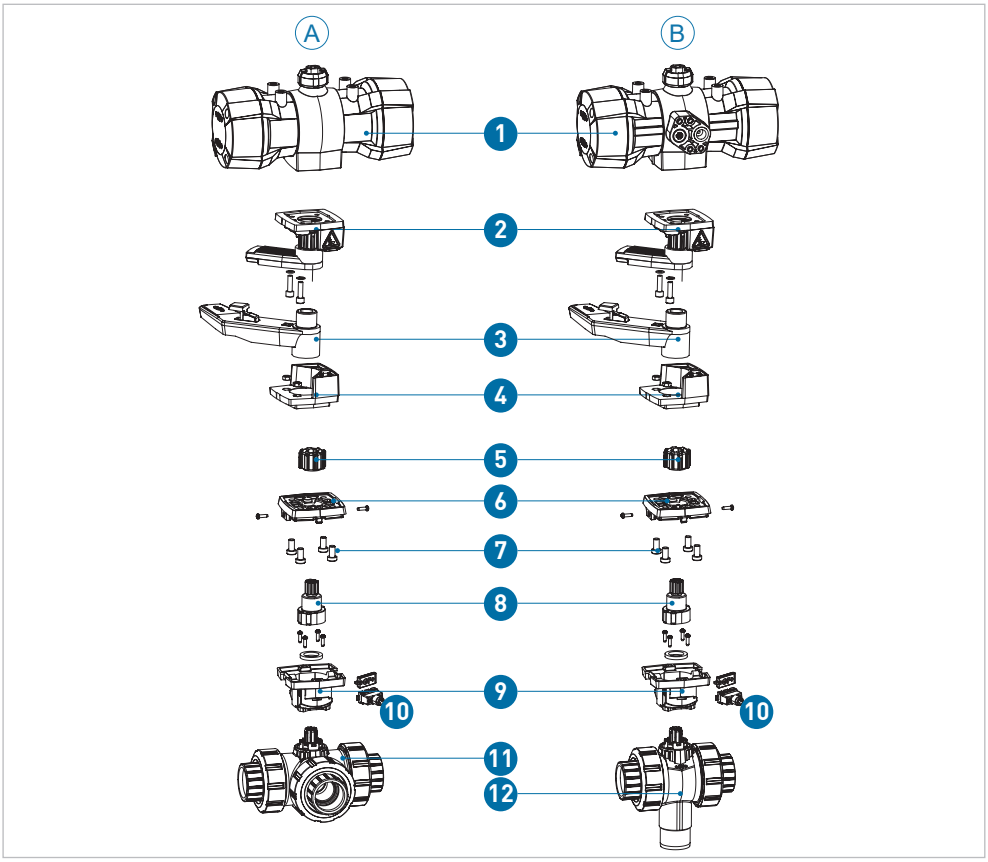
Benefits/features

- Compact design and modular construction of the valves
- Preloaded spring packages, standard version FC, DA; (FO on request)
- Short switching time
- For FC/FO stroke limitation possible
- Control air connection according to NAMUR

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is dependent on the selected valve material (see online tool ChemRes PLUS).

Technical data



A Type 543 Pro horizontal, with pneumatic actuator type PPA, with manual override (optional)
B Type 543 Pro vertical, with pneumatic actuator PPA, with manual override (optional)
1 Actuator type PPA
2 Coupling lever with upper intermediate element
3 Control lever
4 Lower intermediate element
5 Adapter
6 Adapter plate
7 Screws
8 Coupling piece
9 Interface housing
10 Labelling clip or double sensor for electrical position feedback
11 Ball Valve type 543 Pro horizontal
12 Ball Valve type 543 Pro vertical

Specification

			Control pressure 5.6 bar	Control pressure 4.2 bar
Pneumatic actuator Type PPA	DN10/15	FC	PPA08 198155081	PPA15 198155151
		FO	PPA08 198155082	PPA15 198155152
		DA	PPA04 198155043 PPA08 198155083	PPA04 198155043 PPA08 198155083
	DN20	FC	PPA15 198155151	PPA15 198155151
		FO	PPA15 198155152	PPA15 198155152
		DA	PPA08 198155083	PPA08 198155083
	DN25	FC	PPA15 198155151	PPA15 198155151
		FO	PPA15 198155152	PPA15 198155152
		DA	PPA08 198155083	PPA08 198155083
	DN32	FC	PPA15 198155151	PPA40 198155401
		FO	PPA15 198155152	PPA40 198155402
		DA	PPA15 198155153	PPA15 198155153
	DN40	FC	PPA40 198155401	PPA40 198155401
		FO	PPA40 198155402	PPA40 198155402
		DA	PPA15 198155153	PPA15 198155153
	DN50	FC	PPA40 198155401	PPA40 198155401
		FO	PPA40 198155402	PPA40 198155402
		DA	PPA40 198155403	PPA40 198155403
Type 543 Pro	Versions	Horizontal, vertical		
	Housing Materials	PVC-U, ABS, PP-H, PVDF		
	Gasket materials	O-ring gasket		EPDM, FKM, PTFE, PVDF
		Ball gasket		PTFE, PVDF
	Pressure rating	PN10		
	Connections	Socket, spigot, threaded socket		
	Standards	ISO, BS, ASTM, JIS		

Specification	
Accessories	Double sensor for electrical position feedback, manual override

The following technical data can be found in the Planning Fundamentals under "Ball Valve type 543 Pro, manually operated":

- Pressure-temperature diagram
- Pressure loss
- Flow characteristics
- Kv values
- Reference values for screw fastenings

Technical basics

Properties of pneumatic actuators type PPA

The pneumatic actuators PPA are available with the functions fail-safe to close (FC), fail-safe to open (FO) and double-acting (DA) and have an optical position indicator. The housing of the actuator is made of fiberglass-reinforced polypropylene (PP-GF) and therefore has low flammability. For easy mounting of positioners, limit switches and accessories, the actuator type PPA is equipped with an integrated NAMUR interface.
The actuator is mounted to the ball valve via the interface module. The optional double sensor can be attached to the interface module for electrical feedback.

Pneumatic actuators are distinguished with regard to the valve sizes by actuators 1 (for valve sizes DN10 – 25 mm) and actuators 2 (for valve sizes DN32 – 50 mm).

Valve handling

Installation notes

- Ensure that the ball valves are actuated with a control pressure of 2.8 to 7 bar via control pressure and up to a control pressure of 20 Nm.
- Depending on the actuator type, double-acting (type designation DA) or single-acting with spring for fail-safe to CLOSE (type designation FC) or single-acting for fail-safe to OPEN (Type designation FO).
- Control these valves to the OPEN and CLOSED positions via a built-in solenoid valve. The solenoid valve must be either supplied outside of the GF factory or mounted by the customer.
- Indicate these positions OPEN and CLOSED via an electric signal to the system control, if the actuator is equipped for this with the respective subassembly.
- Enable control of these positions through manual operation in case of failure in the compressed air supply, if the actuator is equipped for this with the respective subassembly.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

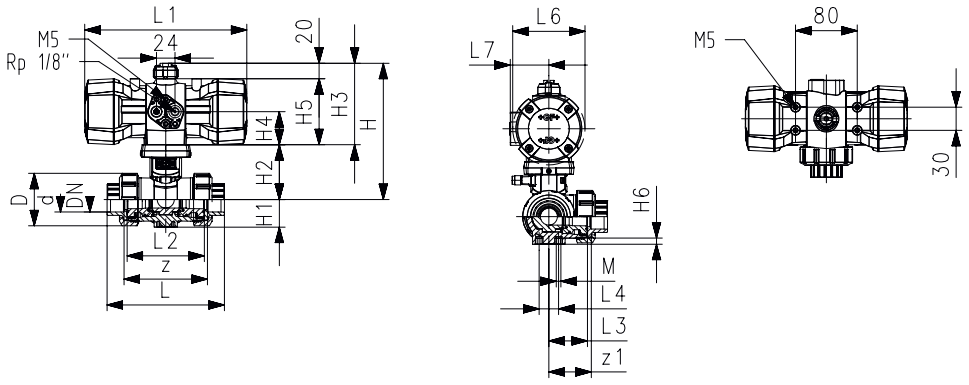
For frequent control operations or due to chemical attack on the sealing material, it may become necessary to replace parts inside the valve. For this purpose, the valve must be removed from the piping system.

Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

Type 543 Pro P horizontal, solvent cement sockets metric

Ball valve type 543 Pro horizontal, with solvent cement sockets metric, with pneumatic actuator type PPA FC/FO

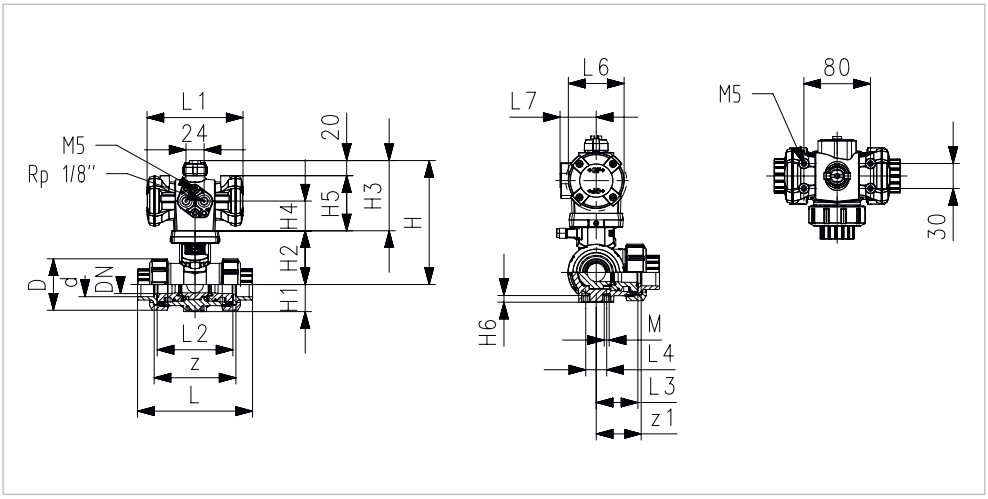


DN (mm)	d (mm)	Actua-tor	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)
10	16	PPA08	50	157	28	62	95	41	75	8
15	20	PPA08	50	157	28	62	95	41	75	8
20	25	PPA15	58	179	32	71	108	45	88	8
25	32	PPA15	68	179	36	71	108	45	88	8
32	40	PPA40	84	215	45	84	131	56	111	9
40	50	PPA40	97	215	51	84	131	56	111	9
50	63	PPA40	124	237	65	106	131	56	111	9

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L6 (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch
16	109	159	73	36	25	74	32	6	81	40	⅜
20	112	159	73	36	25	74	32	6	81	40	½
25	131	211	86	43	25	94	38	6	94	47	¾
32	151	211	99	50	25	94	38	6	107	54	1
40	181	246	120	60	45	120	47	8	130	65	1 ¼
50	205	246	137	69	45	120	47	8	143	72	1 ½
63	261	246	179	89	45	120	47	8	185	92	2

Type 543 Pro P horizontal, solvent cement sockets metric

Ball valve type 543 Pro horizontal, with solvent cement sockets metric, with pneumatic actuator type PPA DA

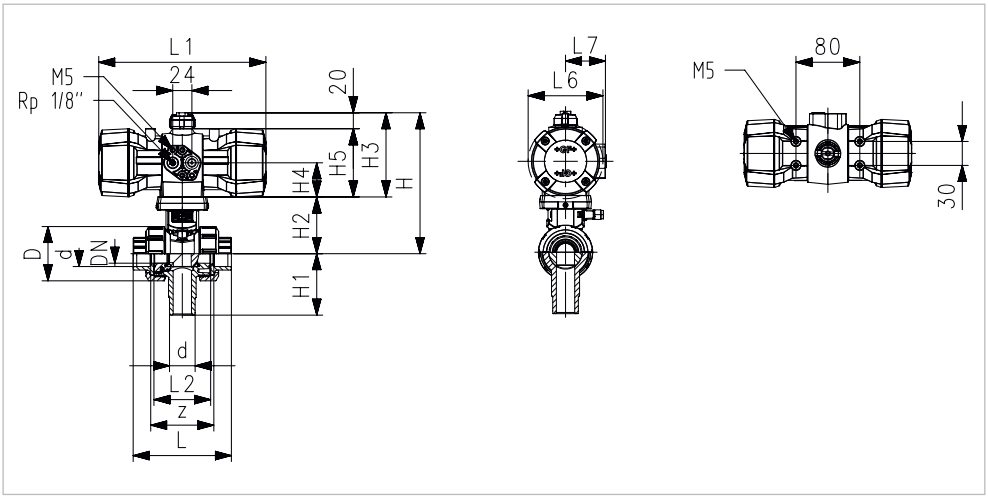


DN (mm)	d (mm)	Actua-tor	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)
10	16	PPA08	50	157	28	62	95	41	75	8
15	20	PPA08	50	157	28	62	95	41	75	8
20	25	PPA08	58	166	32	71	95	41	75	8
25	32	PPA08	68	166	36	71	95	41	75	8
32	40	PPA15	84	192	45	84	108	45	88	9
40	50	PPA15	97	192	51	84	108	45	88	9
50	63	PPA40	124	237	65	106	131	56	111	9

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L6 (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch
16	109	128	73	36	25	74	32	6	81	40	⅜
20	112	128	73	36	25	74	32	6	81	40	½
25	131	128	86	43	25	74	32	6	94	47	¾
32	151	128	99	50	25	74	32	6	107	54	1
40	181	165	120	60	45	94	38	8	130	65	1 ¼
50	205	165	137	69	45	94	38	8	143	72	1 ½
63	261	184	179	89	45	120	47	8	185	92	2

Type 543 Pro P vertical, solvent cement sockets metric

Ball valve type 543 Pro vertical, with solvent cement sockets metric, with pneumatic actuator type PPA FC/FO

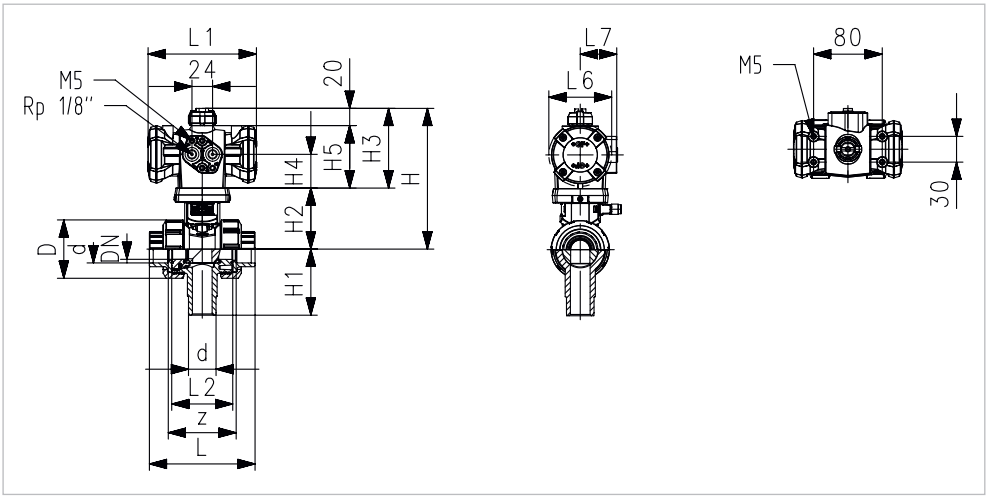


DN (mm)	d (mm)	Actua-tor	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)
10	16	PPA08	50	157	28	62	95	41	75	8
15	20	PPA08	50	157	28	62	95	41	75	8
20	25	PPA15	58	179	32	71	108	45	88	8
25	32	PPA15	68	179	36	71	108	45	88	8
32	40	PPA40	84	215	45	84	131	56	111	9
40	50	PPA40	97	215	51	84	131	56	111	9
50	63	PPA40	124	237	65	106	131	56	111	9

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L6 (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch
16	110	159	72	36	25	74	32	6	82	41	⅜
20	112	159	72	36	25	74	32	6	82	41	½
25	129	211	85	43	25	94	38	6	97	49	¾
32	146	211	97	49	25	94	38	6	110	55	1
40	170	246	118	59	45	120	47	8	132	66	1 ¼
50	193	246	135	68	45	120	47	8	151	76	1 ½
63	244	246	176	88	45	120	47	8	188	94	2

Type 543 Pro P vertical, solvent cement sockets metric

Ball valve type 543 Pro vertical, with solvent cement sockets metric, with pneumatic actuator type PPA DA



DN (mm)	d (mm)	Actua-tor	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)
10	16	PPA08	50	157	28	62	95	41	75	8
15	20	PPA08	50	157	28	62	95	41	75	8
20	25	PPA08	58	166	32	71	95	41	75	8
25	32	PPA08	68	166	36	71	95	41	75	8
32	40	PPA15	84	192	45	84	108	45	88	9
40	50	PPA15	97	192	51	84	108	45	88	9
50	63	PPA40	124	237	65	106	131	56	111	9

d (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L6 (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch
16	110	128	72	36	25	74	32	6	82	41	⅜
20	112	128	72	36	25	74	32	6	82	41	½
25	129	128	85	43	25	74	32	6	97	49	¾
32	146	128	98	49	25	74	32	6	110	55	1
40	170	165	118	59	45	94	38	8	132	66	1 ¼
50	193	165	135	68	45	94	38	8	151	76	1 ½
63	244	184	176	88	45	120	47	8	188	94	2

Accessories

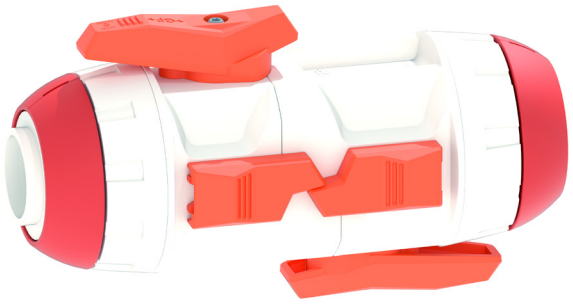
- Manual override -10° to 50° C
- Double sensor for electrical position indicator
- 3/2 way pilot valve type PV94/95
- 3/2 - 5/2 way solenoid valve type MNL532
- 4/2 way pilot valve type 5470
- Valve terminal type PV2000
- Digital positioner type RPC
- Position indicator - feedback box
- AS-Interface ASVC 2300
- See accessories pneumatic actuator PPA

i For further information on accessories, refer to the online product catalog at www.gfps.com

Quick Connect Valve 700



Quick Connect Valve 700 (QC7)
Example: NPT 1" Swivel Version
Direct liquid cooling - Supply (Blue colored clips)



Quick Connect Valve 700 (QC7)
Example: Spigot PVDF d32 Version (Infrared fusion)
Direct liquid cooling - Return (Red colored clips)

Product description

The advanced Quick Connect Valve 700 consists of two ball valves and is engineered for direct liquid cooling applications in mission-critical facilities, where exceptional reliability, safety, and performance are essential.

The design is based on the type 546 Pro full-bore ball valve, which has been proven for its high performance in various markets for decades. The Quick Connect Valve 700 features two identical halves and a patented locking mechanism that allows the halves to be separated only in the valve close position. As such, it provides ultimate safety during operation and maintenance.

Patented
Dual interlock lever mechanism that prevents accidental decoupling.

50% less weight
From 1.8kg to 0.8kg, with same strength, performance, and reliability*.

25% better flow
Full-bore valve design for optimal flow and reduced pressure drop*.

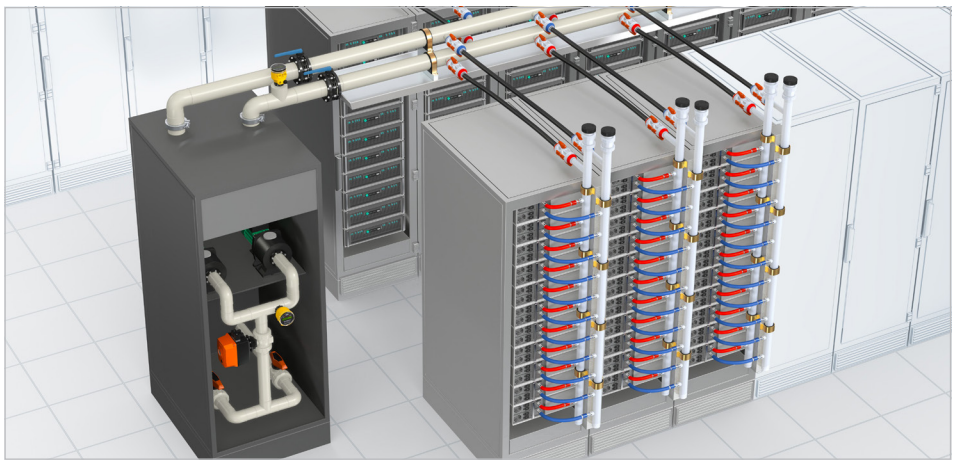
Easy handling
Safe, easy, and ergonomic to handle and color coding for supply/return lines.

100% reliable
Corrosion-free, proven design, and thoroughly tested for long service life.

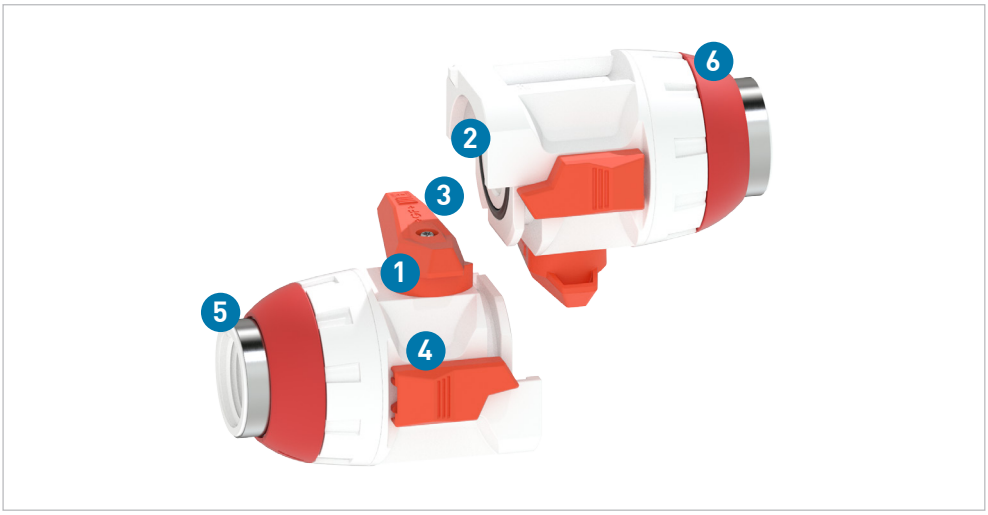
*compared to metal alternatives

Industries/Applications

Data Centers - Direct Liquid Cooling



Technical data



1 Patented dual interlock lever mechanism prevents accidental decoupling
2 Face seal (EPDM)
3 Ergonomic lever (open/close)
4 Two-handed safety lock for vertical release
5 Variety of end connections for flexibility in application
6 Interchangeable colored clips for colour coding the supply and return lines

Technical data		
Dimensions	d32/DN25, 1"	
Pressure	Nominal pressure	PN10
	Burst pressure	Coupled: 3× PN Decoupled: 4× PN
Materials	Valve body	PVDF
	Lever, interlock slider	PP-GF30
	Colored clips	PP-B
	Face seal, o-rings	EPDM
	Ball seat	PTFE
Swivelled end connections	NPT 1"	PVDF - Connectable with metal or plastic threads
	Spigot d32	PVDF (Infrared fusion)
		PP-H (Infrared fusion)
	BSPP Female Thread G1"	PVDF
	BSPP Male Thread G1"	PVDF
	Sanitary clamp 1"	PVDF
	Elbow 90° + Sanitary clamp 1"	PVDF
Flow rate	Kv 100	570 l/min
	Cv 100	39 US gal/min
Weight (pair)	0.75 kg (1.7 lbs)	
Test standard	ISO 9393-1:2004	
Environmental Product Declaration (EPD)	https://manage.epdhub.com/?epd=HUB-3181	
Flow media	The considered materials are compatible with most standard liquid coolants used in the direct liquid cooling application (e.g. 25% monopropylene glycol solution). For chemical compatibility see online tool ChemRes PLUS under www.gfps.com/chemres	

Kv 100 values

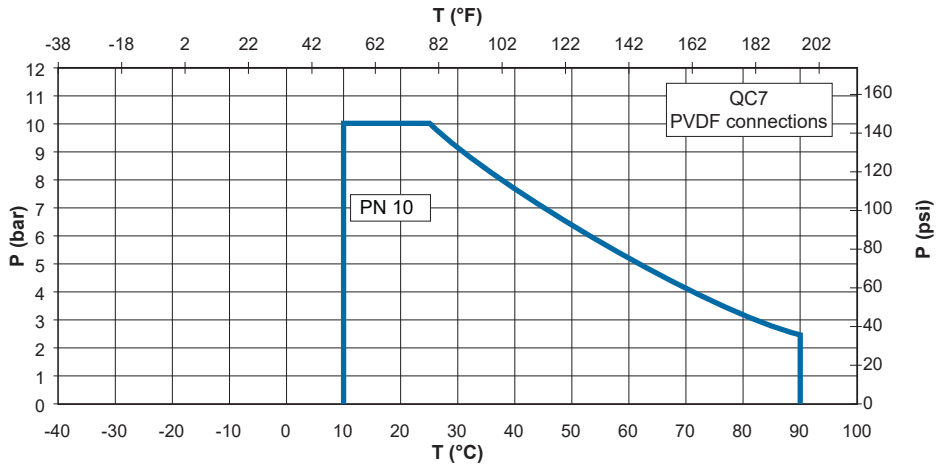
d (mm)	DN (mm)	Inch (")	Kv 100 (l/min)	Cv 100 (US gal/min)
32	25	1	570	39

Pressure-temperature diagrams

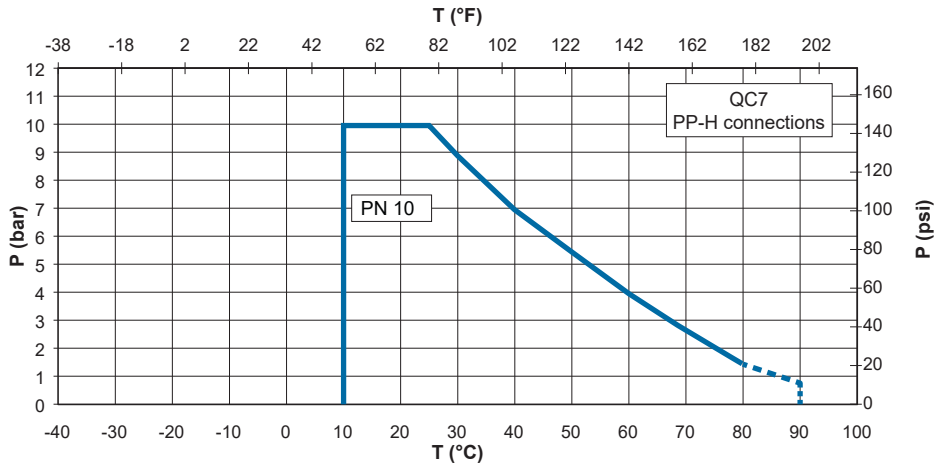
The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

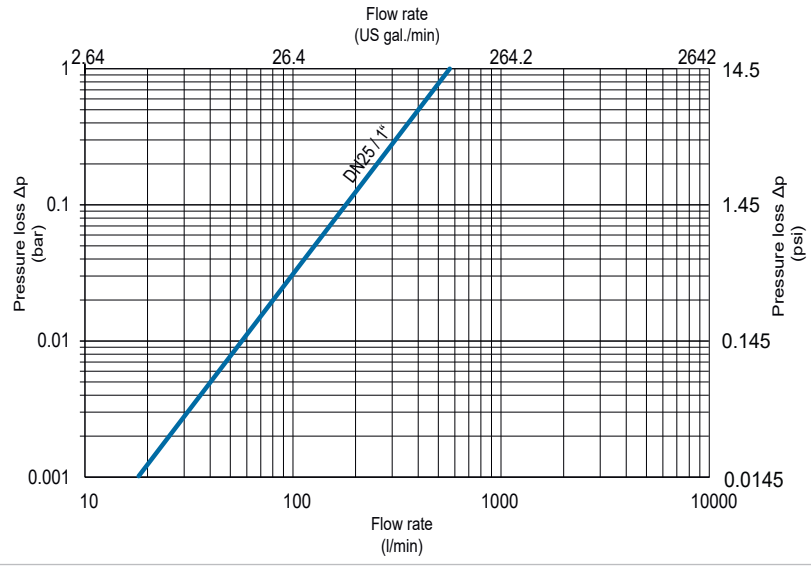
NPT 1" PVDF or Spigot d32 PVDF Version (Infrared fusion)



Spigot d32 PP-H Version (Infrared fusion)



Pressure losses



X Flow rate
(l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Technical basics

Valve handling

Installation notes

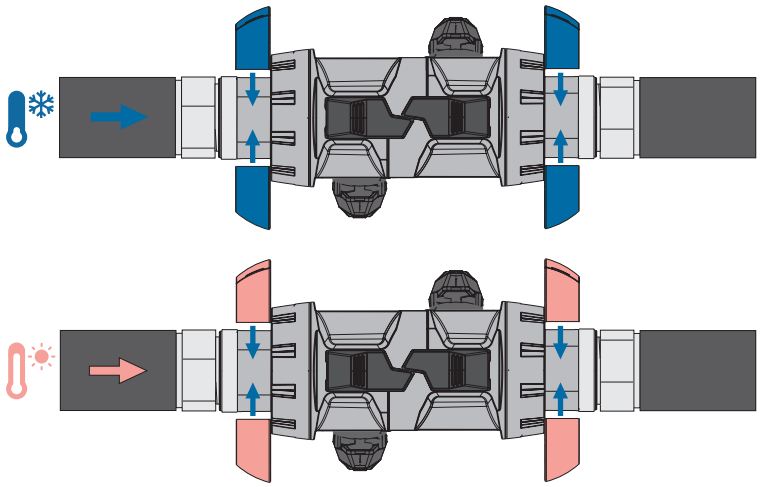
Installation – Forces/stresses

Longitudinal or bending forces on the coupling can cause damage that may result in leaks, among other things.

▶ When installing the Quick Connect Valve 700, ensure that it is mounted in a stress-free manner. Bending stresses in particular must be avoided.

Colored clips

Apply the colored clips to identify the supply lines (blue) and return lines (red).



Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- To check the function of ball valves that remain in the same position permanently, a functional test is recommended 1–2 times per year.

Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Selection of lubricant

All seals should be lubricated with a silicone-based grease. Using the wrong lubricants can damage the material of the ball valve or seals.

- Mineral oil-based and Vaseline (petrolatum) are not appropriate.

Decoupling

Safe decoupling of the halves is ensured by an interlocking mechanism that only permits separation when both valves are fully closed. Rotating both levers to the closed position stops the flow, allowing the halves to be disconnected, even while the main distribution lines remain pressurized.

Pull all four interlock sliders back at the same time and slide the halves vertically apart.

Note: Halves cannot be disconnected until both valves are closed.

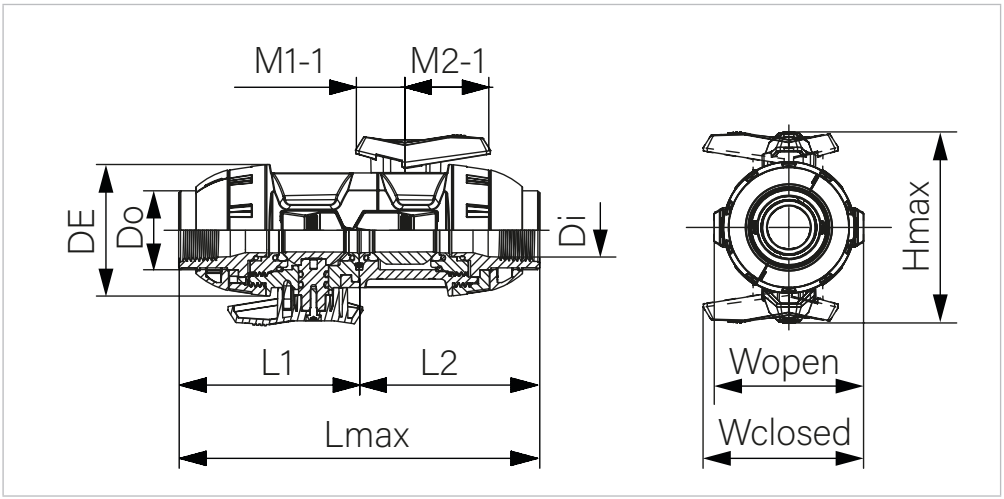
Coupling

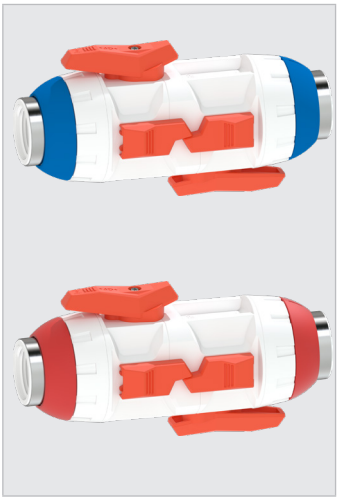
Carefully push the halves together vertically, until the interlocking slides lock into place. The correct position is confirmed by an audible “click".

Dimensions

Quick Connect Valve 700 with swiveled end-connection:

NPT 1" thread version

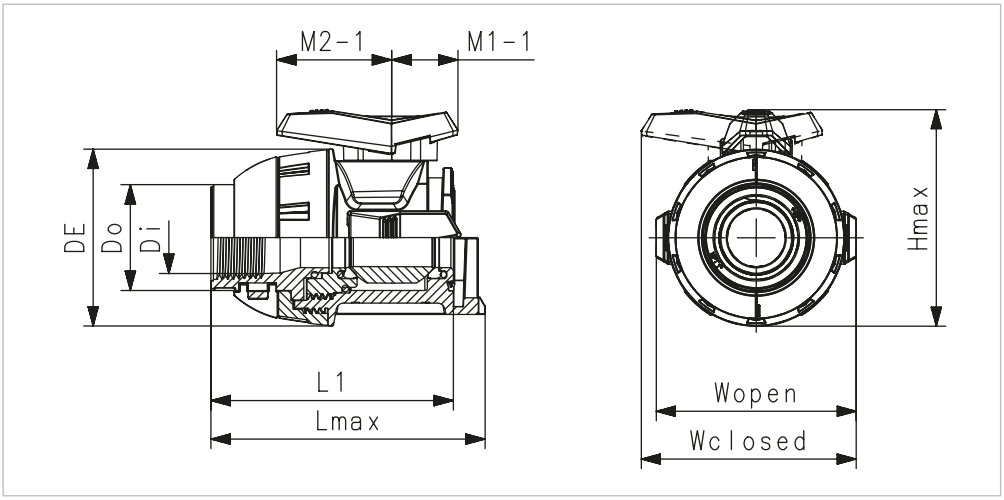


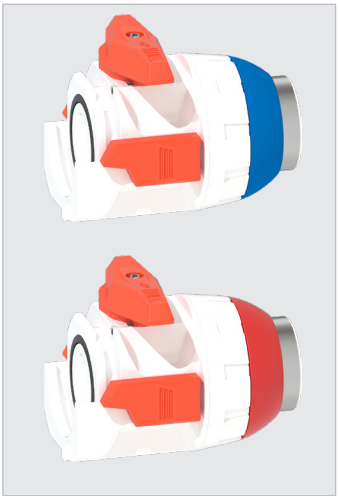


d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do (mm)	Di (mm)	L1 (mm)	L2 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclo-sed (mm)
32	25	1	PVDF	70	42	28	96	96	26.5	46	192	102	79.5	85.5

Quick Connect Valve 700 with swiveled end-connection:

NPT 1" thread version

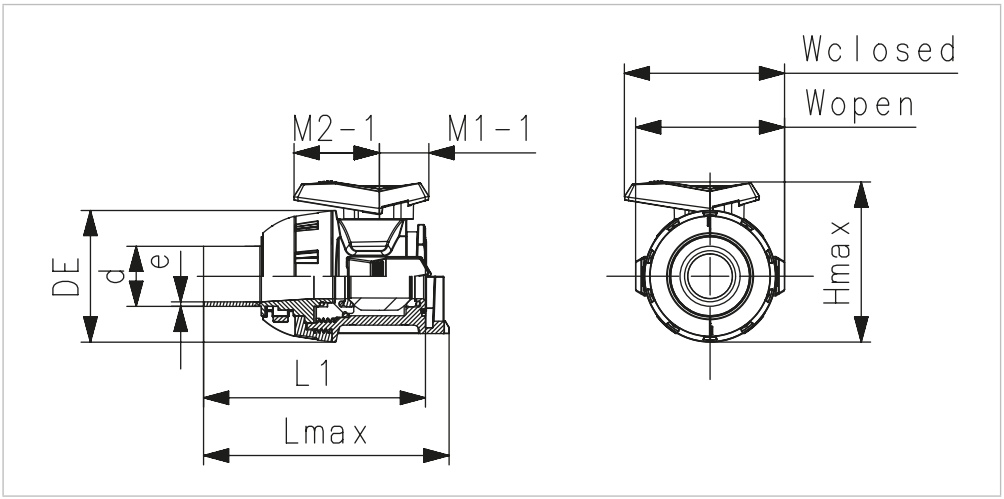


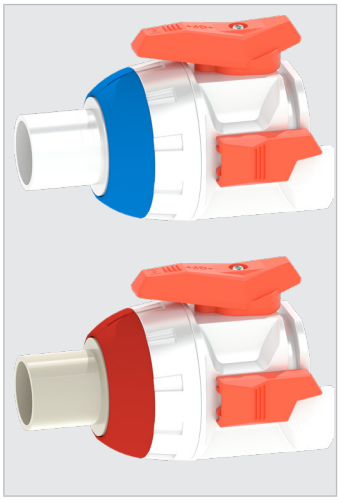


d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do (mm)	Di (mm)	L1 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclo-sed (mm)
32	25	1	PVDF	70	42	28	96	26.5	46	109	85.5	79.5	85.5

Quick Connect Valve 700 with swiveled end-connection:

PP-H / PVDF Spigot (Infrared fusion)

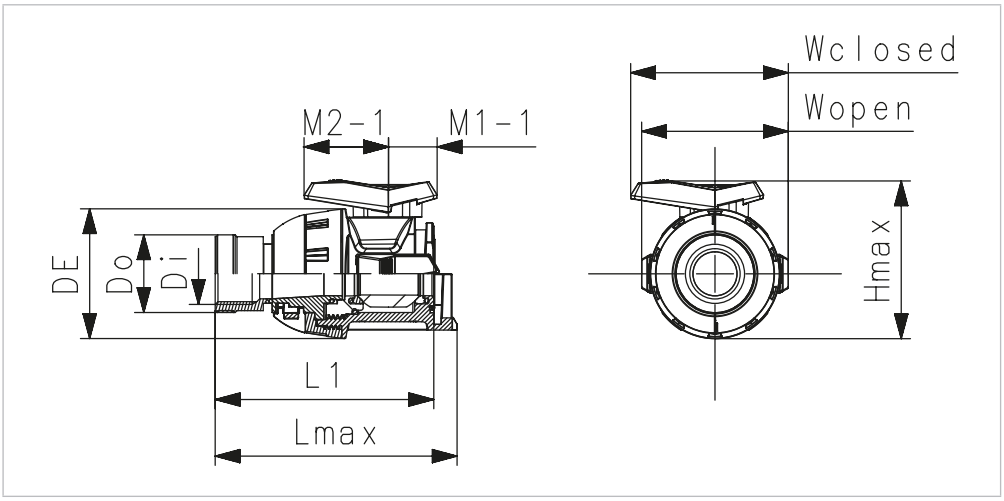


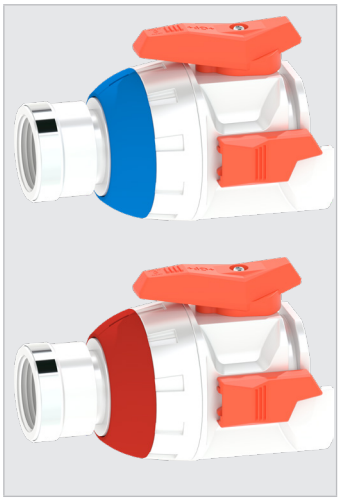


d (mm)	DN (mm)	Inch (")	End connection material	e (mm)	DE (mm)	L1 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclosed (mm)
32	25	1	PVDF	2.4	70	118	26.5	46	131	85.5	79.5	85.5
32	25	1	PP-H	2.9	70	118	26.5	46	131	85.5	79.5	85.5

Quick Connect Valve 700 with swiveled end-connection:

BSPP G1" (Female Thread)*



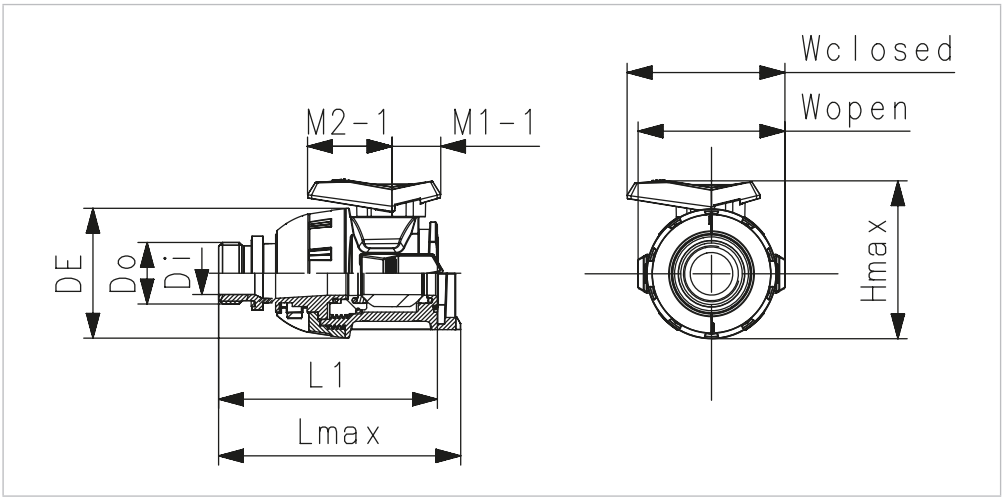


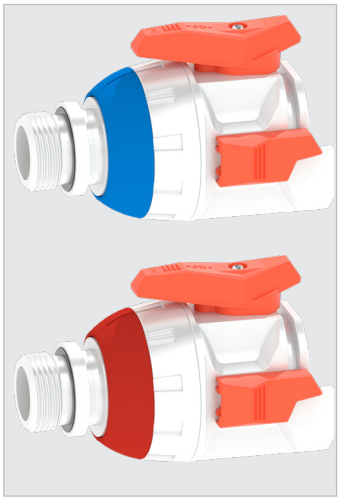
d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do (mm)	Di ("/mm)	L1 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclosed (mm)
32	25	1	PVDF	70	42	G1" (30.5)	118	26.5	46	131	85.5	79.5	85.5

* ISO 1179-1 Flat Face Port with British Standard Pipe, Parallel: Elastomeric Seal Ring; Seal Type E

Quick Connect Valve 700 with swiveled end-connection:

BSPP G1" (Male Thread)*



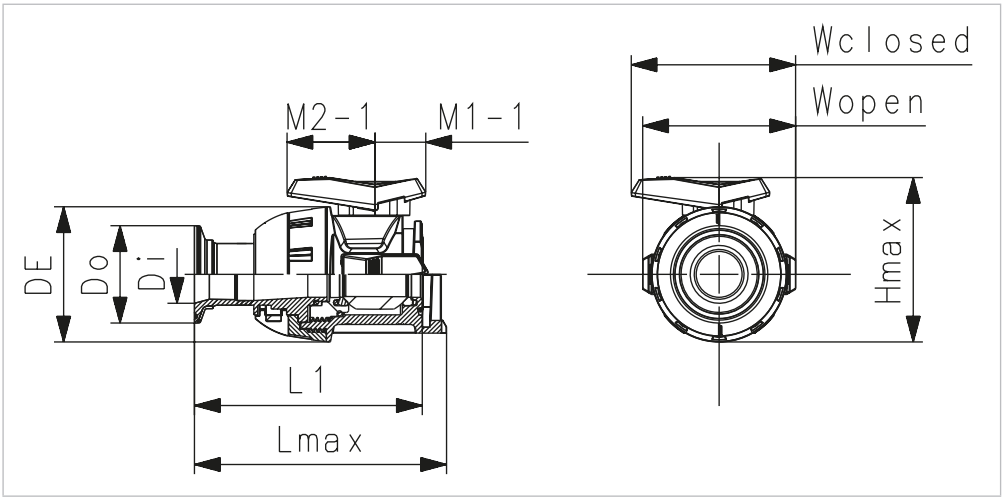


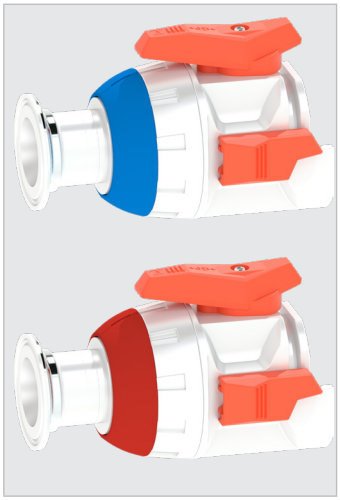
d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do ("/mm)	Di (mm)	L1 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclosed (mm)
32	25	1	PVDF	70	G1" (30.5)	23	118	26.5	46	131	85.5	79.5	85.5

* ISO 1179-1 Flat Face Port with British Standard Pipe, Parallel: Elastomeric Seal Ring; Seal Type E

Quick Connect Valve 700 with swiveled end-connection:

Sanitary clamp 1"

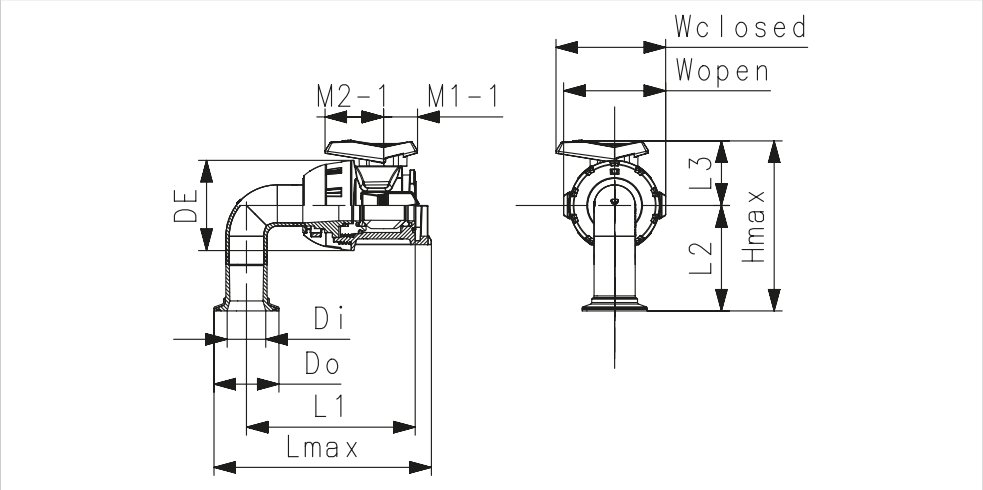


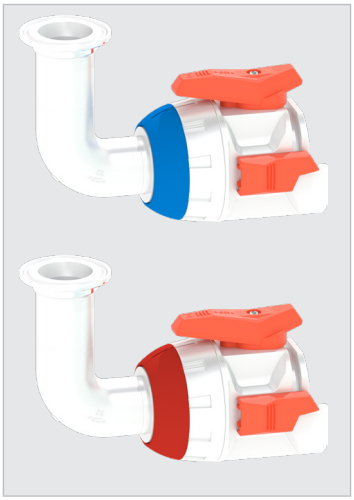


d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do (mm)	Di (mm)	L1 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclosed (mm)
32	25	1	PVDF	70	50.5	30	118	26.5	46	131	85.5	79.5	85.5

Quick Connect Valve 700 with swiveled end-connection:

Elbow 90° with Sanitary clamp 1"

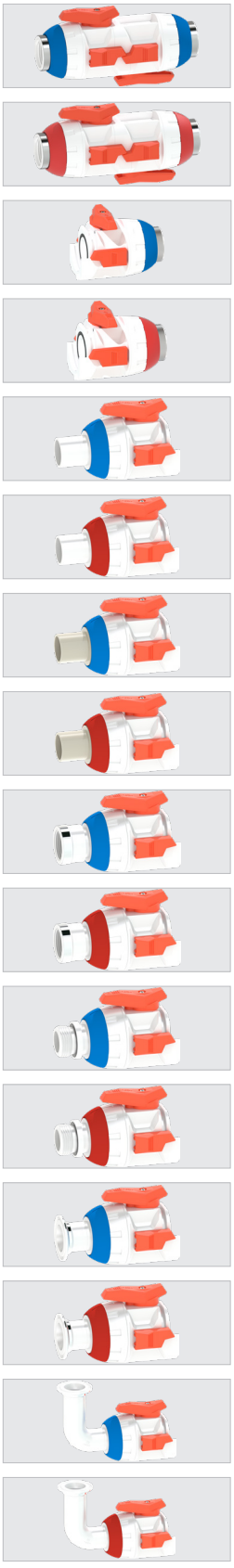




d (mm)	DN (mm)	Inch (")	End connection material	DE (mm)	Do (mm)	Di (mm)	L1 (mm)	L2 (mm)	L3 (mm)	M1-1 (mm)	M2-1 (mm)	Lmax (mm)	Hmax (mm)	Wopen (mm)	Wclosed (mm)
32	25	1	PVDF	70	50.5	30	131	82	50	26.5	46	169	132	79.5	85.5

Ordering Information

Order code	Description	End connection	Colored clips	DN (mm)	Valve Body/Seal Material
735 911 700	QC7 Pair	NPT 1"	Supply (blue)	25	PVDF/EPDM
735 911 702	QC7 Pair	NPT 1"	Return (red)	25	PVDF/EPDM
735 911 701	QC7 Half	NPT 1"	Supply (blue)	25	PVDF/EPDM
735 911 703	QC7 Half	NPT 1"	Return (red)	25	PVDF/EPDM
735 911 705	QC7 Half	Spigot d32 PVDF (IR)	Supply (blue)	25	PVDF/EPDM
735 911 707	QC7 Half	Spigot d32 PVDF (IR)	Return (red)	25	PVDF/EPDM
735 911 709	QC7 Half	Spigot d32 PP-H (IR)	Supply (blue)	25	PVDF/EPDM
735 911 711	QC7 Half	Spigot d32 PP-H (IR)	Return (red)	25	PVDF/EPDM
735 911 713	QC7 Half	BSPP-Female Thread G1" (*)	Supply (blue)	25	PVDF/EPDM
735 911 715	QC7 Half	BSPP-Female Thread G1" (*)	Return (red)	25	PVDF/EPDM
735 911 717	QC7 Half	BSPP-Male Thread G1" (*)	Supply (blue)	25	PVDF/EPDM
735 911 719	QC7 Half	BSPP-Male Thread G1" (*)	Return (red)	25	PVDF/EPDM
735 911 721	QC7 Half	Sanitary clamp 1"	Supply (blue)	25	PVDF/EPDM
735 911 723	QC7 Half	Sanitary clamp 1"	Return (red)	25	PVDF/EPDM
735 911 725	QC7 Half	Elbow 90° + Sanitary clamp 1"	Supply (blue)	25	PVDF/EPDM
735 911 727	QC7 Half	Elbow 90° + Sanitary clamp 1"	Return (red)	25	PVDF/EPDM



* ISO 1179-1 Flat Face Port with British Standard Pipe, Parallel: Elastomeric Seal Ring; Seal Type E

Laboratory Ball Valve type 522



Type 522
PVC-U



Type 522
PVDF

Product description

The laboratory ball valve type 522 is the ideal valve for use in laboratory applications. It is available in diameter DN6 in the materials PVC-U and PVDF, as well as with BSP or NPT thread. The various connection options and other accessories are supplied as standard.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90° to block the flow passage. This valve is mainly used for open/close functions and for regulating services.

Applications

- Laboratory applications
- Dosing
- Sample taking

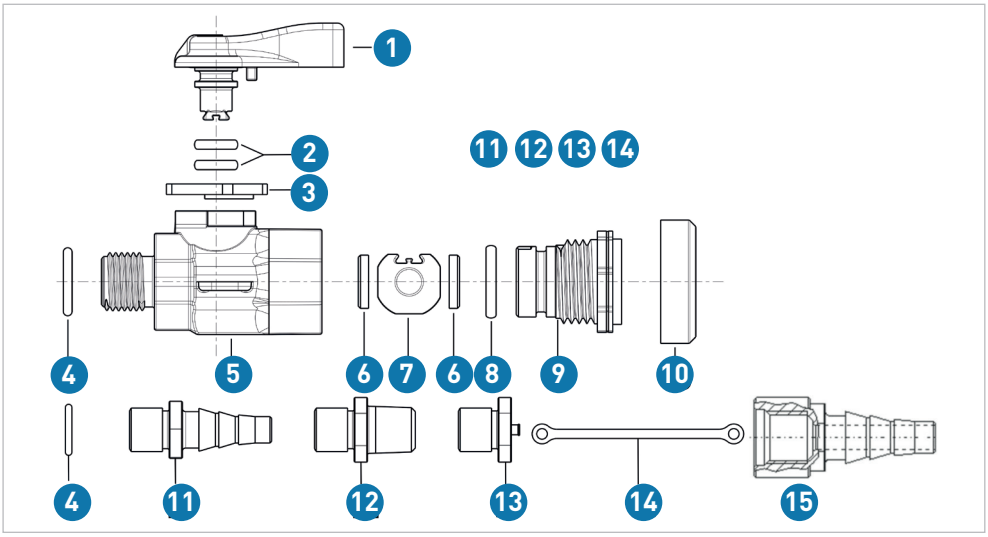
Benefits/features

- ideal for laboratory applications
- Lock and metering ring for protection of sampling ball valve from any unwarranted opening
- Lock and metering ring for adjustment of ball opening angles
- Sampling ball valve can be 100% opened at any time by removing the lock and metering ring
- Compact design
- Low weight
- Corrosion resistant
- PVDF Sampling ball valve is Oil & Silicone-free

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance is independent of the selected valve material (see online tool ChemRes PLUS).

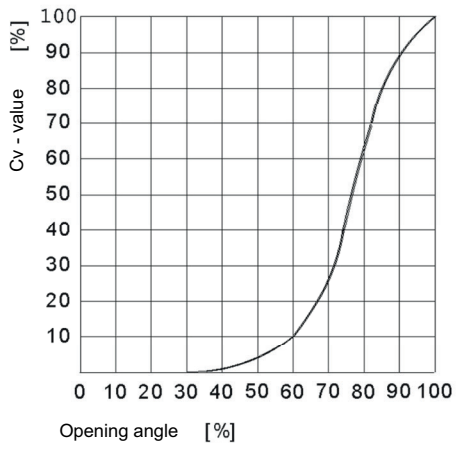
Technical data



1 Handle
2 O rings
3 Blocking and dosage ring
4 O rings
5 Housing
6 Ball seat ring
7 Ball
8 O rings
9 Pressure ring
10 Safety clip
11 Hose connector AG
12 Double nipple
13 Blanking plug
14 Fastening clip
15 Hose connector IG

Specifications		
Dimensions	d10/DN6	
Materials	Valve body and lever	PVC-U, PVDF
Gasket materials	O rings	EPDM, FPM
	Ball seating joint	PTFE
Pressure level	PN10	
Connections PVC-U	Housing	BSP, NPT
	Hose nozzle	BSP, NPT
	Double nipple	BSP - NPT, NPT - NPT
	Plug	BSP
Connections PVDF	Housing	BSP, NPT
	Hose nozzle - male thread	BSP
	Double nipple	BSP, NPT
	Plug	BSP
Product standard	EN ISO 16135	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	FDA, QAP/ITP	

Flow characteristics



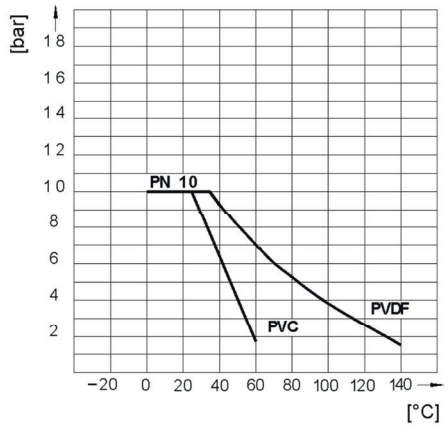
X Opening angle (%)
Y kv, Cv value (%)

Pressure-temperature diagrams

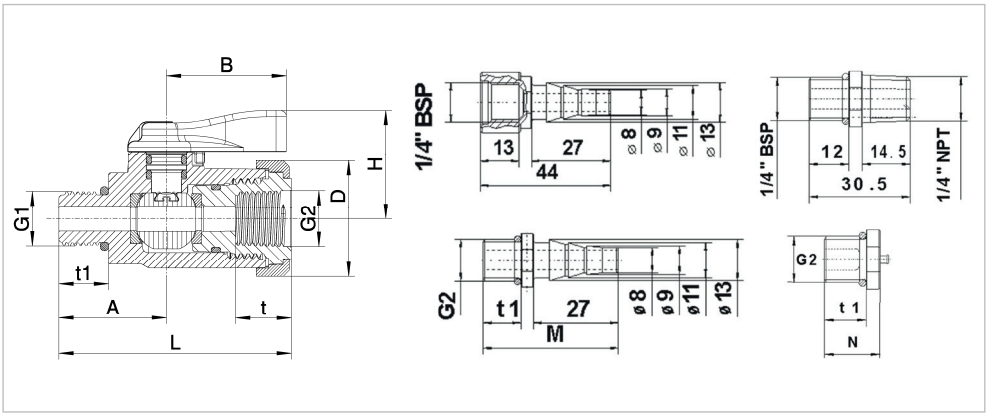
The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U, PVDF



Dimensions



	G1 (inch)	G2 (inch)	A (mm)	B (mm)	D (mm)	H (mm)	L (mm)	M (mm)	N (mm)	t (mm)	t1 (mm)	PN (bar)
PVC-U	1/4" BSP	1/4" BSP	26	29	28	26.5	56	43	16	13.5	12	10
	1/4" NPT	1/4" NPT	28.5	29	28	26.5	58.5	45.5	18.5	13.5	14.5	10
PVDF	1/4" BSP	1/4" BSP	26	28.2	28	26	56	43	16	13.2	12	10
	1/4" NPT	1/4" NPT	28.5	28.2	28	26	58.5	45.5	18.5	13.2	14.5	10

For further information on accessories, refer to the online product catalogue at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Technical basics

Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

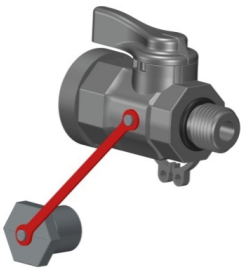
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

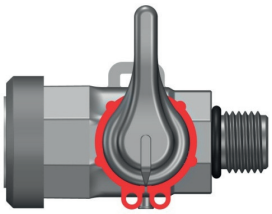
Additional features



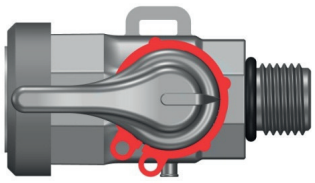
When not in use, lock and metering ring can be hanged on sampling ball valve body.



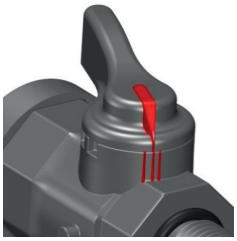
When not in use, plug can be fixed with the clip tie on the sampling ball valve body.



In closed position, the lock and metering ring protects the valve against unwarranted opening.



In open position, the locking ring protects the valve against unwarranted closing.



The three metering marks serves as guidance for flow regulation.

Ball Valves type 374-375

Ball Valve type 374



Ball Valve type 374

Product description

The Ball Valve type 374 is an affordable and high quality manual valve that was developed specially for use in non-critical water applications. Its construction ensures simple maintenance and hence a long service life. Its compact construction is an advantage for use in confined spaces such as filtering modules.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90° to block the flow passage. This valve is used primarily for open/close functions and also for throttling services.

Applications

- Swimming Pools, leisure parks and SPA's
- Building Technology
- Water treatment
- Fountains and municipal landscaping
- Irrigation
- Fish farming and aquaculture
- Other aplications in which non aggressive chemical media is conveyed through the piping system

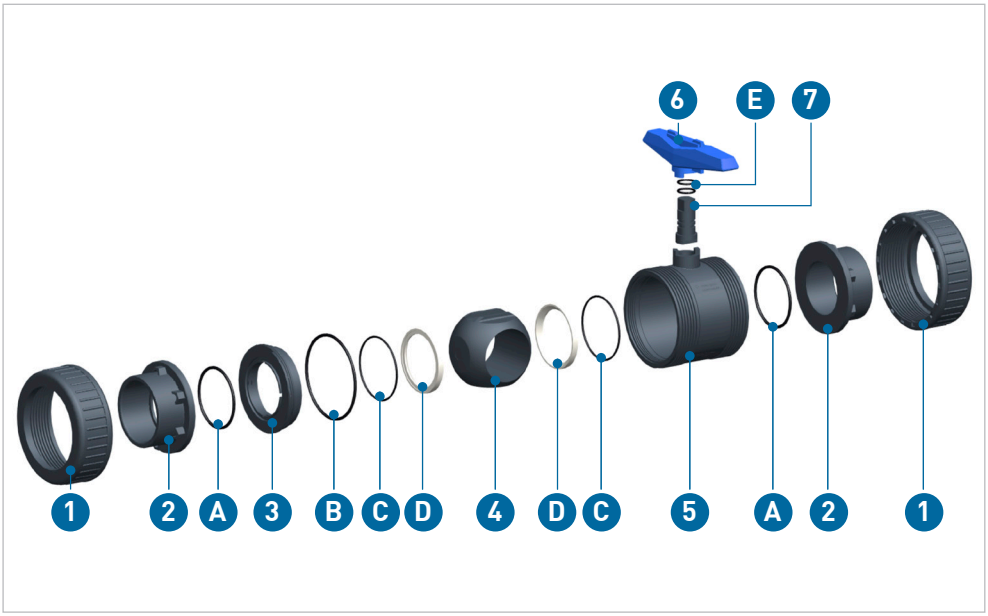
Benefits/features

- Double union for eays installation and removal
- Ergonomic hand lever with integrated tool for removing/adjusting the union bushing
- Simple maintenance and long service life
- Simple installation and removal due to compact construction
- Low torque opening and closing
- Double O-ring sealing on the stem
- Very compact "Z" dimension
- Wide range from 16mm to 110mm and from ½" to 4"

Flow media

Non-solid, neutral and non-aggressive media. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data



1 Coupling nut
2 Connecting part
3 Union bush
4 Ball
5 Valve body
6 Hand lever
7 Stem
A Face seal
B Body seal
C Backing seal
D Ball seat
E Stem seal

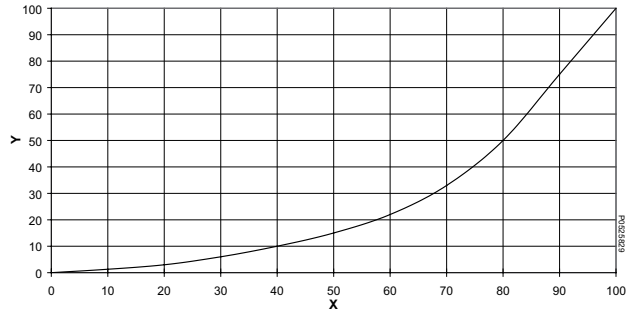
Specification		
Dimensions	d16/DN10 – d110/DN100, ⅜“ – 4“	
Materials	Valve body	PVC-U
	Lever	PVC-U
Gasket materials	O-rings	EPDM
	Ball seat	PE/PTFE
Pressure levels	DN10 – 50	PN16
	DN65 – 100	PN10
Actuation variants	Manually operated	
Connections	Solvent cement sockets	ISO, BS, ASTM/ANSI
	Threaded sockets	NPT, Rp
	Butt fusion spigots, long	PE100 SDR11 ISO
Product standard	EN ISO 16135	
Test standard	ISO 9393-2	
Approvals	QAP/ITP, NSF 61, WRAS	

Kv 100 values

DN (mm)	inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	70	4.9	4
15	½	20	185	12.9	11
20	¾	25	350	24.5	21
25	1	32	700	49.0	42
32	1 ¼	40	1'000	70.0	60
40	1 ½	50	1'600	112.0	96
50	2	63	3'100	217.1	186
65	2 ½	75	5'000	350.0	300
80	3	90	7'000	490.0	420
100	4	110	11'000	770.0	660

The kv values for each intermediate valve position can be determined by using the flow value characteristics and the kv 100 values.

Flow characteristics

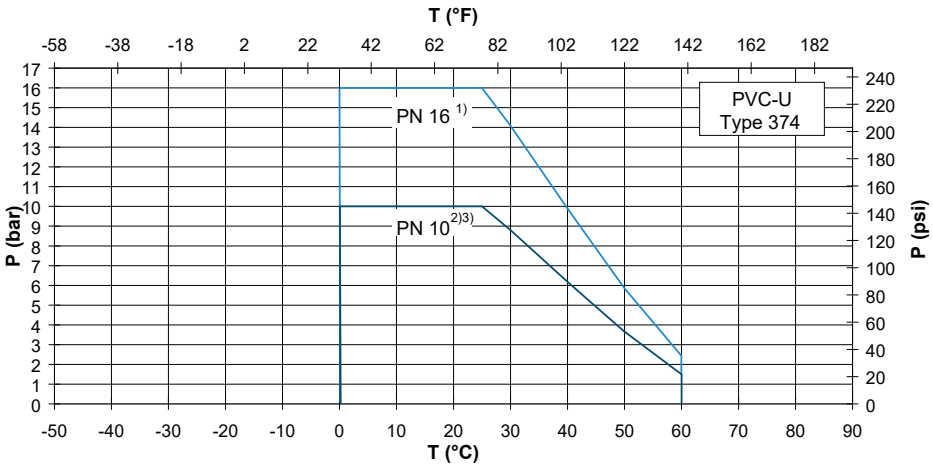


X Opening angle (%)
Y Kv, Cv value (%)

Pressure-temperature diagrams

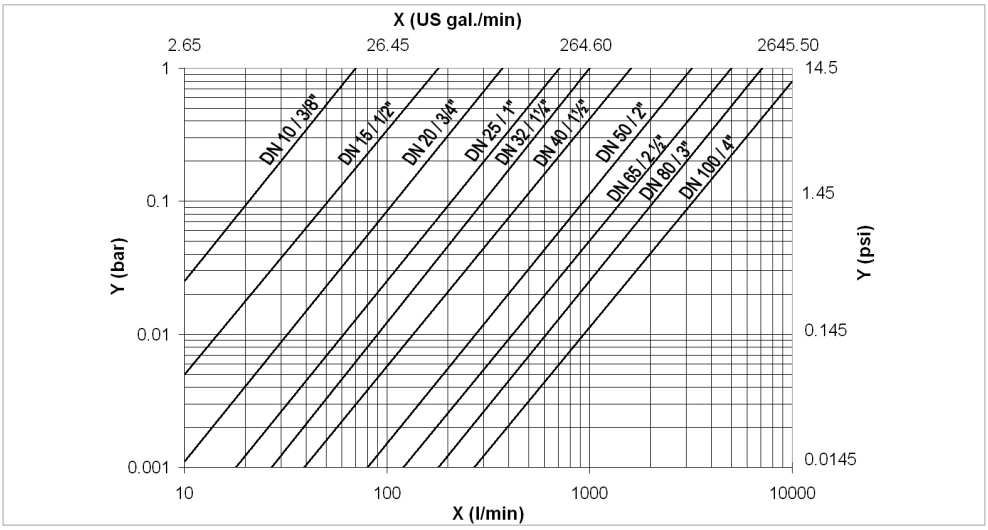
The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)



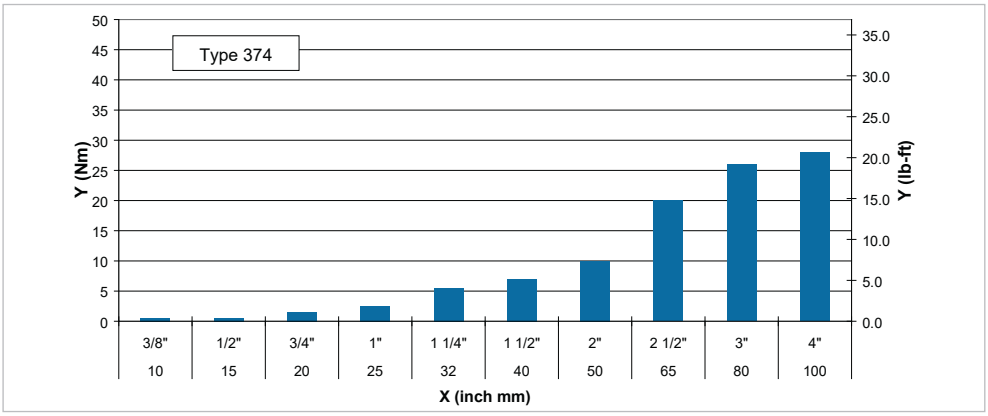
1) For the nominal diameters DN10-DN50 the central part of the ball valve is designed for the nominal pressure PN16
2) For nominal diameters DN10-DN50, the nominal pressure is reduced to PN10 depending on the connection
3) For the nominal diameters DN65-DN100 the central part of the ball valve is designed for nominal pressure PN10

Pressure losses



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

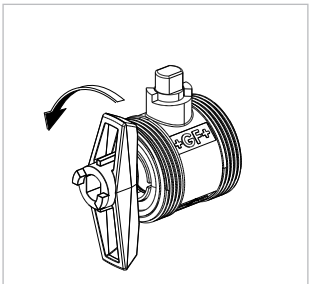
Operating torque



X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Technical basics

- With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM.
- The design of the hand lever serves as a tool for a micro adjustment of the ball support.



All ball valves in DN10 – 100 are available as radially removable valves with two threaded connections according to EN ISO 16135.

Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

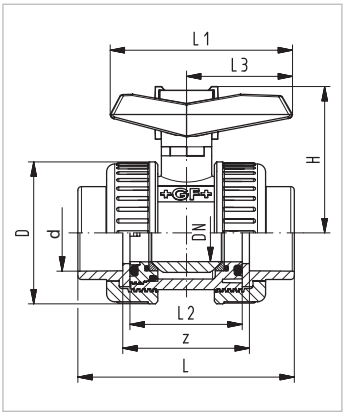
- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Dimensions

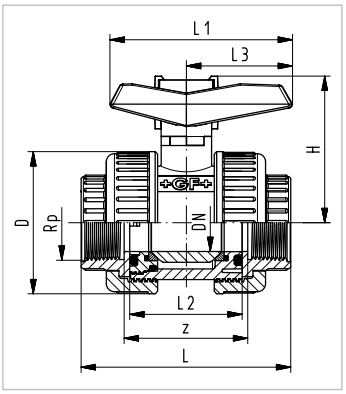
With solvent cement sockets, metric

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
16	10	50	55	76	67	42	40	48
20	15	50	55	80	67	42	40	48
25	20	59	61	91	77	48	45	53
32	25	68	69	102	87	54	51	58
40	32	80	81	120	102	62	59	68
50	40	94	91	140	119	72	70	78
63	50	115	113	169	146	86	84	93
75	65	145	129	206	179	110	103	118
90	80	168	146	242	209	128	120	140
110	100	210	179	282	250	150	141	160



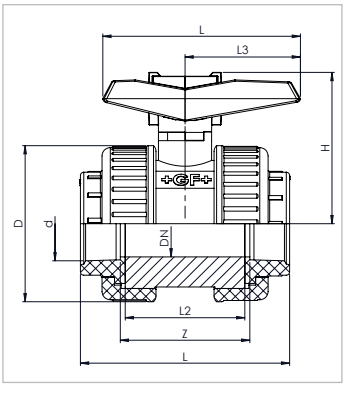
With threaded sockets, Rp

Rp (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
⅜	15	50	55	76	67	42	40	48
½	15	50	55	80	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	116	102	62	59	68
1 ½	40	94	91	126	119	72	70	78
2	50	115	113	149	146	86	84	93
2 ½	65	145	129	184	179	110	103	118
3	80	168	146	212	209	128	120	140
4	100	210	179	244	250	150	141	160



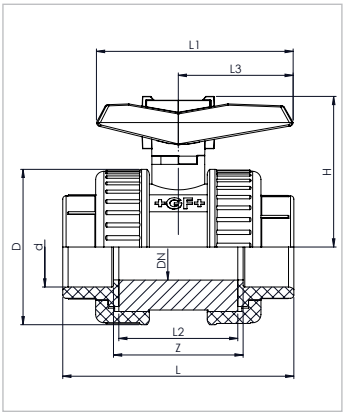
With threaded sockets, NPT

NPT (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	88	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	116	102	62	59	68
1 ½	40	94	91	126	119	72	70	78
2	50	115	113	149	146	86	84	93
2 ½	65	145	129	184	179	110	103	118
3	80	168	146	212	209	128	120	140
4	100	210	179	244	250	150	141	160



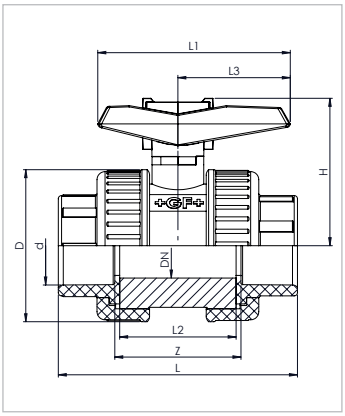
With solvent cement sockets, BS

d (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	80	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	120	105	62	59	68
1 ½	40	94	91	140	119	72	70	78
2	50	115	113	169	146	86	84	93
2 ½	65	145	129	206	179	110	103	118
3	80	168	146	242	209	128	120	140
4	100	210	179	282	250	150	141	160



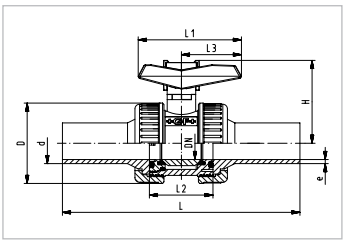
With solvent cement sockets, ASTM

d (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	92	67	42	40	48
¾	20	59	61	104	77	48	45	53
1	25	68	69	116	87	54	51	58
1 ¼	32	80	81	130	102	62	59	68
1 ½	40	94	91	149	119	72	70	78
2	50	115	113	169	146	86	84	93
2 ½	65	145	129	206	179	110	103	118
3	80	168	146	242	209	128	120	140
4	100	210	179	282	250	150	141	160



With butt fusion spigot, long

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	e (mm)
20	15	95	55	175	67	42	40	1.8
25	20	105	61	195	77	48	45	2.3
32	25	115	69	247	87	54	51	2.9
40	32	140	81	233	102	62	59	3.6
50	40	150	91	265	119	72	70	4.5
63	50	165	113	278	146	86	84	5.7
75	65	185	129	348	179	110	103	6.8
90	80	200	146	350	209	128	120	8.2
110	100	220	179	412	250	150	141	10



Ball Valve type 375



Ball Valve type 375

Product description

The Ball Valve type 375 is an affordable manual ball valve that was developed specially for use in water applications or with non-critical chemicals. Its construction ensures simple maintenance and hence a long service life. Its compact construction makes possible simple installation into and removal from the piping system.

Function

The ball valve uses a rotating ball with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90° to block the flow passage. This valve is used primarily for open/close functions and also for throttling services.

Applications

- Water treatment
- Non-critical chemicals

Benefits/features

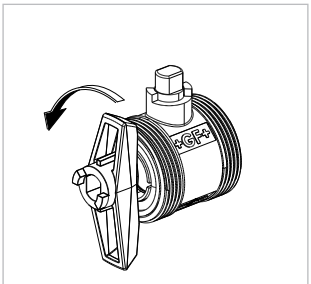
- Manual valve for water applications and non-critical media
- Ergonomic hand lever with integrated tool for removing/adjusting the union bushing
- Simple maintenance and long service life
- Simple installation and removal due to compact construction
- PTFE ball seat
- Double o-ring on the stem
- Very compact "Z" dimension
- Wide range from 16mm to 110mm and from ½" to 4"

Flow media

Non-solid, neutral and non-aggressive media. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical basics

- With the backing seals, the ball has a floating position. This results in preloading and hence a constant seal. Stem, backing, housing and connection seals are made of EPDM or FKM.
- The design of the hand lever serves as a tool for a micro adjustment of the ball support.



All ball valves in DN10 – 100 are available as radially removable valves with two threaded connections according to EN ISO 16135.

Valve handling

Installation notes

When installing the ball valve, ensure that it is always installed into the system in an opened ball position.

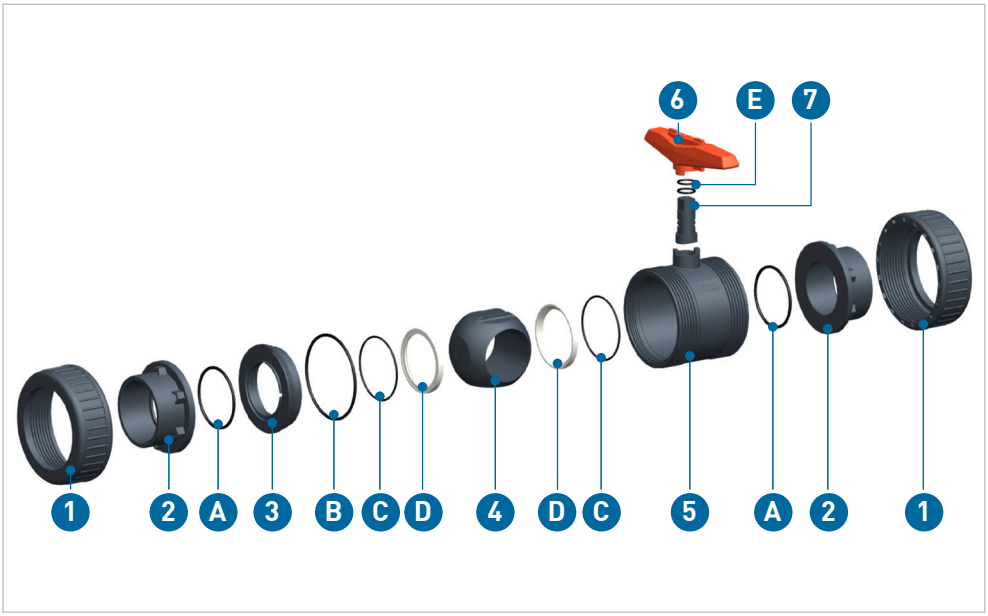
Maintenance notes

Ball valves require no maintenance under normal operating conditions (clear water). However, the following measures must be considered:

- Regularly check that no medium escapes to the outside.
- We recommend a function test for ball type valves that are kept permanently in the same position 1 – 2 times per year to check functionality.

Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalogue at www.gfps.com

Technical data



1 Coupling nut
2 Connecting part
3 Union bush
4 Ball
5 Valve body
6 Hand lever
7 Stem
A Face seal
B Body seal
C Backing seal
D Ball seat
E Stem seal

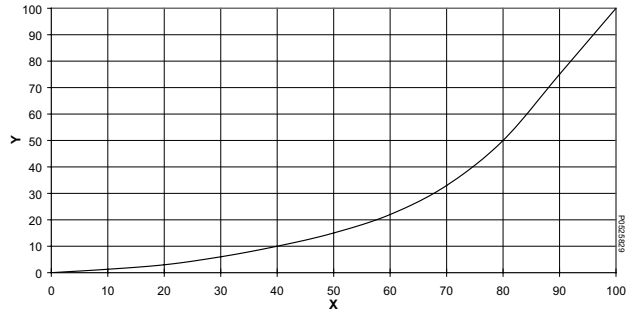
Specification		
Dimensions	d16/DN10 – d110/DN100, ⅜“ – 4“	
Materials	Valve body	PVC-U, PVC-C
	Lever	PVC-U
Gasket meterials	O-rings	EPDM, FKM
	Ball seat	PTFE
Pressure levels	DN10 – 50	PN16
	DN65 – 100	PN10
Actuation variants	Manually operated	
Connections	Solvent cement sockets	ISO, BS, ASTM/ANSI
	Threaded sockets	NPT, Rp
	Butt fusion spigots, long	PE100 SDR11 ISO
Approvals	ACS, NSF 61, WRAS	

Kv 100 values

DN (mm)	inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
10	⅜	16	70	4.9	4
15	½	20	185	12.9	11
20	¾	25	350	24.5	21
25	1	32	700	49.0	42
32	1 ¼	40	1'000	70.0	60
40	1 ½	50	1'600	112.0	96
50	2	63	3'100	217.1	186
65	2 ½	75	5'000	350.0	300
80	3	90	7'000	490.0	420
100	4	110	11'000	770.0	660

The kv values for each intermediate valve position can be determined by using the flow value characteristics and the kv 100 values.

Flow characteristics



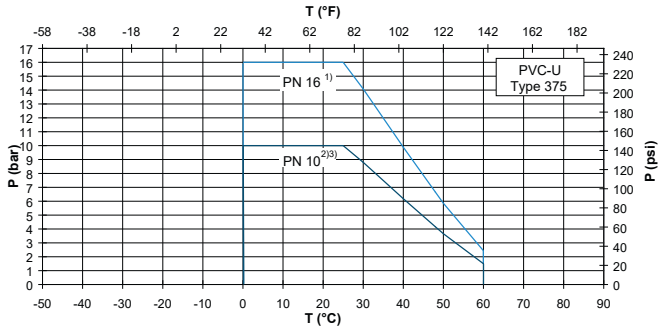
X Opening angle (%)
Y Kv, Cv value (%)

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a service life of 25 years and water or similar media.

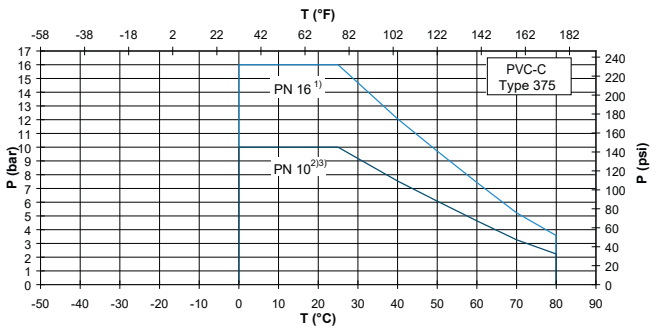
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



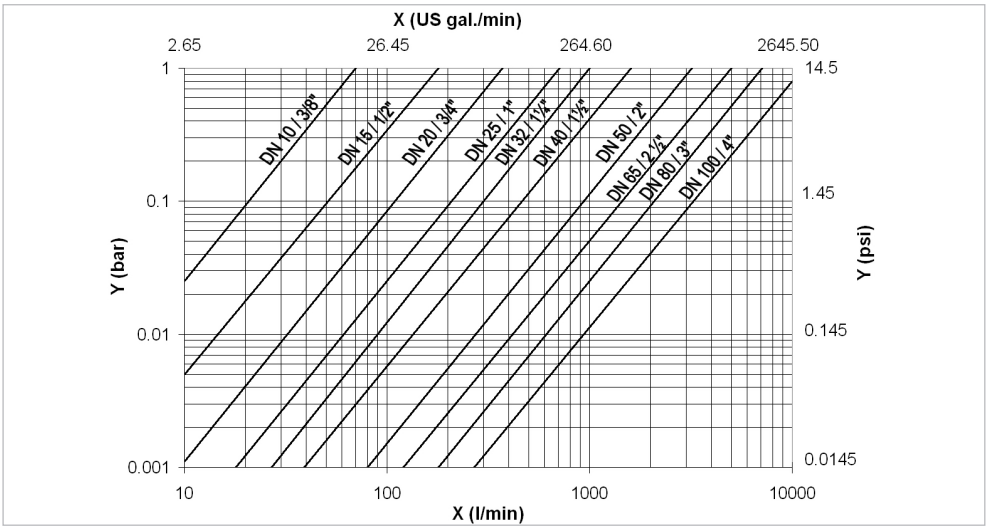
1) For the nominal diameters DN10 - DN50 the central part of the ball valve is designed for the nominal pressure PN16
2) For nominal diameters DN10 - DN50, the nominal pressure is reduced to PN10 depending on the connection

PVC-C



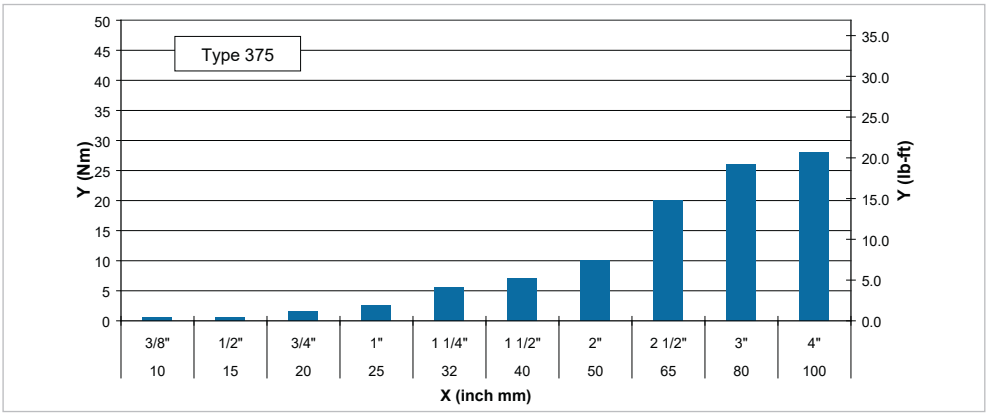
3) For the nominal diameters DN65 - DN100 the central part of the ball valve is designed for nominal pressure PN10

Pressure losses



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Operating torque

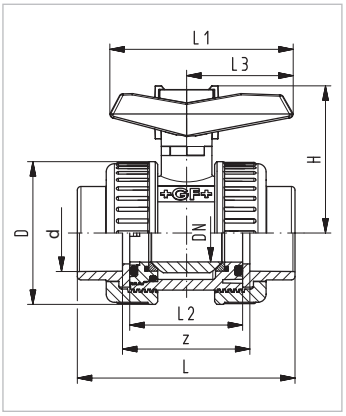


X Nominal diameter DN (mm, inch)
Y Tightening torque (Nm, lb-ft)

Dimensions

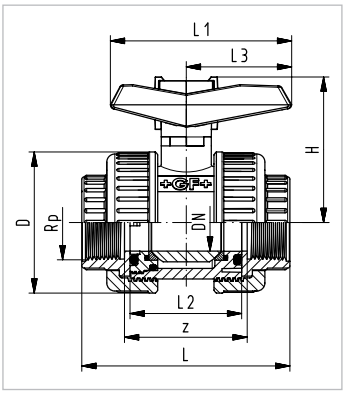
With solvent cement sockets, metric

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
16	10	50	55	76	67	42	40	48
20	15	50	55	80	67	42	40	48
25	20	59	61	91	77	48	45	53
32	25	68	69	102	87	54	51	58
40	32	80	81	120	102	62	59	68
50	40	94	91	140	119	72	70	78
63	50	115	113	169	146	86	84	93
75	65	145	129	206	179	110	103	118
90	80	168	146	242	209	128	120	140
110	100	210	179	282	250	150	141	160



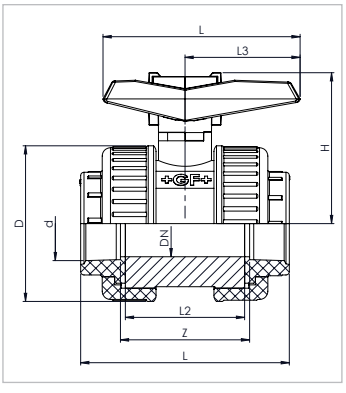
With threaded sockets, Rp

Rp (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
⅜	15	50	55	76	67	42	40	48
½	15	50	55	80	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	116	102	62	59	68
1 ½	40	94	91	126	119	72	70	78
2	50	115	113	149	146	86	84	93
2 ½	65	145	129	184	179	110	103	118
3	80	168	146	212	209	128	120	140
4	100	210	179	244	250	150	141	160



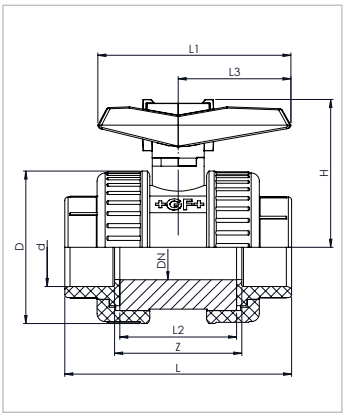
With threaded sockets, NPT

NPT (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	88	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	116	105	62	59	68
1 ½	40	94	91	126	119	72	70	78
2	50	115	113	149	146	86	84	93
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3	80	168	146	212	209	128	120	140
4	100	210	179	244	250	150	141	160



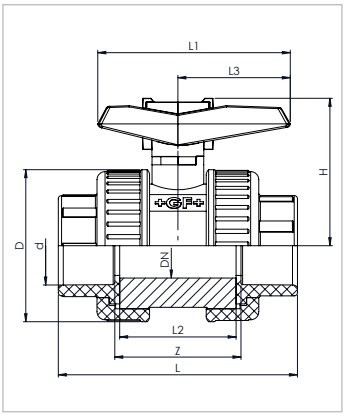
With solvent cement sockets, BS

d (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	80	67	42	40	48
¾	20	59	61	91	77	48	45	53
1	25	68	69	102	87	54	51	58
1 ¼	32	80	81	120	105	62	59	68
1 ½	40	94	91	140	119	72	70	78
2	50	115	113	169	146	86	84	93
2 ½	65	145	129	206	179	110	103	118
3	80	168	146	242	209	128	120	140
4	100	210	179	282	250	150	141	160



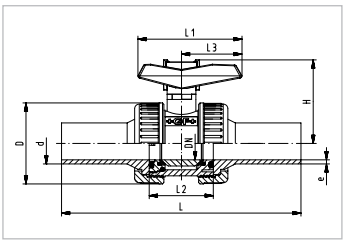
With solvent cement sockets, ASTM

d (inch)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	z (mm)
½	15	50	55	92	67	42	40	48
¾	20	59	61	104	77	48	45	53
1	25	68	69	116	87	54	51	58
1 ¼	32	80	81	130	102	62	59	68
1 ½	40	94	91	149	119	72	70	78
2	50	115	113	169	146	86	84	93
2 ½	65	145	129	206	179	110	103	118
3	80	168	146	242	209	128	120	140
4	100	210	179	282	250	150	141	160



With butt fusion spigot, long

d (mm)	DN (mm)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	e (mm)
20	15	95	55	175	67	42	40	1.8
25	20	105	61	195	77	48	45	2.3
32	25	115	69	247	87	54	51	2.9
40	32	140	81	233	102	62	59	3.6
50	40	150	91	265	119	72	70	4.5
63	50	165	113	278	146	86	84	5.7
75	65	185	129	348	179	110	103	6.8
90	80	200	146	350	209	128	120	8.2
110	100	220	179	412	250	150	141	10



Planning Fundamentals

of Valves and Automation

Butterfly Valves

Content

Butterfly Valve type 565W/L 171
Butterfly Valve type 567/578 217
Butterfly Valve type 038/039 258
Butterfly Valve type 038E/039E 265
Butterfly Valve type 038P/039P 273
Butterfly Valve type 044 279
Butterfly Valve type 065 286

Butterfly Valve type 565W/L



Type 565W
DN50-300, Wafer-style installation



Type 565L
DN50-300, Lug-style installation



Type 565W XL
DN350-400, Wafer-style installation

Product description

The plastic Butterfly Valve type 565 is the best choice for optimizing piping systems built for water applications and a wide range of other applications.

This new generation of Valves comes at a significantly lower initial cost, and will save even more thanks to its lower static weight, requiring less energy for both operation and transportation. Installing the Butterfly Valve type 565 is quick and easy, but thanks to its extremely high durability, it will be almost maintenance-free during its long service life.

With the option as an end of line installation (lug-style) and an intermediate installation (wafer-style) a modular assembly is possible.

Typ 565L

For use as a Lug-style butterfly valve with threaded bushings built into the housing. The pipe can be disassembled on one side. Available in sizes DN50-DN300.

Typ 565W

For use as an intermediate butterfly valve. The Wafer-style type 565W requires flange support on both sides. A disassembly without support flanges is not possible. Available in sizes DN50-DN400.

Direct replacement: The Butterfly Valve type 565 comes in the same installation length as metal solutions and can replace them without any additional rework on the pipes.

20-60 % lighter than metal valves: Can be installed in just a few minutes. For the smaller dimensions even a by a single person. Facilitates planning and reduces the need for costly transportation and personnel.

Highly reliable: High-performance thermoplastics protect from abrasion and corrosion. A longer system lifetime, reduction of maintenance costs and production stops are the results.

Automated and digitized: Prepared for being actuated by wide range of electric and pneumatic actuators. Future-ready through compatibility with wireless controlled Smart Actuators. Prepared mounting option for end position detection sensors.

Sustainable: The Butterfly Valve type 565 have up to 25% less carbon emissions than metal valves. This is verfified with an EPD (Enviormental Product Declaration) and LCA (Life Cycle Assessment).

Information via DataMatrix code: The DataMatrix code simplifies the storage of all technical information for each individual valve and thus enables individual traceability. The perfect identification of each individual type 565 butterfly valve allows easy installation, maintenance and repair.

Process automation with Butterfly Valve

Thanks to a wide range of accessories, butterfly valves can be equipped with the appropriate pneumatic or electric actuators for an on/off valve. In combination with a pneumatic positioner the valve can be used as process and control valves. Double sensors enable hereby the end position detection (open/closed disc).

					
Type 565W with smart electric actuator	**Type 565L** with electric actuator	**Type 565W DN350-400** with electric actuator	**Type 565W** with pneumatic actuator	**Type 565W DN350-400** with pneumatic actuator	**Double Sensor** for end position detection

Applications

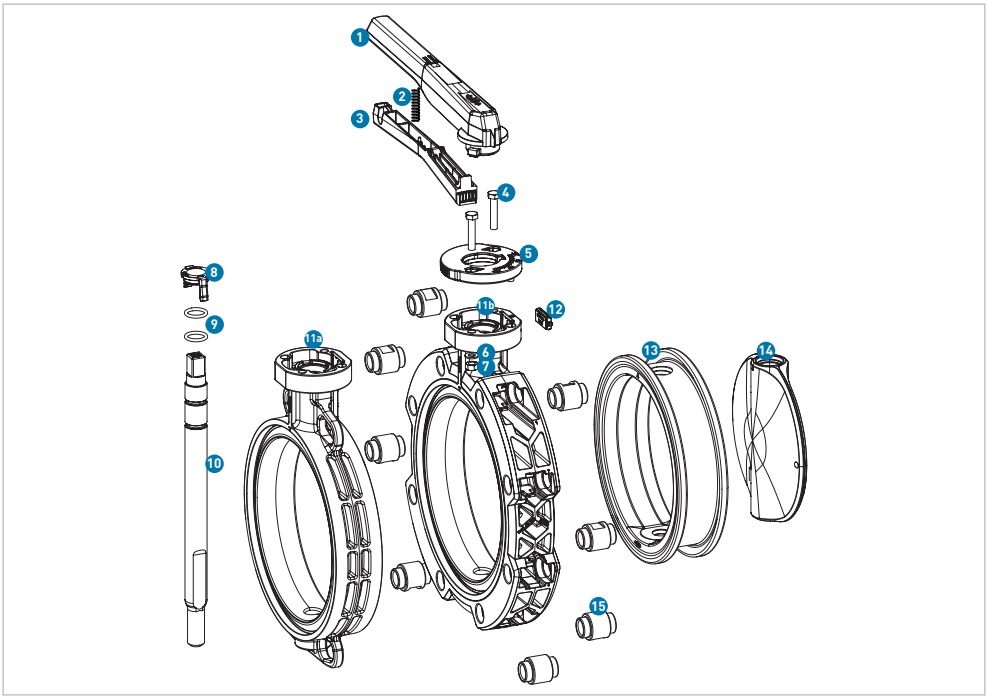
Suitable for water and water treatment applications (e.g. sea water, drinking water and industrial water):

- Drinking water process
- Industrial process water
- Industrial waste water
- Municipal waste water
- Desalination plant
- Aquarium/ Oceania
- Swimming pools
- Cruise ships
- Offshore
- Vessels and merchant fleet
- Cooling
- Life support
- Waser discribution
- Data Centers
- Oxygen services
- Lithium extraction

⚠ For our online tool ChemRes PLUS, go to https://www.gfps.com/com/en/downloads-tools/online-tools/chemical-resistance.html

Technical data

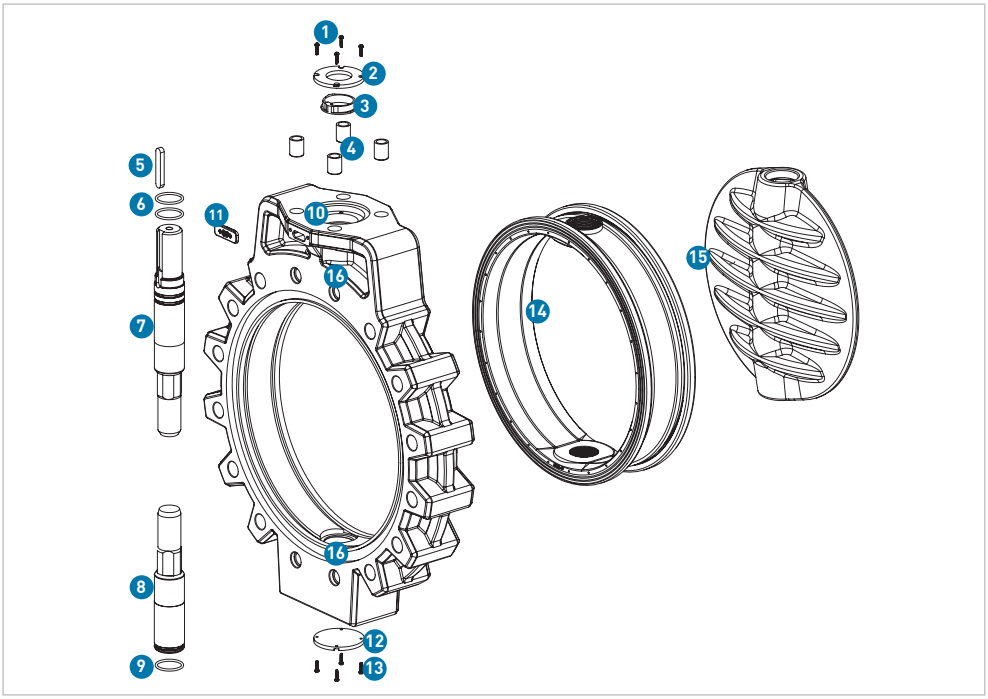
Specifications DN50-300



1 Lever
2 Spring
3 Grid lever
4 Screw
5 Index plate
6 Washer
7 Nut
8 Shaft lock
9 O-Ring
10 Shaft
11a Wafer-style housing
11b Lug-style housing
12 Cap
13 Seat liner
14 Disc
15 Threaded inserts

Specifications						
Body type	565W - Wafer-style housing					
	565L - Lug-style housing					
Dimensions	d63/DN50 – d315/DN300, 2“ – 12“					
Materials	Lever, grid lever, index plate, shaft lock, housing	1 3 5 8 11	Polyamide PA6-GF			
	Disc (outside)	14	PVDF			
	Disc (inside)	14	Polyamide PA6-GF			
	O-Ring, seat liner	9 13	EPDM or FKM			
	Screw, spring, washer, nut, shaft, threaded inserts	2 4 6 7 10 15	Stainless steel			
	Cap	12	EPDM			
Pressure ratings	**Manually actuated**		**Electric actuated**		**Pneumatic actuated**	
	DN50-150	PN16	DN50-200	PN10	DN50-250	PN10
	DN200-250	PN10	DN250	PN6	DN300	PN6
	DN300	PN6	DN300	PN4		
Actuation variants	Manually operated (lockable hand lever or reduction gear with handwheel)					
	Pneumatic actuated: FC, FO, DA					
	Electric actuated: EA45-250 AC: 100 – 230 V, AC/DC: 24 V, Smart actuator dEA					
Installation length	EN558 row 20, ISO 5752 row 20, API 609 table 2					
Actuator interface	EN ISO 5211					
Flange standards	ISO 7005 PN10/16, EN 1092 PN10/16, DIN 2501 PN10/16, ANSI/ASME B 16.5 Class 150, BS 1560: 1989 Class 125/150; BS 4504 PN10/16, JIS B 2220 10K, JIS B 2239 10K					
Markings	CE, UKCA					
Product Standard	EN ISO 16136					
Test Standard	ISO 9393-2, EN 12266-1 (leackage rate A)					
Approvals	ACS, ABS, BV, DNV, EAC, EPD, FDA, KTW-BWGL, LR, NSF; PZH, RINA, WRAS, SIL					

Specifications DN350-400



1 Screw
2 Shaft lock
3 Switching Ring
4 Bushing
5 Feather key
6 O-Ring
7 Upper shaft
8 Lower shaft
9 O-Ring
10 Housing
11 Cap
12 Shaft lock
13 Screw
14 Seat liner
15 Disc
16 Metal Insert

Specifications			
Body type	565W - Wafer-style housing		
Dimensions	d355/DN350 – d400/DN400, 14“ – 16“		
Materials	Housing, Shaft lock	**2 10**	PP-GF30
	Disc (outside)	**15**	PE-UHMW
	Disc (inside)	**15**	Stainless steel
	Switching Ring	**3**	POM
	O-Ring, Seat liner	**6 9 14**	EPDM
	Screws, Bushings, Feather keys, Shafts, Metal inserts	**1 4 5 7 8 12 13 16**	Stainless steel
	Cap	**11**	EPDM
Pressure ratings	PN10		
Actuation variants	Manually operated (reduction gear with handwheel)		
	Pneumatic actuated: FC, FO, DA		
	Electric actuated: 100-230 V, 400V		
Installation length	EN558 row 20, ISO 5752 row 20, API 609 table 2		
Actuator interface	EN ISO 5211		
Flange standards	ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989 Class 125/150; BS 4504 PN10		
Markings	CE, UKCA		
Product Standard	EN ISO 16136		
Test Standard	ISO 9393-2, EN 12266-1 (leackage rate A)		
Approvals	ACS, ABS, BV, DNV, EAC, EPD, FDA, KTW-BWGL, LR, NSF, PZH, RINA, WRAS, SIL (In application for DN350-400)		

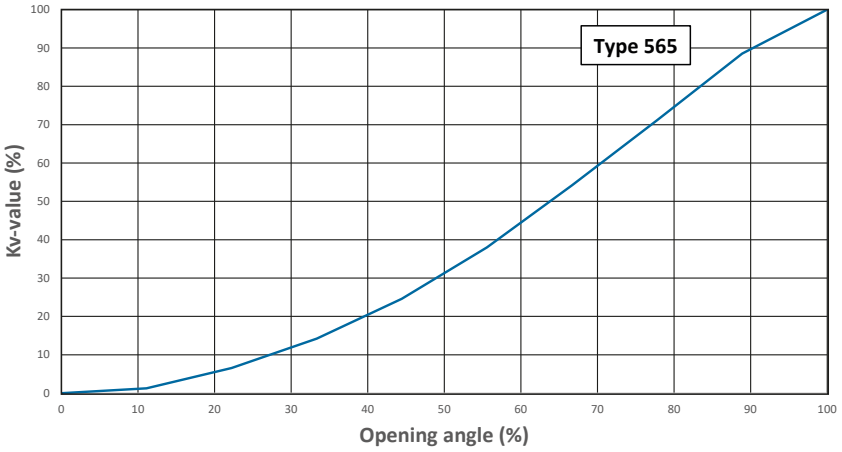
Flow characteristics

Kv 100-values

DN (mm)	d (mm)	Inch (")	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
50	63	2	1'445	101	87
65	75	2 ½	2'530	177	152
80	90	3	4'020	281	241
100	110	4	5'850	400	351
125	140	5	11'900	832	714
150	160	6	18'050	1'262	1'083
200	225	8	43'667	3'052	2'620
250	280	10	62'333	4'357	3'740
300	315	12	94'500	6'606	5'670
350	355	14	148'808	10'322	8'929
400	400	16	185'266	12'851	11'115

Flow characteristics according to opening angle

DN50 - DN400



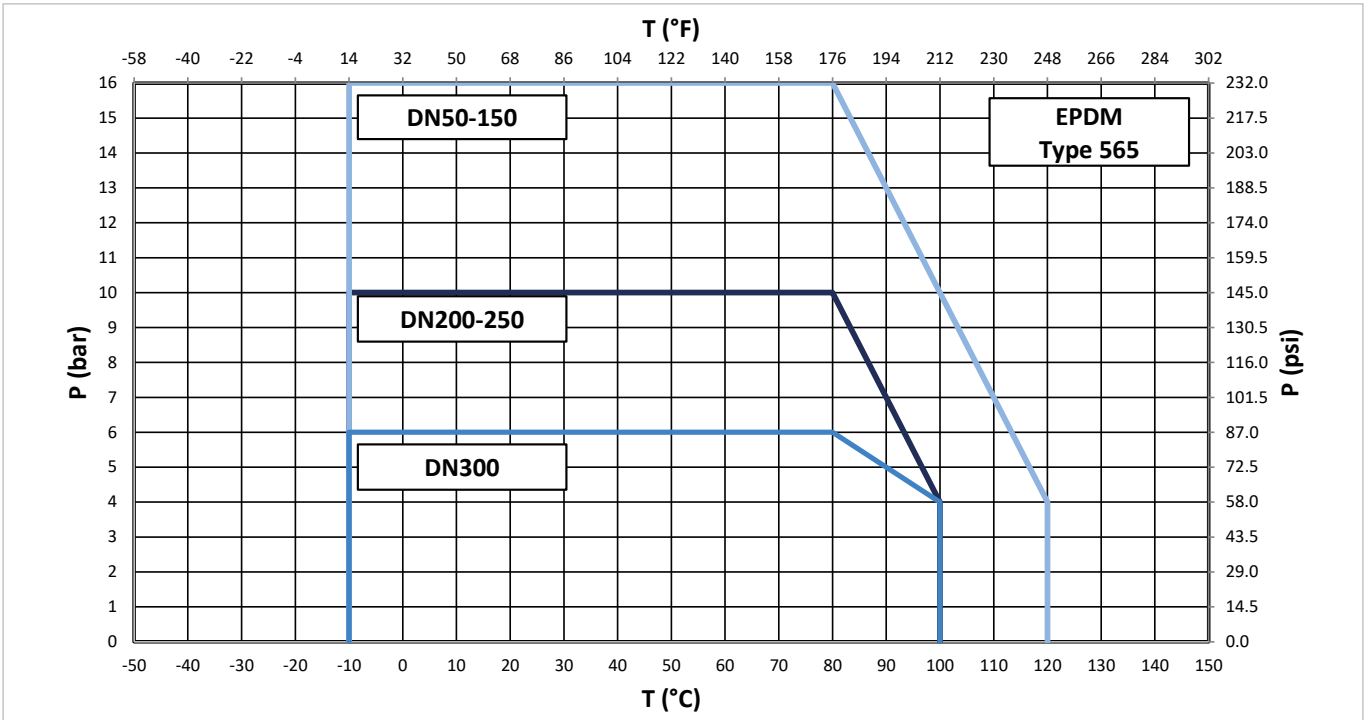
Operating torques

DN (mm)	d (mm)	Inch (")	Operating torque @ maximum operating pressure (Nm)
50	63	2	15
65	75	2 ½	20
80	90	3	25
100	110	4	40
125	140	5	50
150	160	6	60
200	225	8	160
250	280	10	250
300	315	12	300
350	355	14	900
400	400	16	1200

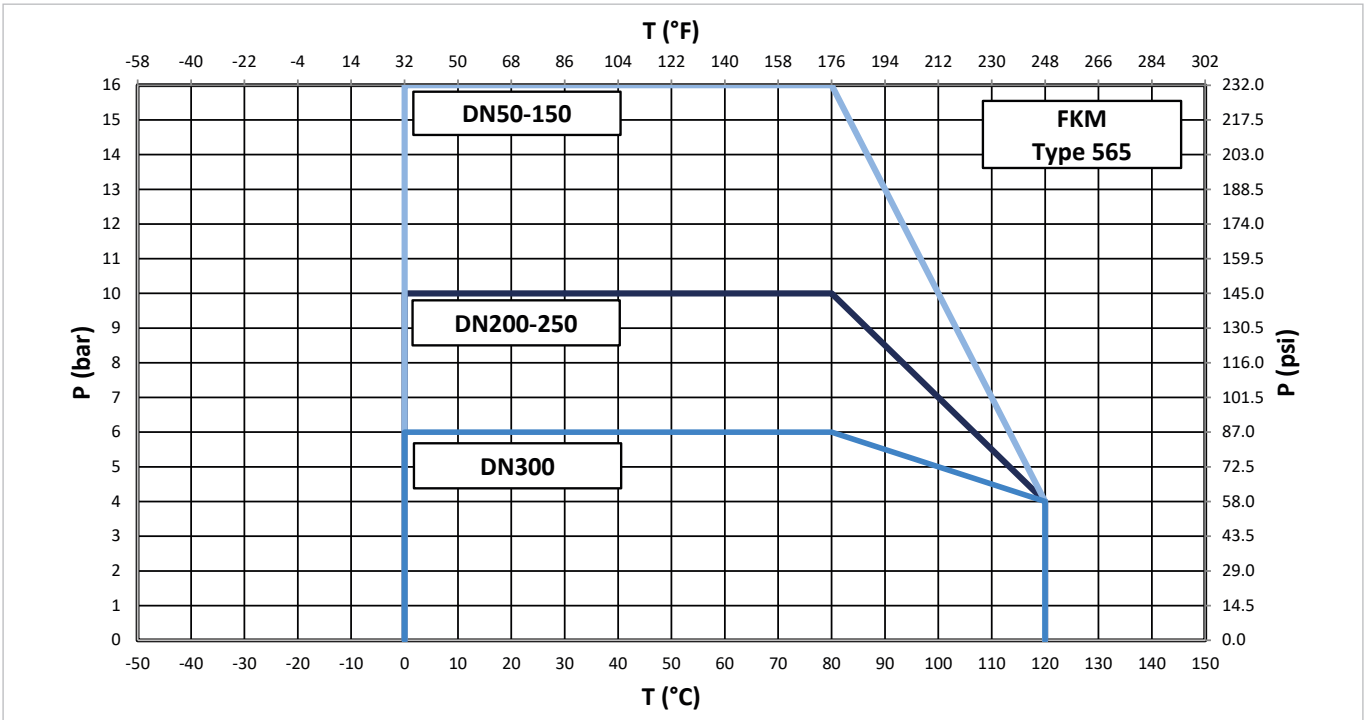
Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

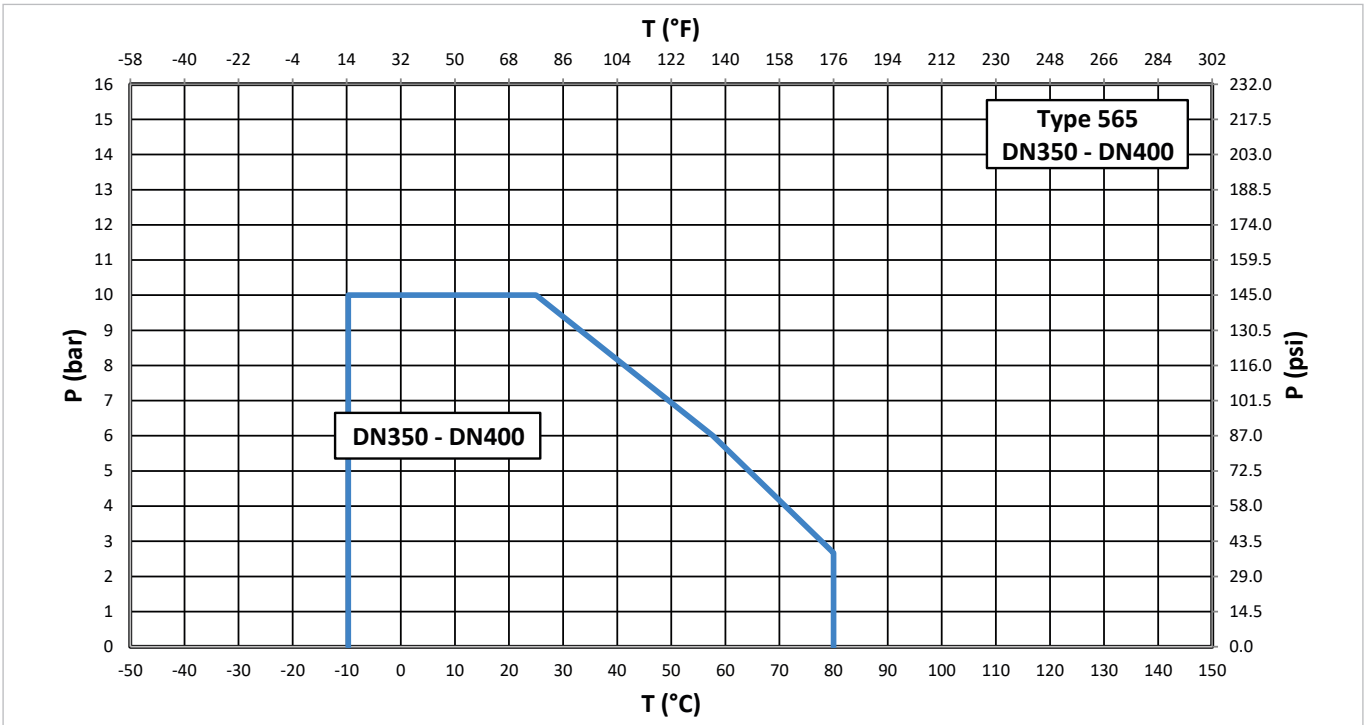
DN50 - DN300, EPDM
T Temperature (°C, °F)
P Permissible pressure (bar, psi)



DN50 - DN300, FKM
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

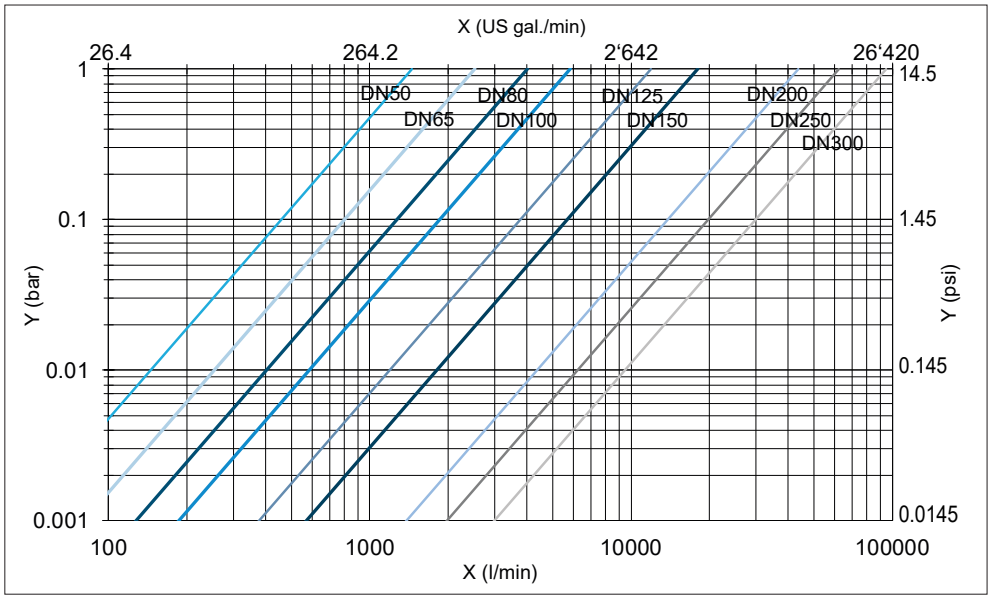


DN350 - DN400, EPDM
T Temperature (°C, °F)
P Permissible pressure (bar, psi)



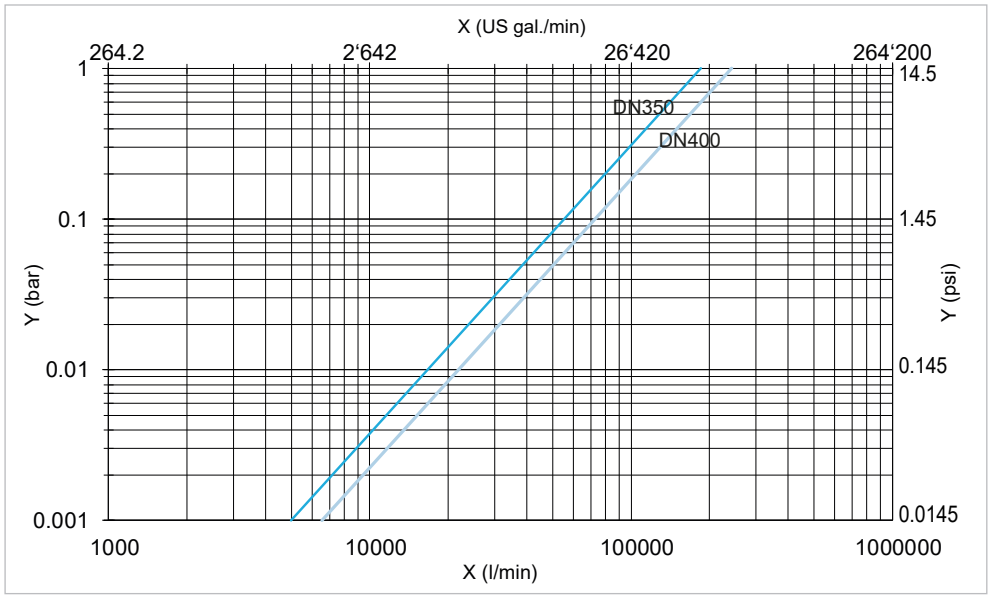
Pressure losses

DN50 – DN300



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

DN350 – DN400

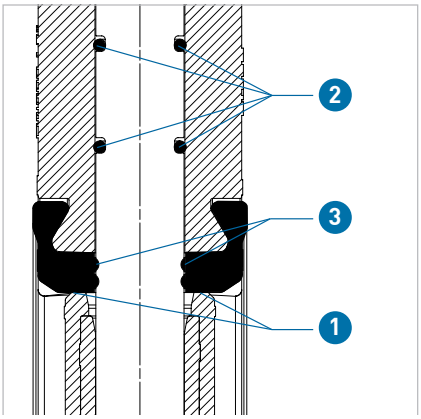


X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Technical basics

Sealings

The tightness (EN 12266-1 / LEACKAGE RATE A) of the valve is ensured by different components.



1 Disc to seat liner
2 Shaft to housing (O-Ring)
3 Seat liner to shaft

The flanged joints are sealed by the beads of the seat liner, eliminating the need for additional flat gaskets.

Installation notes

As a connecting element, GF Piping Systems recommends flange adapters with smooth jointing faces, together with backing flanges made of PVC-U or PP-V. In the case of flanges with a unsmooth jointing face, a flat gasket may also be used in individual cases. Verify that the pressure rating of the flat gasket matches the pressure rating of the valve.

Ensure that the following requirements are met before installation: Only butterfly valves whose pressure class, connection type, connecting dimensions and materials correspond to the operating conditions may be installed.

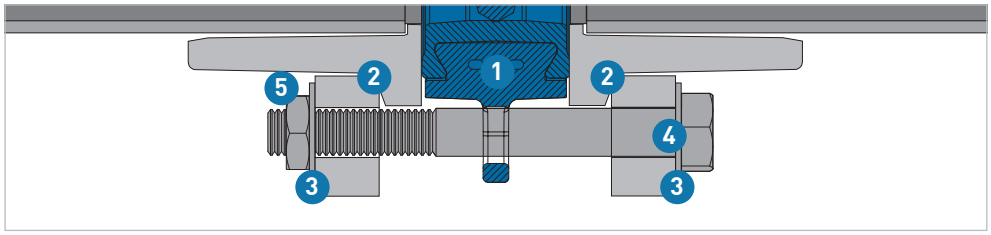
Chamfering of flange adapter

When using the specified flange adapters from GF Piping Systems, chamfering is not necessary. If you install flange adapters of a different brand, make sure that the inside diameter of the flange adapter is wider than the outside diameter of the disc. If necessary, chamfer the flange adapter.

Reference values for tightening torque of screws in flange connections

Type 565W DN50 - DN300 wafer-style reference values

for PVC-U socket flange adaptors and PP-V backing flange

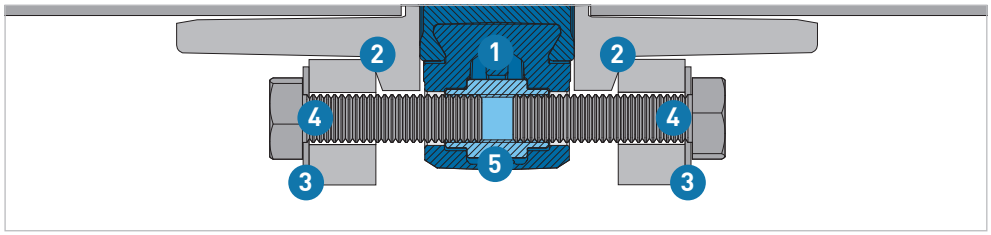


1 Wafer body
2 Backing flange
3 Washer
4 Screw
5 Nut

Dimension			Screws		Max. tightening torque	
DN (mm)	d (mm)	Inch (")	Metric (mm)	UNC (Inch)	(Nm)	(ft-lb)
50	63	2	4 x M16 x 140mm	4 x ⅝" x 5 ½"	25	18
65	75	2 ½	4 x M16 x 140mm	4 x ⅝" x 5 ½"	25	18
80	90	3	8 x M16 x 150mm	4 x ⅝" x 6"	25	18
100	110	4	8 x M16 x 160mm	8 x ⅝" x 6 ½"	30	22
125	140	5	8 x M16 x 170mm	8 x ¾" x 6 ¾"	35	26
150	160	6	8 x M20 x 180mm	8 x ¾" x 7"	40	30
200	225	8	8 x M20 x 200mm	8 x ¾" x 8"	60	44
250	280	10	12 x M20 x 220mm	12 x ⅞" x 8 ½"	80	59
300	315	12	12 x M20 x 250mm	12 x ⅞" x 10"	80	59

Type 565L DN50 - DN300 lug-style reference values

for PVC-U socket flange adaptors and PP-V backing flange

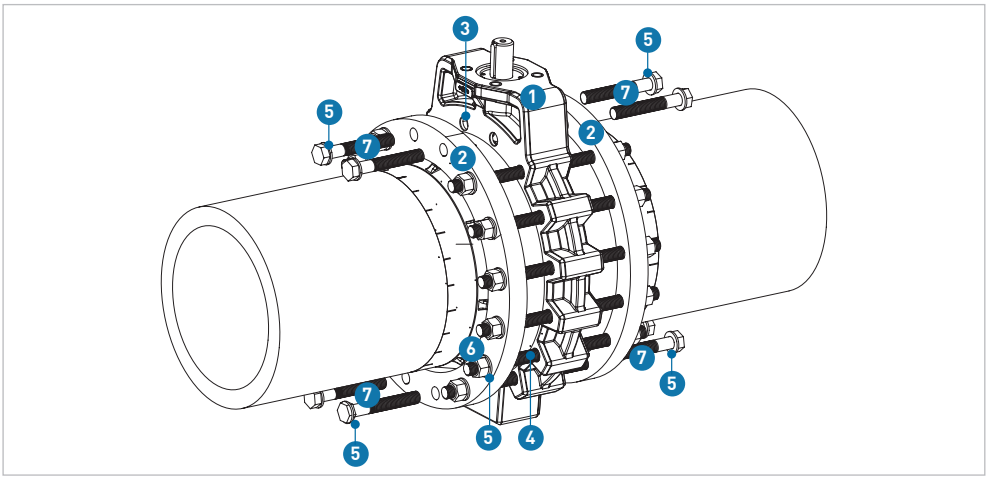


1 Lug body
2 Backing flange
3 Washer
4 Hexagon head screw
5 Threaded insert

Dimension			Screws		Max. tightening torque	
DN (mm)	d (mm)	Inch (")	Metric (mm)	UNC (Inch)	(Nm)	(ft-lb)
50	63	2	8x M16 x 55mm	8x ⅝" x 2"	20	15
65	75	2 ½	8x M16 x 60mm	8x ⅝" x 2 ¼"	20	15
80	90	3	16x M16 x 60mm	8x ⅝" x 2 ¼"	20	15
100	110	4	16x M16 x 65mm	16x ⅝" x 2 ½"	25	18
125	140	5	16x M16 x 70mm	16x ¾" x 2 ¾"	30	22
150	160	6	16x M20 x 75mm	16x ¾" x 2 ¾"	35	26
200	225	8	16x M20 x 85mm	16x ⅞" x 3 ½"	45	33
250	280	10	24x M20 x 90mm	24x ⅞" x 3 ½"	50	37
300	315	12	24x M20 x 100mm	24x ⅞" x 4 ¼"	50	37

Components, screw lengths and tightening torques can be determined using the online tool "Perfect Flange Connection Tool" under the following link:
https://www.gfps.com/perfectflangeconnection

Type 565W DN350 - DN400 wafer-style reference values



1 Wafer body
2 Flange
3 Thread inserts
4 Threaded rods
5 Washer
6 Nuts
7 Bolt screws near to axis

Reference values ISO

for PE flange adaptors SDR11 and PP-Steel flange

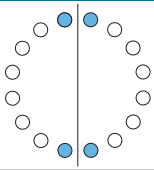
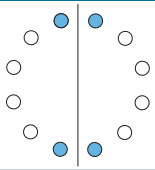
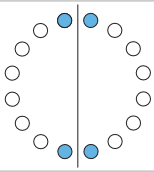
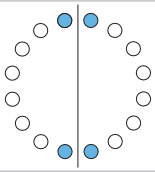
Dimension			Bolt screws near to axis	Threaded rods	Max. tightening torque	
DN (mm)	d (mm)	Inch (")	Metric (mm)	Metric (mm)	(Nm)	(ft-lb)
350	355	14	8 x M20 x 130	12 x M20 x 370	100	74
400	400	16	8 x M24 x 150	12 x M24 x 420	100	74

Reference values ANSI

for PE flange adaptors SDR11 and PP-Steel flange

Dimension			Bolt screws near to axis	Threaded rods	Max. tightening torque	
DN (mm)	d (mm)	Inch (")	UNC (inch)	UNC (inch)	(Nm)	(ft-lb)
350	355	14	8 x 1" x 5"	8 x 1" x 15"	100	74
400	400	16	8 x 1" x 6"	12 x 1" x 17"	100	74

Components, screw lengths and tightening torques can be determined using the online tool "Perfect Flange Connection Tool" under the following link:
https://www.gfps.com/perfectflangeconnection

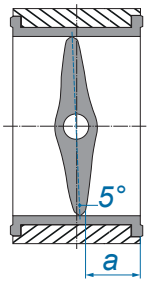
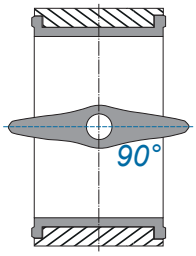
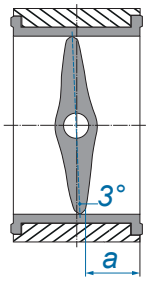
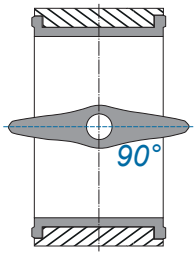
			Bolt screw locations near to axis	
DN (mm)	d (mm)	Inch (")	ISO	ANSI
350	355	14		
400	400	16		

Disc positions

Dimension a = distance at closed position. Disc positions in new condition according to table.

Adhere to a standard value for the closed position in order to apply the minimum required torque and to ensure readjustment possibilities.

Actuator and valve must be in closed position at the beginning of the fine adjustment. The indexing of actuator and valve must match during assembly.

		Butterfly valve type 565, manually actuated			Butterfly valve type 565, actuated		
DN (mm)	Inch (")	a (5°) (mm)	Closed position Angle 0° - 5°	Open position Angle 90°	a (3°) (mm)	Closed position Angle 0° - 3°	Open position Angle 90°
50	2	16.8			18.3		
65	2 ½	17.3			18.9		
80	3	16.7			18.1		
100	4	17.3			18.9		
125	5	17.8			20.0		
150	6	16.1			18.6		
200	8	15.0			18.6		
250	10	15.7			19.7		
300	12	18.2			23.0		

Maintenance notes

In normal operation, butterfly valves do not require maintenance. It is nonetheless recommended to perform maintenance after 5,000 actuation cycles at most. The following steps must be taken when doing so:

- Regularly check that no medium escapes to the outside. If medium exits from the flange connections, tighten them.
- We recommend operating the butterfly valves that are kept permanently in the same position 1 or 2 times a year to check their functionality.
- Depending on the operating conditions, the collars should be lubricated periodically with (silicon-based) grease.
- It is recommended that you check and, if necessary, replace the O-rings when removing the shaft.

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. To be found at www.gfps.com

Type 565 actuator assignment

Dimension				Pneumatic actuator				Electric actuator	
				Plastic Actuator		Metal Actuator			
DN (mm)	d (mm)	Inch (")	Interface	FC/FO	DA	FC/FO	DA	Type	Voltage
50	63	2	F07	PPA40	PPA40	PA30	PA35	EA45 / dEA45 EA120/dEA120	100–230 V~or 24 V 100–230 V~or 24 V
65	75	2 ½	F07	PPA80	PPA40	PA35	PA40	EA120/dEA120	100–230 V~or 24 V
80	90	3	F07	PPA80	PPA40	PA35	PA40	EA120/dEA120	100–230 V~or 24 V
100	110	4	F07			PA40	PA45	EA120/dEA120	100–230 V~or 24 V
125	140	5	F07			PA45	PA45	EA120/dEA120	100–230 V~or 24 V
150	160	6	F07			PA50	PA55	EA250/dEA250	100–230 V~or 24 V
200	225	8	F07			PA60	PA60	EA250/dEA250	100–230 V~or 24 V
250	280	10	F10			PA65	PA65	EA250/dEA250	100–230 V~or 24 V
300	315	12	F10			PA70	PA70	EA250/dEA250	100–230 V~or 24 V
350	355	14	F14			PA75	PA75	AUMA SQ 12.2	100–230 V~or 400 V
400	400	16	F14			PA80	PA80	AUMA SQ 14.2	100–230 V~or 400 V

Design with pneumatic actuator



1 Pneumatic actuator
2 Butterfly valve Type 565

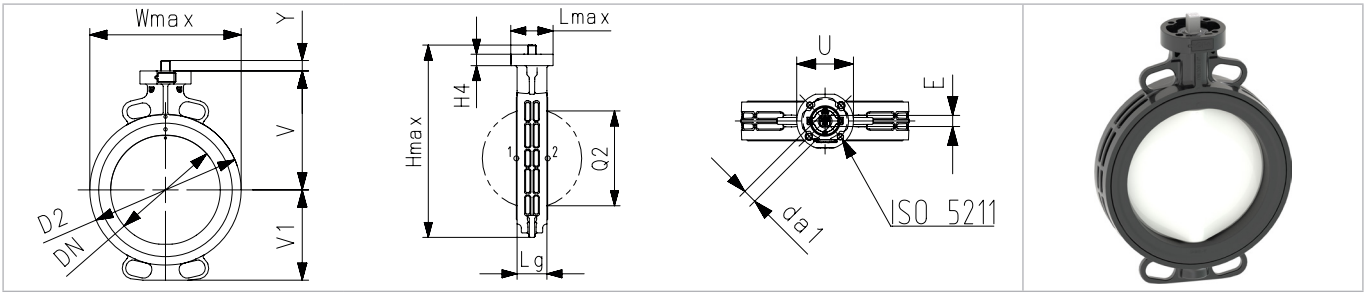
Design with electric actuator



1 Electric actuator
2 Butterfly valve Type 565
3 Manual override (optional)

Dimensions type 565W wafer-style

Butterfly Valve type 565W wafer-style DN50 – DN300 with bare shaft

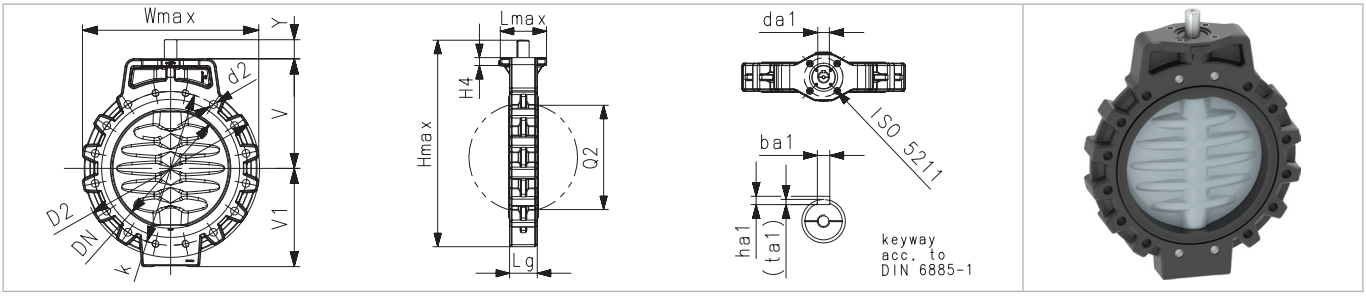


Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	118.5	85.5	222.5	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	85.5	248.5	23.0	140.0	82.0	46.0
80	90	3	138.0	138.0	85.5	261.0	23.0	146.0	89.0	46.0
100	110	4	158.5	158.5	85.5	286.0	23.0	166.5	104.0	52.0
125	140	5	187.0	187.0	85.5	313.5	23.0	180.0	118.0	56.0
150	160	6	213.0	213.0	85.5	337.5	23.0	189.0	130.5	56.0
200	225	8	267.0	267.0	85.5	387.0	23.0	209.5	159.0	60.0
250	280	10	325.5	325.5	125.0	498.5	23.0	262.5	195.5	68.0
300	315	12	380.0	380.0	125.0	555.0	23.0	284.5	230.5	78.0

Dimensions			Interface dimensions					Q	Weight
DN (mm)	d (mm)	Inch (")	Acc. to ISO 5211	da1 (mm)	E (mm)	U (mm)	Y (mm)	Q2 (mm)	(kg)
50	63	2	F07	14.1	11.0	90.0	27.0	28.5	1.0
65	75	2 ½	F07	14.1	11.0	90.0	27.0	44.0	1.2
80	90	3	F07	14.1	11.0	90.0	27.0	63.5	1.4
100	110	4	F07	18.1	14.0	90.0	16.0	84.0	2.2
125	140	5	F07	18.1	14.0	90.0	16.0	110.5	2.9
150	160	6	F07	22.2	17.0	90.0	19.0	137.5	3.8
200	225	8	F07	22.2	17.0	90.0	18.0	190.5	5.2
250	280	10	F10	28.2	22.0	125.0	40.5	239.0	9.5
300	315	12	F10	28.2	22.0	125.0	40.5	285.5	13.7

Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM
50	63	2	199 565 100	199 565 120
65	75	2 ½	199 565 101	199 565 121
80	90	3	199 565 102	199 565 122
100	110	4	199 565 103	199 565 123
125	140	5	199 565 104	199 565 124
150	160	6	199 565 105	199 565 125
200	225	8	199 565 106	199 565 126
250	280	10	199 565 107	199 565 127
300	315	12	199 565 108	199 565 128

Butterfly Valve type 565W wafer-style DN350 – DN400 with bare shaft*



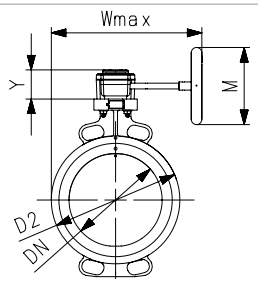
Dimensions			Housing dimensions								Interface dimensions						
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	Acc. to ISO 5211	da1 (mm)	da1* (mm)	ba1 (mm)	ta1 (mm)	ha1 (mm)	Y (mm)
350	355	14	517	530	180	686	29	332	290	78	F14	ø42	□27	12	5	8	64
400	400	16	579	590.5	180	760	29	367	329	102	F14	ø42	□27	12	5	8	64

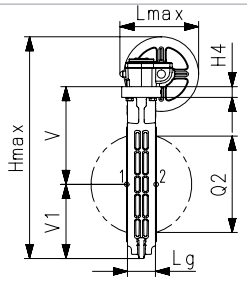
Dimensions			Q	Weight	Holes ISO				Holes ANSI			
DN (mm)	d (mm)	Inch (")	Q2 (mm)	(kg)	Number of bolt holes	Threads metric	Pitch circle k (mm)	d2 (mm)	Number of bolt holes	Threads UNC	Pitch circle k (mm)	d2 (mm)
350	355	14	331	32.6	16	4x M20	460	22	12	4x 1"	476.25	28.6
400	400	16	379	48.9	16	4x M24	515	26	16	4x 1"	539.8	28.6

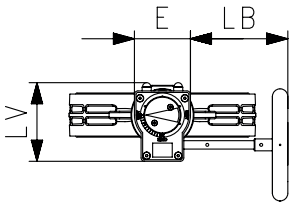
Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	ISO	ANSI
350	355	14	199 555 100	199 556 100
400	400	16	199 555 101	199 556 101

* Square shaft available as an option when needed for special actuators

Butterfly Valve type 565W wafer-style DN50 – DN300 with reduction gear







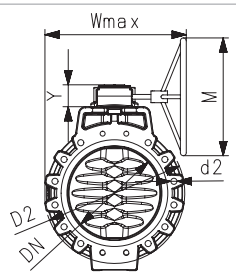


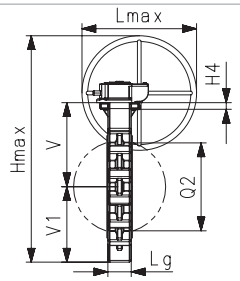
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	238.5	303.0	169.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	246.0	329.0	169.0	23.0	140.0	82.0	46.0
80	90	3	138.0	248.5	341.5	169.0	23.0	146.0	89.0	46.0
100	110	4	158.5	258.5	377.5	169.0	23.0	166.5	104.0	52.0
125	140	5	187.0	272.0	405.0	169.0	23.0	180.0	118.0	56.0
150	160	6	213.0	285.5	426.5	169.0	23.0	189.0	130.5	56.0
200	225	8	267.0	312.5	475.5	169.0	23.0	209.5	159.0	60.0
250	280	10	325.5	360.5	603.0	212.5	23.0	262.5	195.5	68.0
300	315	12	380.0	387.5	659.5	212.5	23.0	284.5	230.5	78.0

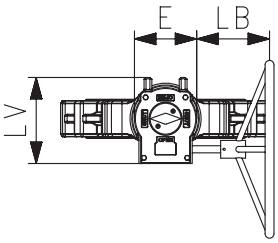
Dimensions			Reduction gear					Q	Weight
DN (mm)	d (mm)	Inch (")	E (mm)	LB (mm)	LV (mm)	M (mm)	Y (mm)	Q2 (mm)	(kg)
50	63	2	80.0	128.0	112.5	160.0	61.5	28.5	3.1
65	75	2 ½	80.0	128.0	112.5	160.0	61.5	44.0	3.3
80	90	3	80.0	128.0	112.5	160.0	61.5	63.5	3.5
100	110	4	80.0	128.0	112.5	160.0	61.5	84.0	4.3
125	140	5	80.0	128.0	112.5	160.0	61.5	110.5	5.0
150	160	6	80.0	128.0	112.5	160.0	61.5	137.5	5.8
200	225	8	80.0	128.0	112.5	160.0	61.5	190.5	7.2
250	280	10	100.0	135.5	130.0	200.0	68.5	239.0	13.4
300	315	12	100.0	135.5	130.0	200.0	68.5	285.5	17.6

Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM
50	63	2	199 565 200	199 565 220
65	75	2 ½	199 565 201	199 565 221
80	90	3	199 565 202	199 565 222
100	110	4	199 565 203	199 565 223
125	140	5	199 565 204	199 565 224
150	160	6	199 565 205	199 565 225
200	225	8	199 565 206	199 565 226
250	280	10	199 565 207	199 565 227
300	315	12	199 565 208	199 565 228

Butterfly Valve type 565W wafer-style DN350 – DN400 with reduction gear







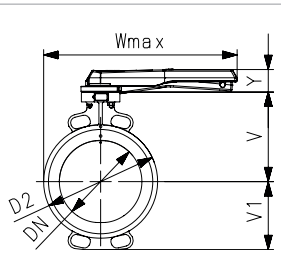


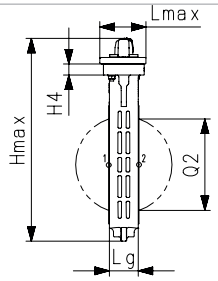
Dimensions			Housing dimensions								Reduction gear				
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	E (mm)	LB (mm)	LV (mm)	M (mm)	Y (mm)
350	355	14	517	530	500	668.5	29	332	290	78	200	114	242	500	93
400	400	16	579	590.5	500	742.5	29	367	329	102	200	114	242	500	93

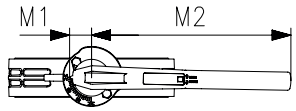
Dimensions			Q	Weight	Holes ISO				Holes ANSI			
DN (mm)	d (mm)	Inch (")	Q2 (mm)	(kg)	Number of bolt holes	Threads metric	Pitch circle k (mm)	d2 (mm)	Number of bolt holes	Threads UNC	Pitch circle k (mm)	d2 (mm)
350	355	14	331	49.5	16	4x M20	460	22	12	4x 1"	476.25	28.6
400	400	16	379	65.7	16	4x M24	515	26	16	4x 1"	539.8	28.6

Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	ISO	ANSI
350	355	14	199 555 200	199 556 200
400	400	16	199 555 201	199 556 201

Butterfly Valve type 565W wafer-style DN50 – DN200 with hand lever







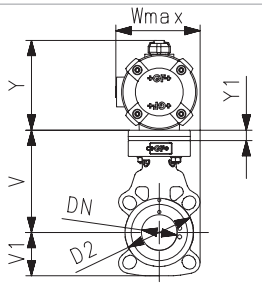


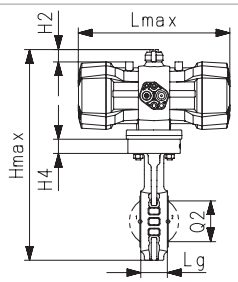
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	264.0	249.5	96.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	271.0	275.5	96.0	23.0	140.0	82.0	46.0
80	90	3	138.0	273.5	288.0	96.0	23.0	146.0	89.0	46.0
100	110	4	158.5	334.0	324.0	96.0	23.0	166.5	104.0	52.0
125	140	5	187.0	348.0	351.0	96.0	23.0	180.0	118.0	56.0
150	160	6	213.0	426.0	372.5	96.0	23.0	189.0	130.5	56.0
200	225	8	267.0	453.0	422.0	96.0	23.0	209.5	159.0	60.0

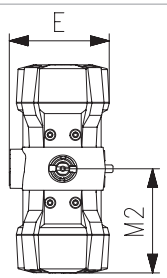
Dimensions			Actuator			Q	Weight
DN (mm)	d (mm)	Inch (")	M1 (mm)	M2 (mm)	Y (mm)	Q2 (mm)	(kg)
50	63	2	35.5	204.5	53.0	28.5	1.4
65	75	2 ½	35.5	204.5	53.0	44.0	1.6
80	90	3	35.5	204.5	53.0	63.5	1.8
100	110	4	35.5	254.5	53.0	84.0	2.7
125	140	5	35.5	254.5	53.0	110.5	3.3
150	160	6	35.5	319.5	53.0	137.5	4.3
200	225	8	35.5	319.5	53.0	190.5	5.7

Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM
50	63	2	199 565 000	199 565 020
65	75	2 ½	199 565 001	199 565 021
80	90	3	199 565 002	199 565 022
100	110	4	199 565 003	199 565 023
125	140	5	199 565 004	199 565 024
150	160	6	199 565 005	199 565 025
200	225	8	199 565 006	199 565 026

Butterfly Valve type 565W wafer-style DN50 – DN80 with pneumatic actuator PPA and FC/FO







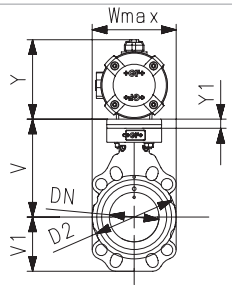


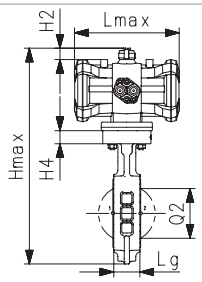
Dimensions			Housing dimensions								
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H2 (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	121.2	341.2	245.5	20.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	140.0	372.2	343.0	20.0	23.0	140.0	82.0	46.0
80	90	3	138.0	142.4	384.9	343.0	20.0	23.0	146.0	89.0	46.0

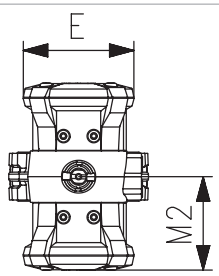
Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)	(kg)
50	63	2	PPA40	119.5	122.8	111.0	15.0	28.5	2.9
65	75	2 ½	PPA80	141.5	171.5	131.0	0.0	44.0	4.9
80	90	3	PPA80	141.5	171.5	131.0	0.0	63.5	5.1

Dimensions			Order code			
DN	d	Inch	FC		FO	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 565 650	199 565 660	199 565 670	199 565 680
65	75	2 ½	199 565 651	199 565 661	199 565 671	199 565 681
80	90	3	199 565 652	199 565 662	199 565 672	199 565 682

Butterfly Valve type 565W wafer-style DN50 – DN80 with pneumatic actuator PPA and DA







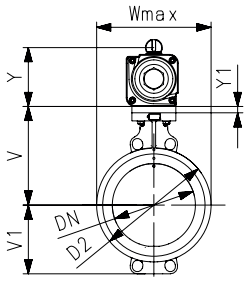


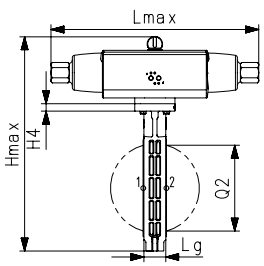
Dimensions			Housing dimensions								
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H2 (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	121.2	341.2	183.5	20.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	367.1	183.5	20.0	23.0	140.0	82.0	46.0
80	90	3	138.0	138.0	379.8	183.5	20.0	23.0	146.0	89.0	46.0

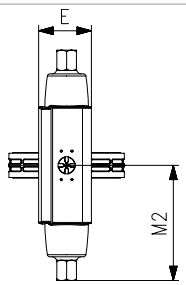
Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)	(kg)
50	63	2	PPA40	119.5	91.8	111.0	15.0	28.5	2.4
65	75	2 ½	PPA40	119.5	91.8	111.0	15.0	44.0	2.7
80	90	3	PPA40	119.5	91.8	111.0	15.0	63.5	2.9

Dimensions			Order code	
DN	d	Inch	DA	
(mm)	(mm)	(")	EPDM	FKM
50	63	2	199 565 630	199 565 690
65	75	2 ½	199 565 631	199 565 691
80	90	3	199 565 632	199 565 692

Butterfly Valve type 565W wafer-style DN50 – DN300 with pneumatic actuator PA30-70 and FC/FO







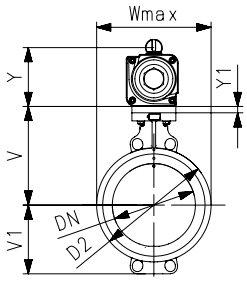


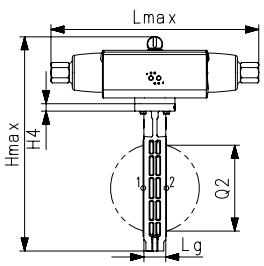
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	118.5	309.5	274.5	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	335.5	275.5	23.0	140.0	82.0	46.0
80	90	3	138.0	138.0	361.0	325.5	23.0	146.0	89.0	46.0
100	110	4	158.5	158.5	385.5	359.5	23.0	166.5	104.0	52.0
125	140	5	187.0	187.0	447.5	418.0	23.0	180.0	118.0	56.0
150	160	6	213.0	213.0	472.5	434.0	23.0	189.0	130.5	56.0
200	225	8	267.0	267.0	545.5	547.5	23.0	209.5	159.0	60.0
250	280	10	325.5	325.5	666.0	681.0	23.0	262.5	195.5	68.0
300	315	12	380.0	380.0	743.0	681.0	23.0	284.5	230.5	78.0

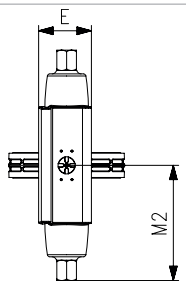
Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)	(kg)
50	63	2	PA30	70.5	137.2	98.5	15.0	28.5	3.3
65	75	2 ½	PA30	70.5	137.2	98.5	15.0	44.0	3.6
80	90	3	PA35	83.5	162.6	111.5	15.0	63.5	4.4
100	110	4	PA40	87.0	179.8	115.0		84.0	6.1
125	140	5	PA45	107.5	209.0	149.5		110.5	8.2
150	160	6	PA50	111.5	217.0	153.5		137.5	11.0
200	225	8	PA60	135	273.6	177.0		190.5	16.9
250	280	10	PA65	148	323.0	190.0	18.0	239.0	26.2
300	315	12	PA70	168	340.5	210.5	18.0	285.5	33.3

Dimensions			Order code			
DN	d	Inch	FC		FO	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 565 500	199 565 520	199 565 540	199 565 560
65	75	2 ½	199 565 501	199 565 521	199 565 541	199 565 561
80	90	3	199 565 502	199 565 522	199 565 542	199 565 562
100	110	4	199 565 503	199 565 523	199 565 543	199 565 563
125	140	5	199 565 504	199 565 524	199 565 544	199 565 564
150	160	6	199 565 505	199 565 525	199 565 545	199 565 565
200	225	8	199 565 506	199 565 526	199 565 546	199 565 566
250	280	10	199 565 507	199 565 527	199 565 547	199 565 567
300	315	12	199 565 508	199 565 528	199 565 548	199 565 568

Butterfly Valve type 565W wafer-style DN50 – DN300 with pneumatic actuator PA30-70 and DA







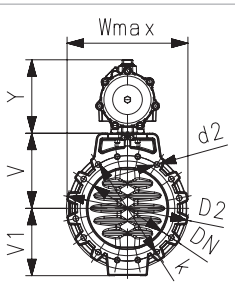


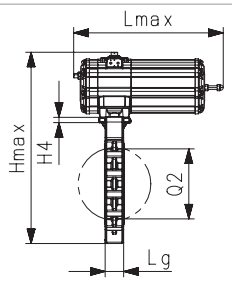
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	118.5	303.5	196.5	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	329.5	196.5	23.0	140.0	82.0	46.0
80	90	3	138.0	138.0	348.0	206.0	23.0	146.0	89.0	46.0
100	110	4	158.5	158.5	381.5	242.0	23.0	166.5	104.0	52.0
125	140	5	187.0	187.0	409.0	242.0	23.0	180.0	118.0	56.0
150	160	6	213.0	213.0	468.5	290.5	23.0	189.0	130.5	56.0
200	225	8	267.0	267.0	522.0	314.0	23.0	209.5	159.0	60.0
250	280	10	325.5	325.5	636.0	340.0	23.0	262.5	195.5	68.0
300	315	12	380.0	380.0	709.5	382.5	23.0	284.5	230.5	78.0

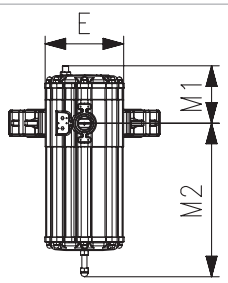
Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)	(kg)
50	63	2	PA35	64.5	98.5	92.5	15.0	28.5	2.7
65	75	2 ½	PA35	64.5	98.5	92.5	15.0	44.0	3.0
80	90	3	PA40	70.5	103.0	98.5	15.0	63.5	3.5
100	110	4	PA45	83.5	121.0	111.5		84.0	4.7
125	140	5	PA45	83.5	121.0	111.5		110.5	5.4
150	160	6	PA55	107.5	145.5	149.5		137.5	8.0
200	225	8	PA60	111.5	157.0	153.5		190.5	11.2
250	280	10	PA65	118.0	170.0	160.0	18.0	239.0	17.6
300	315	12	PA70	135.0	191.5	177.0	18.0	285.5	23.6

Dimensions			Order code	
			DA	
DN (mm)	d (mm)	Inch (")	EPDM	FKM
50	63	2	199 565 600	199 565 620
65	75	2 ½	199 565 601	199 565 621
80	90	3	199 565 602	199 565 622
100	110	4	199 565 603	199 565 623
125	140	5	199 565 604	199 565 624
150	160	6	199 565 605	199 565 625
200	225	8	199 565 606	199 565 626
250	280	10	199 565 607	199 565 627
300	315	12	199 565 608	199 565 628

Butterfly Valve type 565W wafer-style DN350 – DN400 with pneumatic actuator PA75 / PA80 FC/FO







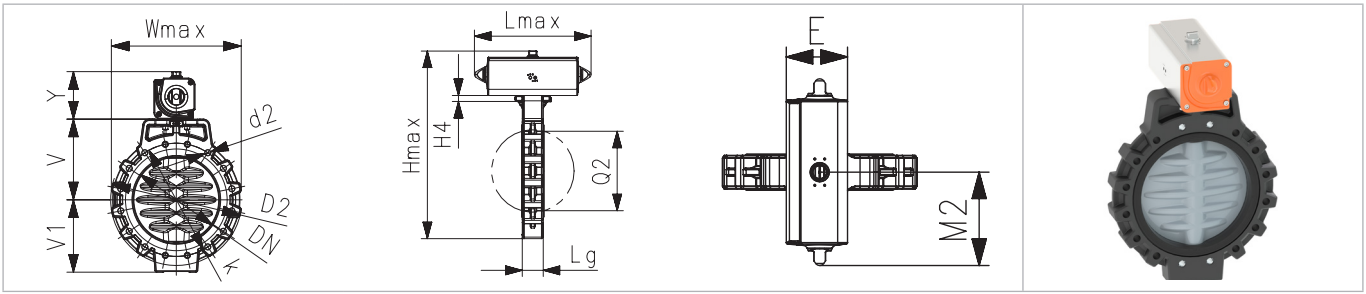


Dimensions			Housing dimensions								Actuator				
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)
350	355	14	517	530	479.4	820	29	332	290	78	PA75	207.7	414.1	414.1	237.7
400	400	16	579	590.5	567.1	912	29	367	329	102	PA80	311	224.7	600.4	359

Dimensions			Q	Weight	Holes ISO				Holes ANSI			
DN (mm)	d (mm)	Inch (")	Q2 (mm)	(kg)	Number of bolt holes	Threads metric	Pitch circle k (mm)	d2 (mm)	Number of bolt holes	Threads UNC	Pitch circle k (mm)	d2 (mm)
350	355	14	331	75.2	16	4x M20	460	22	12	4x 1"	476.25	28.6
400	400	16	379	123.5	16	4x M24	515	26	16	4x 1"	539.8	28.6

Dimensions			ISO order code		ANSI order code	
DN (mm)	d (mm)	Inch (")	FC	FO	FC	FO
350	355	14	199 555 500	199 555 540	199 556 500	199 556 540
400	400	16	199 555 501	199 555 541	199 556 501	199 556 541

Butterfly Valve type 565W wafer-style DN350 – DN400 with pneumatic actuator PA75 / PA80 DA

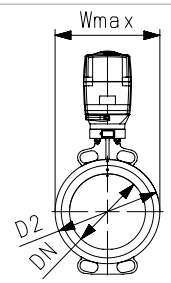


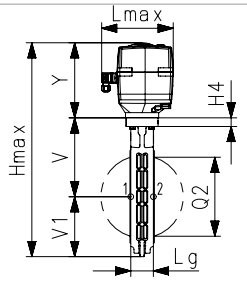
Dimensions			Housing dimensions								Actuator				
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)
350	355	14	517	530	479.4	820	29	332	290	78	PA75	168	239.7	239.7	198
400	400	16	579	590.5	567.1	912	29	367	329	102	PA80	168	283.6	283.6	216

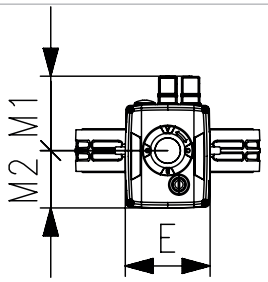
Dimensions			Q	Weight	Holes ISO				Holes ANSI			
DN (mm)	d (mm)	Inch (")	Q2 (mm)	(kg)	Number of bolt holes	Threads metric	Pitch circle k (mm)	d2 (mm)	Number of bolt holes	Threads UNC	Pitch circle k (mm)	d2 (mm)
350	355	14	331	50.6	16	4x M20	460	22	12	4x 1"	476.25	28.6
400	400	16	379	72.9	16	4x M24	515	26	16	4x 1"	539.8	28.6

Dimensions			Order code	
DN (mm)	d (mm)	Inch (")	ISO	ANSI
350	355	14	199 555 600	199 556 600
400	400	16	199 555 601	199 556 601

Butterfly Valve type 565W wafer-style DN50 – DN300 with electric actuator EA45-250







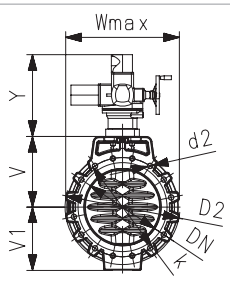


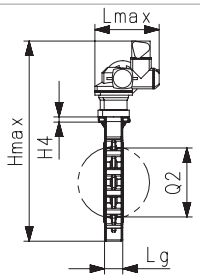
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	122.5	377.5	190.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	411.5	190.0	23.0	140.0	82.0	46.0
80	90	3	138.0	137.5	424.0	190.0	23.0	146.0	89.0	46.0
100	110	4	158.5	158.5	459.5	190.0	23.0	166.5	104.0	52.0
125	140	5	187.0	187.0	487.5	190.0	23.0	180.0	118.0	56.0
150	160	6	213.0	213.0	518.5	190.0	23.0	189.0	130.5	56.0
200	225	8	267.0	267.0	568.0	190.0	23.0	209.5	159.0	60.0
250	280	10	325.5	325.5	674.5	190.0	23.0	262.5	195.5	68.0
300	315	12	380.0	380.0	731.0	190.0	23.0	284.5	230.5	78.0

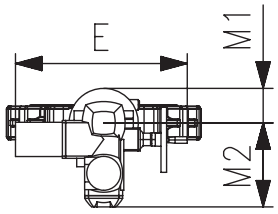
Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)	Q2 (mm)	(kg)
50	63	2	EA45	122.5	107.5	83.0	166.5	28.5	3.4
65	75	2 ½	EA120	122.5	107.5	83.0	189.5	44.0	4.7
80	90	3	EA120	122.5	107.5	83.0	189.5	63.5	4.8
100	110	4	EA120	122.5	107.5	83.0	189.5	84.0	5.8
125	140	5	EA120	122.5	107.5	83.0	189.5	110.5	6.4
150	160	6	EA250	122.5	107.5	83.0	199.5	137.5	9.0
200	225	8	EA250	122.5	107.5	83.0	199.5	190.5	10.5
250	280	10	EA250	122.5	107.5	83.0	216.5	239.0	15.2
300	315	12	EA250	122.5	107.5	83.0	216.5	285.5	19.4

Dimensions			Order code			
DN	d	Inch	24V Actuator		230V Actuator	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 565 400	199 565 420	199 565 300	199 565 320
65	75	2 ½	199 565 401	199 565 421	199 565 301	199 565 321
80	90	3	199 565 402	199 565 422	199 565 302	199 565 322
100	110	4	199 565 403	199 565 423	199 565 303	199 565 323
125	140	5	199 565 404	199 565 424	199 565 304	199 565 324
150	160	6	199 565 405	199 565 425	199 565 305	199 565 325
200	225	8	199 565 406	199 565 426	199 565 306	199 565 326
250	280	10	199 565 407	199 565 427	199 565 307	199 565 327
300	315	12	199 565 408	199 565 428	199 565 308	199 565 328

Butterfly Valve type 565W wafer-style DN350 – DN400 with electric actuator SQ 12.2 / SQ 14.2







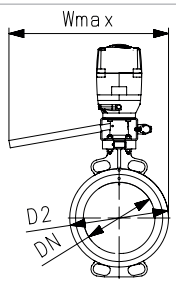


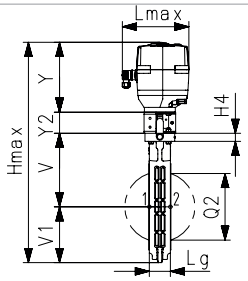
Dimensions			Housing dimensions								Actuator				
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)
350	355	14	517	530	521.8	1047	29	332	290	78	SQ 12.2	360	253.8	268	425
400	400	16	579	590.5	521.8	1146	29	367	329	102	SQ 14.2	367.5	253.8	268	520

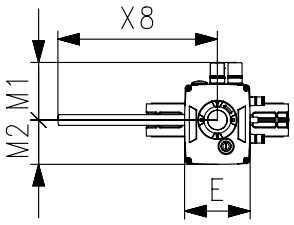
Dimensions			Q	Weight	Holes ISO				Holes ANSI			
DN (mm)	d (mm)	Inch (")	Q2 (mm)	(kg)	Number of bolt holes	Threads metric	Pitch circle k (mm)	d2 (mm)	Number of bolt holes	Threads UNC	Pitch circle k (mm)	d2 (mm)
350	355	14	331	68.1	16	4x M20	460	22	12	4x 1"	476.25	28.6
400	400	16	379	93.4	16	4x M24	515	26	16	4x 1"	539.8	28.6

Dimensions			ISO order code		ANSI order code	
DN (mm)	d (mm)	Inch (")	230V Actuator	400V Actuator	230V Actuator	400V Actuator
350	355	14	199 555 300	199 555 400	199 556 300	199 556 400
400	400	16	199 555 301	199 555 401	199 556 301	199 556 401

Butterfly Valve type 565W wafer-style DN50 – DN200 with electric actuator EA45-250 and manual override







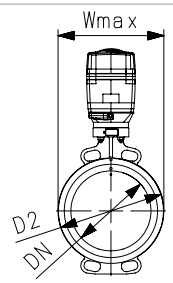


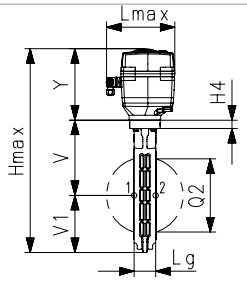
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	385.5	96.0	190.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	385.5	96.0	190.0	23.0	140.0	82.0	46.0
80	90	3	138.0	385.5	96.0	190.0	23.0	146.0	89.0	46.0
100	110	4	158.5	385.5	96.0	190.0	23.0	166.5	104.0	52.0
125	140	5	187.0	385.5	189.5	190.0	23.0	180.0	118.0	56.0
150	160	6	213.0	385.5	106.0	190.0	23.0	189.0	130.5	56.0
200	225	8	267.0	385.5	106.0	190.0	23.0	209.5	159.0	60.0

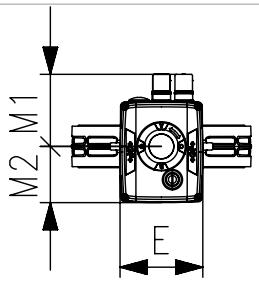
Dimensions			Actuator						Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M1 (mm)	M2 (mm)	X8 (mm)	Y (mm)	Y2 (mm)	Q2 (mm)	(kg)
50	63	2	EA45	122.5	107.5	83.0	297.5	189.5	60.0	28.5	5.6
65	75	2 ½	EA120	122.5	107.5	83.0	297.5	189.5	60.0	44.0	5.9
80	90	3	EA120	122.5	107.5	83.0	297.5	189.5	60.0	63.5	6.0
100	110	4	EA120	122.5	107.5	83.0	297.5	189.5	60.0	84.0	6.8
125	140	5	EA120	122.5	107.5	83.0	297.5	189.5	60.0	110.5	7.4
150	160	6	EA250	122.5	107.5	83.0	297.5	199.5	60.0	137.5	10.0
200	225	8	EA250	122.5	107.5	83.0	297.5	199.5	60.0	190.5	11.5

Dimensions			Order code			
DN	d	Inch	24V Actuator		230V Actuator	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 565 440	199 565 460	199 565 340	199 565 360
65	75	2 ½	199 565 441	199 565 461	199 565 341	199 565 361
80	90	3	199 565 442	199 565 462	199 565 342	199 565 362
100	110	4	199 565 443	199 565 463	199 565 343	199 565 363
125	140	5	199 565 444	199 565 464	199 565 344	199 565 364
150	160	6	199 565 445	199 565 465	199 565 345	199 565 365
200	225	8	199 565 446	199 565 466	199 565 346	199 565 366

Butterfly Valve type 565W wafer-style DN50 – DN300 with smart electric actuator dEA45-250









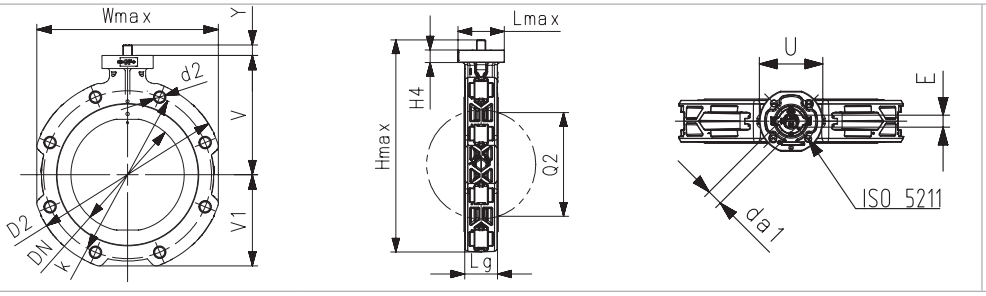
Dimensions			Housing dimensions							
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Hmax (mm)	Lmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)
50	63	2	100.0	122.5	377.5	190.0	23.0	133.5	63.0	43.0
65	75	2 ½	121.0	132.5	411.5	190.0	23.0	140.0	82.0	46.0
80	90	3	138.0	137.5	424.0	190.0	23.0	146.0	89.0	46.0
100	110	4	158.5	158.5	459.5	190.0	23.0	166.5	104.0	52.0
125	140	5	187.0	187.0	487.5	190.0	23.0	180.0	118.0	56.0
150	160	6	213.0	213.0	518.5	190.0	23.0	189.0	130.5	56.0
200	225	8	267.0	267.0	568.0	190.0	23.0	209.5	159.0	60.0
250	280	10	325.5	325.5	674.5	190.0	23.0	262.5	195.5	68.0
300	315	12	380.0	380.0	731.0	190.0	23.0	284.5	230.5	78.0

Dimensions			Actuator					Q	Weight
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)	Q2 (mm)	(kg)
50	63	2	EA45	122.5	107.5	83.0	166.5	28.5	3.4
65	75	2 ½	EA120	122.5	107.5	83.0	189.5	44.0	4.7
80	90	3	EA120	122.5	107.5	83.0	189.5	63.5	4.8
100	110	4	EA120	122.5	107.5	83.0	189.5	84.0	5.8
125	140	5	EA120	122.5	107.5	83.0	189.5	110.5	6.4
150	160	6	EA250	122.5	107.5	83.0	199.5	137.5	9.0
200	225	8	EA250	122.5	107.5	83.0	199.5	190.5	10.5
250	280	10	EA250	122.5	107.5	83.0	216.5	239.0	15.2
300	315	12	EA250	122.5	107.5	83.0	216.5	285.5	19.4

Dimensions			Order code			
DN	d	Inch	24V Actuator		230V Actuator	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 565 718	199 565 727	199 565 700	199 565 709
65	75	2 ½	199 565 719	199 565 728	199 565 701	199 565 710
80	90	3	199 565 720	199 565 729	199 565 702	199 565 711
100	110	4	199 565 721	199 565 730	199 565 703	199 565 712
125	140	5	199 565 722	199 565 731	199 565 704	199 565 713
150	160	6	199 565 723	199 565 732	199 565 705	199 565 714
200	225	8	199 565 724	199 565 733	199 565 706	199 565 715
250	280	10	199 565 725	199 565 734	199 565 707	199 565 716
300	315	12	199 565 726	199 565 735	199 565 708	199 565 717

Dimensions type 565L lug-style

Butterfly Valve type 565L lug-style DN50 – DN300 with bare shaft



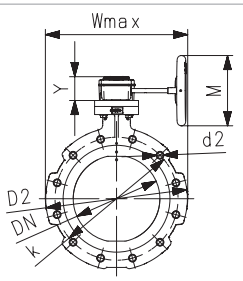


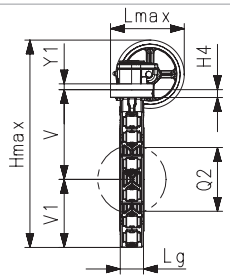
Dimensions			Housing dimensions										
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140	84.8	230.4	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	161	84.8	247.7	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	180	84.8	263.9	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	211	84.8	288.6	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	239	84.8	316.3	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	263	84.8	340.4	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319	84.8	388.8	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403	125.0	501.6	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482	125.0	559.8	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

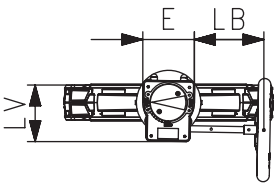
Dimensions			Housing dimensions					Q
DN (mm)	d (mm)	Inch (")	Acc. to ISO 5211	da1 (mm)	E (mm)	U (mm)	Y (mm)	Q2 (mm)
50	63	2	F07	14.1	11.0	90.0	27.0	28.5
65	75	2 ½	F07	14.1	11.0	90.0	27.0	44.0
80	90	3	F07	14.1	11.0	90.0	27.0	63.5
100	110	4	F07	18.1	14.0	90.0	16.0	84.0
125	140	5	F07	18.1	14.0	90.0	16.0	110.5
150	160	6	F07	22.2	17.0	90.0	19.0	137.5
200	225	8	F07	22.2	17.0	90.0	18.5	190.5
250	280	10	F10	28.2	22.0	125.0	40.5	239.0
300	315	12	F10	28.2	22.0	125.0	40.5	285.5

Dimensions			ISO order code		ANSI order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM	EPDM	FKM
50	63	2	199 575 100	199 575 120	199 576 100	199 576 120
65	75	2 ½	199 575 101	199 575 121	199 576 101	199 576 121
80	90	3	199 575 102	199 575 122	199 576 102	199 576 122
100	110	4	199 575 103	199 575 123	199 576 103	199 576 123
125	140	5	199 575 104	199 575 124	199 576 104	199 576 124
150	160	6	199 575 105	199 575 125	199 576 105	199 576 125
200	225	8	199 575 106	199 575 126	199 576 106	199 576 126
250	280	10	199 575 107	199 575 127	199 576 107	199 576 127
300	315	12	199 575 108	199 575 128	199 576 108	199 576 128

Butterfly Valve type 565L lug-style DN50 – DN300 with reduction gear







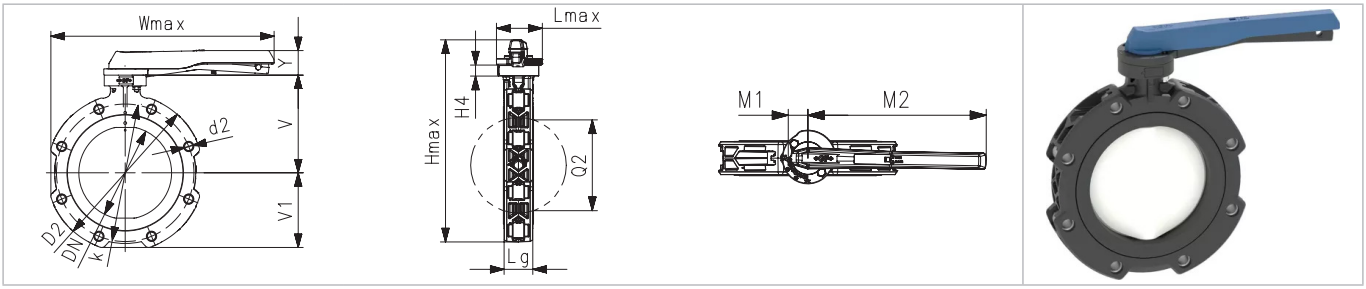


Dimensions			Housing dimensions											
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	251.0	190.8	344.6	23	133.3	70.1	43	125	120.6	M16	UNC 5/8
65	75	2 ½	175	261.5	190.8	361.9	23	139.9	80.8	46	145	139.7	M16	UNC 5/8
80	90	3	190	271.0	190.8	378.1	23	145.6	91.3	46	160	152.4	M16	UNC 5/8
100	110	4	221	286.5	190.8	413.8	23	166.4	106.2	52	180	190.5	M16	UNC 5/8
125	140	5	250	300.5	190.8	441.5	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	312.5	190.8	462.6	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319.0	190.8	511.0	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403.0	207.4	647.0	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482.0	207.4	705.2	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

Dimensions			Actuator					Q
DN (mm)	d (mm)	Inch (")	E (mm)	LB (mm)	LV (mm)	M (mm)	Y (mm)	Q2 (mm)
50	63	2	80.0	129.5	112.3	160.0	61.2	28.5
65	75	2 ½	80.0	129.5	112.3	160.0	61.2	44.0
80	90	3	80.0	129.5	112.3	160.0	61.2	63.5
100	110	4	80.0	129.5	112.3	160.0	61.2	84.0
125	140	5	80.0	129.5	112.3	160.0	61.2	110.5
150	160	6	80.0	129.5	112.3	160.0	61.2	137.5
200	225	8	80.0	129.5	112.3	160.0	61.2	190.5
250	280	10	100.0	134.0	130.0	200.0	68.4	239.0
300	315	12	100.0	134.0	130.0	200.0	68.4	285.5

Dimensions			ISO order code		ANSI order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM	EPDM	FKM
50	63	2	199 575 200	199 575 220	199 576 200	199 576 220
65	75	2 ½	199 575 201	199 575 221	199 576 201	199 576 221
80	90	3	199 575 202	199 575 222	199 576 202	199 576 222
100	110	4	199 575 203	199 575 223	199 576 203	199 576 223
125	140	5	199 575 204	199 575 224	199 576 204	199 576 224
150	160	6	199 575 205	199 575 225	199 576 205	199 576 225
200	225	8	199 575 206	199 575 226	199 576 206	199 576 226
250	280	10	199 575 207	199 575 227	199 576 207	199 576 227
300	315	12	199 575 208	199 575 228	199 576 208	199 576 228

Butterfly Valve type 565L lug-style DN50 – DN200 with hand lever

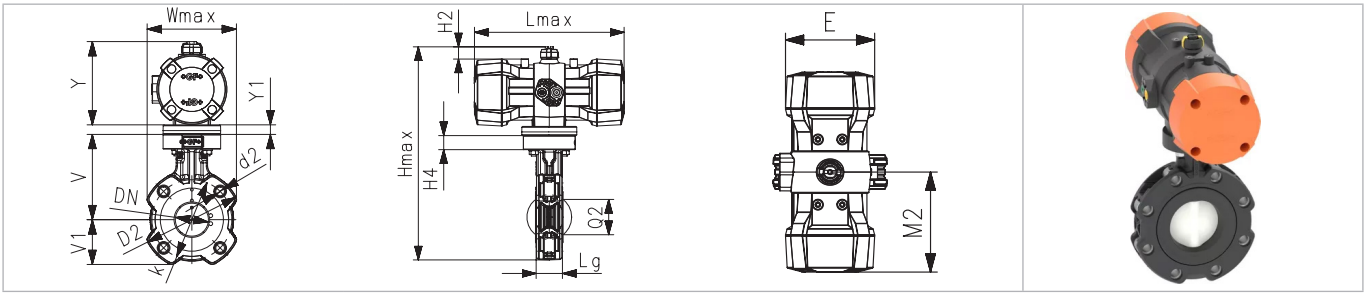


Dimensions			Housing dimensions											
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155.0	274.5	96.0	256.4	23.0	133.3	70.1	43.0	125	120.6	M16	UNC 5/8
65	75	2 ½	175.0	285.0	96.0	273.7	23.0	139.9	80.8	46.0	145	139.7	M16	UNC 5/8
80	90	3	190.0	294.5	96.0	289.9	23.0	145.6	91.3	46.0	160	152.4	M16	UNC 5/8
100	110	4	221.0	360.0	96.0	325.6	23.0	166.4	106.2	52.0	180	190.5	M16	UNC 5/8
125	140	5	250.0	374.0	96.0	353.3	23.0	180.0	120.3	56.0	210	215.9	M16	UNC ¾
150	160	6	277.0	454.5	96.0	374.4	23.0	189.0	132.4	56.0	240	241.3	M20	UNC ¾
200	225	8	337.0	482.5	96.0	422.8	23.0	209.5	160.3	60.0	295	298.4	M20	UNC ¾

Dimensions			Lever			Q
DN (mm)	d (mm)	Inch (")	M1 (mm)	M2 (mm)	Y (mm)	Q2 (mm)
50	63	2	35.5	204.5	53.0	28.5
65	75	2 ½	35.5	204.5	53.0	44.0
80	90	3	35.5	204.5	53.0	63.5
100	110	4	35.5	254.5	53.0	84.0
125	140	5	35.5	254.5	53.0	110.5
150	160	6	32.0	323.0	53.0	137.5
200	225	8	32.0	323.0	53.0	190.5

Dimensions			ISO order code		ANSI order code	
DN (mm)	d (mm)	Inch (")	EPDM	FKM	EPDM	FKM
50	63	2	199 575 000	199 575 020	199 576 000	199 576 020
65	75	2 ½	199 575 001	199 575 021	199 576 001	199 576 021
80	90	3	199 575 002	199 575 022	199 576 002	199 576 022
100	110	4	199 575 003	199 575 023	199 576 003	199 576 023
125	140	5	199 575 004	199 575 024	199 576 004	199 576 024
150	160	6	199 575 005	199 575 025	199 576 005	199 576 025
200	225	8	199 575 006	199 575 026	199 576 006	199 576 026

Butterfly Valve type 565L lug-style DN50 – DN300 with pneumatic actuator PPA and FC/FO

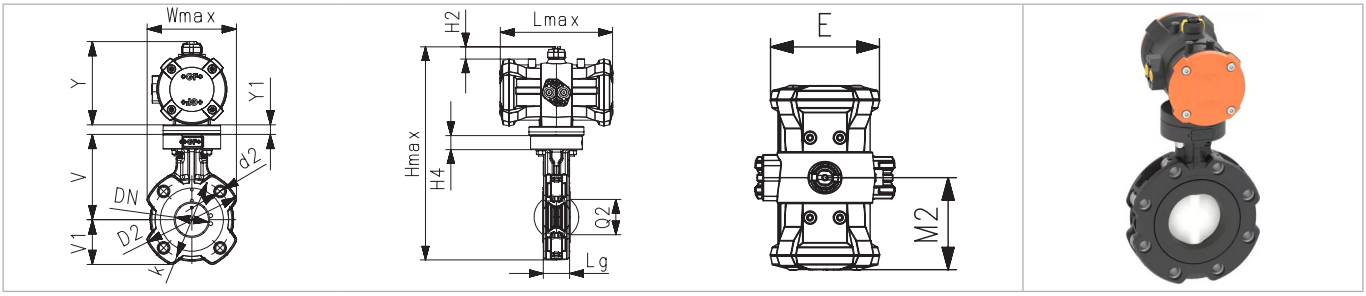


Dimensions			Housing dimensions											
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H2 (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	211.0	245.5	398.6	20	23	133.3	70.1	43	125	120.6	M16	UNC 5/8
65	75	2 ½	175	239.0	343.0	446.3	20	23	139.9	80.8	46	145	139.7	M16	UNC 5/8
80	90	3	190	263.0	343.0	467.4	20	23	145.6	91.3	46	160	152.4	M16	UNC 5/8

Dimensions			Actuator				Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2	PPA40	119.5	122.8	111.0	15.0	28.5
65	75	2 ½	PPA80	141.5	171.5	131.0	0.0	44.0
80	90	3	PPA80	141.5	171.5	131.0	0.0	63.5

Dimensions			ISO order code				ANSI order code			
DN	d	Inch	FC		FO		FC		FO	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM	EPDM	FKM	EPDM	FKM
50	63	2	199 575 650	199 575 660	199 575 670	199 575 680	199 576 650	199 576 660	199 576 670	199 576 680
65	75	2 ½	199 575 651	199 575 661	199 575 671	199 575 681	199 576 651	199 576 661	199 576 671	199 576 681
80	90	3	199 575 652	199 575 662	199 575 672	199 575 682	199 576 652	199 576 662	199 576 672	199 576 682

Butterfly Valve type 565L lug-style DN50 – DN300 with pneumatic actuator PPA and DA

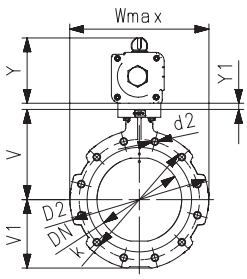


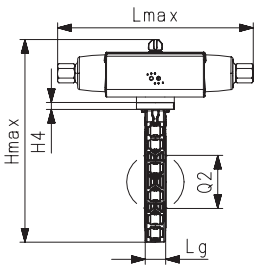
Dimensions			Housing dimensions											
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H2 (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140.0	183.5	314.4	20	23	133.3	70.1	43	125	120.6	M16	UNC 5/8
65	75	2 ½	175	161.0	183.5	331.7	20	23	139.9	80.8	46	145	139.7	M16	UNC 5/8
80	90	3	190	180.0	183.5	347.9	20	23	145.6	91.3	46	160	152.4	M16	UNC 5/8

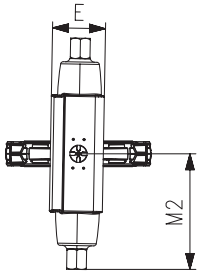
Dimensions			Actuator					Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2	PPA40	119.5	91.8	111.0	15.0	28.5
65	75	2 ½	PPA40	119.5	91.8	111.0	15.0	44.0
80	90	3	PPA40	119.5	91.8	111.0	15.0	63.5

Dimensions			ISO order code		ANSI order code	
			DA		DA	
DN (mm)	d (mm)	Inch (")	EPDM	FKM	EPDM	FKM
50	63	2	199 575 630	199 575 690	199 576 630	199 576 690
65	75	2 ½	199 575 631	199 575 691	199 576 631	199 576 691
80	90	3	199 575 632	199 575 692	199 576 632	199 576 692

Butterfly Valve type 565L lug-style DN50 – DN300 with pneumatic actuator PA30-70 and FC/FO







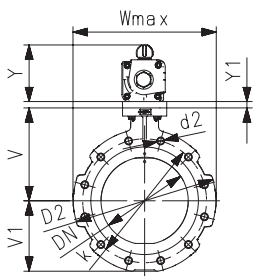


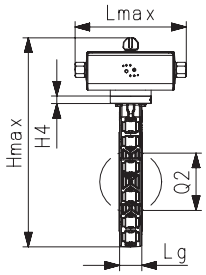
Dimensions			Housing dimensions										
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140.0	274.4	316.6	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	161.0	274.4	333.9	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	180.0	325.2	363.0	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	211.0	359.6	387.4	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	239.0	418.0	449.8	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	263.0	434.0	474.5	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319.0	547.3	546.8	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403.0	646.0	668.6	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482.0	681.0	746.9	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

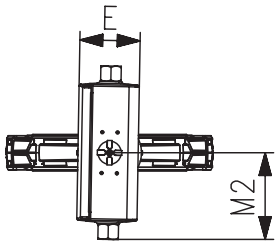
Dimensions			Actuator					Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2	PA30	70.4	137.2	98.2	15.0	28.5
65	75	2 ½	PA30	70.4	137.2	98.2	15.0	44.0
80	90	3	PA35	83.3	162.6	111.1	15.0	63.5
100	110	4	PA40	87.0	179.8	114.8		84.0
125	140	5	PA45	107.5	209.0	149.5		110.5
150	160	6	PA50	111.1	217.0	153.1		137.5
200	225	8	PA60	135.0	274.0	177.0		190.5
250	280	10	PA65	148.0	323.0	190.0	18.0	239.0
300	315	12	PA70	168.0	340.5	210.1	18.0	285.5

Dimensions			ISO order code				ANSI order code			
DN	d	Inch	FC		FO		FC		FO	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM	EPDM	FKM	EPDM	FKM
50	63	2	199 575 500	199 575 520	199 575 540	199 575 560	199 576 500	199 576 520	199 576 540	199 576 560
65	75	2 ½	199 575 501	199 575 521	199 575 541	199 575 561	199 576 501	199 576 521	199 576 541	199 576 561
80	90	3	199 575 502	199 575 522	199 575 542	199 575 562	199 576 502	199 576 522	199 576 542	199 576 562
100	110	4	199 575 503	199 575 523	199 575 543	199 575 563	199 576 503	199 576 523	199 576 543	199 576 563
125	140	5	199 575 504	199 575 524	199 575 544	199 575 564	199 576 504	199 576 524	199 576 544	199 576 564
150	160	6	199 575 505	199 575 525	199 575 545	199 575 565	199 576 505	199 576 525	199 576 545	199 576 565
200	225	8	199 575 506	199 575 526	199 575 546	199 575 566	199 576 506	199 576 526	199 576 546	199 576 566
250	280	10	199 575 507	199 575 527	199 575 547	199 575 567	199 576 507	199 576 527	199 576 547	199 576 567
300	315	12	199 575 508	199 575 528	199 575 548	199 575 568	199 576 508	199 576 528	199 576 548	199 576 568

Butterfly Valve type 565L lug-style DN50 – DN300 with pneumatic actuator PA30-70 and DA







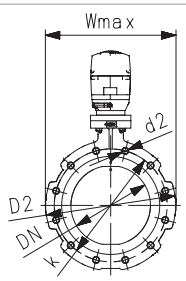


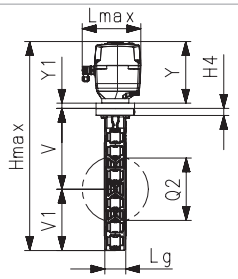
Dimensions			Housing dimensions										
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140.0	196.2	310.7	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	161.0	196.2	328.0	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	180.0	205.6	350.1	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	211.0	242.0	383.8	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	239.0	242.0	411.5	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	263.0	290.0	470.9	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319.0	313.9	523.3	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403.0	339.6	638.6	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482.0	382.5	713.8	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

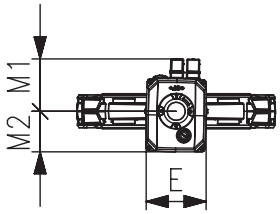
Dimensions			Actuator					Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2	PA35	64.5	98.5	98.1	15.0	28.5
65	75	2 ½	PA35	64.5	98.5	98.1	15.0	44.0
80	90	3	PA40	70.4	103.0	102.8	15.0	63.5
100	110	4	PA45	83.3	121.0	121.0		84.0
125	140	5	PA45	83.3	121.0	121.0		110.5
150	160	6	PA55	107.5	145.5	145.0		137.5
200	225	8	PA60	111.5	157.0	157.0		190.5
250	280	10	PA65	118.0	170.0	169.8	18.0	239.0
300	315	12	PA70	135.0	191.5	191.5	18.0	285.5

Dimensions			ISO order code		ANSI order code	
DN	d	Inch	DA		DA	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM
50	63	2	199 575 600	199 575 620	199 576 600	199 576 620
65	75	2 ½	199 575 601	199 575 621	199 576 601	199 576 621
80	90	3	199 575 602	199 575 622	199 576 602	199 576 622
100	110	4	199 575 603	199 575 623	199 576 603	199 576 623
125	140	5	199 575 604	199 575 624	199 576 604	199 576 624
150	160	6	199 575 605	199 575 625	199 576 605	199 576 625
200	225	8	199 575 606	199 575 626	199 576 606	199 576 626
250	280	10	199 575 607	199 575 627	199 576 607	199 576 627
300	315	12	199 575 608	199 575 628	199 576 608	199 576 628

Butterfly Valve type 565L lug-style DN50 – DN300 with electric actuator EA45-250







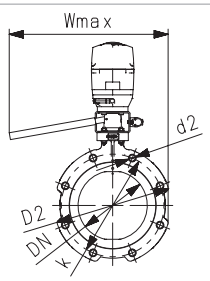


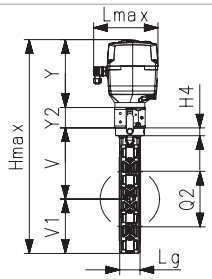
Dimensions			Housing dimensions										
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140.0	190.0	384.6	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	161.0	190.0	410.0	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	180.0	190.0	426.2	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	211.0	190.0	461.9	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	239.0	190.0	489.6	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	263.0	190.0	520.7	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319.0	190.0	569.1	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403.0	190.0	677.9	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482.0	190.0	736.1	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

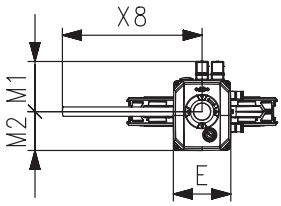
Dimensions			Actuator						Q
DN (mm)	d (mm)	Inch (")	Typ	E (mm)	M1 (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2	EA45	122.3	107.3	82.7	166.5	15	28.5
65	75	2 ½	EA120	122.3	107.3	82.7	189.5		44.0
80	90	3	EA120	122.3	107.3	82.7	189.5		63.5
100	110	4	EA120	122.3	107.3	82.7	189.5		84.0
125	140	5	EA120	122.3	107.3	82.7	189.5		110.5
150	160	6	EA250	122.3	107.3	82.7	199.5		137.5
200	225	8	EA250	122.3	107.3	82.7	199.5		190.5
250	280	10	EA250	122.3	107.3	82.7	199.5	17	239.0
300	315	12	EA250	122.3	107.3	82.7	199.5	17	285.5

Dimensions			ISO order code				ANSI order code			
DN	d	Inch	24V Actuator		230V Actuator		24V Actuator		230V Actuator	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM	EPDM	FKM	EPDM	FKM
50	63	2	199 575 400	199 575 420	199 575 300	199 575 320	199 576 400	199 576 420	199 576 300	199 576 320
65	75	2 ½	199 575 401	199 575 421	199 575 301	199 575 321	199 576 401	199 576 421	199 576 301	199 576 321
80	90	3	199 575 402	199 575 422	199 575 302	199 575 322	199 576 402	199 576 422	199 576 302	199 576 322
100	110	4	199 575 403	199 575 423	199 575 303	199 575 323	199 576 403	199 576 423	199 576 303	199 576 323
125	140	5	199 575 404	199 575 424	199 575 304	199 575 324	199 576 404	199 576 424	199 576 304	199 576 324
150	160	6	199 575 405	199 575 425	199 575 305	199 575 325	199 576 405	199 576 425	199 576 305	199 576 325
200	225	8	199 575 406	199 575 426	199 575 306	199 575 326	199 576 406	199 576 426	199 576 306	199 576 326
250	280	10	199 575 407	199 575 427	199 575 307	199 575 327	199 576 407	199 576 427	199 576 307	199 576 327
300	315	12	199 575 408	199 575 428	199 575 308	199 575 328	199 576 408	199 576 428	199 576 308	199 576 328

Butterfly Valve type 565L lug-style DN50 – DN200 with electric actuator EA45-250 and manual override







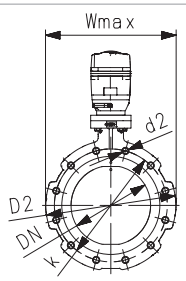


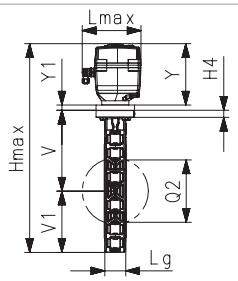
Dimensions			Housing dimensions											
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	274.5	96.0	256.4	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	285.0	96.0	273.7	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	294.5	96.0	289.9	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	360.0	96.0	325.6	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	374.0	96.0	353.3	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	454.5	96.0	374.4	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	482.5	96.0	422.8	23	209.5	160.3	60	295	298.4	M20	UNC ¾

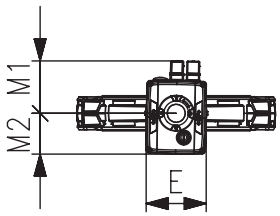
Dimensions			Actuator						Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M1 (mm)	M2 (mm)	X8 (mm)	Y (mm)	Y2 (mm)	Q2 (mm)
50	63	2	EA120	122.3	107.3	82.7	297.5	166.2	60.0	28.5
65	75	2 ½	EA120	122.3	107.3	82.7	297.5	189.3	60.0	44.0
80	90	3	EA120	122.3	107.3	82.7	297.5	189.3	60.0	63.5
100	110	4	EA120	122.3	107.3	82.7	297.5	189.3	60.0	84.0
125	140	5	EA120	122.3	107.3	82.7	297.5	189.3	60.0	110.5
150	160	6	EA250	122.3	107.3	82.7	297.5	199.3	60.0	137.5
200	225	8	EA250	122.3	107.3	82.7	297.5	199.3	60.0	190.5

Dimensions			ISO order code				ANSI order code			
DN	d	Inch	24V Antrieb		230V Antrieb		24V Antrieb		230V Antrieb	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM	EPDM	FKM	EPDM	FKM
50	63	2	199 575 440	199 575 460	199 575 340	199 575 360	199 576 440	199 576 460	199 576 340	199 576 360
65	75	2 ½	199 575 441	199 575 461	199 575 341	199 575 361	199 576 441	199 576 461	199 576 341	199 576 361
80	90	3	199 575 442	199 575 462	199 575 342	199 575 362	199 576 442	199 576 462	199 576 342	199 576 362
100	110	4	199 575 443	199 575 463	199 575 343	199 575 363	199 576 443	199 576 463	199 576 343	199 576 363
125	140	5	199 575 444	199 575 464	199 575 344	199 575 364	199 576 444	199 576 464	199 576 344	199 576 364
150	160	6	199 575 445	199 575 465	199 575 345	199 575 365	199 576 445	199 576 465	199 576 345	199 576 365
200	225	8	199 575 446	199 575 466	199 575 346	199 575 366	199 576 446	199 576 466	199 576 346	199 576 366

Butterfly Valve type 565L lug-style DN50 – DN300 with smart electric actuator dEA45-250









Dimensions			Housing dimensions										
DN (mm)	d (mm)	Inch (")	D2 (mm)	Wmax (mm)	Lmax (mm)	Hmax (mm)	H4 (mm)	V (mm)	V1 (mm)	Lg (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	155	140.0	190.0	384.6	23	133.3	70.1	43	125	120.6	M16	UNC ⅝
65	75	2 ½	175	161.0	190.0	410.0	23	139.9	80.8	46	145	139.7	M16	UNC ⅝
80	90	3	190	180.0	190.0	426.2	23	145.6	91.3	46	160	152.4	M16	UNC ⅝
100	110	4	221	211.0	190.0	461.9	23	166.4	106.2	52	180	190.5	M16	UNC ⅝
125	140	5	250	239.0	190.0	489.6	23	180.0	120.3	56	210	215.9	M16	UNC ¾
150	160	6	277	263.0	190.0	520.7	23	189.0	132.4	56	240	241.3	M20	UNC ¾
200	225	8	337	319.0	190.0	569.1	23	209.5	160.3	60	295	298.4	M20	UNC ¾
250	280	10	403	403.0	190.0	677.9	23	262.5	199.1	68	350	362.0	M20	UNC ⅞
300	315	12	479	482.0	190.0	736.1	23	284.3	235.5	78	400	431.8	M20	UNC ⅞

Dimensions			Actuator					Q
DN (mm)	d (mm)	Inch (")	Type	E (mm)	M1 (mm)	M2 (mm)	Y (mm)	Y1 (mm)	Q2 (mm)
50	63	2		122.3	107.3	83.0	166.2	15	28.5
65	75	2 ½		122.3	107.3	83.0	189.3		44.0
80	90	3		122.3	107.3	83.0	189.3		63.5
100	110	4		122.3	107.3	83.0	189.3		84.0
125	140	5		122.3	107.3	83.0	189.3		110.5
150	160	6		122.3	107.3	83.0	199.3		137.5
200	225	8		122.3	107.3	83.0	199.3		190.5
250	280	10		122.3	107.3	83.0	199.3	17	239.0
300	315	12		122.3	107.3	83.0	199.3	17	285.5

Dimensions			ISO order code				ANSI order code			
DN	d	Inch	24V Actuator		230V Actuator		24V Actuator		230V Actuator	
(mm)	(mm)	(")	EPDM	FKM	EPDM	FKM	EPDM	FKM	EPDM	FKM
50	63	2	199 575 718	199 575 727	199 575 700	199 575 709	199 576 718	199 576 727	199 576 700	199 576 709
65	75	2 ½	199 575 719	199 575 728	199 575 701	199 575 710	199 576 719	199 576 728	199 576 701	199 576 710
80	90	3	199 575 720	199 575 729	199 575 702	199 575 711	199 576 720	199 576 729	199 576 702	199 576 711
100	110	4	199 575 721	199 575 730	199 575 703	199 575 712	199 576 721	199 576 730	199 576 703	199 576 712
125	140	5	199 575 722	199 575 731	199 575 704	199 575 713	199 576 722	199 576 731	199 576 704	199 576 713
150	160	6	199 575 723	199 575 732	199 575 705	199 575 714	199 576 723	199 576 732	199 576 705	199 576 714
200	225	8	199 575 724	199 575 733	199 575 706	199 575 715	199 576 724	199 576 733	199 576 706	199 576 715
250	280	10	199 575 725	199 575 734	199 575 707	199 575 716	199 576 725	199 576 734	199 576 707	199 576 716
300	315	12	199 575 726	199 575 735	199 575 708	199 575 717	199 576 726	199 576 735	199 576 708	199 576 717

Accessories

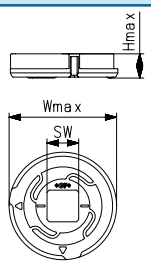
Double Sensor for electrical and visual position feedback

After being mounted in the valve or in the interface module, the double sensor is used to signal the CLOSED or OPEN position of the valve via an electric signal to a controller, supplied by the customer. In addition, the Double Sensor provides visual position feedback via the two build-in LEDs.

Code	Output circuit	Open Signal Color	Closed Signal Color	Product picture
198 546 001	PNP	LED red	LED green	
198 546 002	PNP	LED green	LED red	
198 546 005	NPN	LED red	LED green	
198 546 006	NPN	LED green	LED red	
198 546 003	NAMUR	LED red	LED green	
198 546 004	NAMUR	LED green	LED red	

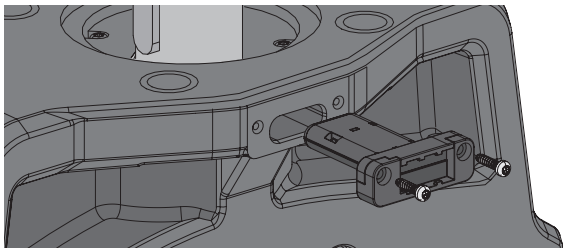
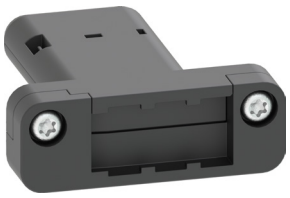
Suitable connection cable code 198546150 available as an accessory.

Switching ring for Double Sensor

DN (mm)	Code	According to ISO 5211	SW (mm)	Wmax (mm)	Hmax (mm)	Dimensions	Product picture
50 - 80	199 565 900	F07	11	57.7	12.5		
100 - 125	199 565 901	F07	14	57.7	12.5		
150 - 200	199 565 902	F07	17	57.7	12.5		
250 - 300	199 565 903	F10	22.1	79.8	12.5		

For manually operated valves an additional switching ring is required. For electrically or pneumatically operated valves, the switching ring is already pre-assembled.

DN350 - DN400 Double Sensor Adapter Set

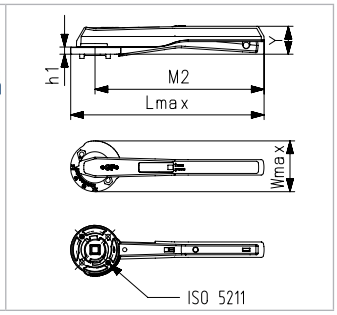
DN (mm)	Code	Installation	Product picture
350 - 400	199 555 900		

For use of the Double Sensor with Type 565 DN350 - DN400 butterfly valves, a Double Sensor Adapter Set is required.

Hand lever

Hand lever incl. fastening screws.



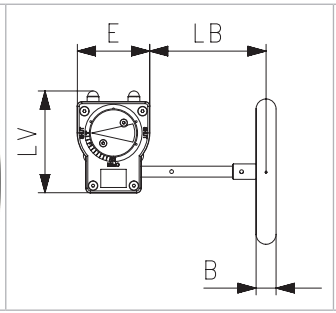


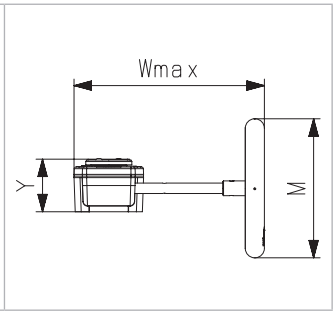
DN (mm)	d (mm)	Inch (")	Code	Wmax (mm)	Lmax (mm)	Acc. to ISO 5211	h1 (mm)	M2 (mm)	Y (mm)
50-80	63 - 90	2 - 3	199 565 906	96	251	F07	13.5	204.5	53
100-125	110 - 140	4 - 5	199 565 907	96	301	F07	13.5	254.5	53
150-200	160 - 225	6 - 8	199 565 908	96	366	F07	13.5	319.5	53

Reduction gear

For valve operation via a reduction gear with handwheel.







DN (mm)	d (mm)	Inch (")	Code	Wmax (mm)	LV (mm)	Y (mm)	M (mm)	B (mm)	E (mm)	LB (mm)
50 - 200	63 - 225	2 - 8	161 483 471	221.0	112.3	61.2	160.0	23.0	80.0	129.5
250 - 300	280 - 315	10 - 12	161 483 472	246.3	130.0	68.4	200.0	24.6	100.0	134.0
350 - 400	355 - 400	14 - 16	161 483 473	405.0	242.0	93.0	500.0	25.0	200.0	114.0

Gearbox with direct mount chain wheel

For valve operation via a manual gear with chainwheel.

- Chains need to be ordered separately.
- A pre-assembly is possible. If needed - please contact your local sales team.

DN (mm)	Code	Product picture
50-80	199 565 984	
100-125	199 565 985	
150-200	199 565 986	
250-300	199 565 987	

Chain to chainwheel

- For 199565980-199565987
- Can be ordered in different lengthes. Mass unit is 1 meter.

DN (mm)	Code	Material	Product picture
50-300	199 565 989	Zink plated	
50-300	199 565 990	AISI316	

Electric Actuator EA45-250

The EA45/120/250 electric actuator is mounted on a valve (e.g. ball valve or butterfly valve) and connected to a control system provided by the customer.

DN (mm)	Code	Type	Spannung	Torque max.	Acc. to ISO 5211	Product picture
50	198 153 184	EA45	AC 100-230V	45 Nm	F05* (WS 11/14)	
50	198 153 185	EA45	AC/DC 24V	45 Nm	F05* (WS 11/14)	
50 - 125	198 153 186	EA120	AC 100-230V	120 Nm	F07 (WS17)	
50 - 125	198 153 187	EA120	AC/DC 24V	120 Nm	F07 (WS17)	
150 - 300	198 153 188	EA250	AC 100-230V	250 Nm	F07 (WS17)	
150 - 300	198 153 189	EA250	AC/DC 24V	250 Nm	F07 (WS17)	

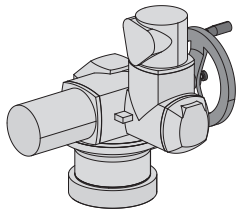
Smart Actuator dEA45-250

The Smart Actuator dEA45/120/250 is mounted on a valve (e.g. ball valve or butterfly valve) and connected to a control system provided by the customer. The Smart Actuator offers wireless connectivity via NFC and Wi-Fi Direct, as well as control and reading of process data via downloadable App.

DN (mm)	Code	Type	Spannung	Torque max.	Acc. to ISO 5211	Product picture
50	198 153 194	dEA45	AC 100-230V	45 Nm	F05* (WS 11/14)	
50	198 153 195	dEA45	AC/DC 24V	45 Nm	F05* (WS 11/14)	
50 - 125	198 153 196	dEA120	AC 100-230V	120 Nm	F07 (WS17)	
50 - 125	198 153 197	dEA120	AC/DC 24V	120 Nm	F07 (WS17)	
150 - 300	198 153 198	dEA250	AC 100-230V	250 Nm	F07 (WS17)	
150 - 300	198 153 199	dEA250	AC/DC 24V	250 Nm	F07 (WS17)	

Electric actuator Auma SQ

The electric actuator Auma SQ is mounted on the type 565 DN 350-DN400 butterfly valve and connected to a control unit provided by the customer.

DN (mm)	Type	Voltage	Torque max.	Acc. to ISO 5211	Produktbild
350	Auma SQ 12.2	100–230 V	1200	F14	
	Auma SQ 12.2	400 V	1200	F14	
400	Auma SQ 14.2	100–230 V	2400	F14	
	Auma SQ 14.2	400 V	2400	F14	

Pneumatic Actuator PPA

The PPA pneumatic actuator can be mounted on any rotary valves with an interface according to ISO 5211.

Single-acting FC

DN (mm)	Code	Type	Torque max.	Acc. to ISO 5211	Product picture
50	198 155 401	PPA40	30 Nm	F05	
65 - 80	198 155 801	PPA80	53 Nm	F07	

Single-acting FO

DN (mm)	Code	Type	Torque max.	Acc. to ISO 5211	Product picture
50	198 155 402	PPA40	17 Nm	F05	
65 - 80	198 155 802	PPA80	40 Nm	F07	

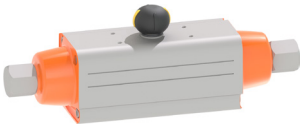
Double-acting DA

DN (mm)	Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
50 - 80	198 155 403	PPA40	31 Nm	F05	

Pneumatic Actuator PA30-80

The PA30 - PA80 pneumatic actuator can be mounted on any rotary valves with an interface according to ISO 5211.

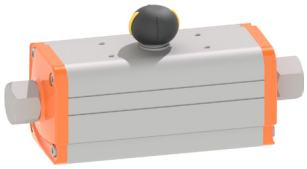
Single-acting FC

DN (mm)	Code	Type	Torque max.	Acc. to ISO 5211	Product picture
50 - 65	198 811 617	PA30 FC	30 Nm	F05/07	
80	198 811 601	PA35 FC	53 Nm	F05/07	
100	198 811 609	PA40 FC	60 Nm	F05/07	
125	198 811 603	PA45 FC	90 Nm	F07/10	
150	198 811 610	PA55 FC	180 Nm	F07/10	
200	198 811 652	PA60 FC	240 Nm	F07/10/12	
250	198 811 607	PA65 FC	360 Nm	F10/12	
300	198 811 612	PA70 FC	480 Nm	F10/12	
350		PA75	720 Nm	F14	
400		PA80	1080 Nm	F14	

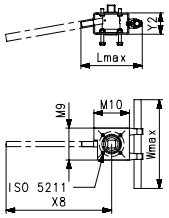
Single-acting FO

DN (mm)	Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
50 - 65	198 811 627	PA30	30 Nm	F05/07	
80	198 811 628	PA35	53 Nm	F05/07	
100	198 811 629	PA40	60 Nm	F05/07	
125	198 811 630	PA45	90 Nm	F07/10	
150	198 811 631	PA55	180 Nm	F07/10	
200	198 811 653	PA60	240Nm	F07/10/12	
250	198 811 654	PA65	360 Nm	F10/12	
300	198 811 634	PA70	480 Nm	F10/12	
350		PA75	720 Nm	F14	
400		PA80	1080 Nm	F14	

Double-acting DA

DN (mm)	Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
50 - 65	198 811 618	PA35	46 Nm	F03/05	
80	198 811 619	PA40	60 Nm	F05/07	
100 - 125	198 811 604	PA45	106 Nm	F05/07	
150	198 811 606	PA55	180 Nm	F07/10	
200	198 811 614	PA60	240 Nm	F07/10	
250	198 811 608	PA65	360 Nm	F07/10	
300	198 811 615	PA70	480 Nm	F10/12	
350		PA75	720 Nm	F14	
400		PA80	1080 Nm	F14	

Manual override

DN (mm)	Code	Acc. to ISO 5211	Lmax (mm)	Wmax (mm)	M9 (mm)	M10 (mm)	X8 (mm)	Y2 (mm)	Dimensions	Product picture
50 - 80	199 565 914	F07	172	250	90	100	298	60		
100 - 125	199 565 915	F07	172	250	90	100	298	60		
150 - 200	199 565 916	F07	172	250	90	100	298	60		

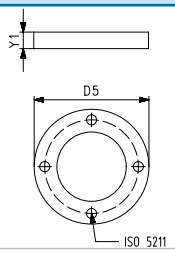
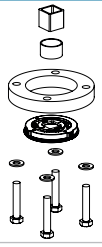
Not recommended to use with pneumatic actuators.

Intermediate elements

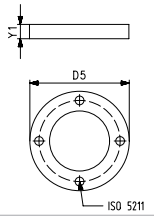
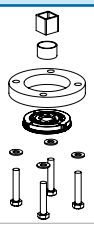
Intermediate elements are required as a connection between valve and Actuator. The intemediate elements include different screws, hexagon nuts, washer, switching rings, etc. (depends on actuator and dimension).

Note: The switching ring for the double sensor for electrical position feedback is supplied with each intermediate element.

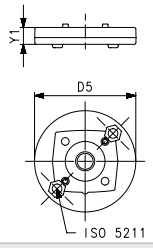
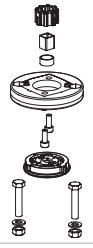
Intermediate elements for Reduction gear

DN (mm)	Code	Reduction gear	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50 - 80	199 565 917	161 483 471	F07				
100 - 125	199 565 918	161 483 471	F07				
150 - 200	199 565 919	161 483 471	F07				
250 - 300	199 565 913	161 483 472	F07/F10	125	17		

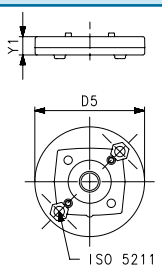
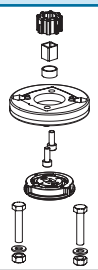
Intermediate elements for Electric Actuators EA45-250, dEA45-250

DN (mm)	Code	Type	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50	199 565 909	EA45	F05/F07	90	15		
50 - 80	199 565 910	xEA120-250	F07				
100 - 125	199 565 911	xEA120-250	F07				
150 - 200	199 565 912	xEA250	F07				
250 - 300	199 565 913	xEA250	F07/F10	125	17		

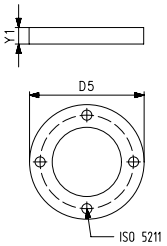
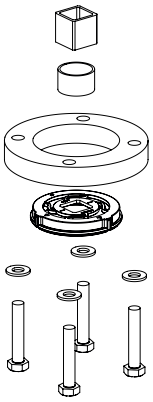
Intermediate elements for Pneumatic Actuators PPA, function FC/FO

DN (mm)	Code	Type	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50	199 565 965	PPA40	F05/F07	90	15		
65 - 80	199 565 966	PPA80	F05/F07				

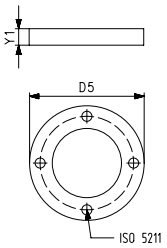
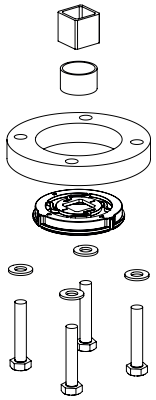
Intermediate elements for Pneumatic Actuators PPA, function DA

DN (mm)	Code	Type	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50 - 80	199 565 965	PPA40	F05/F07	90	15		

Intermediate elements for Pneumatic Actuators PA30-70, function FC/FO

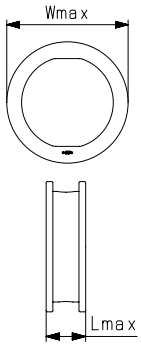
DN (mm)	Code	Type	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50	199 565921	PA30	F05/F07	90	15		
65	199 565 921	PA30	F05/F07	90	15		
80	199 565 922	PA35	F05/F07	90	15		
100	199 565 923	PA40	F07				
125	199 565 924	PA45	F07				
150	199 565 925	PA50	F07				
200	199 565 929	PA60	F07/F10	125	18		
250	199 565 927	PA65	F10	125	18		
300	199 565 928	PA70	F10	125	18		

Intermediate elements for Pneumatic Actuators PA30-70, function DA

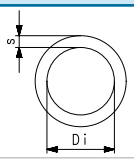
DN (mm)	Code	Type	Acc. to ISO 5211	D5 (mm)	Y1 (mm)	Dimensions	Product picture
50	199 565 920	PA35	F05/F07	90	15		
65	199 565 920	PA35	F05/F07	90	15		
80	199 565 921	PA40	F05/F07	90	15		
100	199 565 923	PA45	F07				
125	199 565 923	PA45	F07				
150	199 565 925	PA55	F07				
200	199 565 925	PA60	F07	125	18		
250	199 565 926	PA65	F10	125	18		
300	199 565 927	PA70	F10	125	18		

Replacement parts

Replacement seat liner

DN (mm)	d (mm)	Inch (")	EPDM	FKM	Lmax (mm)	Wmax (mm)	Dimensions	Product picture
50	63	2	199 565 930	199 565 940	45.2	85.5		
65	75	2 ½	199 565 931	199 565 941	48.4	105.5		
80	90	3	199 565 932	199 565 942	48.4	122.5		
100	110	4	199 565 933	199 565 943	54.6	142.5		
125	140	5	199 565 934	199 565 944	59	169.5		
150	160	6	199 565 935	199 565 945	59	194.5		
200	225	8	199 565 936	199 565 946	63	248		
250	280	10	199 565 937	199 565 947	72	304		
300	315	12	199 565 938	199 565 948	82.8	358		

Replacement o-ring

DN (mm)	d (mm)	Inch (")	EPDM	FKM	Di	s	Dimensions	Product picture
50-80	63-90	2-3	199 565 951	199 565 961	13.95	2.62		
100-125	110-140	4-5	199 565 952	199 565 962	17.13	2.62		
150-200	160-225	6-8	199 565 953	199 565 963	20.22	3.53		
250-300	280-315	10-12	199 565 954	199 565 964	24.99	3.53		

Threaded inserts

DN (mm)	d (mm)	Inch (")	ISO	ANSI	Product picture
50-80	63-90	2-3	199 575 917	199 576 922	
100	110	4	199 575 918	199 576 923	
125	140	5	199 575 919	199 576 925	
150-200	160-225	6-8	199 575 920	199 576 925	
250-300	280-315	10-12	199 575 921	199 576 926	

For further information see www.gfps.com/565

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Butterfly Valve type 567/578



Type 567
Wafer-style installation



Type 578
Lug-style installation



Type 567/578
with reduction gear



Type 567/578
with pneumatic actuator



Type 567/578
with electric actuator

Product description

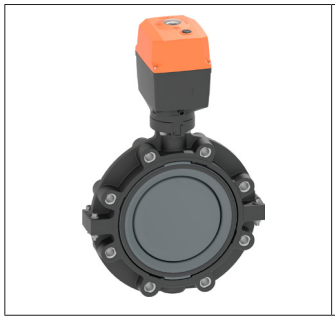
Butterfly valves of types 567 and 578 are corrosion -resistant and reliable control and shut-off valves that can be used in most applications in industrial water treatment, the chemical process industry, chemical trade, galvanization and in power plants. The valves are intended for wafer-style and lug-style applications. They are compact, varied and reliable. The valve is modular in design, allowing individual system parts to be exchanged at any time.

Benefits/features

- Lower weight than metallic butterfly valves due to use of fiberglass-reinforced plastic as housing material
- High corrosion resistance: all components that come into contact with media are made of plastic
- Lockable ergonomic lever with standard 5° ratchet setting (fine adjustment as option)
- Low wear due to double eccentric operating principle: up to 50 % lower actuating torque than with centric valves
- Tightness in the passage and to the outside: double, double-sided, internal axis seal
- Optimized modular components: double internal shaft seal on both sides
- Standard interface conforms to ISO 5211
- Integrated electric position indicator (optional)
- Type 578: Use as lugged valve with threaded inserts integrated into the housing

Automation through use as a process and control valve

Thanks to a wide range of accessories, butterfly valves can be equipped with the appropriate pneumatic or electric actuators and thus used as process and control valves.



Type 567/578 Butterfly Valve with electric actuator EA



Type 567/578 Butterfly Valve with smart actuator dEA



Type 567/578 Butterfly Valve with plastic pneumatic actuator PPA



Type 567/578 Butterfly Valve with pneumatic actuator PA

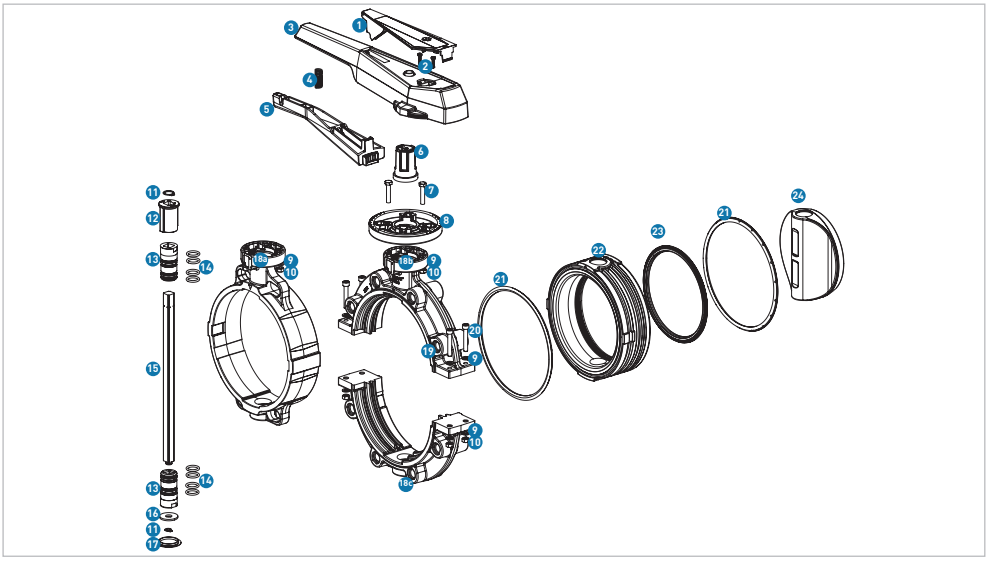
Flow media

- Very well suited for liquid media
- Suited for gaseous media
- Conditionally suited for media containing solids
- Conditionally suited for viscous media

Applications

- Chemical process industry
- Water treatment
- Microelectronics
- Measurement and control
- Shipbuilding
- Food & beverage

Technical data



1 Hand lever clip
2 Screw
3 Lever
4 Spring
5 Grid lever
6 Lever insert
7 Screw
8 Grid element
9 Washer
10 Nut
11 Circlip
12 End stop
13 Bearing bush
14 O-ring
15 Shaft
16 Washer
17 Cap
18 Outer housing
19 Threaded inserts
20 Screw
21 Flange seal
22 Inner housing
23 Profile seal
24 Disc

Specification

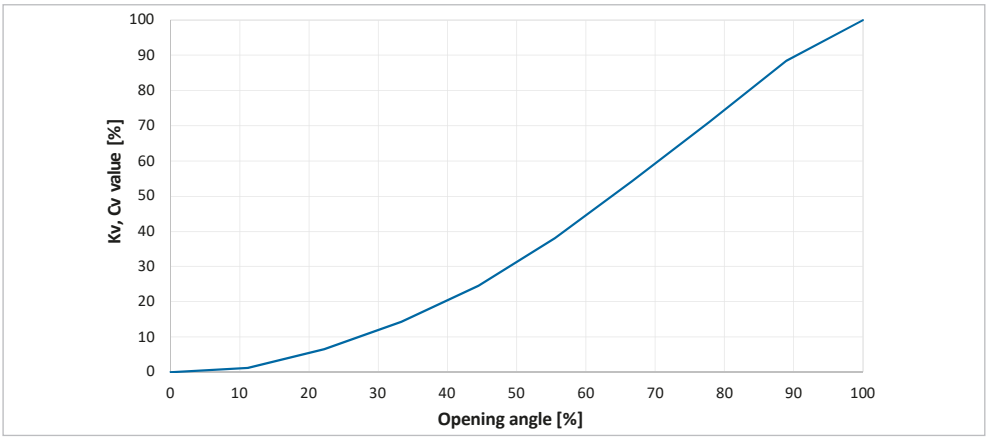
Body type		567 - Wafer-style housing					
		578 - Lug-style housing					
Dimensions	**Manual**	Type 567		d63/DN50 – d600/DN600, 2“ – 24“			
		Type 578		d63/DN50 – d315/DN300, 2" – 12"			
	Pneu-matic	Type 240		d63/DN50 – d600/DN600, 2" – 24"			
		Type 243/244		d63/DN50 – d315/DN300, 2" – 12"			
	Electric	Type 145		d63/DN50 – d600/DN600, 2" – 24"			
		Type 146/147		d63/DN50 – d315/DN300, 2“ – 12“			
Materials	**Hand lever clip, lever, grid lever, grid element, end stop, outer housing**		**1 3 5 8 12 18**	PP-GF30			
	Bearing bush, inner housing, disc		**13 22 24**	PVC-U, PVC-C, ABS, PP-H, PVDF			
	O-ring, flange seal, profile seal		**14 21 23**	EPDM, FKM, PTFE/FKM			
	Cap		**17**	PE			
	Lever insert		**6**	PPS			
	Screw, spring, washer, nut, shaft, circlip, threaded inserts		**2 4 7 9 10 11 15 16 19 20**	Stainless steel			
Pressure ratings	**Manual actuation**			**Electric actuated**		**Pneumatic actuated**	
	DN50-300	PN10		DN50-200	PN10	DN50-250	PN10
	DN350-400	PN6		DN250	PN6	DN300-450	PN5
	DN450	PN5		≥ DN300	PN4	≥ DN500	PN4
	≥ DN500	PN4					
Connections	Flanges			PVC-U, PVC-C, ABS, PP-H, PVDF, PE according to ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220			
	Flange adapters			PVC-U, PVC-C, ABS, PP-H SDR 11: PE100 SDR 11 or 17.6, PVDF			
	Backing flange			PVC-U, PP			
Actuation variants	Manually operated (hand lever or manual reduction gear)						
	Lockable hand lever						
	Pneumatically actuated FC, FO, DA						
	Electrically actuated AC: 100 – 230 V, AC/DC: 24 V						
Installation length	ISO 5752 / EN 558 DN50-200 Series 25, DN250-300 Series 16						
Actuator interface	EN ISO 5211						
Flange standards	EN 1092 PN 10, ASME B16.5 Class 150, BS 1560-3.2 Class 150, JIS B2220 10K						
Markings	CE, UKCA						
Product Standard	EN ISO 16136						
Test Standard	ISO 9393-2, EN 12266-1 (leackage rate A)						
Approvals	ACS, ABS, DIBt, BV, DNV; FDA, SIL, KR						

Flow characteristics

Kv 100 values

DN (mm)	d (mm)	Inch (inch)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
50	63	2	740	52	44
65	75	2 ½	1'500	105	90
80	90	3	2'400	168	144
100	110	4	3'800	266	228
125	140	5	8'600	602	516
150	160	6	11'400	798	684
200	225	8	19'900	1'393	1'194
250	280	10	34'000	2'380	2'040
300	315	12	50'000	3'500	3'000
350	355	14	90'000	6'300	5'400
400	400	16	115'000	8'050	6'900
450	450	18	155'000	10'850	9'300
500	500	20	204'000	14'280	12'240
600	630	24	265'000	18'550	15'900

Flow characteristics according to opening angle



Operating torque

DN50 – DN600 for opening/closing torque (standard valve, as delivered)

DN	d	Inch	Operating torque @ maximum operating pressure	
(mm)	(mm)	(")	(Nm)	(ft-lb)
50	63	2	12	8.8
65	75	2 ½	17	12.5
80	90	3	28	20.6
100	110	4	38	28.0
125	140	5	50	36.9
150	160	6	61	45.0
200	225	8	90	66.4
250	280	10	115	84.8
300	315	12	145	106.9
350	355	14	200	147.5
400	400	16	260	191.7
450	450	18	330	243.4
500	500	20	410	302.4
600	630	24	600	442.5

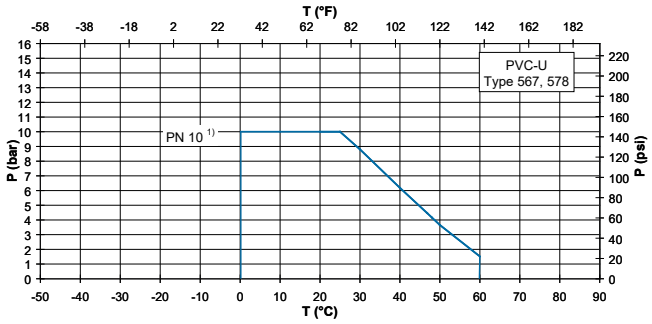
Depending on the operation conditions (e.g. control time, medium, temperature, etc.) the stated operating torque can increase up to 4 times.

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

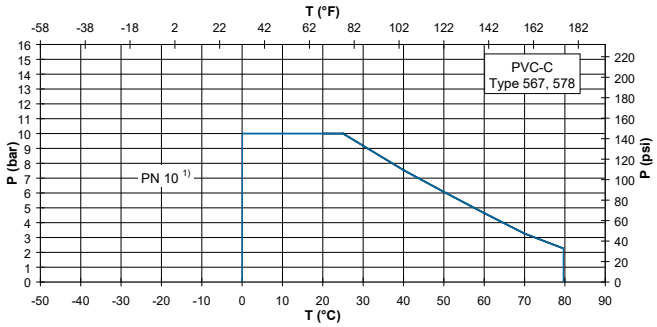
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U (DN50 – DN300)



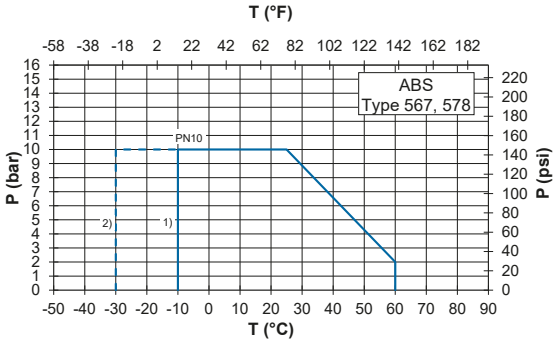
1) DN50 – DN300

PVC-C (DN50 – DN300)



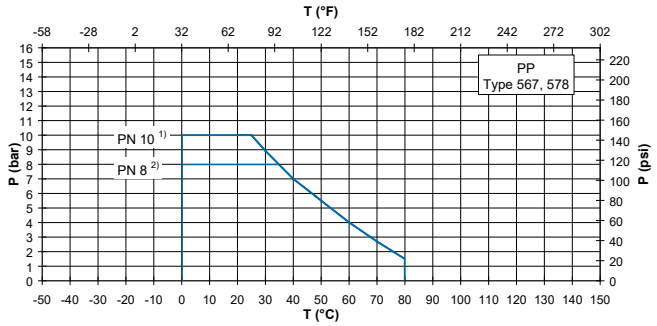
1) DN50 – DN300

ABS (DN50 – DN300)



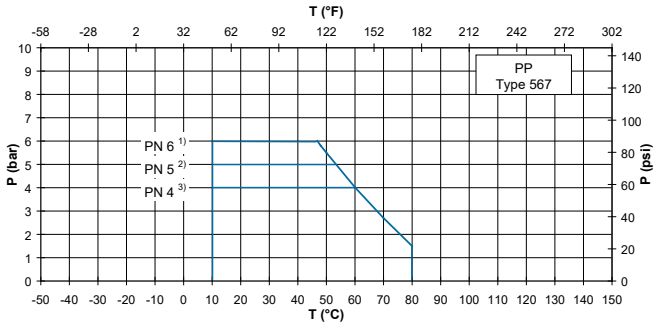
1) with standard type 567/578
2) - with PE flange adapter: only with COOL-FIT version of Type 567
- with ABS flange adapter: with standard type 567 in installation direction A-B, or with COOL-FIT version of type 567

PP (DN50 – DN300)



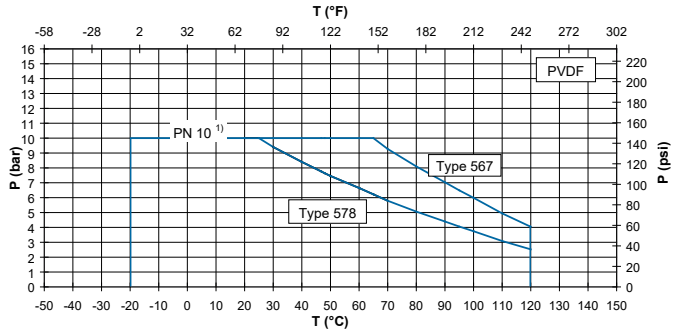
1) DN50 – DN200
2) DN250 – DN300

PP (DN350 – DN600)



1) DN350 – DN400
2) DN450
3) DN500 – DN600

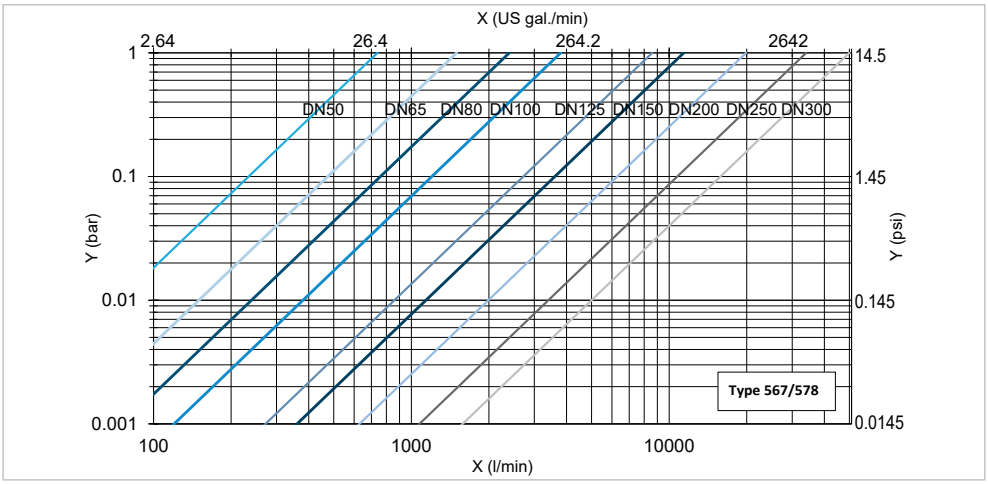
PVDF (DN50 – DN300)



1) DN50 – DN300

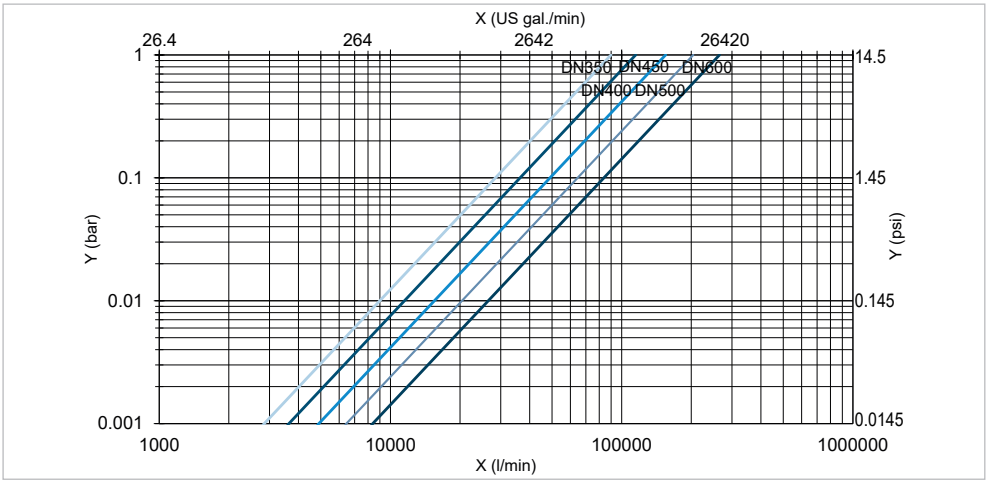
Pressure losses

DN50 – DN300



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

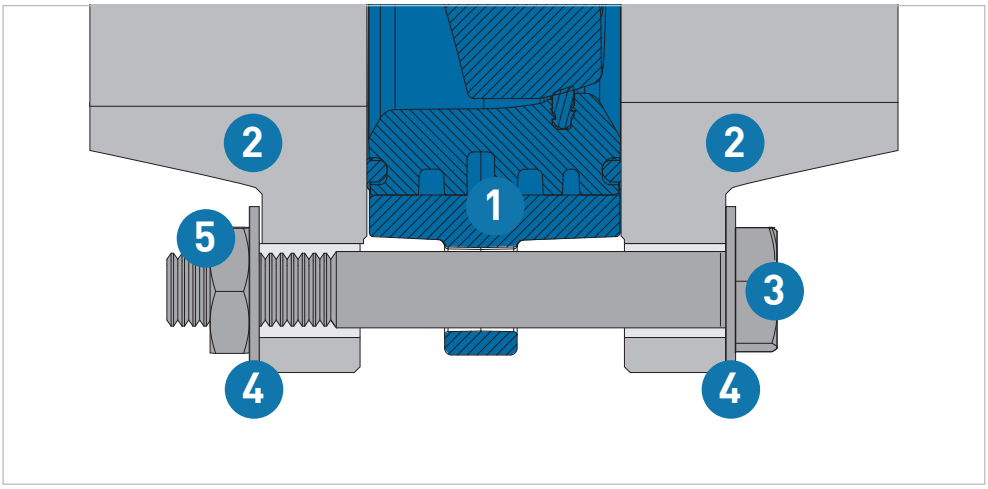
DN350 – DN600



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

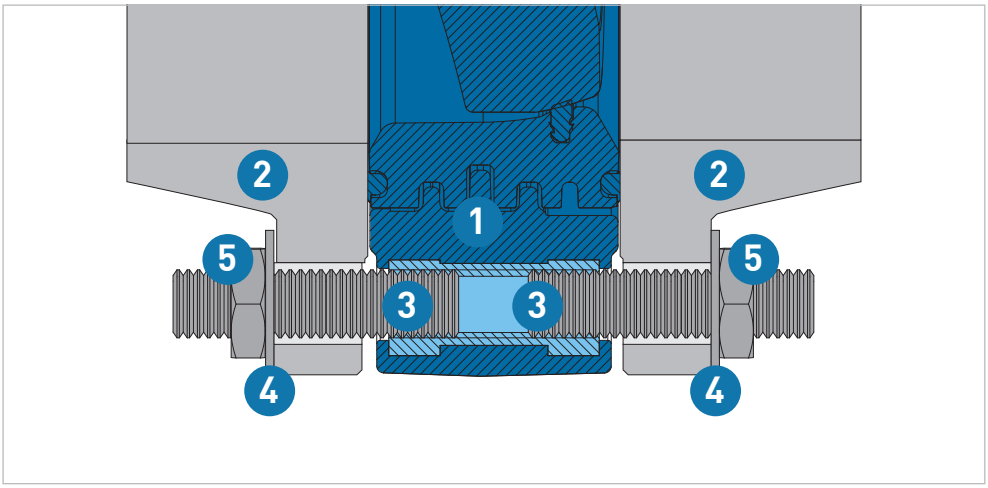
Flange connections

567 wafer-style flange connection with hexagon head screws



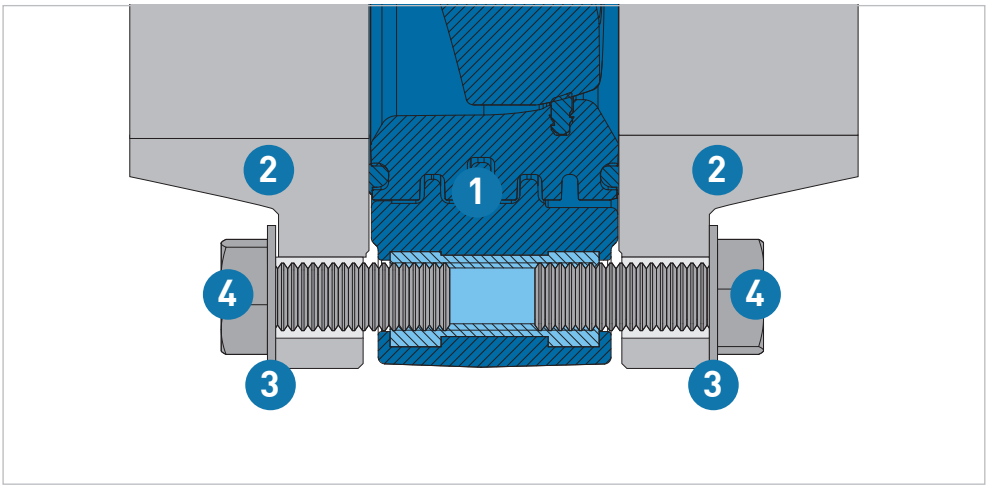
1 Wafer body
2 Flange
3 Screw
4 Washer
5 Nut

578 lug-style flange connection with studs



1 Lug body
2 Flange
3 Stud
4 Washer
5 Nut

578 lug-style flange connection with hexagon head screws



1 Lug body
2 Flange
3 Washer
4 Screw

Reference values for tightening torque of screws

Reference values for tightening torque of screws AK type 567 in flange connections

Dimension			Screws		Max. tightening torque	
DN (mm)	d (mm)	Inch (inch)	Metric (mm)	UNC (Inch)	(Nm)	(ft-lb)
50	63	2	4x M16 x 140mm	4 x UNC ⅝" x 5 ½"	25	18
65	75	2 ½	4x M16 x 140mm	4 x UNC ⅝" x 5 ½"	25	18
80	90	3	8x M16 x 150mm	4 x UNC ⅝" x 6"	25	18
100	110	4	8x M16 x 180mm	8 x UNC ⅝" x 7"	30	22
125	140	5	8x M16 x 200mm	8 x UNC ¾" x 7 ¾"	35	26
150	160	6	8x M20 x 220mm	8 x UNC ¾" x 8 ½"	40	30
200	225	8	8x M20 x 220mm	8 x UNC ¾" x 9 ½"	50	37
250	280	10	8x M20 x 300mm	12 x UNC ⅞" x 12"	80	59
300	315	12	12x M20 x 300mm	12 x UNC ⅞" x 12"	80	59
350	355	14	depending on counterpart		80	59
400	400	16	depending on counterpart		100	74
450	450	18	depending on counterpart		100	74
500	500	20	depending on counterpart		100	74
600	630	24	depending on counterpart		100	74

Reference values for tightening torque of screws AK type 578 in ISO flange connections

ISO			SFA - BFA with the various flanges (mm)							Max. tigh-tening torque (Nm)	Max. tightening torque (ft-lb)
DN (mm)	d (mm)	Quantity of screws/ size	PP/PE		PVC-U/PVC-C/ABS			PVDF			
			PP-V	PP/ steel	PVC-U	PP-V	PP/ steel	PP-V	PP/ steel		
50	63	8x M16	60	55	50	55	50	55	50	20	15
65	75	8x M16	65	55	50	60	50	60	50	20	15
80	90	16x M16	70	60	55	65	55	65	55	20	15
100	110	16x M16	70	65	60	70	60	70	60	25	18
125	140	16x M16	80	80	70	75	70	80	70	30	22
150	160	16x M20	90	80	70	80	70	80	70	35	26
200	225	16x M20	100	90	90	90	90	90	80	45	33
250	280	24x M20	130	120	110	120	110	110	110	50	37
300	315	24x M20	130	120	120	120	120	120	110	50	37

Reference values for tightening torque of screws AK type 578 in ANSI flange connections

ANSI			SFA - BFA with the various flanges (mm)							Max. tigh-tening torque (Nm)	Max. tigh-tening torque (ft-lb)
Inch	d (mm)	Quantity of screws/ size	PP/PE		PVC-U/PVC-C/ABS			PVDF			
			PP-V	PP/ steel	PVC-U	PP-V	PP/ steel	PP-V	PP/ steel		
2	63	8x UNC ⅝	2 ¼	2	2	2	2	2	2	20	15
2 ½	75	8x UNC ⅝	2 ½	2	2	2 ¼	2	2 ¼	2	20	15
3	90	8x UNC ⅝	2 ¾	2 ¼	2	2 ½	2	2 ½	2	20	15
4	110	16x UNC ⅝	2 ¾	2 ½	2 ¼	2 ¾	2 ¼	2 ¾	2 ¼	25	18
5	140	16x UNC ¾	3 ¼	3 ¼	2 ¾	3	2 ¾	3 ¼	2 ¾	30	22
6	160	16x UNC ¾	3 ½	3 ¼	3 ¼	3 ¼	2 ¾	3 ¼	2 ¾	35	26
8	225	16x UNC ¾	4	3 ½	3 ½	3 ½	3 ½	3 ½	3 ¼	45	33
10	280	24x UNC ⅞	5	4 ¾	4 ¼	4 ¾	4 ¼	4 ¼	4 ¼	50	37
12	315	24x UNC ⅞	5	4 ¾	4 ¾	4 ¾	4 ¾	4 ¾	4 ¼	50	37

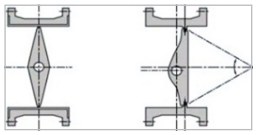
Technical basics

Function

Butterfly valves of types 567 and 578 have a double-eccentric mode of action and are of modular construction.

Double eccentric operating principle

The disc does not touch the seal in the open position. The disc can be quickly unscrewed from the gasket, ensuring low wear and tear. Pressure surges in the direction of flow can be absorbed more readily.



Use as a process and control valve

The butterfly valves can be equipped with corresponding pneumatic or electric actuators and can be used with other extensive accessories as process and regulating valves.

The integrated electrical position indicator IER enables direct feedback of the axis position in the valve head flange by means of limit switches and thereby an exact determination of the position of the valve disc.

The type RPC (Rotary Process Controller) are digital, electro-pneumatic positioners for integrated mounting on pneumatically operated industrial valves with single and double-acting rotary actuators e.g. PA and PPA.

Valve handling

Installation notes

Differentiation between and use of the types concerned

- Use butterfly Valve type 567 only as a wafer-style valve.
- Use butterfly Valve type 578 as either a wafer-style or a lug-style valve.

As a connecting piece, GF Piping Systems recommends valve ends or flange adapters with smooth jointing faces, together with flanges made of PVC-U, PP-V, PP/steel or UP-GF. In the case of SFA Socket flange adaptor or BFA Butt fusion flange adaptor with a ribbed jointing face, a flat gasket can also be used in individual cases.

Requirements for installation

Ensure that the following conditions are satisfied prior to installation:

- Make sure that the butterfly valves to be installed correspond specifically to the pressure rating, type of connection, dimension and materials of the particular application.
- Perform a function test. To do this, close and re-open the butterfly valve.
- Only install butterfly valves that function without problems.

Maintenance notes

In normal operation, butterfly valves do not require maintenance. It is still recommended to perform maintenance on butterfly valves after 5,000 actuation cycles at most. The following steps must be taken when doing so:

- Regularly check that no medium escapes to the outside. If medium exits from the flange connections, tighten them.
- We recommend operating the butterfly valves that are kept permanently in the same position 1-2x per year to check their functionality.
- Depending on the operating conditions, the collars should be lubricated periodically with (silicon-based) grease.
- It is recommended that you check and, if necessary, replace the O-rings when removing the bearing bushings.

Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Tips for installation

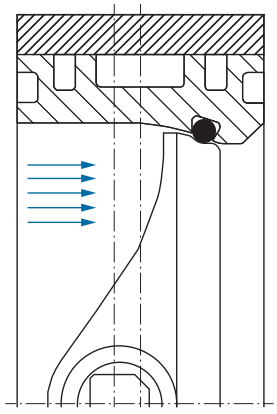
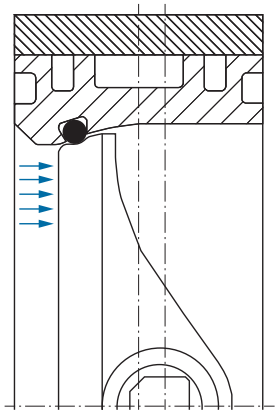
Chamfering of socket flange adaptor/butt fusion flange adaptor

When using the specified socket flange adapters/butt fusion flange adapters from GF Piping Systems, chamfering is not necessary, because the disc does not touch the socket flange adapters/butt fusion flange adapters or the utt fusion flange adapters are already chamfered. If you want to install socket flange adapters/butt fusion flange adapters of a different brand, then please make sure that the inside diameter (int) of the socket flange adaptor/butt fusion flange adaptor is greater than the output measure (Q1) of the disc. If necessary, chamfer the socket flange adaptor/butt fusion flange adaptor.

Installation as a lugged valve

If a valve is installed as a lugged valve and pressure is applied to it, it must be closed with a blind flange (or blind cover and counterflange), in order to prevent personal injury or property damage in the event of leaks and/or impermissible opening.

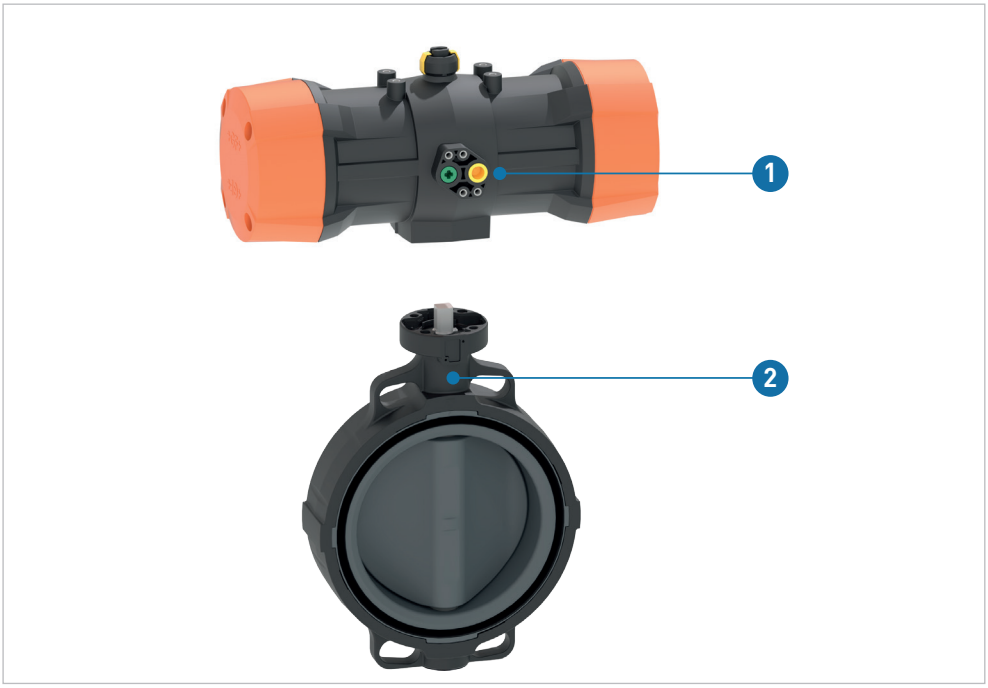
Recommendation of installation direction

A-B	B-A
	
The installation direction A-B is recommended, if increased safety in the event of pressure surges is required.	If lower torques are important when opening and closing the butterfly valve, installation direction B-A is recommended.

Type 567/578 actuator assignment

Dimension				Pneumatic actuator				Electric actuator	
				Plastic Actuator		Metal Actuator			
DN (mm)	d (mm)	Inch (inch)	Interface	FC/FO	DA	FC/FO	DA	Type	Voltage
50	63	2	F07	PPA40	PPA40	PA30	PA35	EA45 / dEA45	100–230 V~or 24 V
65	75	2 ½	F07	PPA40	PPA40	PA30	PA35	EA45 / dEA45	100–230 V~or 24 V
80	90	3	F07	PPA80	PPA40	PA35	PA40	EA120/dEA120	100–230 V~or 24 V
100	110	4	F07	PPA80	PPA80	PA40	PA45	EA120/dEA120	100–230 V~or 24 V
125	140	5	F07	PPA80	PPA80	PA45	PA45	EA120/dEA120	100–230 V~or 24 V
150	160	6	F07			PA50	PA55	EA120/dEA120	100–230 V~or 24 V
200	225	8	F07			PA55	PA55	EA250/dEA250	100–230 V~or 24 V
250	280	10	F10			PA65	PA65	EA250/dEA250	100–230 V~or 24 V
300	315	12	F10			PA70	PA65	EA250/dEA250	100–230 V~or 24 V
350	355	14	F12			Airpower APS 190	Airpower APD 140	AUMA SQ10.2	240 V and 400 V three-phase
400	400	16	F12			Airpower APS 210	Airpower APD 160	AUMA SQ10.2	240 V and 400 V three-phase
450	450	18	F14			Airpower APS 240	Airpower APD 160	AUMA SQ12.2	240 V and 400 V three-phase
500	500	20	F14			Airpower APS 240	Airpower APD 190	AUMA SQ12.2	240 V and 400 V three-phase
600	600	24	F14			Airpower APS 270	Airpower APD 190	AUMA SQ14.2	240 V and 400 V three-phase

Design with pneumatic actuator



1 Pneumatic actuator
2 Butterfly valve Type 567/578

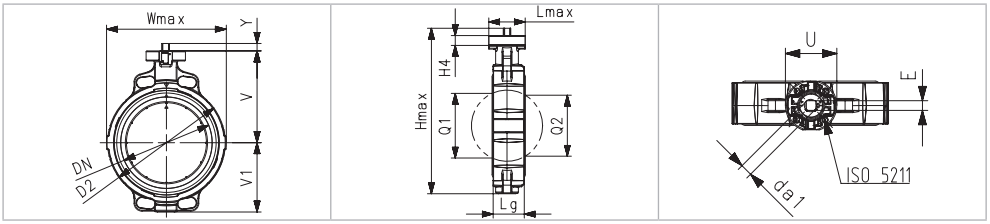
Design with electric actuator



1 Electric actuator
2 Manual override (optional)
3 Butterfly valve Type 567/578

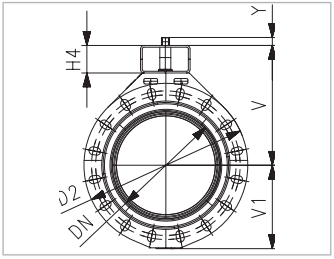
Dimensions type 567 wafer-style

Butterfly Valve type 567 wafer-style, DN50 – DN300, with open shaft end



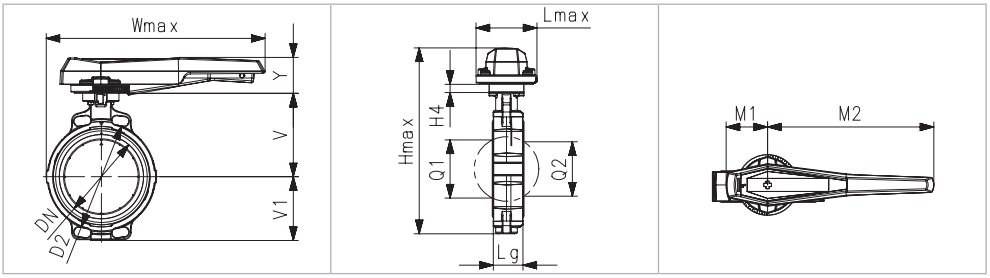
Dimensions			Measurements													
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	U (mm)	V1 (mm)	V (mm)	Y (mm)	H4 (mm)	E (mm)	da1 (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)
50	63	2	238.3	84.8	118.4	104	90	78.8	133.3	26.2	23	11	13.5	45	40	
65	75	2 ½	251.2	84.8	132.5	115	90	85.1	139.9	26.2	23	11	13.5	46	54	35
80	90	3	263.0	84.8	136.8	131	90	91.2	145.6	15.4	23	11	13.5	49	67	50
100	110	4	284.5	84.8	161.0	161	90	105.7	166.4	15.4	23	14	17.3	56	88	74
125	140	5	314.2	84.8	187.0	187	90	118.8	180.0	15.4	23	14	17.3	64	113	97
150	160	6	338.3	84.8	215.0	215	90	130.9	189.0	18.4	23	17	21.1	72	139	123
200	225	8	387.2	84.8	267.0	267	90	158.3	210.5	18.4	23	17	21.1	73	178	169
250	280	10	508.9	125.0	329.0	329	125	206.1	262.6	40.2	23	22	27.0	113	210	207
300	315	12	553.3	125.0	380.4	379	125	228.8	284.3	40.2	23	22	27.0	113	256	253

Butterfly Valve type 567 wafer-style, DN350 – DN600, with open shaft end



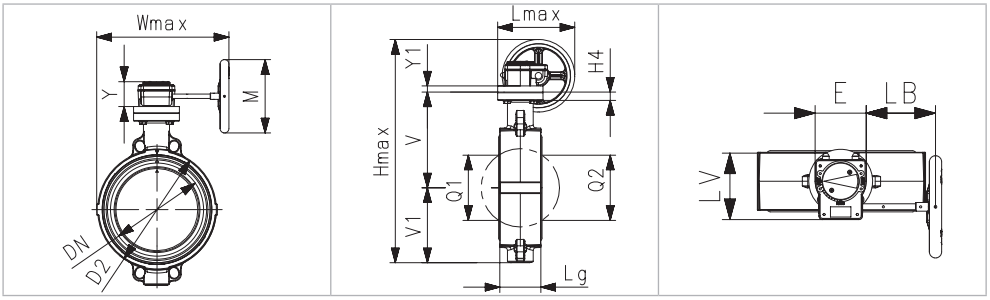
Dimensions			Measurements														
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	k (mm)	D2 (mm)	U (mm)	V (mm)	V1 (mm)	Y (mm)	H4 (mm)	E (mm)	da1 (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)
350	355	14"	709	180	535	460	535	180	410	268	31	100	22	28.5	129	325	305
400	400	16"	766	180	595	515	595	180	435	300	31	100	27	36.0	169	353	350
450	450	18"	875	220	635	565	635	220	520	320	35	130	27	36.0	179	393	390
500	500	20"	935	220	700	620	700	220	550	350	35	130	27	36.0	190	444	440
600	630	24"	1065	220	813	725	813	220	610	420	35	130	36	45.0	209	530	527

Butterfly Valve type 567 wafer-style, DN50 – DN300, with hand lever



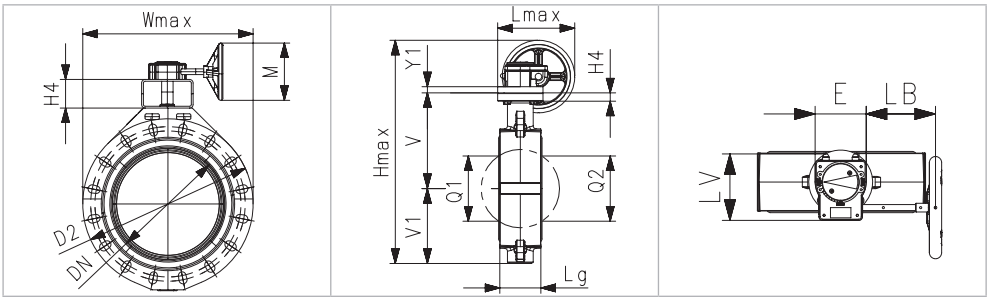
Dimensions			Measurements													
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	U (mm)	H4 (mm)	V1 (mm)	V (mm)	Y (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)	M1 (mm)	M2 (mm)
50	63	2	278.9	115.2	269.0	104	90	23	78.8	134	54	45	40		64.7	205.5
65	75	2 ½	291.8	115.2	271.8	115	90	23	85.1	140	54	46	54	35	64.7	205.5
80	90	3	303.6	115.2	273.9	131	90	23	91.2	146	54	49	67	50	64.7	205.5
100	110	4	342.2	115.2	336.0	161	90	23	105.7	167	55	56	88	74	64.9	255.5
125	140	5	368.9	115.2	349.0	187	90	23	118.8	181	55	64	113	97	64.9	255.5
150	160	6	390.0	115.2	363.0	215	90	23	130.9	189	55	72	139	123	64.9	255.5
200	225	8	455.1	115.2	543.0	267	90	23	158.3	210	67	73	178	169	103.6	409.5
250	280	10	555.0	149.4	574.0	329	125	23	206.1	264	85	113	210	207	103.6	409.5
300	315	12	599.4	149.4	599.7	379	125	23	228.8	285	85	113	256	253	103.6	409.5

Butterfly Valve type 567 wafer-style, DN50 – DN300, with manual reduction gear



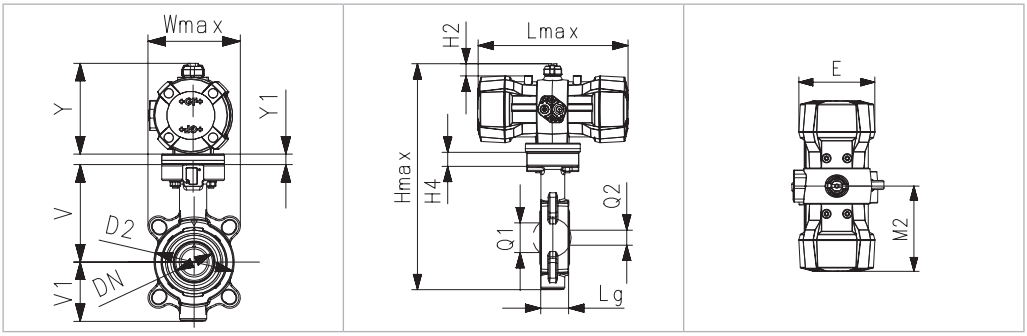
Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	H4 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)	E (mm)	M (mm)	LV (mm)	LB (mm)
50	63	2	319.4	169.1	240.2	104	23	78.8	133.3	61.2		45	40		80	160	112.3	129.5
65	75	2 ½	332.3	169.1	247.3	115	23	85.1	139.9	61.2		46	54	35	80	160	112.3	129.5
80	90	3	344.1	169.1	249.4	131	23	91.2	145.6	61.2		49	67	50	80	160	112.3	129.5
100	110	4	379.4	169.1	261.5	161	23	105.7	166.4	61.2		56	88	74	80	160	112.3	129.5
125	140	5	406.1	169.1	274.5	187	23	118.8	180.0	61.2		64	113	97	80	160	112.3	129.5
150	160	6	427.2	169.1	288.5	215	23	130.9	189.0	61.2		72	139	123	80	160	112.3	129.5
200	225	8	476.1	169.1	267.0	267	23	158.3	210.5	61.2		73	178	169	80	160	112.3	129.5
250	280	10	613.0	212.6	329.0	329	23	206.1	262.6	68.4	17	113	210	207	100	200	130.0	134.0
300	315	12	657.4	212.6	380.4	379	23	228.8	284.3	68.4	17	113	256	253	100	200	130.0	134.0

Butterfly Valve type 567 wafer-style, DN350 – DN600, with manual reduction gear



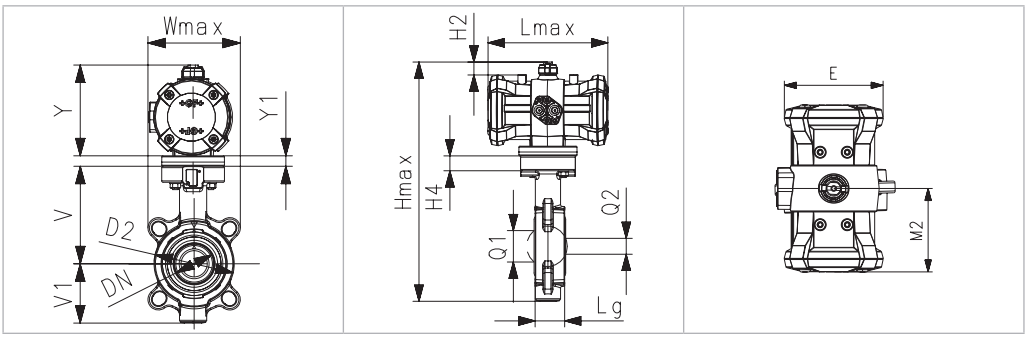
Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	k (mm)	D2 (mm)	H4 (mm)	V1 (mm)	V (mm)	Y (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)	E (mm)	M (mm)	LV (mm)	LB (mm)
350	355	14"	709	180	535	460	535	100	268	410	31	129	325	305	130	200	146	122
400	400	16"	766	180	595	515	595	100	300	435	31	169	353	350	130	200	174	122
450	450	18"	875	220	635	565	635	130	320	520	35	179	393	390	130	250	185	203
500	500	20"	935	220	700	620	700	130	350	550	35	190	444	440	174	300	201	151
600	630	24"	1065	220	813	725	813	130	420	610	35	209	530	527	74	300	210	151

Butterfly valve type 240 wafer-style, DN50 – DN125, with plastic pneumatic actuator FC/FO



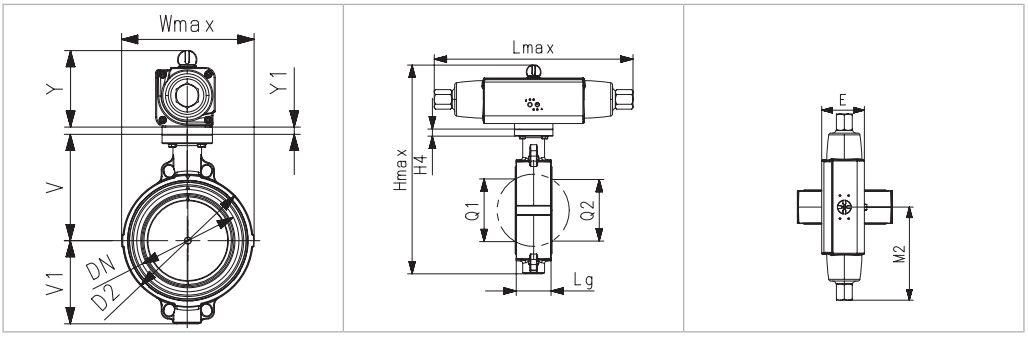
Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)	Y1 (mm)	M2 (mm)	E (mm)
50	63	2	PPA40	338.1	245.5	121.2	133.3	20	23	78.8	45	104	40		111	15	122.75	119.5
65	75	2 ½	PPA40	351.0	245.5	132.5	139.9	20	23	85.1	46	115	54	35	111	15	122.75	119.5
80	90	3	PPA80	382.8	343.0	136.8	145.6	20	23	91.2	49	131	67	50	111	15	171.50	141.5
100	110	4	PPA80	403.1	343.0	161.0	166.4	20	23	105.7	56	161	88	74	131		171.50	141.5
125	140	5	PPA80	429.8	343.0	187.0	180.0	20	23	118.8	64	187	113	97	131		171.50	141.5

Butterfly Valve type 240 wafer-style, DN50 – DN125, with pneumatic actuator DA



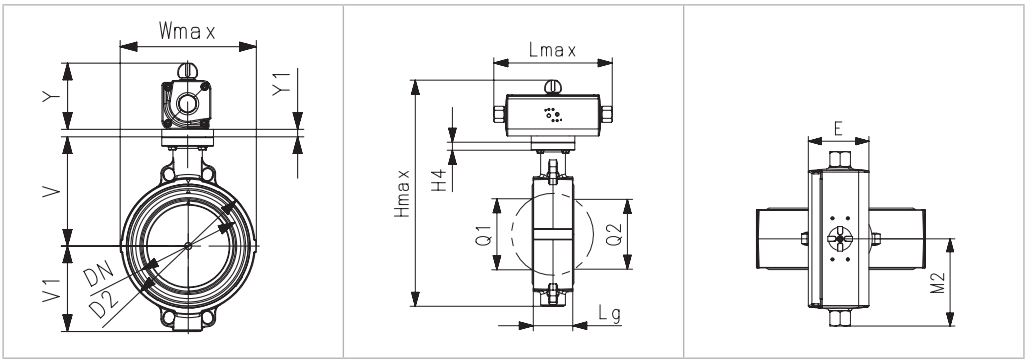
Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)	Y1 (mm)	M2 (mm)	E (mm)
50	63	2	PPA40	338.1	183.5	121.2	133.3	20	23	78.8	45	104	40		111	15	91.8	119.5
65	75	2 ½	PPA40	351.0	183.5	132.5	139.9	20	23	85.1	46	115	54	35	111	15	91.8	119.5
80	90	3	PPA40	362.8	183.5	136.8	145.6	20	23	91.2	49	131	67	50	111	15	91.8	119.5
100	110	4	PPA80	403.1	261.0	161.0	166.4	20	23	105.7	56	161	88	74	131		130.5	141.5
125	140	5	PPA80	429.8	261.0	187.0	180.0	20	23	118.8	64	187	113	97	131		130.5	141.5

Butterfly Valve type 240 wafer-style, DN50 – DN600, with pneumatic actuator FC/FO



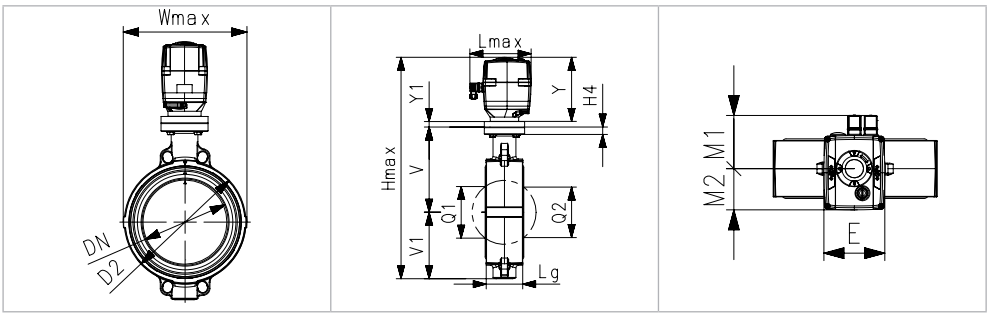
Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V (mm)	V1 (mm)	Y (mm)	Y1 (mm)	H4 (mm)	E (mm)	Q1 (mm)	Q2 (mm)	M2 (mm)	Lg (mm)	
50	63	2	PA30	325.3	274.4	118.4	104	133.3	78.8	98.2	15.0	23	70.4	40		137.2	45	
65	75	2 ½	PA30	338.2	274.4	132.5	115	139.9	85.1	98.2	15.0	23	70.4	54	35	137.2	46	
80	90	3	PA35	362.9	325.2	136.8	131	145.6	91.2	111.1	15.0	23	83.3	67	50	162.6	49	
100	110	4	PA40	386.9	359.6	161.0	161	166.4	105.7	114.8		23	87.0	88	74	179.8	56	
125	140	5	PA45	448.3	418.0	187.0	187	180.0	118.8	149.5		23	107.5	113	97	209.0	64	
150	160	6	PA50	473.0	434.0	215.0	215	189.0	130.9	153.1		23	111.1	139	123	217.0	72	
200	225	8	PA55	528.8	498.4	267.0	267	210.5	158.3	160.0		23	118.0	178	169	249.2	73	
250	280	10	PA60 FC	676.9	646.0	329.0	329	262.6	206.1	190.0	18.2	23	148.0	210	207	323.0	113	
250	280	10	PA70 FO	676.9	646.0	329.0	329	262.6	206.1	190.0	18.2	23	148.0	210	207	323.0	113	
300	315	12	PA65 FC	741.4	681.0	379.0	379	284.3	228.8	210.1	18.2	23	168.0	256	253	340.5	113	
300	315	12	PA70 FO	741.4	681.0	379.0	379	284.3	228.8	210.1	18.2	23	168.0	256	253	340.5	113	
350	355	14	APS190	887.0	390.0	535.0	535	410.0	268.0	185		100	153.0	325	305	195.0	129	
400	400	16	APS210	972.0	458.0	595.0	595	435.0	300.0	206		100	176.0	353	350	326.0	169	
450	450	18	APS240	1077.0	458.0	635.0	635	520.0	320.0	206		130	176.0	393	390	263.0	179	
500	500	20	APS240	1173.0	525.0	700.0	700	550.0	350.0	230		130	206.0	444	440	263.0	190	
600	630	24	APS270	1303.0	525.0	813.0	813	610.0	420.0	300		130	206.0	530	527	263.0	209	

Butterfly Valve type 240 wafer-style, DN50 – DN600, with pneumatic actuator DA



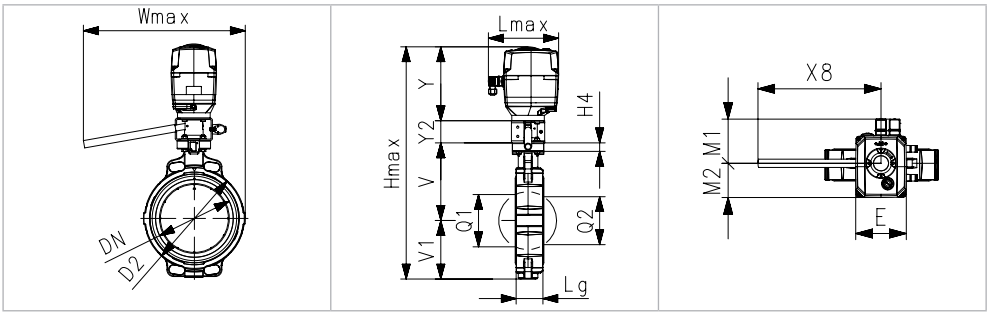
Dimensions			Measurements														
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V (mm)	V1 (mm)	Y (mm)	Y1 (mm)	H4 (mm)	E (mm)	Q1 (mm)	Q2 (mm)	M2 (mm)	Lg (mm)
50	63	2	PA30	319.4	196.2	118.4	104	133.3	78.8	92.3	15.0	23	64.5	40		98.1	45
65	75	2 ½	PA30	332.3	196.2	132.5	115	139.9	85.1	92.3	15.0	23	64.5	54	35	98.1	46
80	90	3	PA35	350.0	205.6	136.8	131	145.6	91.2	98.2	15.0	23	70.4	67	50	102.8	49
100	110	4	PA40	383.3	242.0	161.0	161	166.4	105.7	111.2		23	83.3	88	74	121.0	56
125	140	5	PA45	410.0	242.0	187.0	187	180.0	118.8	111.2		23	83.3	113	97	121.0	64
150	160	6	PA50	469.4	290.0	215.0	215	189.0	130.9	149.5		23	107.5	139	123	145.0	72
200	225	8	PA55	518.3	290.0	267.0	267	210.5	158.3	149.5		23	107.5	178	169	145.0	73
250	280	10	PA65	646.9	339.6	329.0	329	262.6	206.1	160.0	18.2	23	107.5	210	207	169.8	113
300	315	12	PA65	691.4	339.6	380.4	379	284.3	228.8	160.0	18.2	23	118.0	256	253	169.8	113
350	355	14	APS190	887.0	390.0	535.0	535	410.0	268.0	209.0		100	153.0	325	305	195.0	129
400	400	16	APS210	972.0	458.0	595.0	595	435.0	300.0	234.0		100	176.0	353	350	326.0	169
450	450	18	APS240	1077.0	458.0	635.0	635	520.0	320.0	234.0		130	176.0	393	390	326.0	179
500	500	20	APS240	1173.0	525.0	700.0	700	550.0	350.0	270.0		130	206.0	444	440	263.0	190
600	630	24	APS270	1303.0	525.0	813.0	813	610.0	420.0	270.0		130	206.0	530	527	263.0	209

Butterfly Valve type 145 wafer-style, DN50 – DN300, with electric actuator, without manual override



Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	E (mm)	Q1 (mm)	Q2 (mm)	H4 (mm)	M1 (mm)	M2 (mm)	Lg (mm)
50	63	2	EA45	393.3	190	118.4	104	78.8	133.3	166.2	15	122.3	40		23	107.3	82.7	45
65	75	2 ½	EA45	406.2	190	132.5	115	85.1	139.9	166.2	15	122.3	54	35	23	107.3	82.7	46
80	90	3	EA120	426.1	190	136.8	131	91.2	145.6	189.3		122.3	67	50	23	107.3	82.7	49
100	110	4	EA120	461.4	190	161.0	161	105.7	166.4	189.3		122.3	88	74	23	107.3	82.7	56
125	140	5	EA120	488.1	190	187.0	187	118.8	180.0	189.3		122.3	113	97	23	107.3	82.7	64
150	160	6	EA120	509.2	190	215.0	215	130.9	189.0	189.3		122.3	139	123	23	107.3	82.7	72
200	225	8	EA250	568.1	190	267.0	267	158.3	210.5	199.3		122.3	178	169	23	107.3	82.7	73
250	280	10	EA250	685.0	190	329.0	329	206.1	262.6	199.3	17	122.3	210	207	23	107.3	82.7	113
300	315	12	EA250	729.4	190	380.4	379	228.8	262.6	199.3	17	122.3	256	253	23	107.3	82.7	113
350	355	14	EA250	1036.0	190	535	535	268	410	199.3	17	122.3	325	305	23	107.3	82.7	129
400	400	16	EA250	1096.0	190	595	595	300	435	199.3	17	122.3	353	350	23	107.3	82.7	169
450	450	18	EA250	1225.0	190	635	635	320	520	199.3	17	122.3	393	390	23	107.3	82.7	179
500	500	20	EA250	1285.0	190	700	700	350	550	199.3	17	122.3	444	440	23	107.3	82.7	190
600	630	24	EA250	1450.0	190	813	813	420	610	199.3	17	122.3	530	527	23	107.3	82.7	209

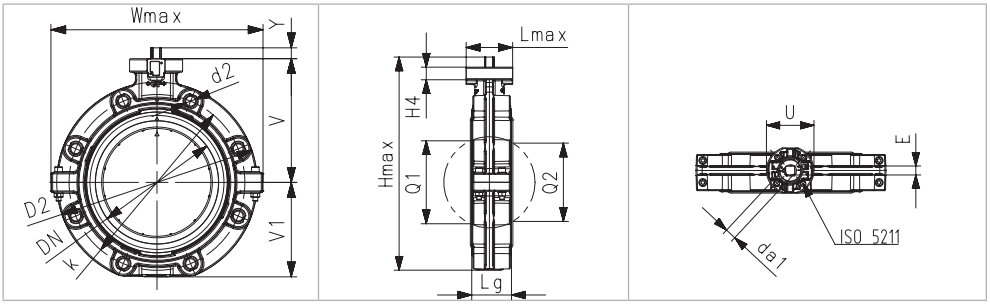
Butterfly Valve type 145 wafer-style, DN50 – DN200, with electric actuator, with manual override



Dimensions			Measurements															
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Y2 (mm)	E (mm)	Q1 (mm)	Q2 (mm)	H4 (mm)	X8 (mm)	M1 (mm)	M2 (mm)	Lg (mm)
50	63	2	EA120	461.4	190	356.7	104	78.8	133.3	189.3	60	122.3	40		23	297.5	107.3	82.7	45
65	75	2 ½	EA120	474.3	190	363.8	115	85.1	139.9	189.3	60	122.3	54	35	23	297.5	107.3	82.7	46
80	90	3	EA120	486.1	190	365.9	131	91.2	145.6	189.3	60	122.3	67	50	23	297.5	107.3	82.7	49
100	110	4	EA120	521.4	190	378.0	161	105.7	166.4	189.3	60	122.3	88	74	23	297.5	107.3	82.7	56
125	140	5	EA120	548.1	190	391.0	187	118.8	180.0	189.3	60	122.3	113	97	23	297.5	107.3	82.7	64
150	160	6	EA120	569.2	190	405.0	215	130.9	189.0	189.3	60	122.3	139	123	23	297.5	107.3	82.7	72
200	225	8	EA250	628.1	190	431.0	267	158.3	210.5	189.3	60	122.3	178	169	23	297.5	107.3	82.7	73

Measurements type 578 Lug-Style

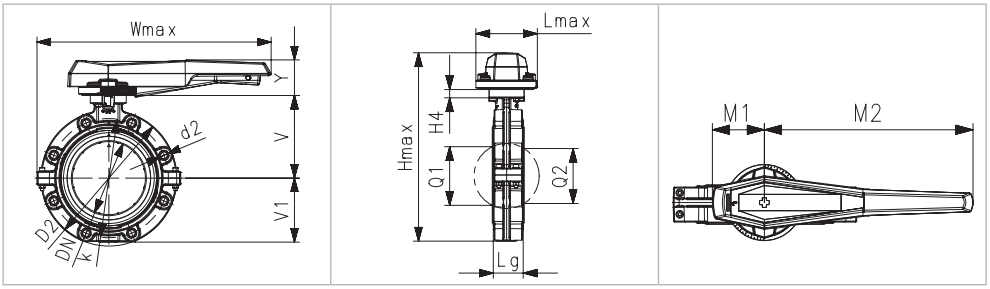
Butterfly Valve type 578 lug-style, DN50 – DN300, with open shaft end



Dimensions			Measurements												
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Lg (mm)	H4 (mm)	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)
50	63	2	238.3	84.8	159.5	160	78.8	133.3	26.2	44.7	23	40		125	120.6
65	75	2½	251.2	84.8	166.1	180	85.1	139.9	26.2	45.7	23	54	35	145	139.7
80	90	3	263.0	84.8	187.8	195	91.2	145.6	15.4	48.7	23	67	50	160	152.4
100	110	4	288.9	84.8	181.4	226	107.5	166.0	15.4	55.6	23	88	74	180	190.5
125	140	5	318.1	84.8	195.4	258	122.7	180.0	15.4	63.5	23	113	97	210	215.9
150	160	6	341.9	84.8	207.4	284	134.5	189.0	18.4	71.5	23	139	123	240	241.3
200	225	8	390.4	84.8	228.9	341	161.5	210.5	18.4	72.5	23	178	169	295	298.4
250	280	10	511.5	125.0	304.6	412	206.9	264.4	40.2	113.2	23	210	207	350	362.0
300	315	12	560.9	125.0	325.4	482	235.5	285.2	40.2	114.6	23	256	253	400	431.8

Dimensions			Measurements				
DN (mm)	d (mm)	d (")	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")	E (mm)	da1 (mm)	U (mm)
50	63	2	M16	UNC ⅝	11	13.5	90
65	75	2½	M16	UNC ⅝	11	13.5	90
80	90	3	M16	UNC ⅝	11	13.5	90
100	110	4	M16	UNC ⅝	14	17.3	90
125	140	5	M16	UNC ¾	14	17.3	90
150	160	6	M20	UNC ¾	17	21.1	90
200	225	8	M20	UNC ¾	17	21.1	90
250	280	10	M20	UNC ⅞	22	27.0	125
300	315	12	M20	UNC ⅞	22	27.0	125

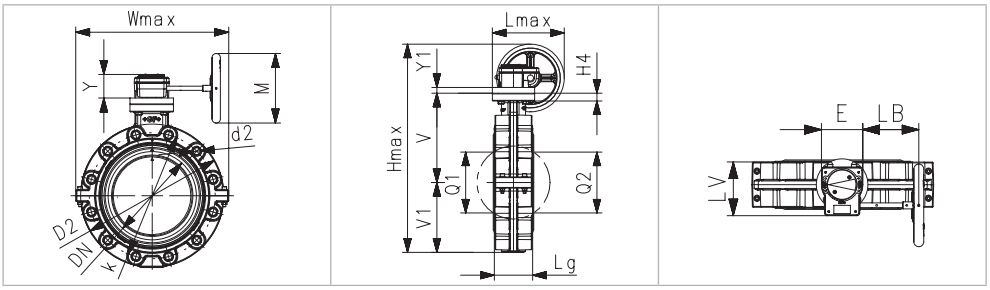
Butterfly Valve type 578 lug-style, DN50 – DN300, with hand lever



Dimensions			Measurements												
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Lg (mm)	H4 (mm)	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)
50	63	2	278.9	115.2	287.8	160	78.8	133.3	66.8	44.7	23	40		125	120.6
65	75	2½	291.8	115.2	296.3	180	85.1	139.9	66.8	45.7	23	54	35	145	139.7
80	90	3	303.6	115.2	310.3	195	91.2	145.6	66.8	48.7	23	67	50	160	152.4
100	110	4	343.6	115.2	375.2	226	107.5	166.0	70.1	55.6	23	88	74	180	190.5
125	140	5	372.8	115.2	391.2	258	122.7	180.0	70.1	63.5	23	113	97	210	215.9
150	160	6	393.6	115.2	395.2	284	134.5	189.0	70.1	71.5	23	139	123	240	241.3
200	225	8	458.1	149.4	588.1	341	161.5	210.5	86.1	72.5	23	178	169	295	298.4
250	280	10	557.6	149.4	628.1	412	206.9	264.4	86.3	113.2	23	210	207	350	362.0
300	315	12	607.0	149.4	663.1	482	235.5	285.2	86.3	114.6	23	256	253	400	431.8

Dimensions			Measurements			
DN (mm)	d (mm)	d (")	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")	M1 (mm)	M2 (mm)
50	63	2	M16	UNC ⅝	63.7	205.3
65	75	2½	M16	UNC ⅝	63.7	205.3
80	90	3	M16	UNC ⅝	63.7	205.3
100	110	4	M16	UNC ⅝	63.7	205.3
125	140	5	M16	UNC ¾	63.7	205.3
150	160	6	M20	UNC ¾	63.7	205.3
200	225	8	M20	UNC ¾	101.7	408.1
250	280	10	M20	UNC ⅞	101.7	408.1
300	315	12	M20	UNC ⅞	101.7	408.1

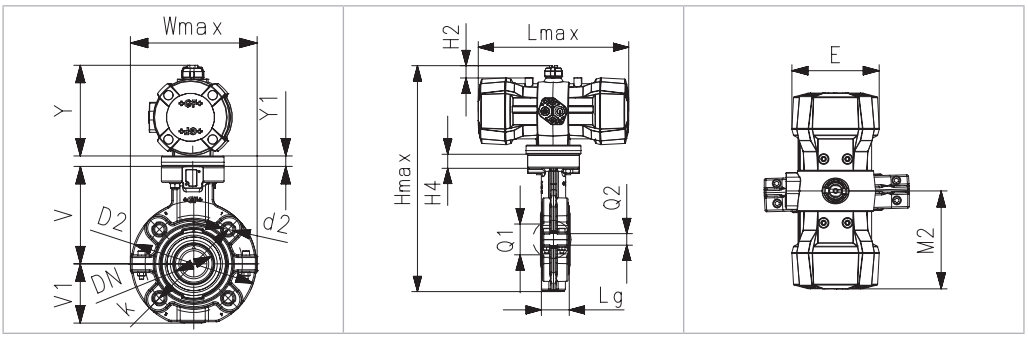
Butterfly Valve type 578 lug-style, DN50 – DN300, with manual reduction gear



Dimensions			Measurements											
DN (mm)	d (mm)	d (")	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	H4 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	Lg (mm)	Q1 (mm)	Q2 (mm)
50	63	2	319.4	263.5	263.5	160	23	78.8	133.3	61.2		44.7	40	
65	75	2 ½	332.3	272.0	272.0	180	23	85.1	139.9	61.2		45.7	54	35
80	90	3	344.1	286.0	286.0	195	23	91.2	145.6	61.2		48.7	67	50
100	110	4	380.8	301.0	301.0	226	23	107.5	166.0	61.2		55.6	88	74
125	140	5	410.0	317.0	317.0	258	23	122.7	180.0	61.2		63.5	113	97
150	160	6	430.8	321.0	321.0	284	23	134.5	189.0	61.2		71.5	139	123
200	225	8	479.3	360.0	360.0	341	23	161.5	210.5	61.2		72.5	178	169
250	280	10	615.6	440.0	440.0	412	23	206.9	264.4	68.4	17	113.2	210	207
300	315	12	665.0	510.0	510.0	482	23	235.5	285.2	68.4	17	114.6	256	253

Dimensions			Measurements							
DN (mm)	d (mm)	d (")	E (mm)	M (mm)	LV (mm)	LB (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	80	160	112.3	129.5	125	120.6	M16	UNC ⅝
65	75	2 ½	80	160	112.3	129.5	145	139.7	M16	UNC ⅝
80	90	3	80	160	112.3	129.5	160	152.4	M16	UNC ⅝
100	110	4	80	160	112.3	129.5	180	190.5	M16	UNC ⅝
125	140	5	80	160	112.3	129.5	210	215.9	M16	UNC ¾
150	160	6	80	160	112.3	129.5	240	241.3	M20	UNC ¾
200	225	8	80	160	112.3	129.5	295	298.4	M20	UNC ¾
250	280	10	100	200	130.0	134.0	350	362.0	M20	UNC ⅞
300	315	12	100	200	130.0	134.0	400	431.8	M20	UNC ⅞

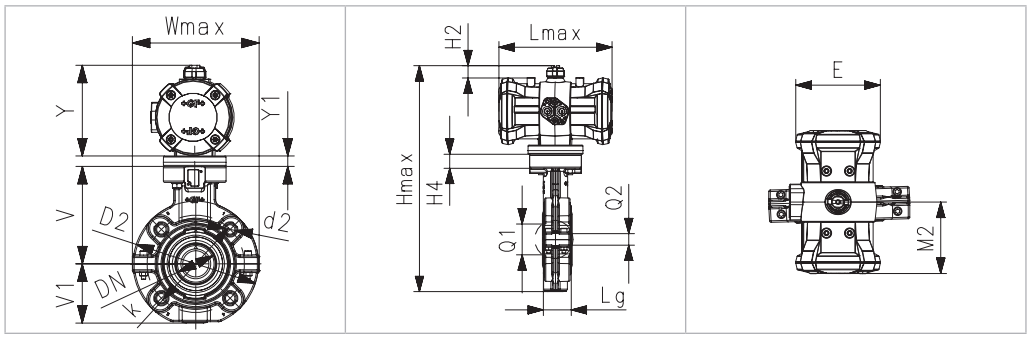
Butterfly valve type 243 lug-style, DN50 – DN125, with plastic pneumatic actuator FC/FO



Dimensions			Measurements												
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)	Y1 (mm)
50	63	2	PPA40	338.1	245.5	165	133.3	20	23	78.8	44.7	160	40		111	15
65	75	2 ½	PPA40	351.0	245.5	182	139.9	20	23	85.1	45.7	180	54	35	111	15
80	90	3	PPA80	367.8	343.0	210	145.6	20	23	91.2	48.7	195	67	50	111	15
100	110	4	PPA80	404.5	343.0	240	166.4	20	23	107.5	55.6	226	88	74	131	
125	140	5	PPA80	433.7	343.0	272	180.0	20	23	122.7	63.5	258	113	97	131	

Dimensions			Measurements					
DN (mm)	d (mm)	d (")	M2 (mm)	E (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	122.8	119.5	125	120.6	M16	UNC ⅝
65	75	2 ½	122.8	119.5	145	139.7	M16	UNC ⅝
80	90	3	171.5	141.5	160	152.4	M16	UNC ⅝
100	110	4	171.5	141.5	180	190.5	M16	UNC ⅝
125	140	5	171.5	141.5	210	215.9	M16	UNC ¾

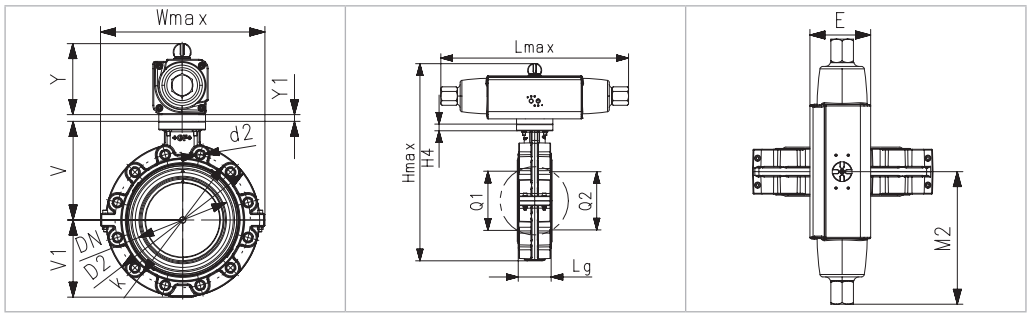
Butterfly valve type 243 lug-style, DN50 – DN125, with plastic pneumatic actuator DA



Dimensions			Measurements											
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)
50	63	2	PPA40	338.1	183.5	165	133.3	20	23	78.8	44.7	160	40		111
65	75	2 ½	PPA40	351.0	183.5	182	139.9	20	23	85.1	45.7	180	54	35	111
80	90	3	PPA40	362.8	183.5	210	145.6	20	23	91.2	48.7	195	67	50	111
100	110	4	PPA80	404.5	261.0	240	166.0	20	23	107.5	55.6	226	88	74	131
125	140	5	PPA80	433.7	261.0	272	180.0	20	23	122.7	63.5	258	113	97	131

Dimensions			Measurements						
DN (mm)	d (mm)	d (")	Y1 (mm)	M2 (mm)	E (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	15	91.8	119.5	125	120.6	M16	UNC ⅝
65	75	2 ½	15	91.8	119.5	145	139.7	M16	UNC ⅝
80	90	3	15	91.8	119.5	160	152.4	M16	UNC ⅝
100	110	4		130.5	141.5	180	190.5	M16	UNC ⅝
125	140	5		130.5	141.5	210	215.9	M16	UNC ¾

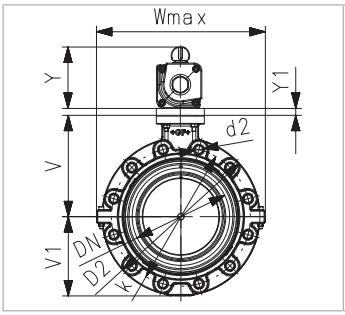
Butterfly Valve type 243 lug-style, DN50 – DN300, with pneumatic actuator FC/FO

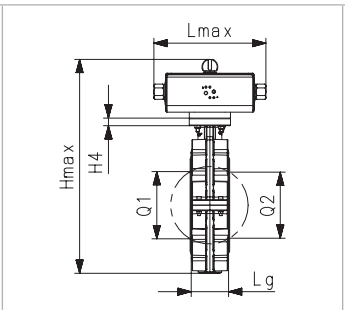


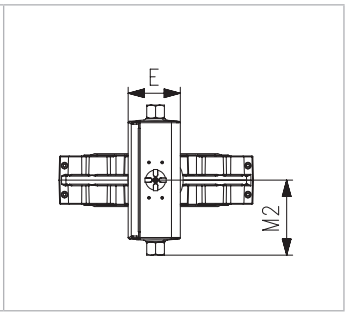
Dimensions			Measurements											
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	H4 (mm)	Lg (mm)	E (mm)	M2 (mm)
50	63	2	PA30	328.1	274.4	165	160	78.8	133.3	98.2	15.0	23	44.7	70.4	137.2
65	75	2 ½	PA30	341.0	274.4	182	180	85.1	139.9	98.2	15.0	23	45.7	70.4	137.2
80	90	3	PA35	365.7	325.2	210	195	91.2	145.6	111.1	15.0	23	48.7	83.3	162.6
100	110	4	PA40	388.3	359.6	240	226	107.5	166.0	114.8		23	55.6	87.0	179.8
125	140	5	PA45	452.2	418.0	272	258	122.7	180.0	149.5		23	63.5	107.5	209.0
150	160	6	PA50	476.6	434.0	280	284	134.5	189.0	153.1		23	71.5	111.1	217.0
200	225	8	PA55	532.0	498.4	360	341	161.5	210.5	160.0		23	72.5	118.0	249.2
250	280	10	PA60 FC	679.5	646.0	440	412	206.9	264.4	190.0		23	113.2	148.0	323.0
250	280	10	PA70 FO	749.0	681.0	440	412	206.9	264.4	190.0		23	113.2	168.0	340.5
300	315	12	PA65 FC	679.5	646.0	510	482	235.5	285.2	210.1	18.2	23	114.6	148.0	323.0
300	315	12	PA70 FO	749.0	681.0	510	482	235.5	285.2	210.1	18.2	23	114.6	168.0	340.5

Dimensions			Measurements					
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	145	139.7	M16	UNC ⅝
80	90	3	67	50	160	152.4	M16	UNC ⅝
100	110	4	88	74	180	190.5	M16	UNC ⅝
125	140	5	113	39	210	215.9	M16	UNC ¾
150	160	6	139	123	240	241.3	M20	UNC ¾
200	225	8	178	169	295	298.4	M20	UNC ¾
250	280	10	210	207	350	362.0	M20	UNC ⅞
250	280	10	210	207	350	362.0	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞

Butterfly Valve type 243 lug-style, DN50 – DN300, with pneumatic actuator DA



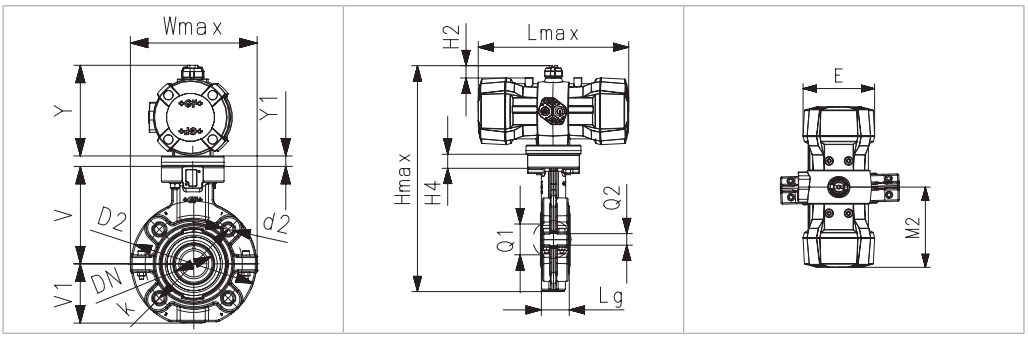




Dimensions			Measurements													
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	U (mm)	V (mm)	Y (mm)	Y1 (mm)	H4 (mm)	Lg (mm)	E (mm)	M2 (mm)
50	63	2	PA35	319.4	196.2	165	160	78.8	90	133.3	92.3	15.0	23	44.7	64.5	98.1
65	75	2 ½	PA35	332.3	196.2	182	180	85.1	90	139.9	92.3	15.0	23	45.7	64.5	98.1
80	90	3	PA40	352.8	205.6	210	195	91.2	90	145.6	98.2	15.0	23	48.7	70.4	102.8
100	110	4	PA45	384.7	242.0	240	226	107.5	90	166.0	111.2		23	55.6	83.3	121.0
125	140	5	PA45	413.9	242.0	272	258	122.7	90	180.0	111.2		23	63.5	83.3	121.0
150	160	6	PA55	473.0	290.0	280	284	134.5	90	189.0	149.5		23	71.5	107.5	145.0
200	225	8	PA55	521.5	290.0	360	341	161.5	90	210.5	149.5		23	72.5	107.5	145.0
250	280	10	PA65	649.5	339.6	440	412	206.9	90	264.4	160.0		23	113.2	118.0	169.8
300	315	12	PA65	689.9	339.6	510	482	235.5	125	285.2	160.0	18.2	23	114.6	118.0	169.8

Dimensions			Measurements					
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	145	139.7	M16	UNC ⅝
80	90	3	67	50	160	152.4	M16	UNC ⅝
100	110	4	88	74	180	190.5	M16	UNC ⅝
125	140	5	113	39	210	215.9	M16	UNC ¾
150	160	6	139	123	240	241.3	M20	UNC ¾
200	225	8	178	169	295	298.4	M20	UNC ¾
250	280	10	210	207	350	362.0	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞

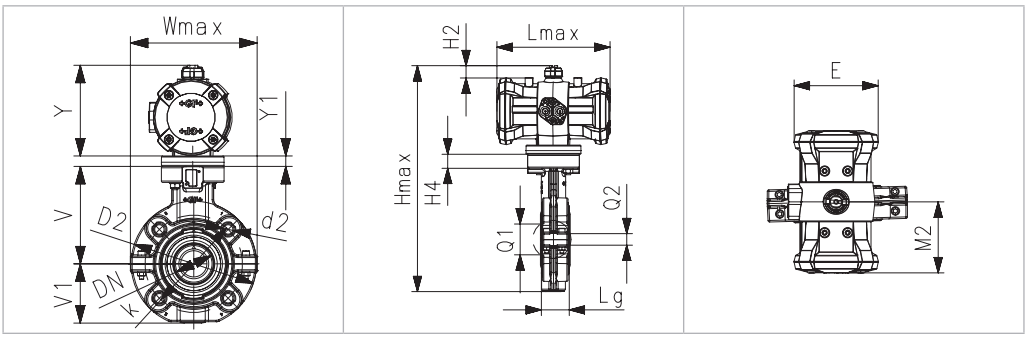
Butterfly valve type 244 lug-style, DN50 – DN125, with plastic pneumatic actuator FC/FO



Dimensions			Measurements														
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	U (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)	Y1 (mm)	M2 (mm)
50	63	2	PPA40	338.1	245.5	165	90	133.3	20	23	78.8	44.7	160	40		111	15	122.8
65	75	2 ½	PPA40	351.0	245.5	182	90	139.9	20	23	85.1	45.7	180	54	35	111	15	122.8
80	90	3	PPA80	367.8	343.0	210	90	145.6	20	23	91.2	48.7	195	67	50	131	15	171.5
100	110	4	PPA80	404.5	343.0	240	90	166.4	20	23	107.5	55.6	226	88	74	131		171.5
125	140	5	PPA80	433.7	343.0	272	90	180.0	20	23	122.7	63.5	258	113	97	131		171.5

Dimensions			Measurements				
DN (mm)	d (mm)	d (")	E (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	119.5	125	120.6	M16	UNC ⅝
65	75	2 ½	119.5	145	139.7	M16	UNC ⅝
80	90	3	141.5	160	152.4	M16	UNC ⅝
100	110	4	141.5	180	190.5	M16	UNC ⅝
125	140	5	141.5	210	215.9	M16	UNC ¾

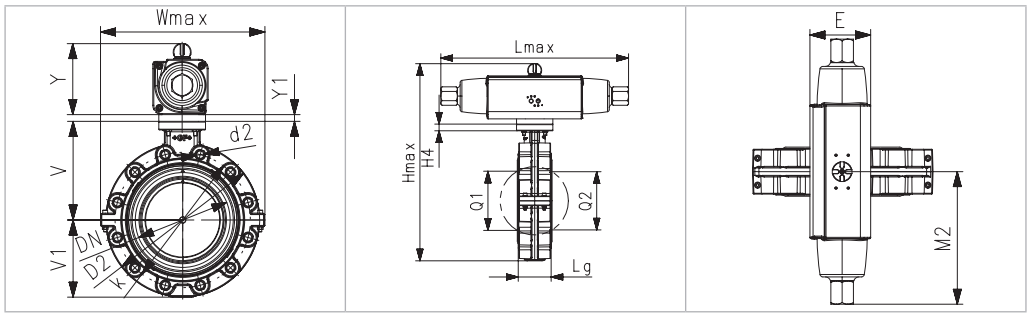
Butterfly valve type 244 lug-style, DN50 – DN125, with plastic pneumatic actuator DA



Dimensions			Measurements													
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	V (mm)	H2 (mm)	H4 (mm)	V1 (mm)	Lg (mm)	D2 (mm)	Q1 (mm)	Q2 (mm)	Y (mm)	Y1 (mm)	M2 (mm)
50	63	2	PPA40	338.1	183.5	165	133.3	20	23	78.8	44.7	160	40		111	15	91.8
65	75	2 ½	PPA40	351.0	183.5	182	139.9	20	23	85.1	45.7	180	54	35	111	15	91.8
80	90	3	PPA40	362.8	183.5	210	145.6	20	23	91.2	48.7	195	67	50	111	15	91.8
100	110	4	PPA80	404.5	261.0	240	166.0	20	23	107.5	55.6	226	88	74	131		130.5
125	140	5	PPA80	433.7	261.0	272	180.0	20	23	122.7	63.5	258	113	97	131		130.5

Dimensions			Measurements				
DN (mm)	d (mm)	d (")	E (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	119.5	125	120.6	M16	UNC ⅝
65	75	2 ½	119.5	145	139.7	M16	UNC ⅝
80	90	3	119.5	160	152.4	M16	UNC ⅝
100	110	4	141.5	180	190.5	M16	UNC ⅝
125	140	5	141.5	210	215.9	M16	UNC ¾

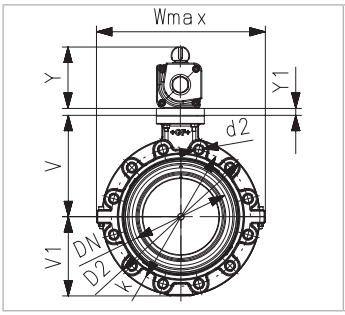
Butterfly Valve type 244 lug-style, DN50 – DN300, with pneumatic actuator FC/FO

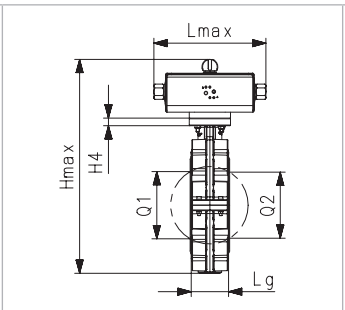


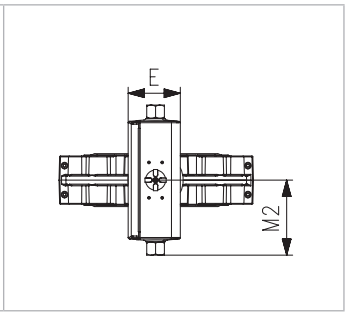
Dimensions			Measurements											
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	H4 (mm)	Lg (mm)	E (mm)	M2 (mm)
50	63	2	PA30	328.1	274.4	165	160	78.8	133.3	98.2	15.0	23	44.7	70.4	137.2
65	75	2 ½	PA30	341.0	274.4	182	180	85.1	139.9	98.2	15.0	23	45.7	70.4	137.2
80	90	3	PA35	365.7	325.2	210	195	91.2	145.6	111.1	15.0	23	48.7	83.3	162.6
100	110	4	PA40	388.3	359.6	240	226	107.5	166.0	114.8		23	55.6	87.0	179.8
125	140	5	PA45	452.2	418.0	272	258	122.7	180.0	149.5		23	63.5	107.5	209.0
150	160	6	PA50	476.6	434.0	280	284	134.5	189.0	153.1		23	71.5	111.1	217.0
200	225	8	PA55	532.0	498.4	360	341	161.5	210.5	160.0		23	72.5	118.0	249.2
250	280	10	PA60 FC	679.5	646.0	440	412	206.9	264.4	190.0		23	113.2	148.0	323.0
250	280	10	PA70 FO	749.0	681.0	440	412	206.9	264.4	190.0		23	113.2	168.0	340.5
300	315	12	PA65 FC	679.5	646.0	510	482	235.5	285.2	210.1	18.2	23	114.6	148.0	323.0
300	315	12	PA70 FO	749.0	681.0	510	482	235.5	285.2	210.1	18.2	23	114.6	168.0	340.5

Dimensions			Measurements					
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	145	139.7	M16	UNC ⅝
80	90	3	67	50	160	152.4	M16	UNC ⅝
100	110	4	88	74	180	190.5	M16	UNC ⅝
125	140	5	113	39	210	215.9	M16	UNC ¾
150	160	6	139	123	240	241.3	M20	UNC ¾
200	225	8	178	169	295	298.4	M20	UNC ¾
250	280	10	210	207	350	362.0	M20	UNC ⅞
250	280	10	210	207	350	362.0	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞

Butterfly Valve type 244 lug-style, DN50 – DN300, with pneumatic actuator DA





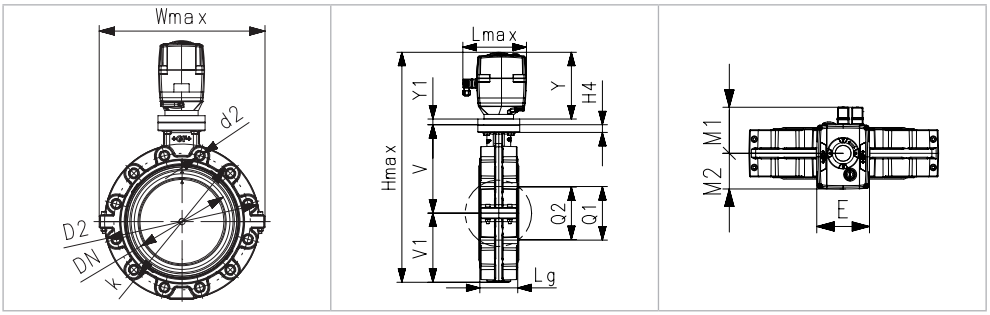


Dimensions			Measurements											
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	H4 (mm)	Lg (mm)	E (mm)	M2 (mm)
50	63	2	PA35	319.4	196.2	165	160	78.8	133.3	92.3	15.0	23	44.7	64.5	98.1
65	75	2 ½	PA35	332.3	196.2	182	180	85.1	139.9	92.3	15.0	23	45.7	64.5	98.1
80	90	3	PA40	352.8	205.6	210	195	91.2	145.6	98.2	15.0	23	48.7	70.4	102.8
100	110	4	PA45	384.7	242.0	240	226	107.5	166.0	111.2		23	55.6	83.3	121.0
125	140	5	PA45	413.9	242.0	272	258	122.7	180.0	111.2		23	63.5	83.3	121.0
150	160	6	PA55	473.0	290.0	280	284	134.5	189.0	149.5		23	71.5	107.5	145.0
200	225	8	PA55	521.5	290.0	360	341	161.5	210.5	149.5		23	72.5	107.5	145.0
250	280	10	PA65	649.5	339.6	440	412	206.9	264.4	160.0		23	113.2	118.0	169.8
300	315	12	PA65	689.9	339.6	510	482	235.5	285.2	160.0	18.2	23	114.6	118.0	169.8

Dimensions			Measurements					
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	145	139.7	M16	UNC ⅝
80	90	3	67	50	160	152.4	M16	UNC ⅝
100	110	4	88	74	180	190.5	M16	UNC ⅝
125	140	5	113	39	210	215.9	M16	UNC ¾
150	160	6	139	123	240	241.3	M20	UNC ¾
200	225	8	178	169	295	298.4	M20	UNC ¾
250	280	10	210	207	350	362.0	M20	UNC ⅞
300	315	12	256	253	400	431.8	M20	UNC ⅞

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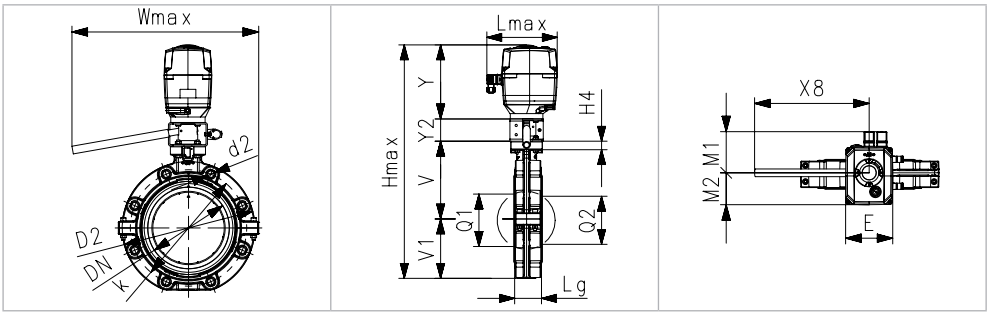
Butterfly Valve type 146 lug-style, DN50 – DN200, with electric actuator, without manual override



Dimensions			Measurements										
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	Lg (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	E (mm)
50	63	2	EA45	378.3	190	165	160	44.7	78.8	133.3	166.2		122.3
65	75	2 ½	EA45	391.2	190	182	180	45.7	85.1	139.9	166.2		122.3
80	90	3	EA120	426.1	190	210	195	48.7	91.2	145.6	189.3		122.3
100	110	4	EA120	462.8	190	240	225	55.6	107.5	166.4	189.3		122.3
125	140	5	EA120	492.0	190	272	258	63.5	122.7	180.0	189.3		122.3
150	160	6	EA120	522.8	190	300	284	71.5	134.5	189.0	189.3		122.3
200	225	8	EA250	571.3	190	360	341	72.5	161.5	210.5	199.3		122.3
250	280	10	EA250	670.6	190	440	412	113.2	206.9	264.4	199.3	17	122.3
300	315	12	EA250	720.0	190	510	482	114.6	235.5	285.2	199.3	17	122.3

Dimensions			Measurements								
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	H4 (mm)	M1 (mm)	M2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		23	107.3	82.7	125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	23	107.3	82.7	145	139.7	M16	UNC ⅝
80	90	3	67	50	23	107.3	82.7	160	152.4	M16	UNC ⅝
100	110	4	88	74	23	107.3	82.7	180	190.5	M16	UNC ⅝
125	140	5	113	97	23	107.3	82.7	210	215.9	M16	UNC ¾
150	160	6	139	123	23	107.3	82.7	240	241.3	M20	UNC ¾
200	225	8	178	169	23	107.3	82.7	295	298.4	M20	UNC ¾
250	280	10	210	207	23	107.3	82.7	350	362.0	M20	UNC ⅞
300	315	12	256	253	23	107.3	82.7	400	431.8	M20	UNC ⅞

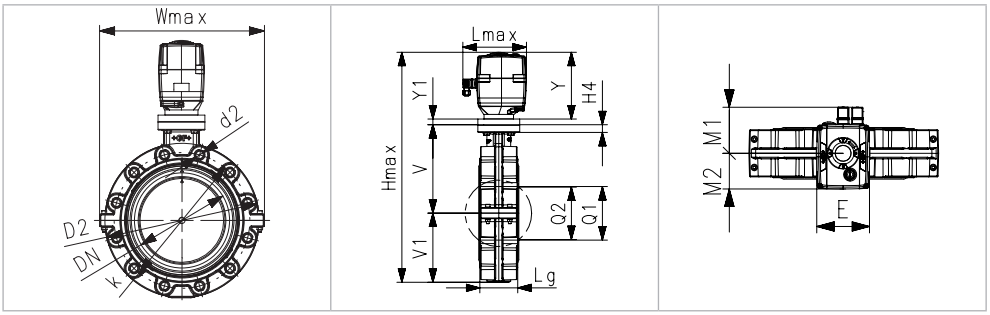
Butterfly Valve type 146 lug-style, DN50 – DN200, with electric actuator, with manual override



Dimensions			Measurements										
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	Lg (mm)	V1 (mm)	V (mm)	Y (mm)	Y2 (mm)	E (mm)
50	63	2	EA45	438.3	190	380.0	160	44.7	78.8	133.3	166.2	60	122.3
65	75	2 ½	EA45	451.2	190	388.5	180	45.7	85.1	139.9	166.2	60	122.3
80	90	3	EA120	486.1	190	402.5	195	48.7	91.2	145.6	189.3	60	122.3
100	110	4	EA120	522.8	190	417.5	225	55.6	107.5	166.4	189.3	60	122.3
125	140	5	EA120	552.0	190	433.5	258	63.5	122.7	180.0	189.3	60	122.3
150	160	6	EA120	582.8	190	447.5	284	71.5	134.5	189.0	189.3	60	122.3
200	225	8	EA250	631.3	190	447.5	341	72.5	161.5	210.5	199.3	60	122.3

Dimensions			Measurements									
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	H4 (mm)	M1 (mm)	M2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")	X8 (mm)
50	63	2	40		23	107.3	82.7	125	120.6	M16	UNC ⅝	297.5
65	75	2 ½	54	35	23	107.3	82.7	145	139.7	M16	UNC ⅝	297.5
80	90	3	67	50	23	107.3	82.7	160	152.4	M16	UNC ⅝	297.5
100	110	4	88	74	23	107.3	82.7	180	190.5	M16	UNC ⅝	297.5
125	140	5	113	97	23	107.3	82.7	210	215.9	M16	UNC ¾	297.5
150	160	6	139	123	23	107.3	82.7	240	241.3	M20	UNC ¾	297.5
200	225	8	178	169	23	107.3	82.7	295	298.4	M20	UNC ¾	297.5

Butterfly Valve type 147 lug-style, DN50 – DN300, with electric actuator, without manual override

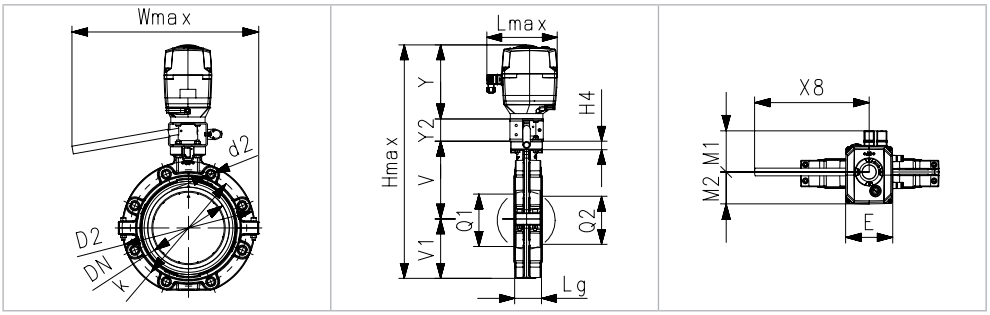


Dimensions			Measurements									
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	Lg (mm)	V1 (mm)	V (mm)	Y (mm)	Y1 (mm)	E (mm)
50	63	2	EA45	378.3	190	165	160	44.7	78.8	133.3	166.2		122.3
65	75	2 ½	EA45	391.2	190	182	180	45.7	85.1	139.9	166.2		122.3
80	90	3	EA120	426.1	190	210	195	48.7	91.2	145.6	189.3		122.3
100	110	4	EA120	462.8	190	240	225	55.6	107.5	166.4	189.3		122.3
125	140	5	EA120	492.0	190	272	258	63.5	122.7	180.0	189.3		122.3
150	160	6	EA120	522.8	190	300	284	71.5	134.5	189.0	189.3		122.3
200	225	8	EA250	571.3	190	360	341	72.5	161.5	210.5	199.3		122.3
250	280	10	EA250	670.6	190	440	412	113.2	206.9	264.4	199.3	17	122.3
300	315	12	EA250	720.0	190	510	482	114.6	235.5	285.2	199.3	17	122.3

Dimensions			Measurements								
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	H4 (mm)	M1 (mm)	M2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")
50	63	2	40		23	107.3	82.7	125	120.6	M16	UNC ⅝
65	75	2 ½	54	35	23	107.3	82.7	145	139.7	M16	UNC ⅝
80	90	3	67	50	23	107.3	82.7	160	152.4	M16	UNC ⅝
100	110	4	88	74	23	107.3	82.7	180	190.5	M16	UNC ⅝
125	140	5	113	97	23	107.3	82.7	210	215.9	M16	UNC ¾
150	160	6	139	123	23	107.3	82.7	240	241.3	M20	UNC ¾
200	225	8	178	169	23	107.3	82.7	295	298.4	M20	UNC ¾
250	280	10	210	207	23	107.3	82.7	350	362.0	M20	UNC ⅞
300	315	12	256	253	23	107.3	82.7	400	431.8	M20	UNC ⅞

Dimensions in accordance with ANSI/ASME B16.5 Class 150

Butterfly Valve type 147 lug-style, DN50 – DN200, with electric actuator, with manual override



Dimensions			Measurements										
DN (mm)	d (mm)	d (")	Act. type	Hmax (mm)	Lmax (mm)	Wmax (mm)	D2 (mm)	Lg (mm)	V1 (mm)	V (mm)	Y (mm)	Y2 (mm)	E (mm)
50	63	2	EA45	438.3	190	380.0	160	44.7	78.8	133.3	166.2	60	122.3
65	75	2 ½	EA45	451.2	190	388.5	180	45.7	85.1	139.9	166.2	60	122.3
80	90	3	EA120	486.1	190	402.5	195	48.7	91.2	145.6	189.3	60	122.3
100	110	4	EA120	522.8	190	417.5	225	55.6	107.5	166.4	189.3	60	122.3
125	140	5	EA120	552.0	190	433.5	258	63.5	122.7	180.0	189.3	60	122.3
150	160	6	EA120	582.8	190	447.5	284	71.5	134.5	189.0	189.3	60	122.3
200	225	8	EA250	631.3	190	447.5	341	72.5	161.5	210.5	199.3	60	122.3

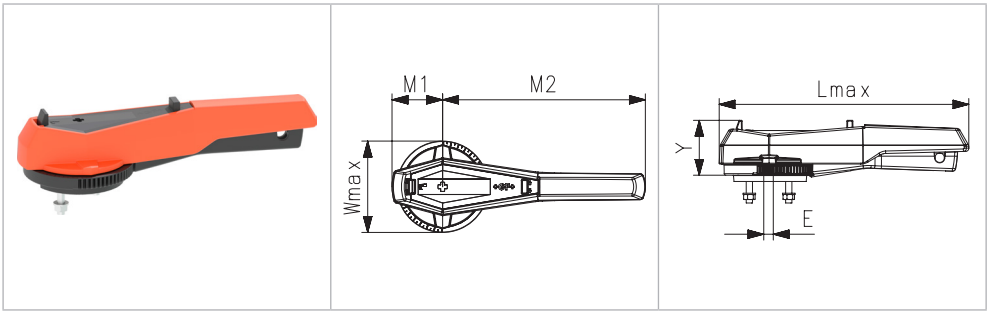
Dimensions			Measurements										
DN (mm)	d (mm)	d (")	Q1 (mm)	Q2 (mm)	H4 (mm)	U (mm)	M1 (mm)	M2 (mm)	k_{ISO} (mm)	k_{ANSI} (mm)	$d2_{ISO}$ (mm)	$d2_{ANSI}$ (")	X8 (mm)
50	63	2	40		23	90	107.3	82.7	125	120.6	M16	UNC ⅝	297.5
65	75	2 ½	54	35	23	90	107.3	82.7	145	139.7	M16	UNC ⅝	297.5
80	90	3	67	50	23	90	107.3	82.7	160	152.4	M16	UNC ⅝	297.5
100	110	4	88	74	23	90	107.3	82.7	180	190.5	M16	UNC ⅝	297.5
125	140	5	113	97	23	90	107.3	82.7	210	215.9	M16	UNC ¾	297.5
150	160	6	139	123	23	90	107.3	82.7	240	241.3	M20	UNC ¾	297.5
200	225	8	178	169	23	90	107.3	82.7	295	298.4	M20	UNC ¾	297.5

Dimensions in accordance with ANSI/ASME B16.5 Class 150

Accessories

Hand lever

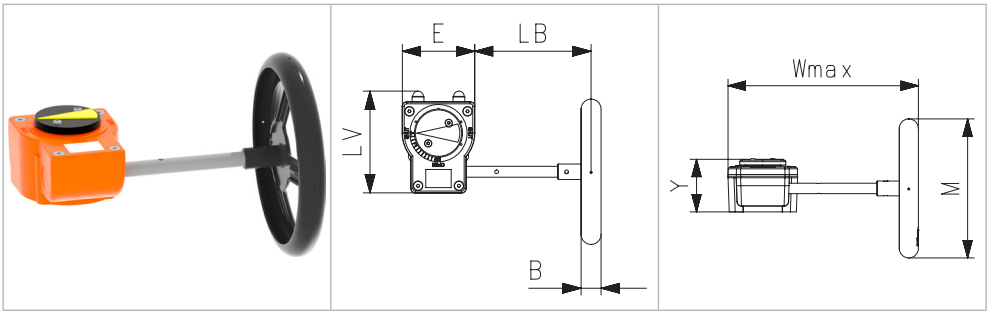
Hand lever incl. fastening screws.



d (mm)	DN (mm)	Inch (")	With index plate Code	With fine adjustment Code	Wmax (mm)	Lmax (mm)	M1 (mm)	M2 (mm)	Y (mm)	E (mm)
63 - 90	50 - 80	2 - 3	161 486 690	161 486 325	115.2	269.0	64.7	205.5	66.8	11
110 - 140	100 - 125	4 - 5	161 486 691	161 486 326	115.2	318.9	64.9	255.5	70.1	14
160	150	6	161 486 694	161 486 327	115.2	318.9	64.9	255.5	70.1	17
225	200	8	161 486 695	161 486 328	149.4	509.7	103.6	409.5	86.3	17
280 - 315	250 - 300	10 - 12	161 486 697		149.4	509.7	103.6	409.5	86.3	22

Reduction gear

For valve operation via a manual gear with handwheel.



d (mm)	DN (mm)	Inch (")	Code	Wmax (mm)	LV (mm)	Y (mm)	M (mm)	B (mm)	E (mm)	LB (mm)
63 - 225	50-200	2 - 8	161 483 471	221.0	112.3	61.2	160.0	23.0	80.0	129.5
280 - 315	250-300	10 - 12	161 483 472	246.3	130.0	68.4	200.0	24.6	100.0	134.0

Integrated electrical position indicator (IER)

- Position indicator in combination with actuators
- For manual valve as well as for manual reduction gear

General technical data of the electrical position indicator:

- Protection rating with DIN plug (2) IP65
- Protection rating with cable gland IP67
- Ambient temperature: -10 °C to +50 °C

Assignment of the electrical position indicator to butterfly valve of types 567 and 578:

Shaft		Dimension
1	11 mm	DN50 – DN80
2	14 mm	DN100 – DN125
3	17 mm	DN150 – DN200

Double Sensor Adapter Butterfly Valve 567

Adapter to mount the double sensor on butterfly valves type 567. Double sensor for electrical position feedback must be ordered separately. The adapter kit can only be used with existing intermediate elements for the respective application (e.g. butterfly valve with pneumatic actuator).

Butterfly Valve type 567 DN50-DN200 with lever

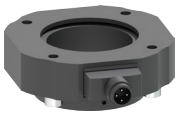
Code	DN (mm)	d (")	Actuation Type	
161486949	DN50-DN80	2"-3"	Lever	
161486951	DN100-DN125	4"-5"	Lever	
161486950	DN150-DN200	6"-8"	Lever	

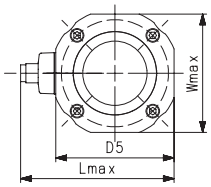
Butterfly Valve type 567 DN50-DN200 with actuator

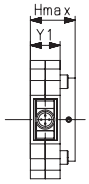
Code	DN (mm)	d (")	Actuation Type	
161486956	DN50	2"	PA DA	
161486955	DN50-DN65	2"-2.5"	PPA, PA FC/FO, EA	
161486953	DN80	3"	PPA	
161486954	DN80	3"	PA, EA	
161486952	DN100-DN125	4"-5"	PPA	
161486951	DN100-DN125	4"-5"	PA, EA	
161486950	DN150-DN200	6"-8"	PA, EA	

Butterfly Valve type 567 DN350-DN600

Code	DN (mm)	D5 (mm)	Hmax (mm)	Hmax (mm)	Wmax (mm)	Y1 (mm)
167484209	DN350-400	74	28	96	74	18.6
167484210	DN450-600	74	28	96	74	18.6

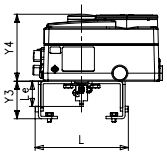


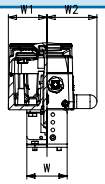


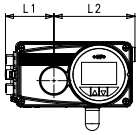


Type RPC / RPC D / RPC PID

Designation	Order code	Y4	W1	W2	L1	L2
RPC	199 190 640	83.5	48	62	60.5	100.5
RPC D	199 190 641	83.5	48	62	60.5	100.5
RPC PID	199 190 644	83.5	48	62	60.5	100.5







Pneumatic Plastic Actuator PPA

The PPA pneumatic actuator can be mounted on any rotary valves with an interface according to ISO 5211.

Single-acting FC

Code	Type	Torque max.	Acc. to ISO 5211	Product picture
198 155 401	PPA40	30 Nm	F05	
198 155 801	PPA80	53 Nm	F07	



Single-acting FO

Code	Type	Torque max.	Acc. to ISO 5211	Product picture
198 155 402	PPA40	17 Nm	F05	
198 155 802	PPA80	40 Nm	F07	



Double-acting DA

Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
198 155 403	PPA40	31 Nm	F05	

Pneumatic Actuator PA30-90

The PA30 - PA90 pneumatic actuator can be mounted on any rotary valves with an interface according to ISO 5211.

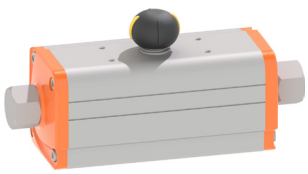
Single-acting FC

Code	Type	Torque max.	Acc. to ISO 5211	Product picture
198 811 617	PA30	30 Nm	F05/07	
198 811 601	PA35	53 Nm	F05/07	
198 811 609	PA40	60 Nm	F05/07	
198 811 603	PA45	90 Nm	F07/10	
198 811 610	PA50	180 Nm	F07/10	
198 811 605	PA55	240 Nm	F07/10/12	
198 811 607	PA65	360 Nm	F10/12	
198 811 612	PA70	480 Nm	F10/12	

Single-acting FO

Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
198 811 627	PA30	30 Nm	F05/07	
198 811 628	PA35	53 Nm	F05/07	
198 811 629	PA40	60 Nm	F05/07	
198 811 630	PA45	90 Nm	F07/10	
198 811 631	PA50	180 Nm	F07/10	
198 811 632	PA55	240Nm	F07/10/12	
198 811 654	PA65	360 Nm	F10/12	
198 811 634	PA70	480 Nm	F10/12	

Double-acting DA

Code	Typ	Torque max.	Acc. to ISO 5211	Product picture
198 811 618	PA35	46 Nm	F03/05	
198 811 619	PA40	60 Nm	F05/07	
198 811 604	PA45	106 Nm	F05/07	
198 811 606	PA55	180 Nm	F07/10	
198 811 608	PA65	360 Nm	F07/10	

Electric Actuator EA25-250

The EA45/120/250 electric actuator is mounted on a valve (e.g. ball valve or butterfly valve) and connected to a control system provided by the customer. It actuates the valve with a rotary movement of up to 180°.

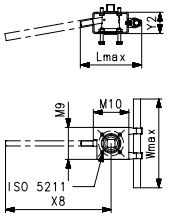
Code	Type	Spannung	Torque max.	Acc. to ISO 5211	Product picture
198 153 184	EA45	AC 100-230V	45 Nm	F05* (WS 11/14)	
198 153 185	EA45	AC/DC 24V	45 Nm	F05* (WS 11/14)	
198 153 186	EA120	AC 100-230V	120 Nm	F07 (WS17)	
198 153 187	EA120	AC/DC 24V	120 Nm	F07 (WS17)	
198 153 188	EA250	AC 100-230V	250 Nm	F07 (WS17)	
198 153 189	EA250	AC/DC 24V	250 Nm	F07 (WS17)	

Smart Actuator dEA45-250

The Smart Actuator dEA45/120/250 is mounted on a valve (e.g. ball valve or butterfly valve) and connected to a control system provided by the customer. It actuates the valve with a rotary movement up to 180°. The Smart Actuator offers wireless connectivity via NFC and Wi-Fi Direct, as well as control and reading of process data via downloadable App.

Code	Type	Spannung	Torque max.	Acc. to ISO 5211	Product picture
198 153 194	dEA45	AC 100-230V	45 Nm	F05* (WS 11/14)	
198 153 195	dEA45	AC/DC 24V	45 Nm	F05* (WS 11/14)	
198 153 196	dEA120	AC 100-230V	120 Nm	F07 (WS17)	
198 153 197	dEA120	AC/DC 24V	120 Nm	F07 (WS17)	
198 153 198	dEA250	AC 100-230V	250 Nm	F07 (WS17)	
198 153 199	dEA250	AC/DC 24V	250 Nm	F07 (WS17)	

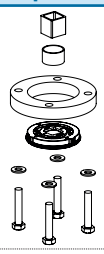
Manual override

Code	Acc. to ISO 5211	Lmax (mm)	Wmax (mm)	M9 (mm)	M10 (mm)	X8 (mm)	Y2 (mm)	Dimensions	Product picture
198 000 623	F05	172	250	90	100	298	60		
198 000 624	F07	172	250	90	100	298	60		
198 000 625	F07	172	250	90	100	298	60		

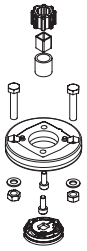
Intermediate elements

Intermediate elements are required as a connection between valve and Actuator. The intemediate elements include different screws, hexagon nuts, washer, switching rings, etc. (depends on actuator and dimension).

Intermediate elements for Reduction Gear

DN (mm)	Code	Reduction gear	Acc. to ISO 5211	Product picture example
50 - 80	198 000 621	161 483 471	F07	
100 - 125	198 000 622	161 483 471	F07	
150 - 200	198 000 600	161 483 471	F07	
250 - 300	198 000 732	161 483 472	F07	

Intermediate elements for Electric Actuators EA45-250, dEA45-250

DN (mm)	Code	Actuator Type	Acc. to ISO 5211	Product picture example
50 - 65	198 000 943	EA45	F05/F07	
80	198 000 601	xEA120	F07	
100 - 125	198 000 602	xEA120	F07	
150	198 000 600	xEA120	F07	
200 - 250	198 000 603	xEA250	F07	
300	198 000 732	xEA250	F07/F10	

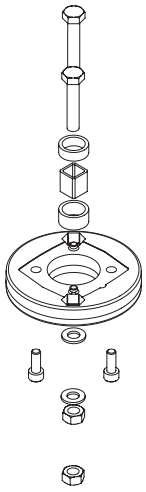
Intermediate elements for Pneumatic Actuators PPA, function FC/FO

DN (mm)	Code	Typ	Acc. to ISO 5211	Product picture example
50 - 65	198 000 950	PPA40	F05/F07	
80	198 000 949	PPA80	F05/F07	
100 - 125	198 000 948	PPA80	F05/F07	

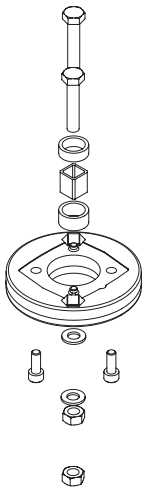
Intermediate elements for Pneumatic Actuators PPA, function DA

DN (mm)	Code	Typ	Acc. to ISO 5211	Product picture example
50 - 65	198 000 950	PPA40	F05/F07	
80	198 000 950	PPA40	F05/F07	
100 - 125	198 000 948	PPA80	F05/F07	

Intermediate elements for Pneumatic Actuators PA30-90, function FC/FO

DN (mm)	Butterfly valve type	Code	Type	Acc. to ISO 5211	Product picture example
50	567/578	198 000 791	PA30	F05/F07	
65	567/578	198 000 791	PA30	F05/F07	
80	567/578	198 000 793	PA35	F05/F07	
100	567/578	198 000 794	PA40	F07	
125	567/578	198 000 795	PA45	F07	
150	567/578	198 000 796	PA50	F07	
200	567/578	198 000 798	PA55	F07	
250	567	198 000 730	PA65	F10	
250	578	198 000 945	PA65	F10	
300	567	198 000 225	PA70	F10	
300	578	198 000 946	PA70	F10	

Intermediate elements for Pneumatic Actuators PA30-90, function DA

DN (mm)	Butterfly valve type	Code	Type	Acc. to ISO 5211	Product picture example
50	567/578	198 000 595	PA35	F05/F07	
65	567/578	198 000 595	PA35	F05/F07	
80	567/578	198 000 791	PA40	F07	
100	567/578	198 000 794	PA45	F07	
125	567/578	198 000 797	PA45	F07	
150	567/578	198 000 796	PA55	F07	
200	567/578	198 000 796	PA55	F07	
250	567	198 000 731	PA65	F10	
250	578	198 000 944	PA65	F10	
300	567	198 000 731	PA65	F10	
300	578	198 000 944	PA65	F10	

For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Butterfly Valve type 038/039

			
Type 038 With hand lever Wafer or lug style valve	**Type 038** Manual reduction gear Wafer or lug style valve	**Type 039** With hand lever Wafer style valve	**Type 039** Manual reduction gear Wafer style valve

Product description

Metal butterfly valves are ideal for shutting off and controlling the flow of liquid media in pipelines. They offer high temperature and pressure resistance as well as outstanding resistance to corrosion.

Function

Metal butterfly and control Valve types 038 and 039 can be universally used and are intended exclusively for shutting off, conveying and dosing media in the allowable pressure and temperature range or for controlling flow in piping systems into which they have been installed. The easy installation of the valves between pipe flanges guarantees reliable operation and sealing.

The Rilsan-coating of the valve body and the ductile iron valve disk provide a high resistance against corrosion. The butterfly valves are also available in a standard version with a stainless steel valve disk.

Applications

- Water treatment
- Chemical process industry
- Cooling water facilities
- Power plant
- Shipbuilding

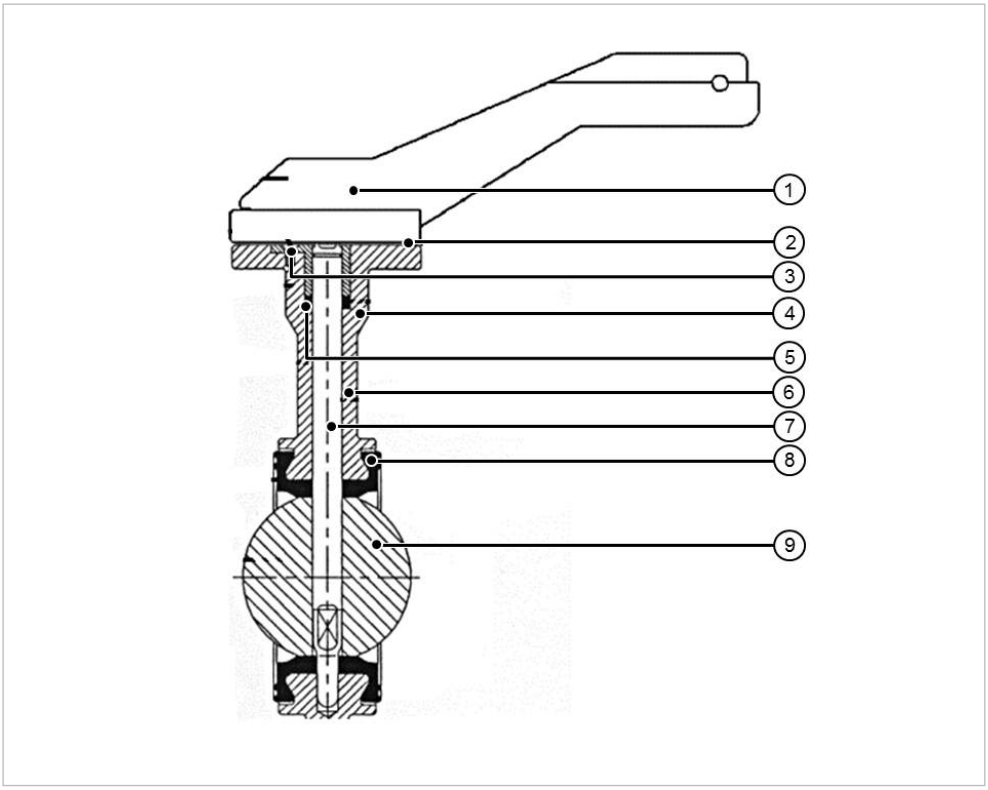
Benefits/features

- Good flow characteristics
- Rilsan/epoxy-coating: good chemical resistance
- Easy installation
- Space-saving installation
- Large dimensions to DN1200
- Compact design
- Varied applications
- Low maintenance and high cost efficiency
- KTW / DVGW / WRAS certification

Flow media

Not recommended for media containing solids.

Technical data



1 Hand lever
2 Ten-position plate
3 Screw for bushing
4 Bushing
5 Shaft sealing
6 Valve housing
7 Shaft
8 Collar
9 Valve disc

Specification			
Dimensions	Type 038 wafer or lug style	DN50 – DN600, 2" – 24"	
	Type 039 wafer style	DN50 – DN1200, 2" – 48"	
Materials	Disc	Ductile cast iron Rilsan/epoxy-coated	
		Stainless steel	
		Aluminum bronze	
	Outside housing	Ductile cast iron	
Gasket materials	EPDM, FKM, others upon request		
Pressure ratings	Type 038, 039	PN10/16	
Actuation variants	Manually operated		
	Pneumatically actuated FC, FO, DA		
	Electrically actuated AC: 100 – 230 V, AC/DC: 24 V		
Connections	Flange connections	EN1092-1	PN10/PN16
		DIN2501	PN10/PN16
		ANSI B16.5	Class 150
	Valve flange	ISO/DIN, BS, ASTM	
Standards	Type 038	ISO/DIN, ASTM	
	Type 039	All standards	
Product standard	EN ISO 16136		
Test standard	ISO 5208 (leackage rate A)		
Approvals	PZH, DVGW		

Kv 100 values

Nominal diameter DN		Opening angle (l/min)							
(mm)	(inch)	20°	30°	40°	50°	60°	70°	80°	90°
50	2"	117	267	433	717	1'150	1'833	2'833	3'167
65	2 ½"	150	367	633	1'000	1'583	2'583	4'167	4'667
80	3"	233	550	950	1'583	2'500	4'000	6'167	7'167
100	4"	400	900	1'583	2'583	4'000	6'667	10'334	11'834
125	5"	633	1'433	2'583	4'000	6'500	10'667	15'834	18'334
150	6"	867	2'000	3'667	5'750	9'167	15'834	23'334	26'667
200	8"	1'583	3'667	5'750	10'000	15'834	26'667	40'001	46'668
250	10"	2'583	5'750	10'167	15'834	26'667	43'334	66'668	78'335
300	12"	3'667	8'500	14'334	25'001	38'334	63'335	98'335	115'002
350	14"	4'833	11'000	20'000	31'667	48'334	80'002	130'003	143'336
400	16"	6'333	14'334	26'667	40'001	65'001	106'669	158'337	186'670
450	18"	8'167	18'334	33'334	51'668	83'335	138'336	215'004	258'339
500	20"	10'167	23'334	41'668	66'668	103'335	171'670	258'339	316'673
600	24"	14'334	33'334	56'668	91'669	143'336	245'005	373'341	431'675
700	28"	18'334	43'334	76'668	111'669	203'337	310'006	488'343	618'346
800	32"	30'001	60'001	110'002	161'670	276'672	471'676	720'014	871'684
900	36"	36'667	75'002	130'003	215'004	330'007	546'678	861'684	1'005'020
1'000	40"	51'668	88'335	145'003	266'672	401'675	703'347	1'035'021	1'306'693
1'200	48"	75'002	130'003	211'671	388'341	586'678	1'025'021	1'511'697	1'906'705

Operating torque

Nominal diameter DN (mm)	Inch (inch)	Operating pressure 10 bar (Nm)	Operating pressure 16 bar (Nm)
50	2"	15	15
65	2 ½"	20	20
80	3"	25	25
100	4"	40	40
125	5"	50	50
150	6"	60	60
200	8"	160	160
250	10"	250	250
300	12"	300	300
350	14"	900	
400	16"	1'200	
450	18"	1'650	
500	20"	2'300	
600	24"	4'100	

Reference values for tightening torque of screws

Use of PVC-U flange adapters

DIN PN16 / PN10 Standard								Required screws for type 039 wafer butterfly valve With PVC-U flange adapters					Required screws for type 038 lug style butterfly valve With PVC-U flange adapters			
		Butterfly valve	Flange (DIN-2632)					Studs			Nuts		Screws			
PN (bar)	DN (mm)	inch (inch)	Housing width A	Flange thickness B	Hole distanceøC	Number of holes N°	Outer ø øD (mm)	Length L (mm)	Thread metric	Number N°	Thread metric	Number N°	Length L (mm)	Thread metric	Thread UNC	Number N°
16	50	2"	43	18	125	4	165	150	M16	4	M16	8	50	M16	⅝" UNC	
16	65	2 ½"	46	18	145	4	185	155	M16	4	M16	8	55	M16	⅝" UNC	4
16	80	3"	46	20	160	8	200	155	M16	8	M16	16	55	M16	⅝" UNC	8
16	100	4"	52	20	180	8	220	165	M16	8	M16	16	60	M16	⅝" UNC	8
16	125	5"	56	22	210	8	250	180	M16	8	M16	16	65	M16	¾" UNC	8
16	150	6"	56	22	240	8	285	190	M20	8	M20	16	70	M20	¾" UNC	8
16	200	8"	60	24	295	12	340	220	M20	8	M20	16	80	M20	¾" UNC	8
16	250	10"	68	26	355	12	405	230	M20	8	M20	16	90	M20	⅞" UNC	8
16	300	12"	78	28	410	12	460	255	M20	12	M20	16	100	M20	⅞" UNC	12
10	350	14"	78	30	470	16	520	275	M20	16	M20	32				
10	400	16"	102	32	525	16	580	310	M24	16	M24	32				

Use flange adapter PP and PE100

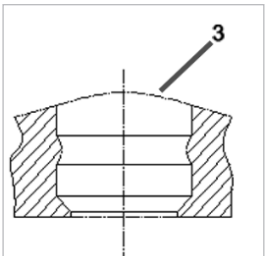
DIN PN16 / PN10 Standard								Required screws for type 039 Wafer butterfly flange With flange adapter PP- and PE100					Required screws type 038 with flange adapter PP and PE 100			
		Butterfly valve	Flange (DIN-2632)					Studs			Nuts		Screws			
PN (bar)	DN (mm)	Inch (inch)	Housing width A	Flange thickness B	Hole distance øC	Number of holes N°	Outer ø øD (mm)	Length L (mm)	Thread metric	Number N°	Thread metric	Number N°	Length L (mm)	Thread metric	Thread UNC	Number N°
16	50	2"	43	18	125	4	165	160	M16	4	M16	8	55	M16	⅝" UNC	4
16	65	2 ½"	46	18	145	4	185	165	M16	4	M16	8	60	M16	⅝" UNC	4
16	80	3"	46	20	160	8	200	170	M16	8	M16	16	60	M16	⅝" UNC	8
16	100	4"	52	20	180	8	220	175	M16	8	M16	16	65	M16	⅝" UNC	8
16	125	5"	56	22	210	8	250	200	M16	8	M16	16	80	M16	¾" UNC	8
16	150	6"	56	22	240	8	285	210	M20	8	M20	16	80	M20	¾" UNC	8
16	200	8"	60	24	295	12	340	230	M20	8	M20	16	90	M20	¾" UNC	8
16	250	10"	68	26	355	12	405	250	M20	8	M20	16	100	M20	⅞" UNC	8
16	300	12"	78	28	410	12	460	270	M20	12	M20	16	110	M20	⅞" UNC	12
10	350	14"	78	30	470	16	520	340	M20	16	M20	32				
10	400	16"	102	32	525	16	580	380	M24	16	M24	32				
10	500	20"	126	34	650	20	715	470	M24	20	M24	40				
10	600	24"	146	36	770	20	840	420	M27	20	M27	40				

Technical basics

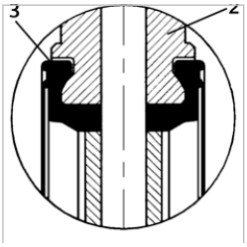
Shaft sealing

Shaft sealing is guaranteed by:

1. Special profile of the collar in the area of the shaft seal.
2. Fixation of the collar with the valve housing



Longitudinal section of the collar



Cross-section of the valve housing with collar

The outer grooves of the collar seal the flange connection. No additional flange seals are required.

Valve handling

Differentiation between and use of respective types

- Use butterfly Valve type 039 only as a wafer style valve
- Use butterfly Valve type 038 as either a wafer style or a lug style valve

Installation notes

- Make sure that the butterfly valves to be installed correspond specifically to the pressure rating, type of connection, dimension and materials of the particular application.
- Perform a function test. To do this, close and re-open the butterfly valve.
- Only install butterfly valves that function without trouble.

Maintenance notes

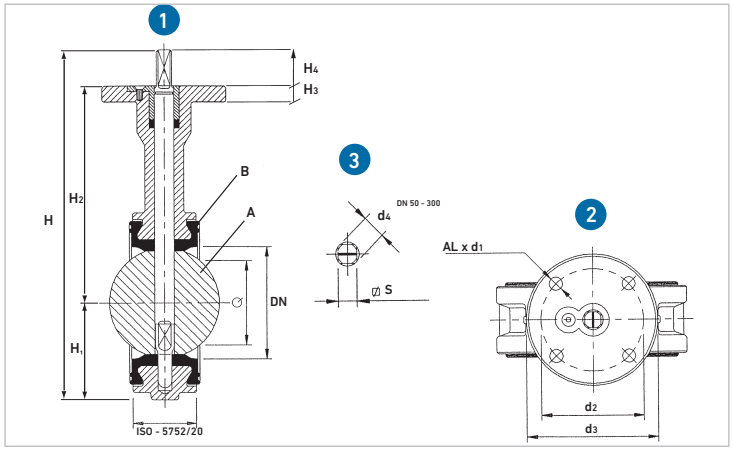
In normal operation, butterfly valves do not require maintenance. It is nonetheless recommended to perform maintenance on butterfly valves after 5,000 actuation cycles at most. The following steps must be taken when doing so:

- Regularly check that no medium escapes to the outside. If medium exits from the flange connections, tighten them.
- We recommend operating butterfly valves that are kept permanently in the same position 1 – 2 times per year to check their functionality.
- Depending on the operating conditions, the collars should be lubricated periodically with grease (silicone-based grease).

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

Butterfly Valve types 038 and 039 with open shaft end DN50 – DN1200



Type 038			Butterfly valve[1]							Actuation flange[2]					Shaft end[3]		
d (mm)	DN (mm)	inch (inch)	(kg)	(Nm)	Q (mm)	L (mm)	H (mm)	H1 (mm)	H2 (mm)	Type	d1 (mm)	d2 (mm)	d3 (mm)	H3 (mm)	H4 (mm)	d4 (mm)	ΦS (mm)
63	50	2"	3.2	24	32	43	215	63	140	F-07	9	70	90	12	26	14	11
75	65	2 ½"	4.3	30	51	46	241	73	152	F-07	9	70	90	12	26	14	11
90	80	3"	6.0	39	69	46	256	81	159	F-07	9	70	90	12	26	14	11
110	100	4"	8.0	59	89	52	295	97	178	F-07	9	70	90	14	30	18	14
140	125	5"	9.8	78	115	56	323	112	191	F-07	9	70	90	14	30	18	14
160	150	6"	12.0	98	143	56	358	122	203	F-07	9	70	90	15	33	22	17
225	200	8"	18.0	157	194	60	423	149	245	F-07	9	70	90	15	33	22	17
280	250	10"	32.0	209	243	68	521	203	275	F-10	12	102	125	17	47	28	22
315	300	12"	48.0	301	293	78	559	241	315	F-10	12	102	125	17	47	28	22

Type 039			Butterfly valve[1]							Actuation flange[2]					Shaft end[3]		
d (mm)	DN (mm)	inch (inch)	(kg)	(Nm)	Q (mm)	L (mm)	H (mm)	H1 (mm)	H2 (mm)	Type	d1 (mm)	d2 (mm)	d3 (mm)	H3 (mm)	H4 (mm)	d4 (mm)	ΦS (mm)
63	50	2"	3.3	24	32	43	219	53	140	F-07	9	70	90	13	26	14	11
75	65	2 ½"	4.0	30	51	46	241	63	152	F-07	9	70	90	13	26	14	11
90	80	3"	4.3	39	69	46	256	71	159	F-07	9	70	90	13	26	14	11
110	100	4"	5.7	59	89	52	295	87	178	F-07	9	70	90	16	30	18	14
140	125	5"	7.4	78	115	56	323	102	191	F-07	9	70	90	16	30	18	14
160	150	6"	8.9	98	143	56	358	122	203	F-07	9	70	90	17	33	22	17
225	200	8"	13.5	157	194	60	423	149	241	F-07	9	70	90	17	33	22	17
280	250	10"	22.8	209	243	68	521	201	273	F-10	12	102	125	17	47	28	22
315	300	12"	31.7	301	293	78	559	231	311	F-10	12	102	125	17	47	28	22
355	350	14"	43.2	900	332	78	653	291	307	F-12	13	125	150	22	55	36	
400	400	16"	65.2	1'200	382	102	732	325	342	F-14	17	140	175	24	65	42	
450	450	18"	84.5	1'650	432	113	809	357	387	F-14	17	140	175	27	65	48	
500	500	20"	119.0	2'300	478	126	871	381	425	F-14	17	140	175	27	65	48	
630	600	24"	281.0	4'100	585	146	1'130	488	532	F-25	18	254	300	40	110	72	
700	700	28"	414.0	5'500	683	175	1'189	506	573	F-25	18	254	300	40	110	72	
800	800	32"	572.0	8'100	755	215	1'338	578	650	F-25	18	254	300	40	110	72	
900	900	36"	639.0	10'000	852	246	1'460	643	707	F-25	18	254	300	40	110	98	
1'000	1'000	40"	918.0	13'500	958	280	1'594	729	755	F-25	18	254	300	40	110	98	
1'200	1'200	48"	1'760.0	16'500	1'098	360	1'885	855	900	F-30	22	298	350	50	130	120	

[1] Butterfly valve: kg = net weight
Nm = closing torque
Q = disc outlet diameter
L = mounting length

[2] Actuation flange:
AL = number of holes (4)

[3] Shaft end: DN50 – DN300: square end
DN350 – DN1200: key way
Butterfly Valve type 039
with manual override

Tightening torque for installing the butterfly valve

DN (mm)	Inch (inch)	Max. closing torque	
		(Nm)	(lb-ft)
50	2"	30	22
65	2 ½"	35	26
80	3"	40	30
100	4"	45	33
125	5"	50	37
150	6"	60	44
200	8"	75	55
250	10"	75	55
300	12"	80	59

Accessories

- Lever with fine adjustment
- Mechanical limit switch box

Butterfly Valve type 038E/039E



Type 038E
Wafer or lug style with electric valve EA or smart electric valve dEA



Type 039E
Wafer style with electric valve EA or smart electric valve dEA

Product description

The butterfly Valve types 038E and 039E consists of the basic valve body with the electric actuator EA or the smart electric valve dEA.

The metal butterfly Valve types 038E and 039E can be used universally as open/close or control valves. The easy installation of the valve between pipe flanges ensures reliable operation and sealing. The Rilsan-coating of the valve body and the ductile iron valve disk provide a high resistance against corrosion. The butterfly valves are also available in a standard version with a stainless steel valve disk.

Function

Butterfly valves of types 038E and 039E are intended for shutting off, conveying and dosing media in the allowable pressure and temperature range or for controlling flow in piping systems into which they have been installed

Applications

- Water treatment
- Chemical process industry
- Cooling water facilities
- Power plant
- Shipbuilding

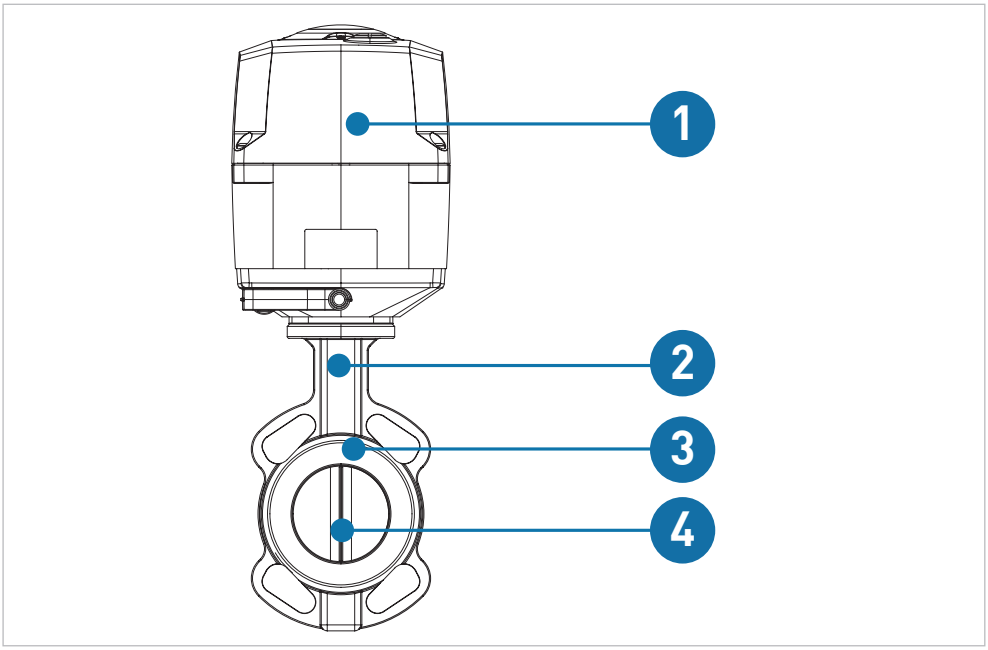
Benefits/features

- Good flow characteristics
- Simple installation
- Ductile cast iron Rilsan/epoxy-coated
- Reliable automatic open/close and control valves
- Lasting high temperature and pressure resistance
- Low maintenance costs and high cost efficiency
- KTW / DVGW / WRAS certification

Flow media

Not recommended for media containing solids

Technical data



1 Electric actuator EA or dEA
2 Outside housing
3 Flange seal
4 Disc

Specification			
Dimensions	Type 038E wafer style or lug style installation	DN50 – DN600, 2" – 24"	
	Type 039E wafer style installation	DN50 – DN1200, 2" – 48"	
Base type	Type 038		
	Type 039		
Materials	Disc	Ductile cast iron Rilsan/epoxy-coated	
		Stainless steel	
		Aluminum bronze	
	Outside housing	Ductile cast iron	
Gasket materials	EPDM, FKM, others upon request		
Pressure levels	Type 038E, 039E	PN4/6/10	
Actuator type	Type 038E wafer style or lug style installation	EA45/120/250	
	Type 039E wafer style installation	EA45/120/250, Auma	
Connections	Flange connections	EN1092-1	PN10/PN16
		DIN2501	PN10/PN16
		ANSI B16.5	Class 150
	Valve flange	ISO/DIN, BS, ASTM	
Standards	Type 038E	ISO/DIN, ASTM	
	Type 039E	All standards	
Approvals	KTW, DVGW, ACS, WRAS		

Kv 100 values

Nominal diameter DN		Opening angle (m^3/h)							
(mm)	(inch)	20°	30°	40°	50°	60°	70°	80°	90°
50	2"	7	16	26	43	69	110	170	190
65	2 ½"	9	22	38	60	95	155	250	280
80	3"	14	33	57	95	150	240	370	430
100	4"	24	54	95	155	240	400	620	710
125	5"	38	86	155	240	390	640	950	1'100
150	6"	52	120	220	345	550	950	1'400	1'600
200	8"	95	220	345	600	950	1'600	2'400	2'800
250	10"	155	345	610	950	1'600	2'600	4'000	4'700
300	12"	220	510	860	1'500	2'300	3'800	5'900	6'900
350	14"	290	660	1'200	1'900	2'900	4'800	7'800	8'600
400	16"	380	860	1'600	2'400	3'900	6'400	9'500	11'200
450	18"	490	1'100	2'000	3'100	5'000	8'300	12'900	15'500
500	20"	610	1'400	2'500	4'000	6'200	10'300	15'500	19'000
600	24"	860	2'000	3'400	5'500	8'600	14'700	22'400	25'900
650	26"	980	2'300	4'000	6'100	10'400	16'650	25'850	31'500
700	28"	1'100	2'600	4'600	6'700	12'200	18'600	29'300	37'100
750	30"	1'300	3'100	5'200	8'500	13'800	22'400	34'500	40'500
800	32"	1'800	3'600	6'600	9'700	16'600	28'300	43'200	52'300
900	36"	2'200	4'500	7'800	12'900	19'800	32'800	51'700	60'300
1'000	40"	3'100	5'300	8'700	16'000	24'100	42'200	62'100	78'400
1'050	42"	3'400	5'900	9'600	17'700	26'600	46'600	68'400	86'200
1'100	44"	3'800	6'500	10'600	19'500	29'300	51'300	75'100	95'100
1'200	48"	4'500	7'800	12'700	23'300	35'200	61'500	90'700	114'400

Reference values for tightening torque of screws

Use of PVC-U flange adapters

DIN PN16 and PN10 standard								Required screws for type 039 wafer butterfly valve With PVC-U flange adaptors					Required screws for type 038 lug style butterfly valve With PVC-U flange adaptors		
		Butterfly valve		Flange (DIN-2632)				Studs		Nuts			Screws		
PN (bar)	DN (mm)	Inch (inch)	Housing width A	Flange thickness B	Hole distance øC	Number of holes N°	Outer ø øD	Length L	Thread M	Number N°	Thread M	Number N°	Length L	Thread M	Number N°
16	50	2"	43	18	125	4	165	150	M16	4	M16	8	50	M16	
16	65	2 ½"	46	18	145	4	185	155	M16	4	M16	8	55	M16	4
16	80	3"	46	20	160	8	200	155	M16	8	M16	16	55	M16	8
16	100	4"	52	20	180	8	220	165	M16	8	M16	16	60	M16	8
16	125	5"	56	22	210	8	250	180	M16	8	M16	16	65	M16	8
16	150	6"	56	22	240	8	285	190	M20	8	M20	16	70	M20	8
16	200	8"	60	24	295	12	340	220	M20	8	M20	16	80	M20	8
16	250	10"	68	26	355	12	405	230	M20	8	M20	16	90	M20	8
16	300	12"	78	28	410	12	460	255	M20	12	M20	16	100	M20	12
10	350	14"	78	30	470	16	520	275	M20	16	M20	32			
10	400	16"	102	32	525	16	580	310	M24	16	M24	32			

Use flanger adapter PP and PE100

DIN PN16 and PN10 standard								Required screws for type 039 Wafer butterfly flange with flange adapter PP and PE100					Required screws type 038 with flange adapter PP and PE 100		
		Butterfly valve	Flange (DIN-2632)					Studs		Nuts			Screws		
PN (bar)	DN (mm)	Inch (inch)	Housing width A	Flange thick-ness B	Hole spacing øC	Number of holes N°	Outer ø øD	Length L	Thread M	Number N°	Thread M	Number N°	Length L	Thread M	Number N°
16	50	2"	43	18	125	4	165	160	M16	4	M16	8	55	M16	4
16	65	2 ½"	46	18	145	4	185	165	M16	4	M16	8	60	M16	4
16	80	3"	46	20	160	8	200	170	M16	8	M16	16	60	M16	8
16	100	4"	52	20	180	8	220	175	M16	8	M16	16	65	M16	8
16	125	5"	56	22	210	8	250	200	M16	8	M16	16	80	M16	8
16	150	6"	56	22	240	8	285	210	M20	8	M20	16	80	M20	8
16	200	8"	60	24	295	12	340	230	M20	8	M20	16	90	M20	8
16	250	10"	68	26	355	12	405	250	M20	8	M20	16	100	M20	8
16	300	12"	78	28	410	12	460	270	M20	12	M20	16	110	M20	12
10	350	14"	78	30	470	16	520	340	M20	16	M20	32			
10	400	16"	102	32	525	16	580	380	M24	16	M24	32			
10	500	20"	126	34	650	20	715	470	M24	20	M24	40			
10	600	24"	146	36	770	20	840	420	M27	20	M27	40			

Technical basics

Valve handling

Differentiation between and use of respective types

- Use butterfly Valve type 039E only as a wafer style valve
- Use butterfly Valve type 038E as either a wafer style or a lug style valve

Installation notes

- Make sure that the butterfly valves to be installed correspond specifically to the pressure rating, type of connection, dimension and materials of the particular application.
- Perform a function test. To do this, close and re-open the butterfly valve.
- Only install butterfly valves that function without trouble.

Maintenance notes

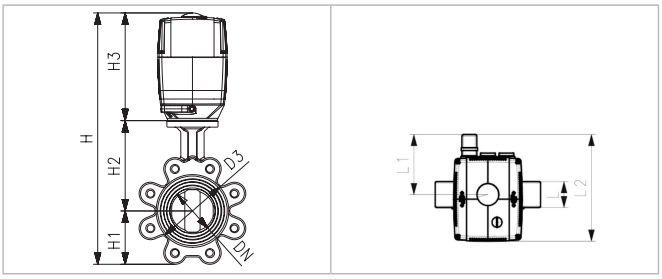
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- We recommend operating butterfly valves that are kept permanently in the same position 1 – 2 times per year to check their functionality.
- Depending on the operating conditions, the collars should be lubricated periodically with grease (silicone-based grease).

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

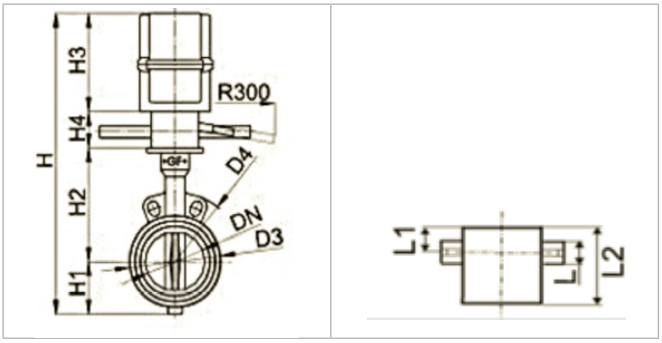
Butterfly Valve type 038E



d (mm)	DN (mm)	Inch (inch)	PN (bar)	kv value(Δp=1bar) (l/min)	Cv value (Δp=1psi) (US gal)/min)
63	50	2	10	3'140	220
75	65	2 ½	10	4'570	320
90	80	3	10	7'140	500
110	100	4	10	11'710	820
140	125	5	10	18'570	1'300
160	150	6	10	27'130	1'900
225	200	8	10	47'130	3'300
280	250	10	6	77'110	5'400
315	300	12	4	114'240	8'000

d (mm)	DN (mm)	inch (inch)	Actuator type	D3 (mm)	L (mm)	L1 (mm)	l2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)
63	50	2	EA45	65	43	28	122	393	63	140	190
75	65	2 ½	EA120	114	46	28	122	415	73	152	190
90	80	3	EA120	131	46	28	122	430	81	159	190
110	100	4	EA120	152	52	60	220	333	97	178	58
140	125	5	EA120	182	56	60	220	361	112	191	58
160	150	6	EA250	209	56	60	220	383	122	203	58
225	200	8	EA250	262	60	60	220	452	149	245	58
280	250	10	EA250	331	68	70	220	545	203	275	67
315	300	12	EA250	380	78	70	220	623	241	315	67

Butterfly Valve type 039E with manual override

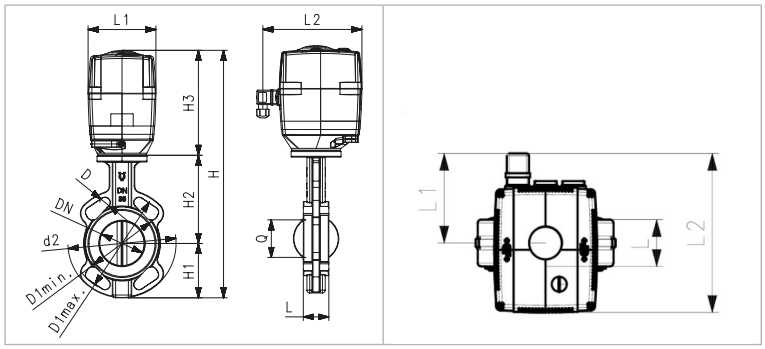


d (mm)	DN (mm)	Inch (inch)	PN (bar)	kv value (Δp=1bar) (l/min)	Cv value (Δp=1psi) (US gal/min)	Q
63	50	2	10	3'167	837	32
75	65	2 ½	10	4'667	1'233	51
90	80	3	10	7'167	1'893	69
110	100	4	10	11'834	3'126	89
140	125	5	10	18'334	4'844	115
160	150	6	10	26'667	7'045	143
225	200	8	10	46'668	12'330	194
280	250	10	6	78'335	20'696	243
315	300	12	4	115'002	30'384	293

d (mm)	DN (mm)	Inch (inch)	Actuator type	D3 (mm)	D4 (mm)	L (mm)	L1 (mm)	l2 (mm)
63	50	2	EA45	96	165	43	64	181
75	65	2 ½	EA120	114	185	46	28	181
90	80	3	EA120	131	190	46	28	181
110	100	4	EA250	152	229	52	28	181
140	125	5	EA250	182	254	56	60	220
160	150	6	EA250	209	285	56	60	220
225	200	8	EA250	262	343	60	60	220
280	250	10	EA250	323	333	68	70	220
315	300	12	EA250	373	353	78	70	220

d (mm)	DN (mm)	Inch (inch)	Actuator type	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
63	50	2	EA45	352	53	140	159	60
75	65	2 ½	EA120	374	63	152	159	60
90	80	3	EA120	389	71	159	159	60
110	100	4	EA250	415	87	178	149	60
140	125	5	EA250	443	102	191	149	60
160	150	6	EA250	475	122	203	149	60
225	200	8	EA250	540	149	241	149	60

Butterfly Valve type 039E without manual override



d (mm)	DN (mm)	inch (inch)	PN (bar)	kv-Wert (Δp=1bar) (l/min)	Cv Wert (Δp=1psi) (US gal/min)	Q
63	50	2	10	3'140	837	32
75	65	2 ½	10	4'570	1'233	51
90	80	3	10	7'140	1'893	69
110	100	4	10	11'710	3'126	89
140	125	5	10	18'570	4'844	115
160	150	6	10	27'130	7'045	143
225	200	8	10	47'130	12'330	194
280	250	10	6	77'110	20'696	243
315	300	12	4	114'240	30'384	293
355	350	14	4	143'360		332
400	400	16	4	186'700		382
450	450	18	4	258'390		432
500	500	20	4	316'730		478
630	600	24	4	431'750		585
700	700	28	4	618'333		683
800	800	32	4	675'000		755
900	900	36	4	1'005'200		852
1'000	1'000	40	4	1'306'930		958
1'200	1'200	48	4	1'907'050		958

d (mm)	DN (mm)	inch (inch)	Actuator type	D3 (mm)	D4 (mm)	L (mm)	L1 (mm)	l2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)
63	50	2	EA45	96	165	43	64	181	352	53	140	159
75	65	2 ½	EA120	114	185	46	28	181	374	63	152	159
90	80	3	EA120	131	190	46	28	181	389	71	159	159
110	100	4	EA250	152	229	52	28	181	415	87	178	149
140	125	5	EA250	182	254	56	60	220	443	102	191	149
160	150	6	EA250	209	285	56	60	220	475	122	203	149
225	200	8	EA250	262	343	60	60	220	540	149	241	149
280	250	10	EA250	323	333	68	70	220	671	201	273	197
315	300	12	EA250	373	353	78	70	220	739	231	311	197
355	350	14	GS80	442	460	78		130	905	291	307	307
400	400	16	GS80	493	515	102		154	974	325	342	307
450	450	18	GS100	544	565	113		182	1'065	357	387	321
500	500	20	GS125	601	620	126		182	1'127	381	425	321
630	600	24	GS125	695	725	146		286	1'350	488	532	330
700	700	28	GS125	798	840	175		286	1'409	506	573	330
800	800	32	GS160	908	950	215		286	1'541	578	650	313
900	900	36	GS160	1'004	1'050	246		370	1'673	643	707	323
1'000	1'000	40	GS160	1'114	1'160	280		370	1'807	729	755	323
1'200	1'200	48	GS200	1'330	1'380	360		1'133	2'103	855	900	348

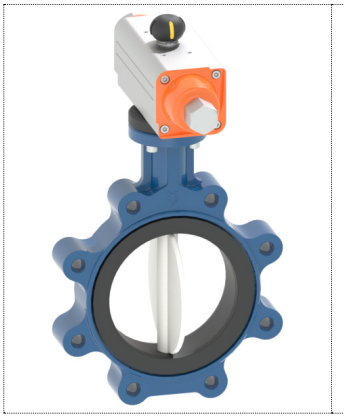
More dimensions are available in the product range of butterfly Valve types 038 and 039 at www.gfps.com

Accessories

- Limit switch boxes

For further information on accessories, refer to the online product catalog at www.gfps.com

Butterfly Valve type 038P/039P



Type 038P
Wafer or lug style



Type 039P
Wafer style installation

Product description

Metal butterfly valves are ideal for shutting off and controlling the flow of liquid media in pipelines. They possess high temperature and pressure resistance.

Function

The metal butterfly Valve types 038P and 039P can be used universally as open/close or control valves. The easy installation of the valve between pipe flanges guarantees reliable operation and sealing. The Rilsan-coating of the valve body and the ductile iron valve disk provide a high resistance against corrosion. The butterfly valves are also available in a standard version with a stainless steel valve disk.

Applications

- Water treatment
- Chemical process industry
- Cooling water facilities
- Power plant
- Shipbuilding

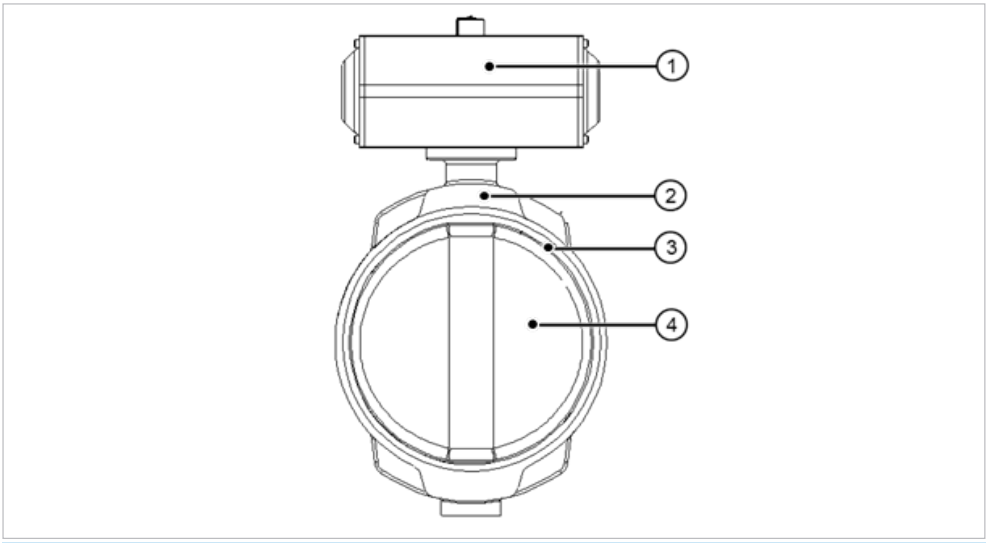
Benefits/features

- Good flow characteristics
- Rilsan/epoxy-coating: good chemical resistance
- Easy installation
- Reliable automatic open/close and control valves
- Lasting high temperature and pressure resistance
- Low maintenance costs and high cost efficient
- KTW / DVGW / WRAS certification

Flow media

Not recommended for media containing solids

Technical data



1 Pneumatic actuator
2 Outside housing
3 Flange seal
4 Disc

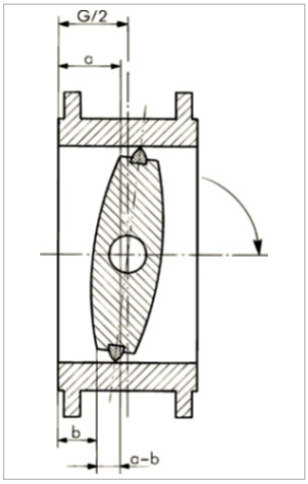
Specification			
Dimensions	Type 038P wafer style or lug style installation	DN50 – DN300, 2" – 12"	
	Type 039P wafer style installation	DN50 – DN1200, 2" – 48"	
Base type	Type 038		
	Type 039		
Materials	Disc	Ductile cast iron Rilsan/epoxy-coated	
		Stainless steel	
		Aluminum bronze	
	Outside housing	Ductile cast iron	
Gasket materials	EPDM, FKM, others upon request		
Pressure levels	Type 038P, 039P	PN10/16	
Actuator type	Type 038P	PA30 – PA90	
	Type 039P	PA30 – PA90	
Connections	Flange connections	EN1092-1	PN10/PN16
		DIN2501	PN10/PN16
		ANSI B16.5	Class 150
	Valve flange	ISO/DIN, BS, ASTM	
Standards	Type 038P	ISO/DIN, ASTM	
	Type 039EP	All standards	
Approvals	KTW, DVGW, ACS, WRAS		

Technical basics

Setting the "Closed" position when setting up actuators for DN50 – DN300

When the butterfly valve is in the CLOSED position, the valve disc is not perfectly perpendicular to the pipe axis. The table below shows the deflection.

DN (mm)	d (mm)	b (mm)
50	63	16
65	75	16
80	90	16
100	110	18
125	140	17
150	160	17
200	225	17
250	280	15
300	315	15



Valve handling

Differentiation between and use of respective types

- Use butterfly Valve type 039P only as a wafer style valve
- Use butterfly Valve type 038P as either a wafer style or a lug style valve

Installation notes

- Make sure that the butterfly valves to be installed correspond specifically to the pressure rating, type of connection, dimension and materials of the particular application.
- Perform a function test. To do this, close and re-open the butterfly valve.
- Only install butterfly valves that function without trouble.

Pneumatic actuator PA30 – PA90

- Actuators without spring accumulator remain in the current position in case of a loss of the control pressure.
- Actuators with spring accumulator go into safety position, in case of failure or after switching off the control pressure, depending on the version of the actuator.
- The actuator is not intended for uses other than those stated here. Failure to observe the instructions contained in this manual will void the manufacturer's liability for the products mentioned above.

Maintenance notes

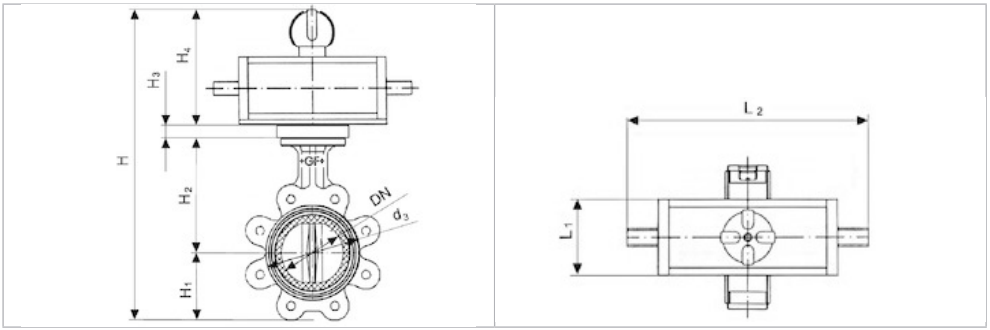
In normal operation, butterfly valves do not require maintenance. It is nonetheless recommended to perform maintenance on butterfly valves after 5,000 actuation cycles at most. The following steps must be taken when doing so:

- Regularly check that no medium escapes to the outside. If medium exits from the flange connections, tighten them.
- We recommend operating butterfly valves that are kept permanently in the same position 1 – 2 times per year to check their functionality.
- Depending on the operating conditions, the collars should be lubricated periodically with grease (silicon-base grease).

⚠ Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

Type 038P



d (mm)	DN (mm)	Inch (inch)	PN (bar)	kv value opening value 90° (Δp=1bar) (l/min)	Cv value opening value 90° (Δp=1psi) (US gal/min)
65	50	2	10	3'167	837
75	65	2 ½	10	4'667	1'233
90	80	3	10	7'167	1'893
110	100	4	10	11'834	3'126
140	125	5	10	18'334	4'844
160	150	6	10	26'667	7'045
225	200	8	10	46'668	12'330
280	250	10	6	78'335	20'696
315	300	12	4	115'002	30'384

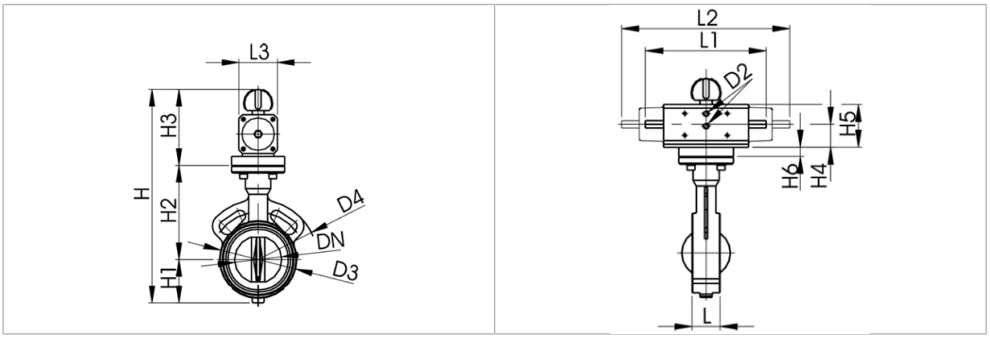
Single-acting FC/FO

d (mm)	Actuator type	d3 (mm)	L1 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
65	PA30	95	70.4	274.4	313.2	63	140	12	98.2
75	PA30	114	70.4	274.4	335.2	73	152	12	98.2
90	PA35	131	83.3	325.2	366.1	81	159	15	111.1
110	PA40	152	87	359.5	404.8	97	178	15	114.8
140	PA45	182	107.5	418	467.5	112	191	15	149.5
160	PA50	209	111.1	433.9	493.1	122	203	15	153.1
225	PA60	262	134.9	547.3	582.9	149	245	12	176.9
280	PA60	331	134.9	547.3	679.9	203	275	25	176.9
315	PA70	380	168	681	789.1	241	315	23	210.1

Double-acting DA

d (mm)	Actuator type	d3 (mm)	L1 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
65	PA35	95	64.5	196.1	313.3	63	140	18	92.3
75	PA35	114	64.5	196.1	335.3	73	152	18	92.3
90	PA35	131	64.5	196.1	350.3	81	159	18	92.3
110	PA45	152	83.3	242	401.1	97	178	15	111.1
140	PA45	182	83.3	242	429.1	112	191	15	111.1
160	PA55	209	107.5	290.2	489.5	122	203	15	149.5
225	PA60	262	111.1	313.9	562.1	149	245	15	153.1
280	PA65	331	118	339.6	663	203	275	25	160
315	PA70	380	134.9	382.5	757.9	241	315	25	176.9

Type 039P



d (mm)	DN (mm)	Inch (inch)	L (mm)	H1 (mm)	H2 (mm)	Q (mm)	D3 (mm)	D4 (mm)	kv value opening value 90° (Δp=1bar) (l/min)	Cv value opening value 90° (Δp=1psi) (US gal/min)
65	50	2	43	83	140	32	102	165	3'167	219.45
75	65	2 ½	46	93	152	51	122	185	4'667	323.4
90	80	3	46	98	159	69	139	190	7'167	496.65
110	100	4	52	111	178	89	159	229	11'834	820.05
140	125	5	56	127	191	115	189	254	18'334	1'270.5
160	150	6	56	143	203	143	214	285	26'667	1'848
225	200	8	60	172	241	194	269	343	46'668	3'234
280	250	10	68	204	275	243	331	333	78'335	5'428.5
315	300	12	78	242	315	293	380	353	115'002	7'969.5
355	350	14	78	291	307	332	460	442	143'336	9'933
400	400	16	102	325	342	382	515	493	186'670	12'936
450	450	18	113	357	387	432	565	544	258'339	17'902.5
500	500	20	126	381	425	478	620	601	316'673	21'945
630	600	24	146	488	532	585	725	695	431'675	29'914.5
700	700	28	175	506	573	683	840	798	618'346	42'850.5
800	800	32	215	578	650	755	950	908	871'684	60'406.5
900	900	36	246	643	707	852	1'050	1004	1'005'020	59'713.5
1'000	1'000	40	280	729	755	958	1'160	1114	1'306'693	90'552
1'200	1'200	48	360	855	900	1'098	1'380	1330	1'906'705	132'132

Single-acting FC/FO

d (mm)	DN (mm)	Inch (inch)	Actuator type	L2 (mm)	L3 (mm)	H (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	D2 (mm)
65	50	2	PA30	274.4	70.4	333.2	110.2	35.2	70.4	12	1/8"
75	65	2 ½	PA30	274.4	70.4	355.2	110.2	35.2	70.4	12	1/8"
90	80	3	PA35	325.2	83.3	383.1	126.1	42	83.3	15	1/8"
110	100	4	PA40	359.5	87	418.8	129.8	43.5	87	15	1/8"
140	125	5	PA45	418	107.5	482.5	164.5	54	107.5	15	1/8"
160	150	6	PA50	433.9	111.4	514.1	168.1	55.5	111.1	15	1/8"
225	200	8	PA60	547.3	134.9	601.9	188.9	67	134.9	12	1/8"
280	250	10	PA60	547.3	134.9	680.9	201.9	67	134.9	25	1/8"
315	300	12	PA70	681	168	790.1	233.1	84	168	23	¼"
355	350	14	*	590	200	980	382				
400	400	16	*	684	350	1'047	380				
450	450	18	*	722	281	1'094	350				
500	500	20	*	860	349	1'238	432				
630	600	24	*	918	450	1'530	540				
700	700	28	*	1'550	640	1'779	700				
800	800	32	*	1'550	640	1'928	700				
900	900	36	*	1'550	640	2'050	700				
1'000	1'000	40	*	1'550	640	2'184	700				
1'200	1'200	48	*	2'070	850	2'630	875				

* On request, depending on application

Double-acting DA

d (mm)	DN (mm)	inch (inch)	Actuator type	L1 (mm)	L3 (mm)	H (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	D2 (mm)
65	50	2	PA35	196.1	64.5	333.3	110.3	32.3	64.5	18	1/8"
75	65	2 ½	PA35	196.1	64.5	355.3	110.3	32.3	64.5	18	1/8"
90	80	3	PA35	196.1	64.5	367.3	110.3	32.3	64.5	18	1/8"
110	100	4	PA45	242	83.3	415.1	126.1	41.7	83.3	15	1/8"
140	125	5	PA45	242	83.3	444.1	126.1	41.7	83.3	15	1/8"
160	150	6	PA55	290.2	87	510.5	164.5	53.75	107.5	15	1/8"
225	200	8	PA60	313.9	111.1	581.1	168.1	55.6	111.1	15	1/8"
280	250	10	PA65	339.6	118	664	185	59	118	25	1/8"
315	300	12	PA70	382.5	134.9	758.9	201.9	67.5	134.9	25	¼"
355	350	14	*	575	220	888	290				
400	400	16	*	575	220	957	290				
450	450	18	*	684	350	1'124	380				
500	500	20	*	684	350	1'186	380				
630	630	24	*	8680	349	1'452	432				
700	700	28	*	860	349	1'511	432				
800	800	32	*	918	450	1'738	510				
900	900	36	*	1'550	640	2'050	700				
1'000	1'000	40	*	1'550	640	2'184	700				
1'200	1'200	48	*	1'550	640	2'455	700				

* On request, depending on application

Butterfly Valve type 044



Type 044 with hand lever Wafer style valve	**Type 044** with manual gear Wafer style valve	**Type 044** with pneumatic actuator FC/FO Wafer style valve	**Type 044** with pneumatic actuator DA Wafer style valve

Product description

The butterfly valve type 044 is a high performance butterfly valve which is particularly suitable for applications in the chemical industry due to the materials used.

- Isostatically molded seat liner made of PTFE in 3 mm wall thickness.
- The valve disc and shaft are made out of one single piece of stainless steel micro investment casting.
- The disc is injection molded with a 3mm thick mechanically anchored PFA layer.
- The shape of the valve disc achieves optimum Kv or Cv values, minimizing flow resistance and thus pressure loss.

Benefits/features

- Wafer Style
- 2-piece carbon steel body (ASTM 216 WCB)
- Installation length: EN 558 row 20
- Interface according to DIN EN ISO 5211
- From vacuum to 16 bar (depending on DN and temperature)
- Single-piece axis with square profile
- Intermediate flange DIN PN10, PN16 AND ASME B16.5 150 Lbs. (others on request)
- PTFE seat liner with silicone backing
- Disc 1.4542 stainless steel, in 3 mm thick PFA encapsulated
- Aluminum lever with 6 regulating position and padlock device

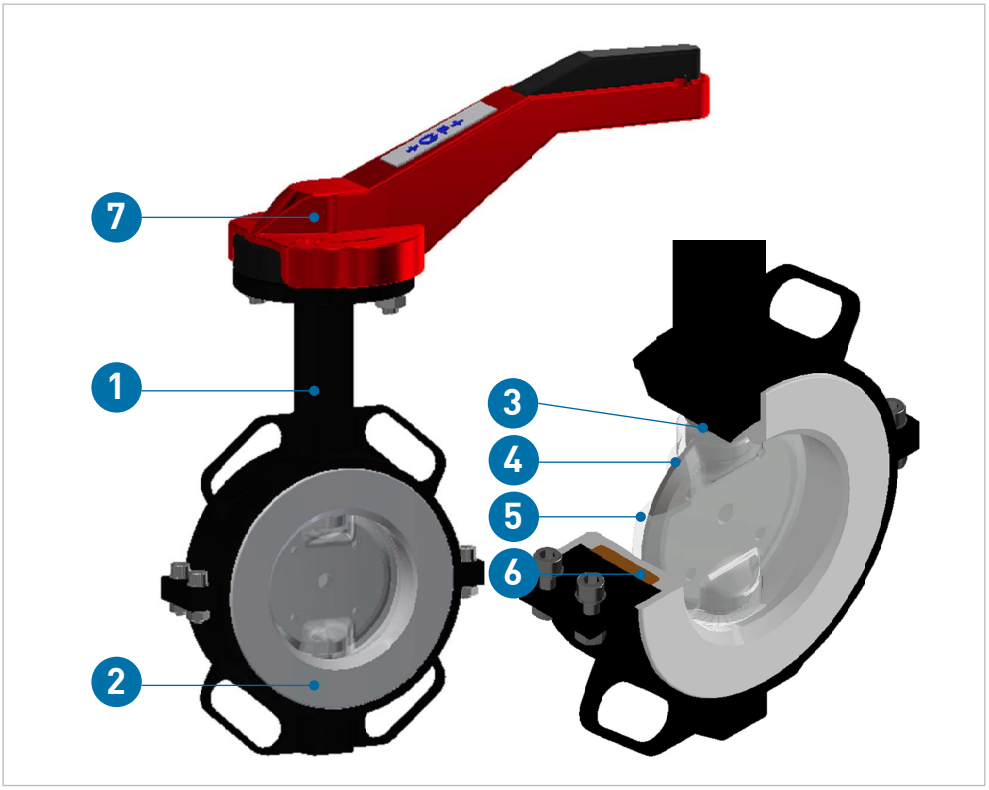
Flow media

- Especially suitable for liquid chemical and corrosive media (demineralized water, acids and solvents)
- Suitable for gaseous media such as exhaust gases, chlorine gas, hydrocarbon, oxygen and vacuum
- Suitable for abrasive and aggressive substances such as wet chlorine, sodium chloride, pigments, brine and sugar solutions
- Suitable for viscous media such as fats, oils, mash, sludge and cellulose mixtures

Applications

- Biotechnology
- Fertilizer Industry
- Semiconductor Industry
- cosmetics industry
- Food Industry
- Seawater desalination RO
- pharmaceutical industry
- Pigment processing systems
- Cleanroom applications
- Ultrapure water treatment

Technical data



1 Body
2 Seat liner
3 Shaft
4 Disc
5 Disc encapsulated
6 Backing
7 Hand lever

Specifications				
Dimensions			d63/DN50 – d315/DN300, 2“ – 12“	
Materials	Body	1	Ductile iron ASTM A395	
	Seat liner	2	PTFE® (wall thickness ≥ 3 mm)	
	Shaft	3	Stainless steel 1.4542	
	Disc	4 5	Stainless steel 1.4542, encapsulated with PFA® (wall thickness ≥ 3 mm)	
	Backing	6	Silicone	
	Lever	7	Die-cast aluminum	
Pressure ratings	DN50 – DN150		PN16	
	DN200 – DN300		PN10	
Interface			DIN EN ISO 5211	
Installation length			EN 558 row 20 or ISO 5752/20	
Actuation variants	Manually operated: Lever , reduction gear with handwheel			
	Pneumatically actuated: FC, FO and DA			
Connections	Flange connections		EN1092-1	PN10/16
			DIN2501	PN10/16
			ANSI B16.5	Class 150
	Valve flange		ISO/DIN, BS, ASTM	
Standards	ISO/DIN			
Product standard	EN 593			
Test standard	ISO 5208 (leackage rate A)			
Approvals	FDA			

Kv100 values (flow characteristics)

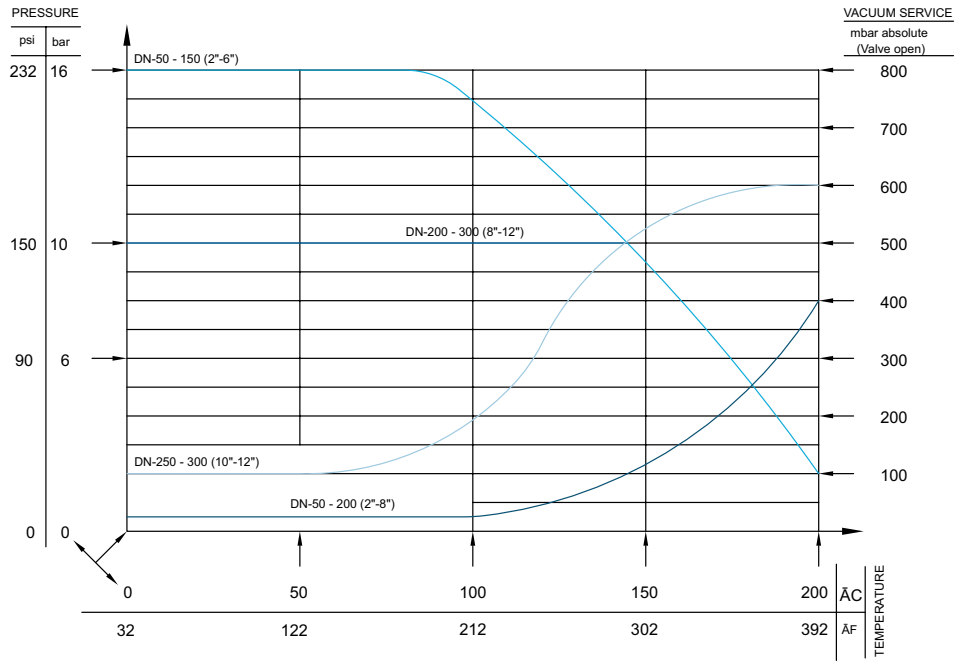
Nominal diameter DN		Opening angle (m^3/h)							
(mm)	(inch)	20°	30°	40°	50°	60°	70°	80°	90°
50	2"	7	16	26	43	69	110	170	190
65	2 ½"	9	22	38	60	95	155	250	280
80	3"	14	33	57	95	150	240	370	430
100	4"	24	54	95	155	240	400	620	710
125	5"	38	86	155	240	390	640	950	1'100
150	6"	52	120	220	345	550	950	1'400	1'600
200	8"	95	220	345	600	950	1'600	2'400	2'800
250	10"	155	345	610	950	1'600	2'600	4'000	4'700
300	12"	220	510	860	1'500	2'300	3'800	5'900	6'900

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

Type 044 (DN50 – DN300)

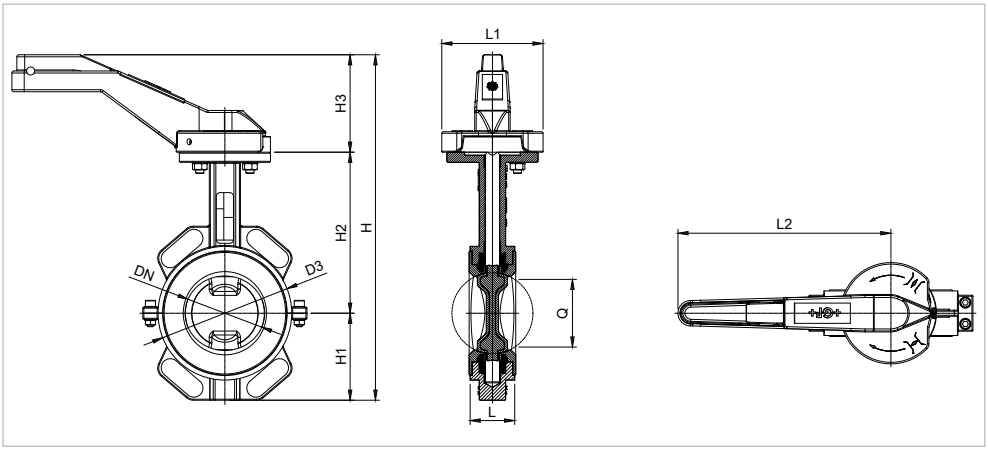


Reference values for tightening torque of screws

DN (mm)	d (mm)	DN (inch)	Total number of screws	Tightening torque	
				Nm	Lbs-Inch
50	63	2"	4 x M16 x 120mm	109	965
65	75	2 ½"	4 x M16 x 125mm	109	965
80	90	3"	8 x M16 x 130mm	109	965
100	110	4"	8 x M16 x 135mm	109	965
125	140	5"	8 x M16 x 140mm	109	965
150	160	6"	8 x M20 x 150mm	212	1'876
200	225	8"	8 x M20 x 160mm	212	1'876
250	280	10"	12 x M20 x 170mm	212	1'876
300	315	12"	12 x M20 x 180mm	212	1'876

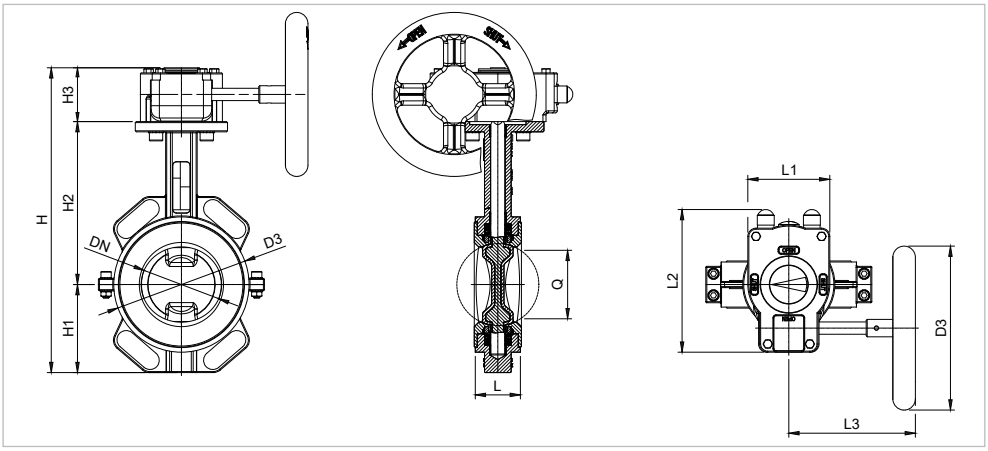
Dimensions

Butterfly Valve type 044 with hand lever DN50 – DN150



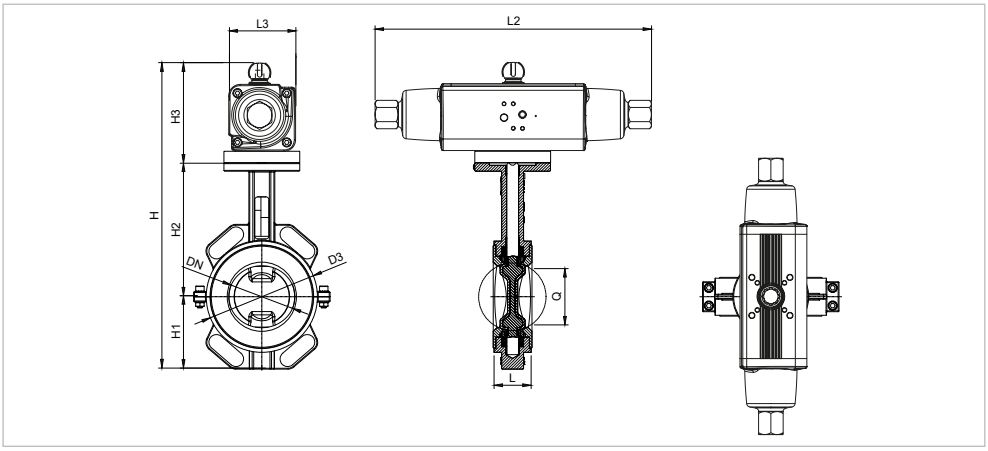
DN (mm)	d (mm)	DN (inch)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L2 (mm)	Q (mm)	Weight (kg)
50	63	2"	95	287	57	135	95	43	220	27.4	3.5
65	75	2 ½"	114	303	63	145	95	46	220	46.6	4.2
80	90	3"	132	340	86	159	95	46	220	66.1	4.7
100	110	4"	152	374	105	175	95	52	220	85.5	5.9
125	140	5"	182	403	118	190	95	56	320	110.0	7.6
150	160	6"	207	430	132	203	95	56	320	140.3	8.8

Butterfly Valve type 044 with manual reduction gear DN50 – DN300



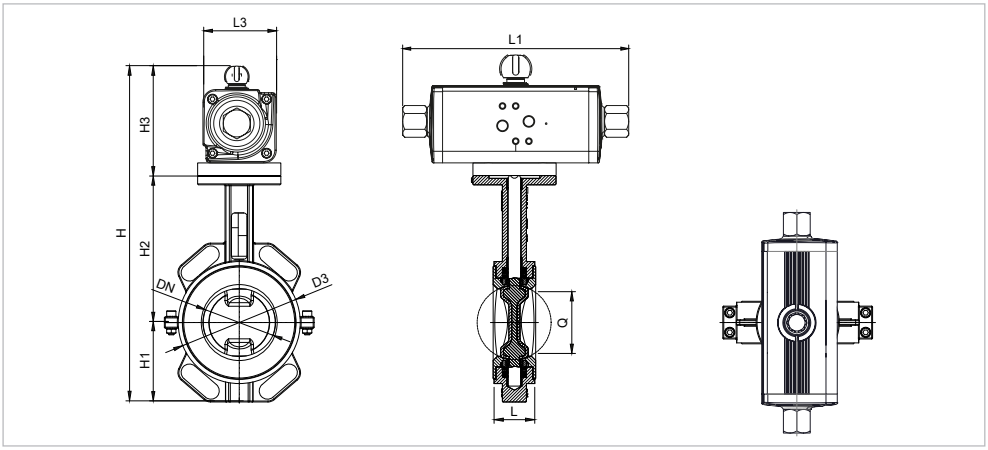
DN (mm)	d (mm)	DN (inch)	D3 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	Q (mm)	Weight (kg)
50	63	2"	95	140	250.3	57	135	58.3	43	88	145.5	38.5	107.3	27.4	3.3
65	75	2 ½"	114	140	266.3	63	145	58.3	46	88	145.5	38.5	107.3	46.6	4.0
80	90	3"	132	140	303.3	86	159	58.3	46	88	145.5	38.5	107.3	66.1	4.3
100	110	4"	152	140	337.3	104	175	58.3	52	88	145.5	38.5	107.3	85.5	5.7
125	140	5"	182	140	366.3	118	190	58.3	56	88	145.5	38.5	107.3	110.0	7.4
150	160	6"	207	140	393.3	132	206	58.3	56	88	145.5	38.5	107.3	140.3	8.9
200	225	8"	260	140	458.3	160	240	58.3	60	88	145.5	38.5	107.3	188.7	13.5
250	280	10"	327	250	534.6	198	275	62.6	68	102	212.0	52.0	130.0	237.5	22.8
300	315	12"	375	250	604.6	232	310	62.6	78	102	212.0	52.0	130.0	286.6	31.7

Butterfly Valve type 044 FC with pneumatic actuator DN50 – DN300



DN (mm)	d (mm)	DN (inch)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L2 (mm)	L3 (mm)	Q (mm)	Weight (kg)
50	63	2"	95	337	57	135	145	43	281	120	27.4	9.6
65	75	2 ½"	114	353	63	145	145	46	281	120	46.6	10.3
80	90	3"	132	390	86	159	145	46	281	120	66.1	10.8
100	110	4"	152	451	104	175	172	52	310	134	85.5	15.5
125	140	5"	182	480	118	190	172	56	310	134	110.0	17.1
150	160	6"	207	520	132	203	185	56	362	141	140.3	22.2
200	225	8"	260	585	160	240	185	60	362	141	188.7	26.7
250	280	10"	327	742	198	275	270	68	474	196	237.5	58.7
300	315	12"	375	832	232	310	290	78	575	220	286.6	84.0

Butterfly Valve type 044 DA with pneumatic actuator DN50 – DN300



DN (mm)	d (mm)	DN (inch)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L3 (mm)	Q (mm)	Weight (kg)
50	63	2"	95	312	57	135	120	43	281	120	27.4	9.6
65	75	2 ½"	114	328	63	145	120	46	281	120	46.6	10.3
80	90	3"	132	365	86	159	120	46	281	120	66.1	10.8
100	110	4"	152	409	104	175	130	52	310	134	85.5	15.5
125	140	5"	182	438	118	190	130	56	310	134	110.0	17.1
150	160	6"	207	480	132	203	145	56	362	141	140.3	22.2
200	225	8"	260	572	160	240	172	60	362	141	188.7	26.7
250	280	10"	327	657	198	275	185	68	474	196	237.5	58.7
300	315	12"	375	747	232	310	205	78	575	220	286.6	84.0

Accessories

Integrated electrical feedback (IER)

- Feedback unit in combination with actuators
- For both manual valve and manual gear

General technical data of the IER:

- Protection class with DIN connector (2): IP65
- Protection class with cable gland: IP67
- Ambient temperature: -10 °C to +50 °C

Assignment of IER to butterfly valves type 567/578 and 044:

Axis		Dimension
1	11 mm	DN50 – DN80
2	14 mm	DN100 – DN125
3	17 mm	DN150 – DN200
4	22 mm	DN250 – DN300

For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



Butterfly Valve type 065



Type 065
Standard for lug style and wafer style installation



Type 065
with hand lever



Type 065
with reduction gear

Product description

The type 065 Butterfly Valve can be used universally as a shut-off or control valve in high purity water treatment or water filtration applications. All valves are cleaned and manufactured for Ultrapure water service.

Benefits/features

- PTFE-lined
- PFA encapsulated one-piece disc
- ANSI 150 and PN10, PN16 bolt pattern
- Pressure ratings up to 16 bar
- Temperature ratings up to 200°C

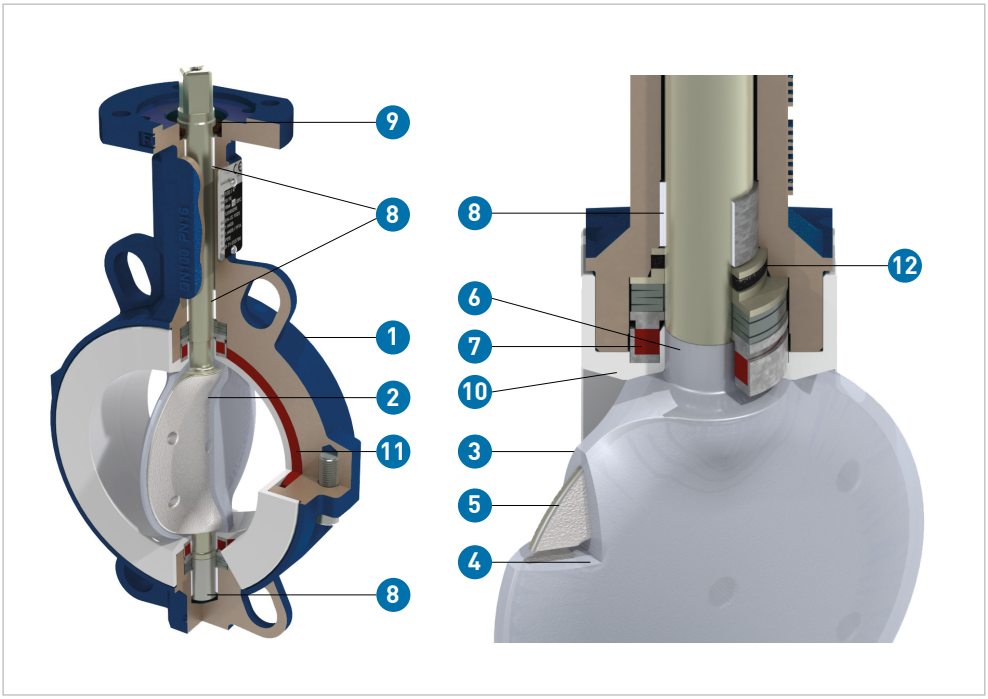
Flow media

- Ultrapure DI Water
- Hot Ultrapure DI Water

Applications

- Water
- Water Treatment Plants
- Power Generation
- Chemical Processing
- Oil & Gas
- Marine
- Life Science
- Mining/Slurry
- Bulk Handling
- Air Separation
- Steel Industry

Technical data



1 Two-piece body in ductile iron EN-JS 1025
2 One-piece, blow out proof disc/shaft
3 Disc encapsulated with a min. thickness of 3 mm
4 Disc encapsulation is mechanically locked with the core
5 Optimized disc profile to allow high kV flow rate
6 Encapsulated shaft sealing surface
7 Life loaded safety shaft sealing
8 Self-lubricating shaft bushings
9 Shaft sealed from environment
10 Chambered liner, to prevent radial cold-flow
11 Elastomeric backing
12 TA-Luft VDI 2440 / EN ISO 15848 packing optional

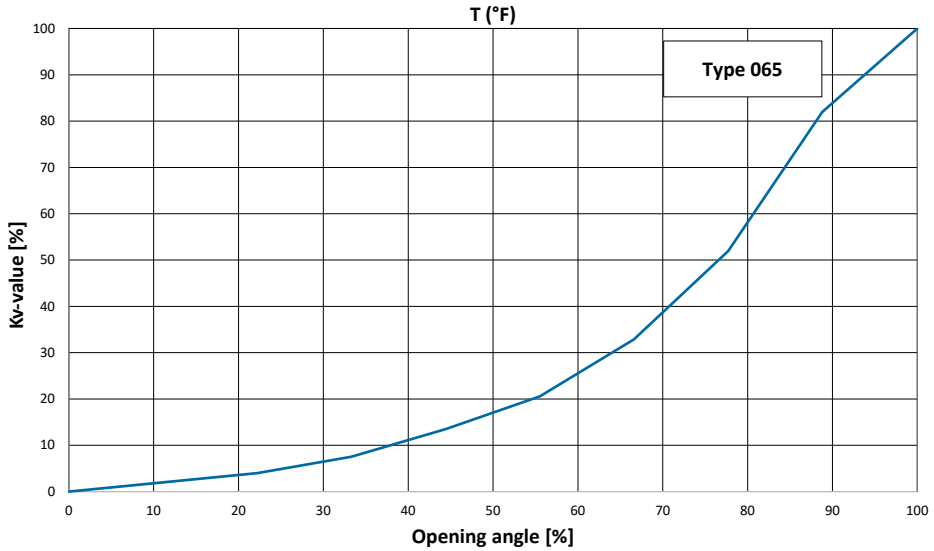
Specification			
Dimensions		d63/DN50 – d355/DN350, 2“ – 14“	
Materials	Body	Ductile iron EN-JS 1025 / ≈ ASTM A395 60-40-18, Epoxy coated 80 µm	
	Disc/shaft	dimensions 2“-12“	Stainless steel PFA overmoulded
		dimension 14“	Disc carbon steel PFA overmoulded, shaft stainless steel
	Collar	PTFE	
	Backing	FKM	
Pressure ratings	PN16	DN50-150, 2“ – 6“	
	PN10	DN200-300, 8“ – 12“	
	PN6	DN350, 14“	
Temperature range		-20°C to 200°C, -4°F to 392°F	
Connections	Flanges	ANSI cl. 150, PN10, PN16	
	Mounting Flanges	EN ISO 5211	
Actuation variants	Manually operated (hand lever or manual reduction gear)		
Special options	High purity: The valve is cleaned, assembled, tested and packaged under cleanroom conditions. US federal standard 209b, class 10000, ISO Class 7 (ISO 14644-1)		
Product standard	EN 593		
Test standard	ISO 5208 (leackage rate A)		
Approvals	FDA and EC 1935/2004, IEC 61508 / 61511, Safety Integrity Level SIL 3, Pressure Equipment Directive 2014/68/EU (PED) appendix 1 for fluids of the groups 1 and 2, EAC		

Kv 100 values (Flow characteristics)

DN (mm)	Inch (inch)	d (mm)	d (mm)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
50	2	63	63	134	155	8.04
65	2 ½	75	75	227	263	13.62
80	3	90	90	392	455	23.52
100	4	110	110	585	679	35.1
125	5	140	140	1'015	1'177	60.9
150	6	160	160	1'495	1'734	89.7
200	8	225	225	3'050	3'538	183
250	10	280	280	4'510	5'232	270.6
300	12	315	315	7'210	8'364	432.6
350	14	335	335	8'760	10'162	525.6

Flow characteristics

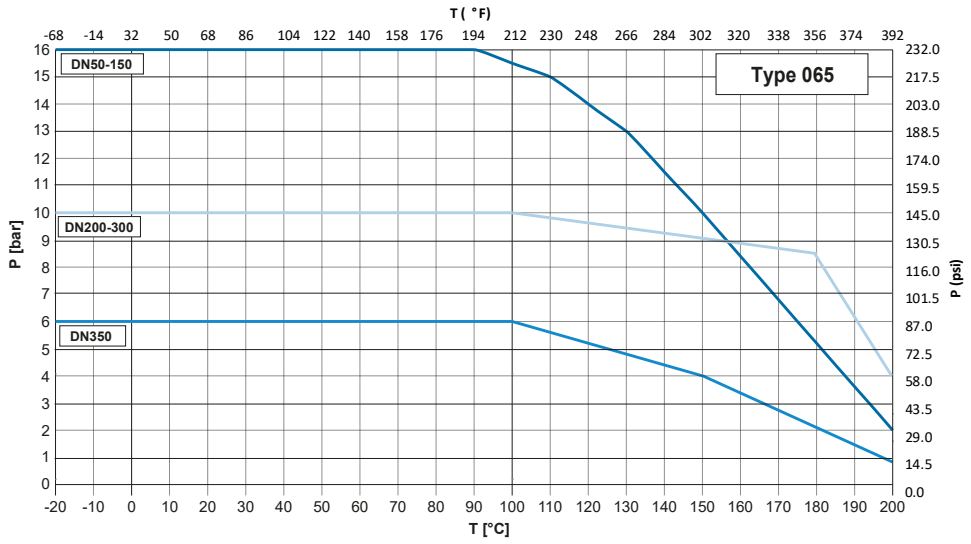
DN (mm)	Inch (inch)	d (mm)	20 (°)	30 (°)	40 (°)	50 (°)	60 (°)	70 (°)	80 (°)	90 (°)
50	2	63	5	11	24	42	64	92	118	134
65	2 ½	75	8	19	41	70	108	155	200	227
80	3	90	15	33	72	125	190	270	335	392
100	4	110	20	48	95	162	255	385	485	585
125	5	140	38	82	165	255	455	645	815	1'015
150	6	160	60	130	235	395	645	955	1'220	1'495
200	8	225	95	230	465	795	1'180	1'815	2'410	3'050
250	10	280	175	350	710	1'160	1'610	2'420	3'650	4'510
300	12	315	265	522	995	1'720	2'665	3'965	5'960	7'210
350	14	335	350	660	1'180	1'800	2'880	4'550	7'180	8'760



Pressure-temperature diagram

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

DN50 – DN350



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

Operating torque

DN (mm)	Inch (")	d (mm)	M (Nm)
50	2	63	25
65	2 ½	75	39
80	3	90	43
100	4	110	73
125	5	140	87
150	6	160	146
200	8	225	189
250	10	280	330
300	12	315	476
350	14	335	675

Depending on the operation conditions (e.g. control time, medium, temperature, etc.) the stated operating torque can increase up to 4 times.

Reference values for tightening torque of screws

Reference values for tightening torque of screws type 065 in ISO flange connections

DN (mm)	Inch (")	d (mm)	PN10		PN16	
			(Nm)	(Inch-lbs)	(Nm)	(Inch-lbs)
50	2	63	52	460	52	460
65	2 ½	75	52	460	52	460
80	3	90	32	285	32	285
100	4	110	45	396	45	396
125	5	140	55	483	55	483
150	6	160	90	794	90	794
200	8	225	112	993	75	662
250	10	280	116	1'028	139	1'234
300	12	315	137	1'209	164	1'451
350	14	335	142	1'255	170	1'506

Technical basics

Tips for installation

Use lug style valve as either a wafer style or a lug style valve.

Installation as a lugged valve

If a valve is installed as a lugged valve and pressure is applied to it, it must be closed with a blind flange (or blind cover and counterflange), in order to prevent personal injury or property damage in the event of leaks and/or impermissible opening.

Requirements for installation

Ensure that the following conditions are satisfied prior to installation:

- Make sure that the butterfly valves to be installed correspond specifically to the pressure rating, type of connection, dimension and materials of the particular application.
- Perform a function test. To do this, close and re-open the butterfly valve.
- Only install butterfly valves that function without problems.

Gaskets

There is no need to use gaskets between the flanges and the valve. However, where the valve has to be mounted between flanges which are uneven or slightly distorted, PTFE-envelope gaskets should be fitted.

Maintenance notes

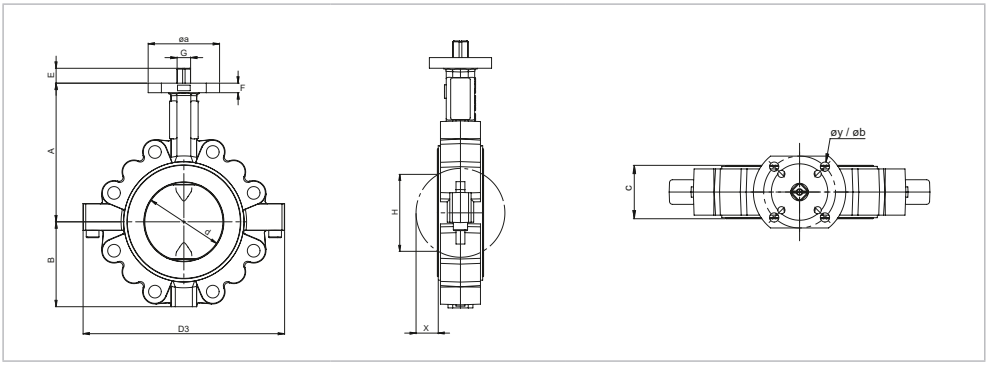
In normal operation, butterfly valves do not require maintenance. It is nonetheless recommended to perform maintenance on butterfly valves after 5,000 actuation cycles at most. The following steps must be taken when doing so:

- Regularly check that no medium escapes to the outside. If medium exits from the flange connections, tighten them.
- We recommend operating the butterfly valves that are kept permanently in the same position 1 or 2 x a year to check their functionality.

Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Dimensions

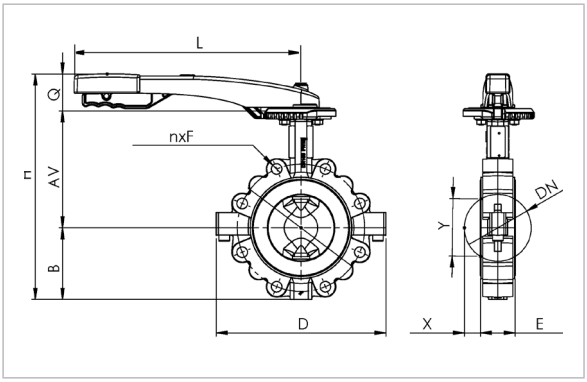
Butterfly Valve type 065 with open shaft end DN50 – DN350



DN (mm)	Inch (inch)	d_1 (mm)	d (mm)	A (mm)	B (mm)	C (mm)	H (mm)	X (mm)	D3 (mm)
50	2	63	50	134	68	43	26	9	162
65	2 ½	75	65	145	78	46	39	7	170
80	3	90	80	160	92	46	66	17	216
100	4	110	100	175	107	52	86	24	254
125	5	140	125	194	120	56	112	35	293
150	6	160	150	210	134	56	140	47	315
200	8	225	200	239	162	60	191	70	389
250	10	280	250	275	199	68	241	91	483
300	12	315	300	310	230	78	290	111	543
350	14	335	339	349	254	78	330	131	564

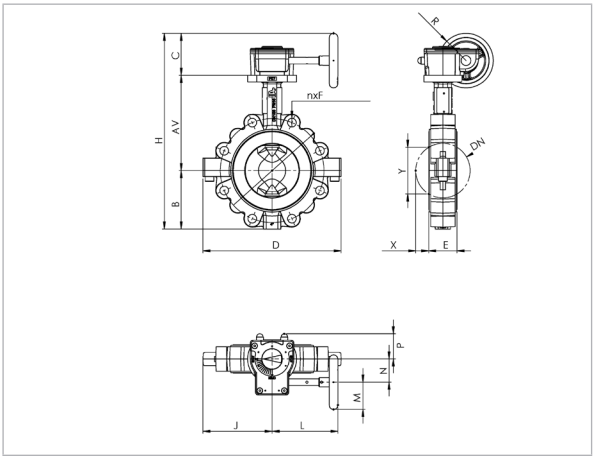
DN (mm)	Inch (inch)	d_1 (mm)	ISO	a (mm)	y (mm)	b (mm)	G (mm)	E (mm)	Weight (kg)
50	2	63	F05	65	4x7	50	◊ 11	12	3.2
65	2 ½	75	F05	65	4x7	50	◊ 11	12	4.1
80	3	90	F05	65	4x7	50	◊ 11	12	6.2
100	4	110	F05/07	90	4x7/9	50/70	◊ 14	16	9.3
125	5	140	F05/07	90	4x7/9	50/70	◊ 14	16	10.7
150	6	160	F07	90	4x9	70	◊ 17	19	12.9
200	8	225	F07/F10	125	4x9/11	70/102	◊ 17	19	22.3
250	10	280	F10	125	4x11	102	◊ 22	24	32.4
300	12	315	F10	125	4x11	102	◊ 22	24	46.9
350	14	335	F12	155	4x13.5	125	◊ 27	40	87

Butterfly Valve type 065 with hand lever DN50 – DN150



DN (mm)	Inch (inch)	d_1 (mm)	H (mm)	B (mm)	AV (mm)	Q (mm)	D (mm)	Y (mm)	X (mm)	E (mm)	L (mm)	Weight (kg)
50	2	63	245	68	138	56	162	26	9	43	210	3.6
80	3	90	295	92	164	56	216	66	17	46	210	6.6
100	4	110	325	107	179	66	254	86	24	52	340	9.8
150	6	160	395	134	214	66	315	140	47	56	340	13.4

Butterfly Valve type 065 with reduction gear DN50 – DN350



DN (mm)	Inch (inch)	d_1 (mm)	H (mm)	B (mm)	AV (mm)	C (mm)	D (mm)	Y (mm)	X (mm)	E (mm)	L (mm)	P (mm)	N (mm)	W (mm)	Weight (kg)
50	2	63	279	68	134	77	162	26	9	43	126	48	43	50	4
80	3	90	329	92	160	77	216	66	17	46	126	48	43	50	7
100	4	110	359	107	175	77	254	86	24	52	126	48	43	50	10.1
150	6	160	454	134	210	110	315	140	47	56	189	48	43	80	13.8
200	8	225	511	162	239	110	389	191	70	60	189	48	43	80	23.2
250	10	280	633	199	275	159	483	241	91	68	219	56	50	125	33.95
300	12	315	699	230	310	159	543	290	111	78	219	56	50	125	48.45
350	14	335	796	254	349	193	564	330	131	78	371	83	80	150	92.4

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Planning Fundamentals

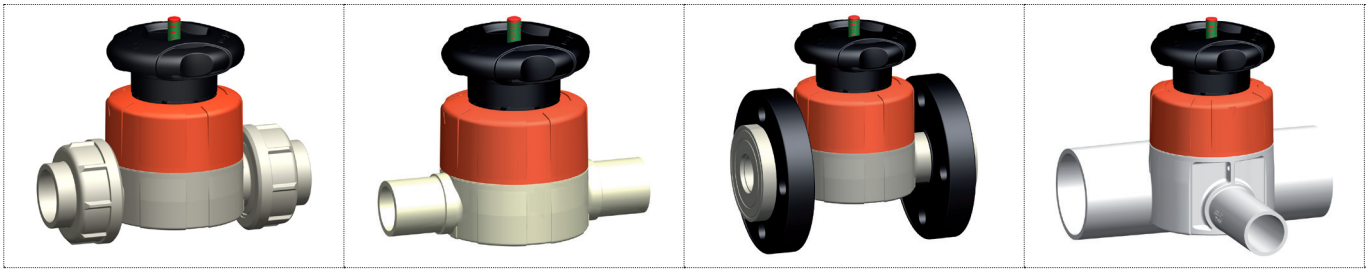
of Valves and Automation

Diaphragm Valves

Content

Diaphragm Valve type 514, 515, 517, 519 295
Diaphragm Valve type 317 306
e-DIASTAR for types 514, 515 and 517 312
DIASTAR type Six, Ten, TenPlus and Sixteen 320
Diaphragm Valve type 604/605 344
DIASTAR type 025 352

Diaphragm Valve type 514, 515, 517, 519



Type 514 Radial installation and removal	**Type 515** Spigot version	**Type 517** Flange version	**Type 519** Branched valve

Product description

Diaphragm valves of the type 5 series from GF Piping Systems are used for regulating, closing, controlling and monitoring volume flows. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and diaphragm come into contact with the medium.

The valve is suitable for use with gases and liquids and can be used in any location and drained completely.

Unlike other Valve types, no pressure surges can be caused by closing the diaphragm valve. GF Piping Systems offers this Valve type as a manually operated valve and automatic valve.

Applications

- Chemical process industry
- Microelectronics
- Water treatment
- Cooling
- Control applications

Benefits/features

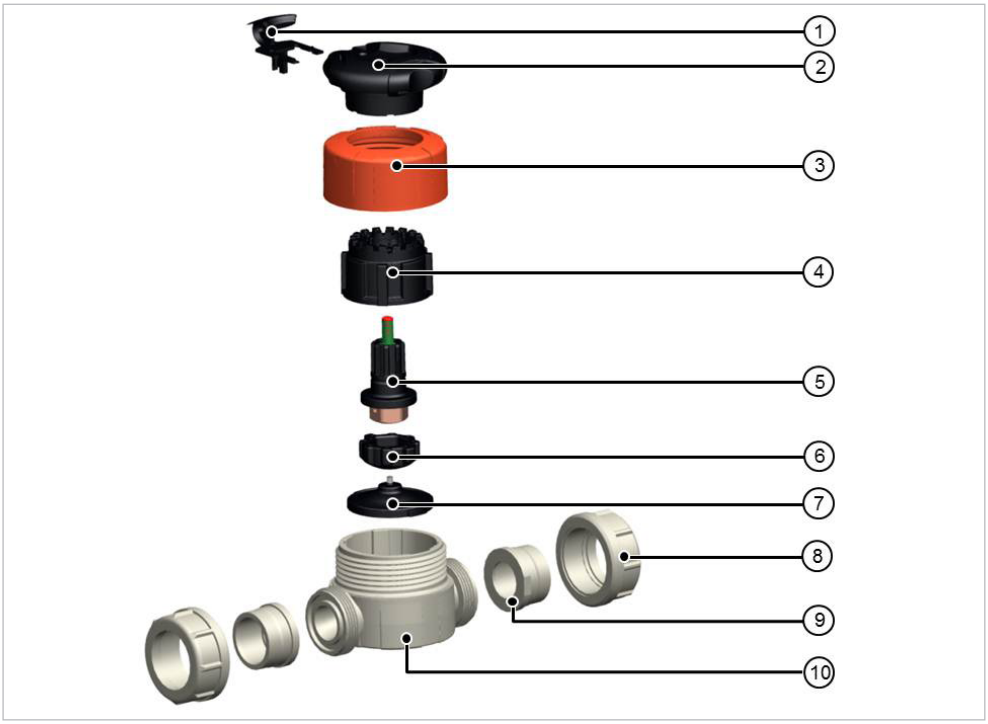
- Full plastic valve without metal screws
- No corrosion due to aggressive media/environment
- Constant leak-tightness in the event of changes in temperature without tightening screws
- Plastic-appropriate, highly stable connection of upper part and valve body by means of a buttress thread
- Maximum flow and linear characteristic curves for easier control
- Diaphragm geometry for longer service life
- Integrated handwheel locking device
- Valve is free of dead space, sealing web lies close to the pipe wall

Possible flow media

Contaminated, solid or ultrapure media.

Liquid and gaseous medium which do not negatively affect the physical and chemical properties of the respective housing and diaphragm material during normal mode. Information on chemical resistance is available from the GF Piping Systems Sales Company or at www.gfps.com.

Technical data



1 Handwheel locking device
2 Handwheel
3 Central housing nut
4 Inner housing
5 Spindle assembly incl. diaphragm holder
6 Pressure piece
7 Diaphragm
8 Coupling nut
9 Insert
10 Valve body

Specification						
Approved media		Liquid and gaseous media which, in normal operation, do not adversely affect the physical and chemical properties of the respective housing and diaphragm material. Information on chemical resistance is available from the Georg Fischer Sales Company or at www.gfps.com.				
Dimensions		Type 514	d20/DN15 – d63/DN50, ½" - 2"			
		Type 517	d20/DN15 – d63/DN50, ½" - 2"			
		Type 515	d20/DN15 – d63/DN50, ½" - 2"			
		Type 519	d20/DN15 – d20/DN15, ½"; d160/DN150 – d63/DN50, 4"- 2"			
Materials	**Valve body**	Type 514	PVC-U, PVC-C, ABS, PP-H, PVDF, PVDF-HP			
		Type 515	PVC-U, PVC-C, ABS, PP-H, PP-N, PVDF, PVDF-HP			
		Type 517	PVC-U, PVC-C, PP-H, PVDF, PVDF-HP			
		Type 519	PP-H, PP-N, PVDF-HP			
	Housing nut	PPGF 30 for PN10 PPSGF40 for PN 16 (only for water applications)				
	Gasket/ diaphragm[1]	Diaphragm O-Ring	NBR EPDM	FKM FKM	EPDM EPDM	PTFE PTFE
Operating temperature[2] **(valve body material)**		PVC-U	0 to 60 °C			
		PVC-C	0 to 80 °C			
		ABS	-30 to 60 °C			
		PP	0 to 80 °C			
		PVDF	-20 to 140 °C			
Pressure levels		PN16	PVC-U, PVDF, PVDF-HP (dependant from threaded bush)			
		PN10	PVC-U, PVC-C, ABS, PP-H, PP-N, PVDF, PVDF-HP			
Actuation variants		Manually operated				
		Pneumatic (see type DIASTAR)				

Specification		
Connections	Type 514	Screw connection with solvent cement sockets, threaded sockets, fusion sockets, butt fusion spigots
	Type 515	Solvent cement spigot, socket fusion spigot, butt fusion spigot
	Type 517	Fixed flange, backing flange
	Type 519	3-way valve with butt fusion spigot
Product standard	EN ISO 16138	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, DIBt	

[1] Other combinations on request.

[2] According to pressure-temperature diagram. Temperature ranges may vary depending on the seal material combination.

Kv 100 values

Type 514 – 517

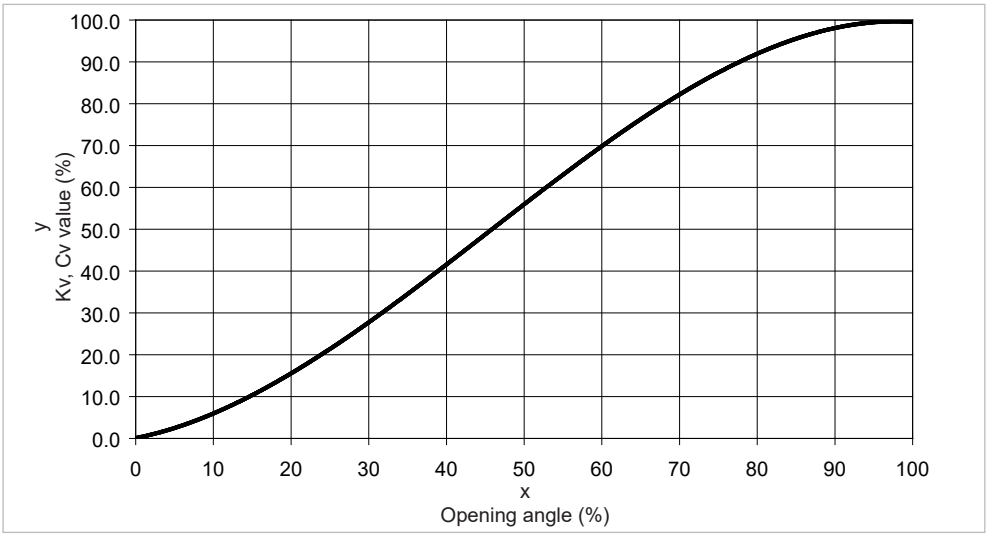
Dim. (mm)	DN (mm)	Inch (inch)	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
20	15	½	125	9	8
25	20	¾	271	19	16
32	25	1	481	33	29
40	32	1 ¼	759	52	45
50	40	1 ½	1'263	87	76
63	50	2	1'728	119	104

Type 519

d (mm)	DN (mm)	Inch (")	d1 (mm)	DN1 (mm)	Inch1 (")	Kv 100 (l/min)	Cv 100 (US gal/min)	Kv 100 (m^3/h)
20	15	½	20	15	½	57	4	3
25	20	¾	20	15	½	89	6	5
25	20	¾	25	20	¾	118	8	7
32	25	1	20	15	½	80	6	5
32	25	1	25	20	¾	105	7	6
32	25	1	32	25	1	231	16	14
40	32	1 ¼	20	15	½	85	6	5
40	32	1 ¼	25	20	¾	119	8	7
40	32	1 ¼	32	25	1	153	11	9
40	32	1 ¼	40	32	1 ¼	187	13	11
50	40	1 ½	20	15	½	86	6	5
50	40	1 ½	25	20	¾	160	11	10
50	40	1 ½	32	25	1	206	14	12
50	40	1 ½	40	32	1 ¼	524	36	31
50	40	1 ½	50	40	1 ½	667	46	40
63	50	2	20	15	½	84	6	5
63	50	2	25	20	¾	150	11	9
63	50	2	32	25	1	184	13	11
63	50	2	40	32	1 ¼	471	32	28
63	50	2	50	40	1 ½	610	42	37
63	50	2	63	50	2	747	52	45
90	80	3	20	15	½	82	6	5
90	80	3	25	20	¾	103	7	6
90	80	3	32	25	1	129	9	8
90	80	3	50	40	1 ½	623	43	37
90	80	3	63	50	2	696	48	42

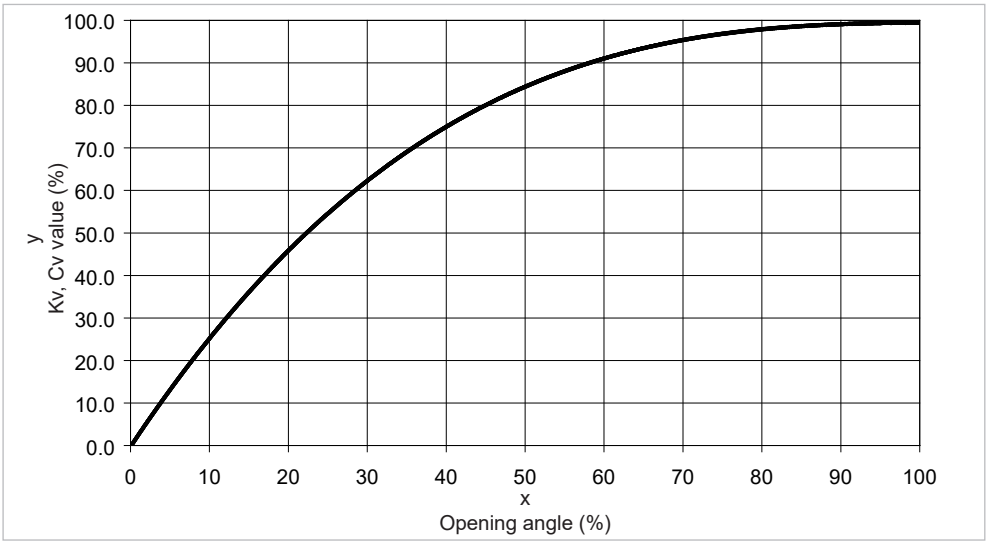
d (mm)	DN (mm)	Inch (")	d1 (mm)	DN1 (mm)	Inch1 (")	Kv 100 (l/min)	Cv 100 (US gal/ min)	Kv 100 (m^3/h)
110	100	4	20	15	½	78	5	4
110	100	4	25	20	¾	103	7	6
110	100	4	32	25	1	131	9	8
110	100	4	50	40	1 ½	604	42	36
110	100	4	63	50	2	661	46	40
140	125	5	32	25	1	146	10	9
140	125	5	40	32	1 ¼	382	26	23
140	125	5	50	40	1 ½	440	30	26
140	125	5	63	50	2	502	35	30
160	150	6	32	25	1	139	10	8
160	150	6	40	32	1 ¼	382	26	23
160	150	6	50	40	1 ½	436	30	26
160	150	6	63	50	2	498	34	30

Flow characteristics type 514–517



x Open angle (%)
y Kv, Cv value (%)

Flow characteristics type 519

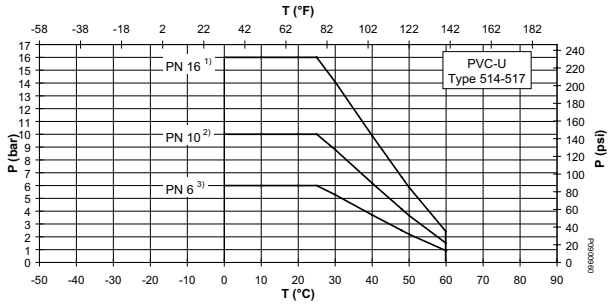


x Open angle (%)
y Kv, Cv value (%)

Pressure-temperature diagrams

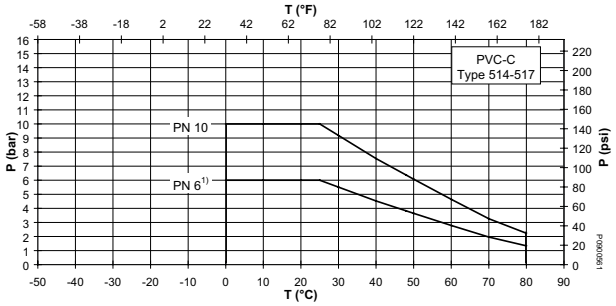
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



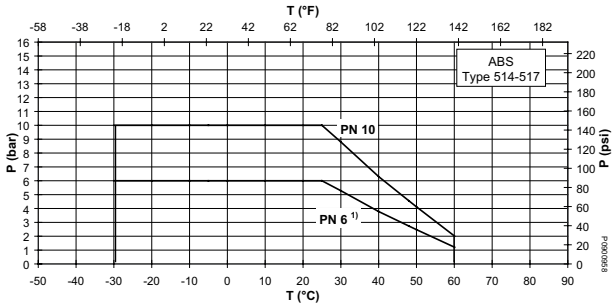
1) Only with black PPS housing nut for water applications
2) Depending on the connection type and actuator, the nominal pressure is reduced to PN10
3) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PVC-C



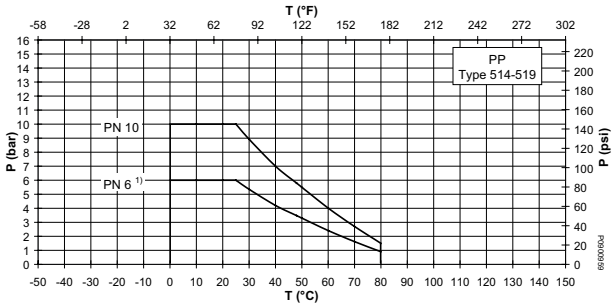
1) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

ABS



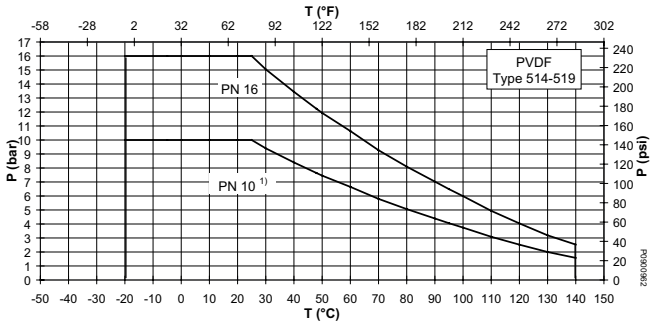
1) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PP



1) Depending on the connection type, actuator and sealing material, the nominal pressure is reduced to PN6

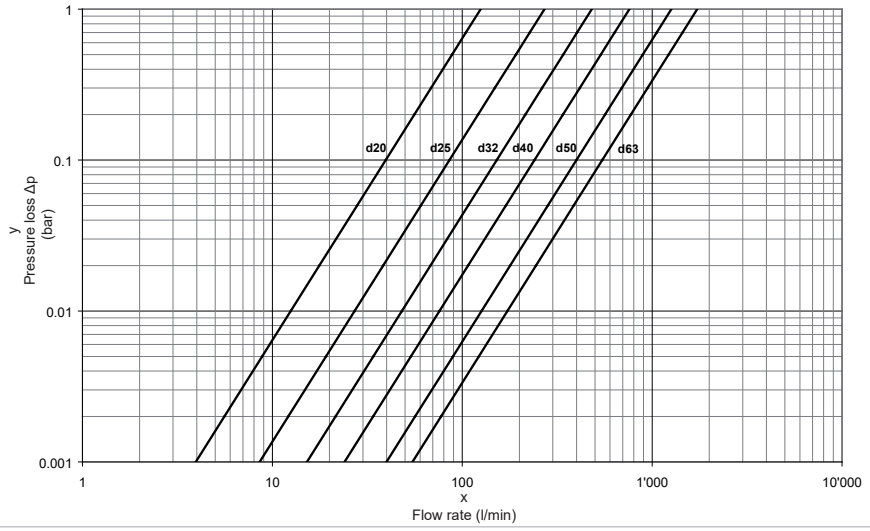
PVDF



1) PN16 only with black PPS housing nut. Depending on the connection type and actuator, the nominal pressure is reduced to PN10

Pressure losses

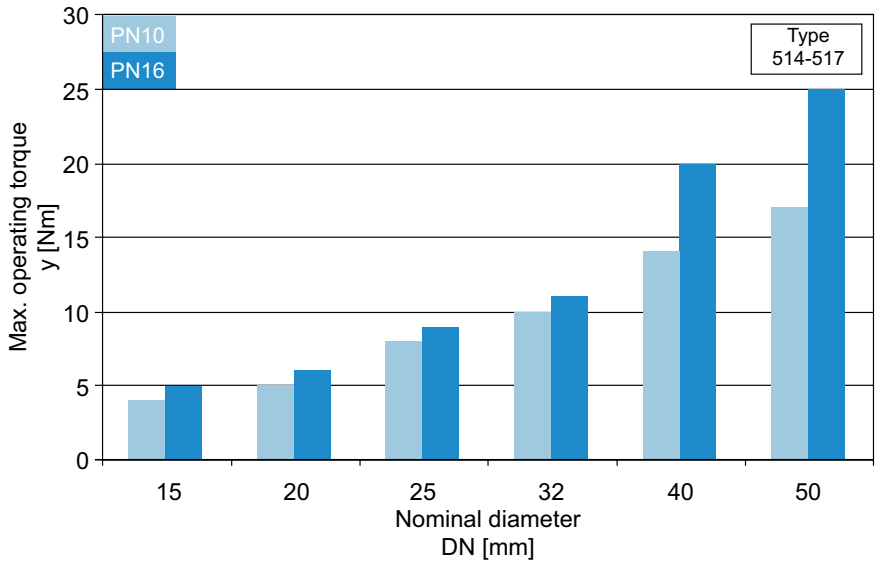
Type 514 – 517



x Flow rate (l/min, US gal/min)
y Pressure loss Δp (bar, psi)

Operating torque

Type 514 – 517



Technical basics

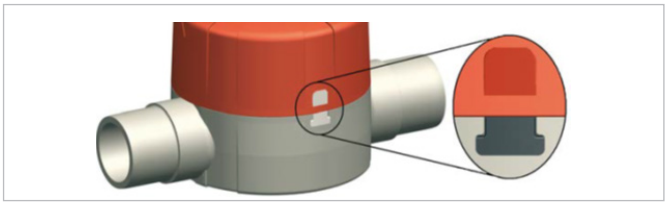
The upper part of the housing is made of PPGF (fiberglass-reinforced polypropylene) and is screwed to the lower part of the housing using a central plastic nut, which avoids exposed metal screws. The handwheel is lockable as a standard. The two-colored position indicator pin indicates the current position of the diaphragm.

All diaphragm valves are manufactured in accordance with EN ISO 16138.

Indicator for diaphragm material

The color of the index plate on the valve body shows the type of diaphragm material:

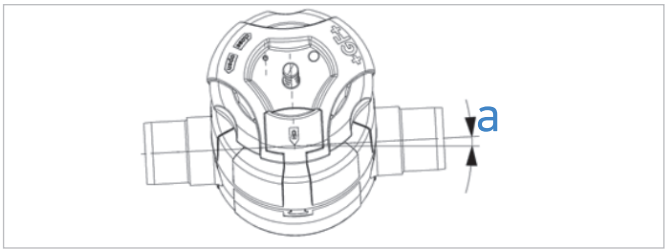
Color	Diaphragm material
Black	EPDM
White	PTFE/EPDM
Green	PTFE/FKM
Red	FKM
Blue	NBR



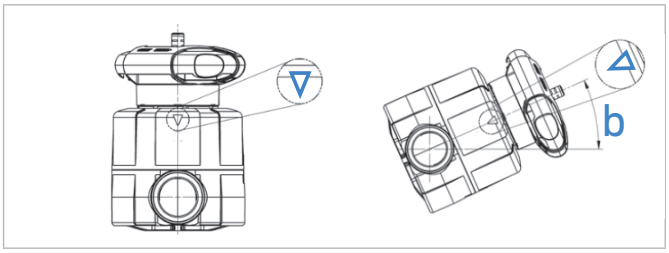
Installation angle for optimal draining of the valve

To achieve optimal draining, GF Piping Systems recommends installing the individual dimensions in accordance with the corresponding angle (a and b). An installation inclination of about 1° to 2° is not taken into consideration with the stated angles.

Dimension	Angle a for types 514, 515, 517
d20/DN15	2
d25/DN20	2
d32/DN25	3
d40/DN32	4
d50/DN40	5
D63/DN50	7

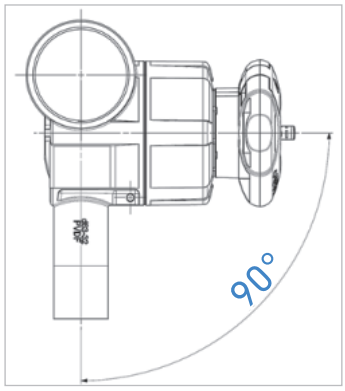


Dimension	Angle b for types 514, 515, 517
d20/DN15	27
d25/DN20	24
d32/DN25	25
d40/DN32	23
d50/DN40	24
d63/DN50	22



Optimum angle with one of the triangle legs horizontal.

Emptying angle for type 519 (3-way valve) is 90°, independent of the dimension



Integrated fastening and PP mounting blocks

Integrated mounting

ENSAT® bushings on the underside of the valve allow simple and stable attachment of the diaphragm valve. With this, the forces that can occur when operating the valve (e.g. breakaway torque) are absorbed and therefore not transferred to the piping system.



PP mounting block for diaphragm valves

The mounting blocks for diaphragm valves help compensate for the different distances from the mounting surface to the pipe axis, even when using different dimensions. The blocks can also be used for the PVC diaphragm Valve type 514 to compensate for the coupling nut to the mounting surface.

- Material: PP-GF15, black
- 5 sizes, numbered from 1 to 5
- Adjustable, in order to achieve the desired height

Valve handling

Installation notes

- Thermal expansion due to temperature changes can lead to longitudinal or bending forces in the pipe.
- Install the diaphragm valve as a fixed point. Install the pipe bracket directly in front of and behind the diaphragm valve.
- Only use the specified control pressures and use the diaphragm valve in optimum regulating mode.

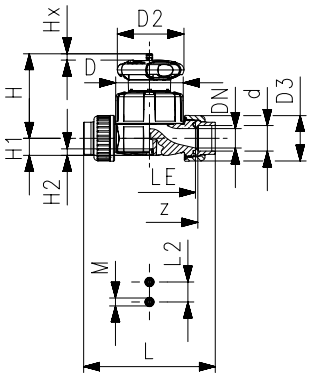
Selection of lubricants

Gaskets and spare parts can be mounted with silicon-based grease. Other lubricants may corrode the diaphragm valve material or diaphragm. Therefore, never use mineral-oil-based grease or Vaseline. Pay attention to special instructions for silicon-free and High Purity diaphragm valves.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Dimensions

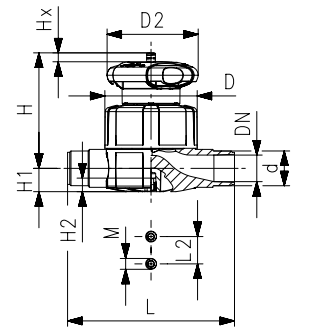
Type 514



L_1 – Threaded socket
L_2 – Solvent cement socket
L_3 – Fusion socket
L_4 – Butt fusion spigot

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D2 (mm)	D3 (mm)	L_1 (mm)	L_2 (mm)	L_3 (mm)	L_4 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	z (mm)	LE (mm)	Hx (mm)
20	15	½	65	65	43	128	128	128	196	25	73	14	12	M6	96	90	7
25	20	¾	80	65	51	152	152	150	221	25	81	18	12	M6	114	108	10
32	25	1	88	87	58	166	166	162	234	25	107	22	12	M6	122	116	13
40	32	1 ¼	101	87	72	192	192	184	260	45	115	26	15	M8	140	134	15
50	40	1 ½	117	135	83	222	222	210	284	45	148	32	15	M8	160	154	19
63	50	2	144	135	100	266	266	148	321	45	166	39	15	M8	190	184	25

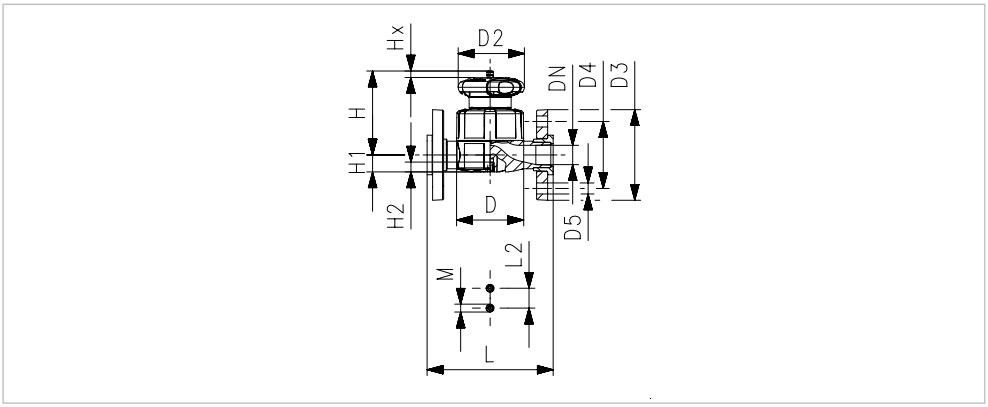
Type 515



L_5 – Fusion spigot
L_6 – Solvent cement spigot
L_7 – Butt fusion spigots

Dim. (mm)	DN (mm)	inch (inch)	D (mm)	D2 (mm)	L_5 (mm)	L_6 (mm)	L_7 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	Hx (mm)
20	15	½	65	65	124	124	124	25	73	14	12	M6	7
25	20	¾	80	65	144	144	144	25	81	18	12	M6	10
32	25	1	88	87	155	154	154	25	107	22	12	M6	13
40	32	1 ¼	101	87	176	174	174	45	115	26	15	M8	15
50	40	1 ½	117	135	193	194	194	45	148	32	15	M8	19
63	50	2	144	135	223	224	223	45	166	39	15	M8	25

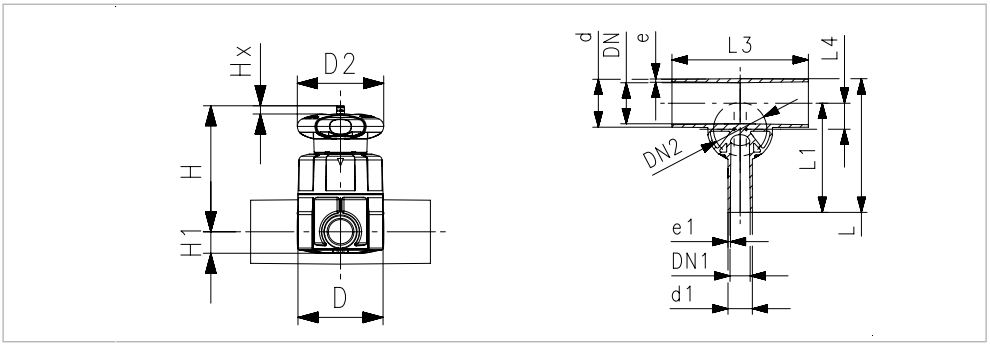
Type 517



L_8 – Backing flange

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D2 (mm)	D3 (mm)	D4 (mm)	D5 (mm)	L_8 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	Hx (mm)
20	15	½	65	65	95	65	14	130	25	73	14	12	M6	7
25	20	¾	80	65	105	75	14	150	25	81	18	12	M6	10
32	25	1	88	87	115	85	14	160	25	107	22	12	M6	13
40	32	1 ¼	101	87	140	100	18	180	45	115	26	15	M8	15
50	40	1 ½	117	135	150	110	18	200	45	148	32	15	M8	19
63	50	2	144	135	165	125	18	232	45	166	39	15	M8	25

Type 519



L_5 – Fusion spigot

D (mm)	d1 (mm)	DN (mm)	inch (inch)	DN1 (mm)	Inch1 (")	DN2 (mm)	Inch2 (")	D (mm)	D2 (mm)	L_5 (mm)	L1 (mm)	L3 (mm)	L4 (mm)	H (mm)	H1 (mm)	Hx (mm)
20	20	15	½	15	½	15	½	65	65	117	96	162	12	75	14	7
25	20	20	¾	15	½	20	¾	80	65	133	108	162	16	80	17.5	10
25	25	20	¾	20	¾	20	¾	80	65	133	108	162	16	80	17.5	10
32	20	25	1	15	½	20	¾	80	65	142	120	162	19	84	21.5	10
32	25	25	1	20	¾	20	¾	80	65	142	120	162	19	84	21.5	10
32	32	25	1	25	1	25	1	88	87	145	120	160	19	107	21.5	13
40	20	32	1 ¼	15	½	25	1	88	87	149	128	180	23	115	21.5	13
40	25	32	1 ¼	20	¾	25	1	88	87	149	128	180	23	115	21.5	13
40	32	32	1 ¼	25	1	25	1	88	87	149	128	180	23	115	21.5	13
40	40	32	1 ¼	32	1 ¼	25	1	88	87	174	159	180	23	115	21.5	13
50	20	40	1 ½	15	½	20	¾	80	65	160	134	180	27	97	17.5	10
50	25	40	1 ½	20	¾	25	1	88	87	160	134	180	28	120	21.5	13
50	32	40	1 ½	25	1	25	1	88	87	160	134	180	28	120	21.5	13
50	40	40	1 ½	32	1 ¼	50	2	144	135	209	169	209	33	164	32	25
50	50	40	1 ½	40	1 ½	50	2	144	135	209	169	209	33	164	32	25
63	20	50	2	15	½	20	2	80	65	177	144	180	33	104	17.5	10
63	25	50	2	20	¾	25	1	88	87	177	144	180	35	127	21.5	13
63	32	50	2	25	1	25	1	88	87	177	144	180	35	127	21.5	13

D (mm)	d1 (mm)	DN (mm)	inch (inch)	DN1 (mm)	Inch1 (")	DN2 (mm)	Inch2 (")	D (mm)	D2 (mm)	L_5 (mm)	L1 (mm)	L3 (mm)	L4 (mm)	H (mm)	H1 (mm)	Hx (mm)
63	40	50	2	32	1 ¼	50	1	144	135	225	192	220	39	170	39	25
63	50	50	2	40	1 ½	50	2	144	135	225	192	220	39	170	39	25
63	63	50	2	50	2	50	2	144	135	225	192	220	39	170	39	25
90	20	80	3	15	½	25	1	88	87	205	159	190	47	140	21.5	13
90	25	80	3	20	¾	25	1	88	87	205	159	190	47	140	21.5	13
90	32	80	3	25	1	25	1	88	87	205	159	190	47	140	21.5	13
90	50	80	3	40	1 ½	50	2	144	135	254	207	250	51	184	39	25
90	63	80	3	50	2	50	2	144	135	254	207	250	51	184	39	25
110	20	100	4	15	½	25	1	88	87	227	171	190	56	149	21.5	13
110	25	100	4	20	¾	25	1	88	87	227	171	190	56	149	21.5	13
110	32	100	4	25	1	25	1	88	87	227	171	190	56	149	21.5	13
110	50	100	4	40	1 ½	50	2	144	135	276	219	250	60	194	39	25
110	63	100	4	50	2	50	2	144	135	276	219	250	60	194	39	25
140	32	125	5	25	1	25	1	87	87	258	186	310	70	155	21.5	25
140	40	125	5	32	1 ¼	50	2	144	135	291	219	310	78	204	39	50
140	50	125	5	40	1 ½	50	2	144	135	291	219	310	78	204	39	50
140	63	125	5	50	2	50	2	144	135	291	219	310	78	204	39	50
160	32	150	6	25	1	25	1	87	87	278	196	310	81	161	21.5	25
160	40	150	6	32	1 ¼	50	2	144	135	301	219	310	87	213	39	50
160	50	150	6	40	1 ½	50	2	144	135	301	219	310	87	213	39	50
160	63	150	6	50	2	50	2	144	135	301	219	310	87	213	39	50

Accessories

- Electrical position indicator with Ag Ni or AU limit switch

For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



Diaphragm Valve type 317



Product description

Diaphragm Valve type 317 is distinguished in particular by its compact, short design, and is available in the dimensions DN65 to DN150.

Type 317 is connected to the piping by means of flanges.

GF Piping Systems offers the option of using a lockable handwheel in order to make the process even safer. This is an important and useful function for all areas of application of diaphragm valves.

For automated plants, the valves are also available with pneumatic actuator of the DIASTAR type.

Function

Diaphragm valves from GF Piping Systems are used for regulating, controlling as well as closing monitoring volume flows. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and the diaphragm come into contact with the medium.

Applications

- Controlling pure and ultrapure media
- Applications with high viscosity and solid content
- Chemical dosing
- Water treatment

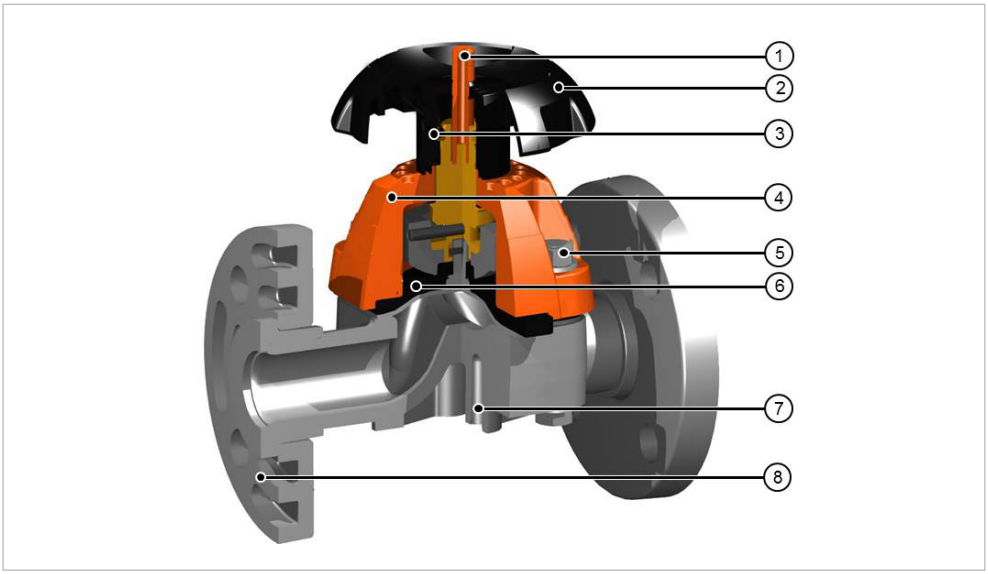
Benefits/features

- Reliable plastic valve for controlling neutral, aggressive, gaseous and liquid media
- None of the components come into contact with the medium
- Reliable and durable
- Flexible sealing element
- Integrated attachment and hence no transfer of operating forces to the piping system
- Position indicator

Possible flow media

Contaminated, solid or ultrapure media.

Technical data



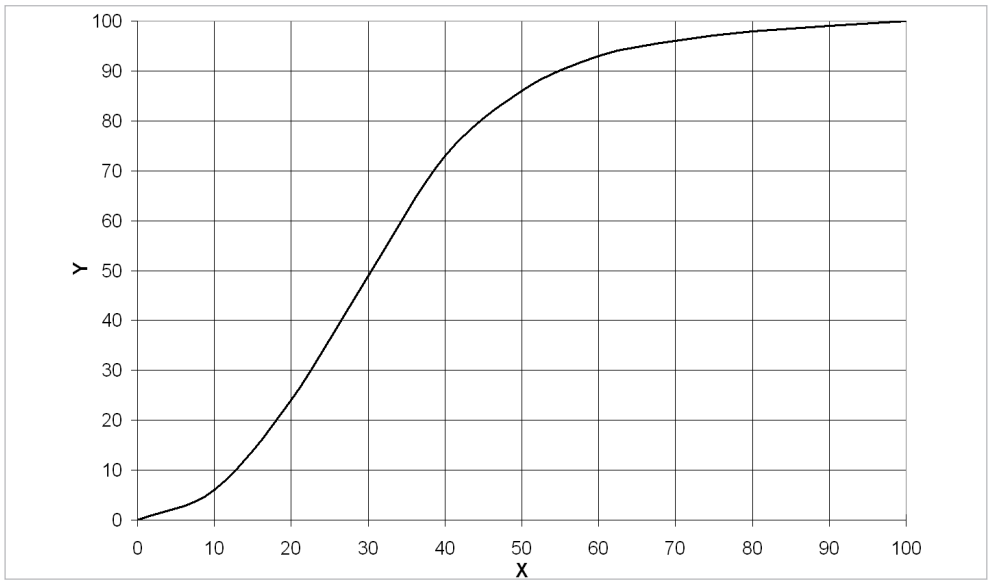
1 Position Indicator
2 Handwheel
3 Sealing disk
4 Upper part
5 Screws
6 Diaphragm
7 Fastening threads
8 Flange connector

Specification		
Dimensions	d75/DN65 - d160/DN150	
Materials	Upper part	PPGF 30
	Handwheel	PP; PVC-U; PP TSG
Gasket/diaphragm materials	NBR; EPDM; PTFE/EPDM; FKM;	
Pressure levels	PN10	
	PN6 from DN100	
Actuation variants	Manually operated	
	Pneumatically actuated (see DIASTAR 025)	
Connections	Backing flange	DN65
	Fixed flange	from DN80
Accessories	DN65	Lockable handwheel
Product standard	EN ISO 16138	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, DIBt	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 US (US gal/min)	Kv 100 (m^3/h)
65	2 ½	75	992	69.5	59.5
80	3	90	1'700	119	102
100	4	110	2'700	189	162
150	6	160	6'033	422.3	362

Flow characteristics

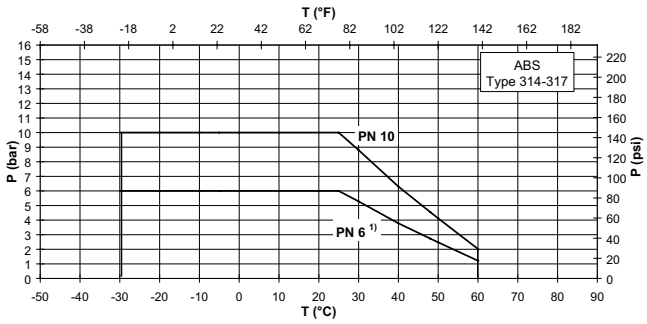


x Open angle (%)
y Kv, Cv value (%)

Pressure-temperature diagrams

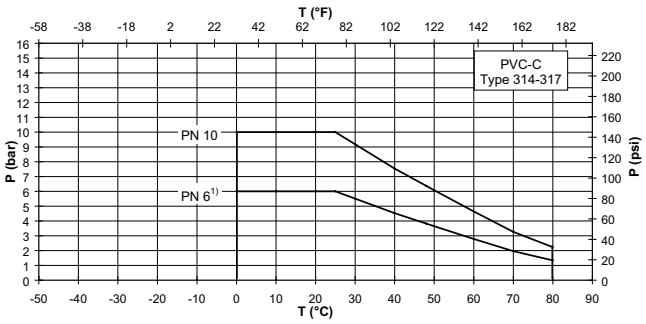
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

ABS



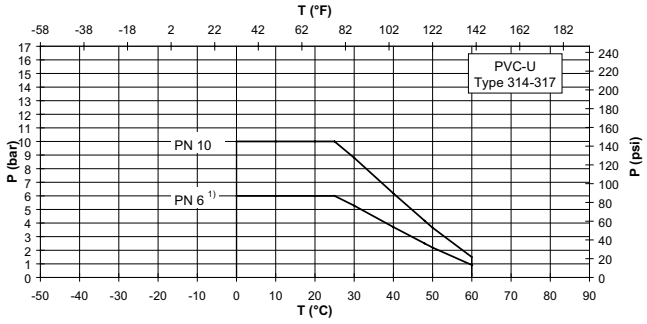
1) Only type 317, manually operated DN100 and DN150

PVC-C



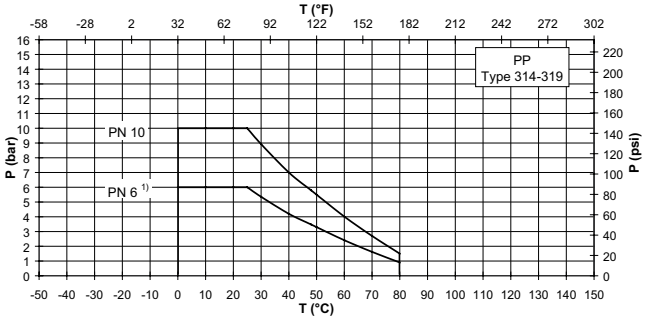
1) Only type 317, manually operated DN100 and DN150

PVC-U



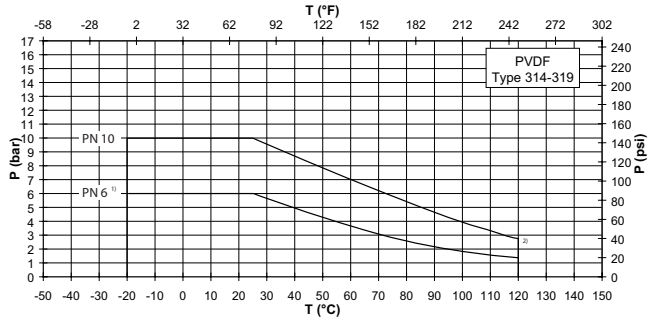
1) Only type 317, manually operated DN100 and DN150

PP



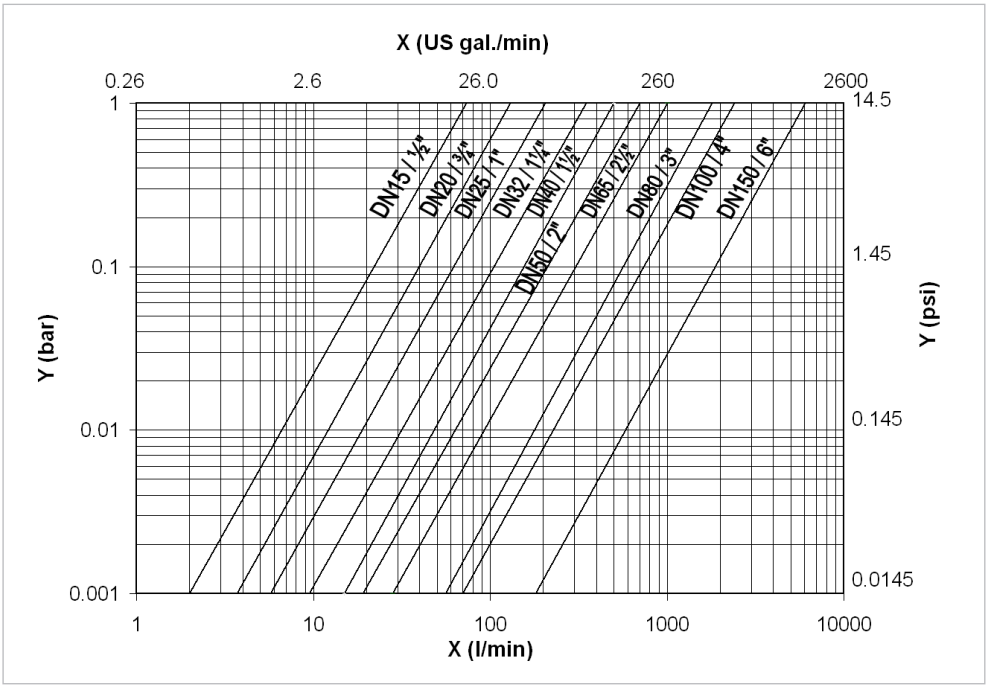
1) Only type 317, manually operated DN100 and DN150

PVDF



1) Only type 317, manually operated DN100 and DN150
2) Higher temperature after consultation

Pressure losses



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Reference values for tightening torque of flange connection screws of type 317

d (mm)	DN (mm)	Inch (inch)	Total number of screws	Torque (Nm)	Torque (lfb)
75	65	2 ½	8 x M16 x 85	25	222
90	80	3	16 x M16 x 95	15	133
110	100	4	16 x M16 x 100	20	177
160	150	6	16 x M16 x 110	35	310

Tightening torque for diaphragms of type 317

d	DN	Tightening torques for elastomer diaphragms		Tightening torque for PTFE diaphragms	
(mm)	(mm)	(Nm)	(lbf)	(Nm)	(lbf)
75	65	25	221.3	25	221.3
90	80	30	265.5	30	265.5
110	100	30	265.5	30	265.5
160	150	40	354.0	40	354.0

Operating torque for handwheel

DN (mm)	Inch (inch)	Tightening torque (Nm)
65	2 ½	20
80	3	30
100	4	45
150	6	140

Technical basics

The upper part of the housing is made of PPGF (fiberglass-reinforced polypropylene) and is screwed to the lower part of the housing with four bolts, which avoids exposed metal screws. A position indicator integrated into the handle is required for determining the diaphragm position.

i All diaphragm valves of type 317 in metric sizes are manufactured with flange versions DN65–DN150, and in accordance with EN ISO 16138.

Valve handling

Installation notes

In piping systems that are subject to changes in temperature, longitudinal and bending forces are created when thermal expansion is prevented. To avoid compromising the functioning of the valve, these forces must be absorbed through appropriate fixed points in front of and behind the valve. Diaphragm valves and pipes must be aligned with one another so that the valve is not subjected to superimposed loads.

Ensure that the valve is open and not under pressure. Using a calibrated torque wrench, all four screws must be evenly tightened crosswise to screw positions in accordance with the recommended torques.

Integrated mounting

The diaphragm valve includes an integrated mounting insert. Mounting plates help to compensate different distances from the mounting surface to the pipe axis. They are adapted to the pipe clips from GF Piping Systems. With the integrated inserts, the forces that can be generated when operating the valve are absorbed (e.g., breakaway torque). Because of this, no operating forces are transferred to the piping system.

Selection of lubricants

Gaskets and spare parts can be mounted with silicon-based grease. Other lubricants may chemically attack the diaphragm valve material or diaphragm. Therefore, never use mineral-oil-based grease or Vaseline. Pay attention to special instructions for silicon-free and high purity diaphragm valves.

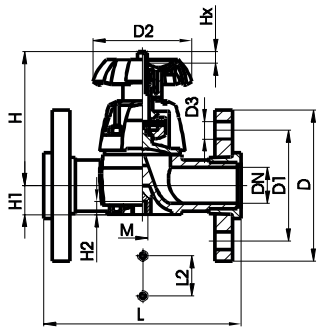
Maintenance notes

Check the connection between the upper part and valve body for leak-tightness at regular intervals. Leaky threaded connections must be tightened. We recommend that you actuate continuously opened or closed valves once to twice a year to check their function.

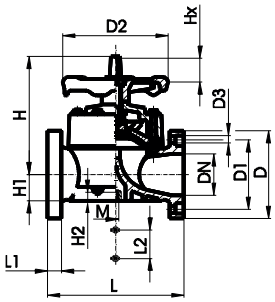
⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Dimensions

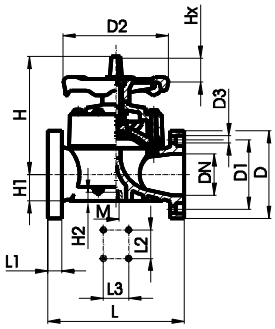
DN65



DN80-100



DN150



d (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	H (mm)	H1 (mm)	H2 (mm)	M	Hx (mm)
75	65	2 ½	185	145	152	18	290		70		201	46	15	M8	30
90	80	3	200	160	270	18	310	35	120		265	57	23	M12	40
110	100	4	225	180	270	18	350	35	120		304	69	23	M12	50
160	150	6	285	240	400	32	480	26	100	200	437	108	23	M12	70

ⓘ For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

e-DIASTAR for types 514, 515 and 517



Diaphragm Valve type 514 with e-DIASTAR actuator

Product description

The e-DIASTAR system is based on the diaphragm Valve type 514 (threaded sockets) and type 515 (spigots), on which the electric actuator EA-MT is mounted. The diaphragm Valve type 517 (flange) can be retrofitted after installation. The electric actuator EA-MT opens and closes the diaphragm valve fully automatic.

The e-DIASTAR is used to regulate, close and control volume flows automatically. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and the replaceable diaphragm are in contact with the medium.

Applications

- Chemical process industry
- Microelectronics
- Water treatment
- Cooling
- Control applications

Actuator benefits/features

- Multiturn actuator
- Adjustable integrated heating
- 7-segment error display
- Position feedback (open/close)
- Fully automatic end position teach-in
- Integrated emergency manual override
- Retrofit set includes: Conversion kit with drive, half shells and screws

Valve benefits/features

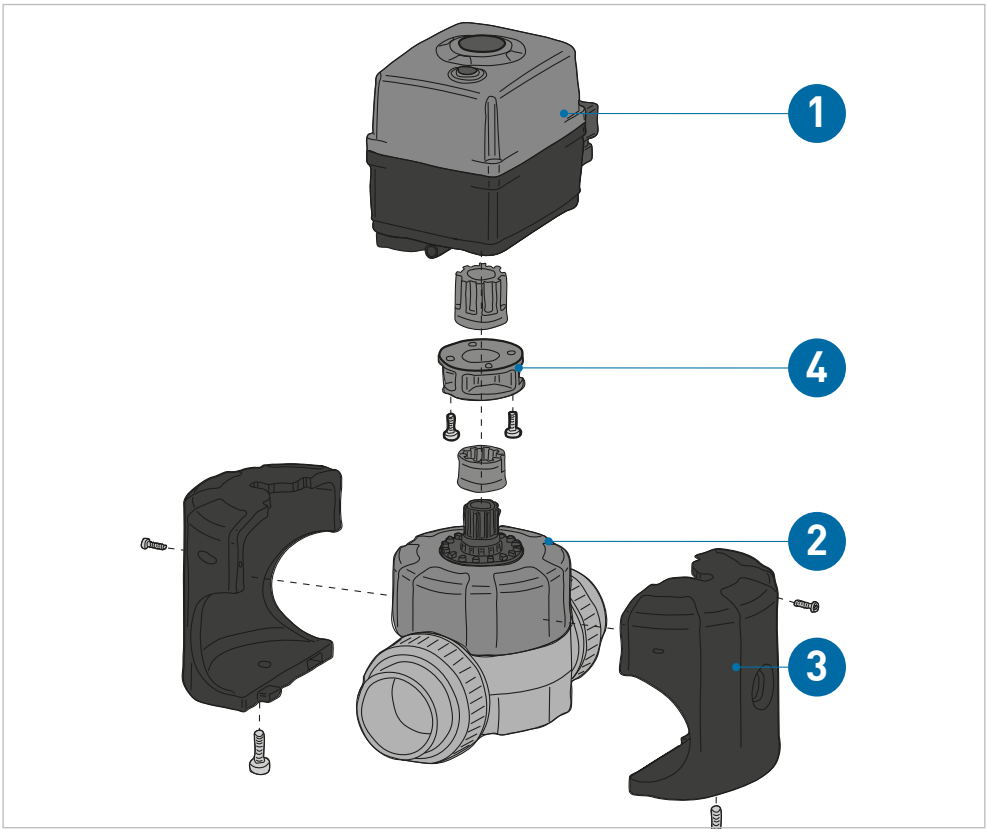
- Full plastic valve without metal screws
- No corrosion due to aggressive media/environment
- Constant leak-tightness in the event of changes in temperature without tightening screws
- Plastic-appropriate, highly stable connection of upper part and valve body by means of a buttress thread
- Maximum flow and linear characteristic curves for easier control
- Diaphragm geometry for longer service life

Possible flow media

- Contaminated, solid or ultrapure media

Technical data

The standard version of the EAMT electric actuator consists of the following elements:



1 Electric actuator EAMT
2 Diaphragm valve
3 Assembly shells
4 Intermediate elements

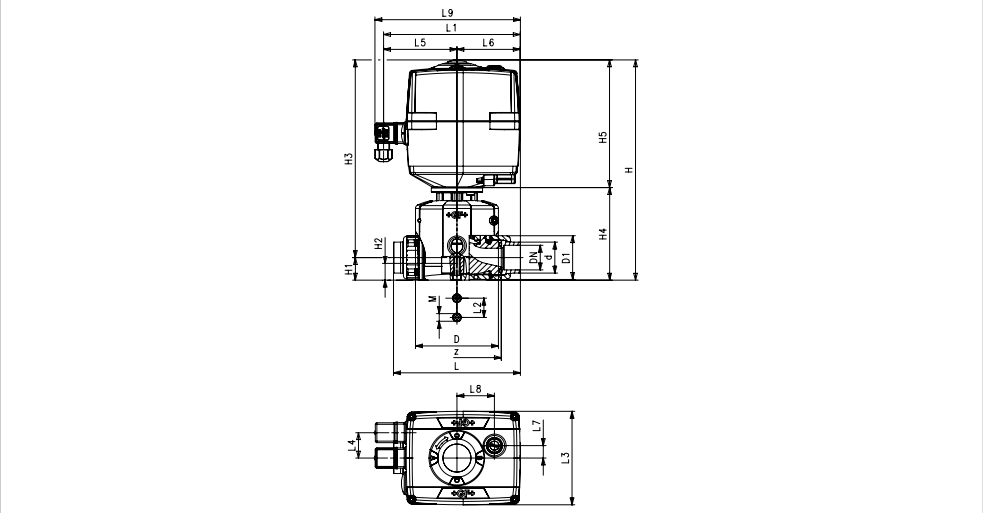
Specification diaphragm valve		
Dimensions	d32/DN25 and d63/DN50, ¾" - 2"	
Valve body materials	Type 514	PVC-U, PVC-C, ABS, PP-H, PVDF Retrofittable: PVDF-HP
	Type 515	PVC-U, PVC-C, ABS, PP-H, PVDF Retrofittable: PVDF-HP
	Type 517 (on request)	PVC-U, PVC-C, PP-H, PVDF
Housing nut materials	PPGF 30	
Gasket/diaphragm materials	EPDM, PTFE/EPDM, NBR, FKM, PTFE/FKM	
Pressure levels	DN25: PN10	
	DN50: PN6	
Connections	Type 514	Screw connection
	Type 515	Spigot
	Type 517 (on request)	Flange
Product standard	EN ISO 16138	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, DIBt	

Specification EAMT	
Power input max.	65 VA
Current (calculated)	0.55A at 100V 0.24A at 230V
	2.5A at 24V
Power Supply	AC: 100 – 230 V, 50/60 Hz
	AC/DC: 24 V, 50/60 Hz
Supply voltage toler-ance	-10%...+15%
Mechanical interface	F05* (WS 11/14)
Duty cycle	50 %
Cycle time open/close	DN25: ≈ 85 sec. DN50: ≈ 130 sec.
Tested cycles (at 20 °C and Mdn)	5'000
Weight	2.2 kg / 4.85 lbs
Actuating angle	Multiturn
Protection class	IP 65 (IP67)[1)] per EN 60529 Designed for wet & dry locations (NEC), designed for indoor use (UV light may cause discoloration)
Pollution degree	Operation: Pollution Level 3 Commissioning (open housing cover): Only in controlled environments of pollution level 2
Overload protection	Current/time dependent, resetting
Overvoltage category	II
Fuse	Internal: SMD fuse 2 A, not replaceable. Req. external breakers on all live wires: Rated Current: max. 16A Trip Curve: C, Standards Compliance: UL489, CSA C22.2 No. 5.1, IEC 60947-2
Ambient temp.	-10 °C to +50 °C (14°F to 122°F)
Max. installation altitude	2000m above sea level (AMSL)
Feedback relays	Mono-stable change-over contacts Either max 6A @ 230VAC or 24VDC, no mixed voltage potentials allowed!
Recommended connecting cable	AWG 18-16, UL/cUL AWM 4486 min. 125°C 1000V , outside diameter 8-13mm (cable glands), 4-9mm (DIN-connectors)
Allowable humidity	Max. 90 % relative humidity, non-condensing
Housing material	Housing: PP-GF (POLYFLAM, RPP 4225 CS1) Inspection glass: Udel P-1700 (CL2611) Assembly shells and intermediate elements: PPGF 30

[1)] When used with cable glands and vertical installation.

Dimensions

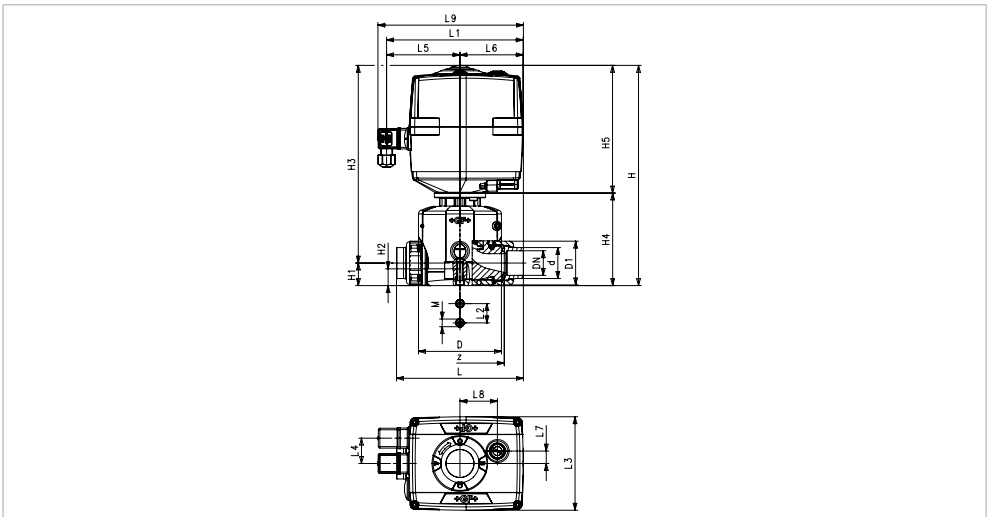
e-DIASTAR type 514 with solvent cement sockets metric



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	166	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	266	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

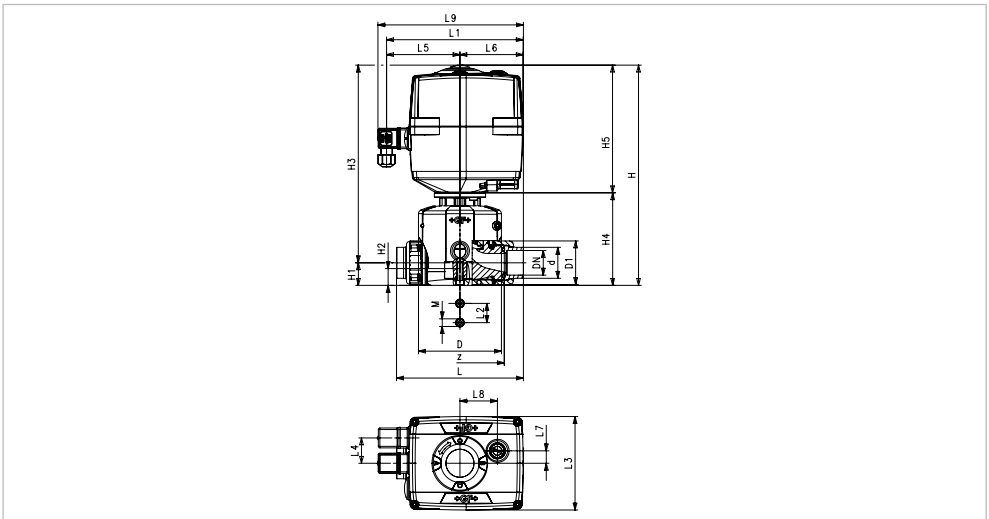
e-DIASTAR type 514 with solvent cement sockets BS



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	170	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	265	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

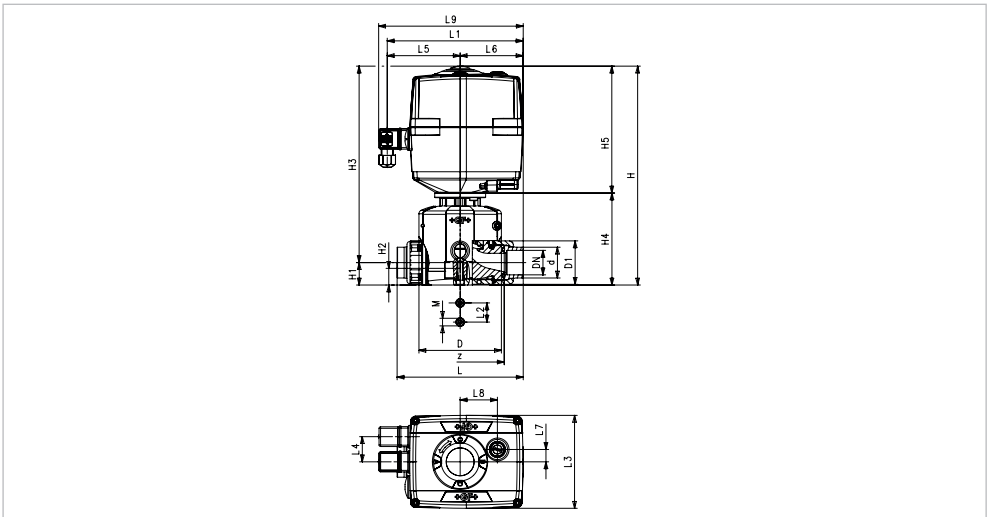
e-DIASTAR type 514 with solvent cement sockets ASTM



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	166	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	266	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

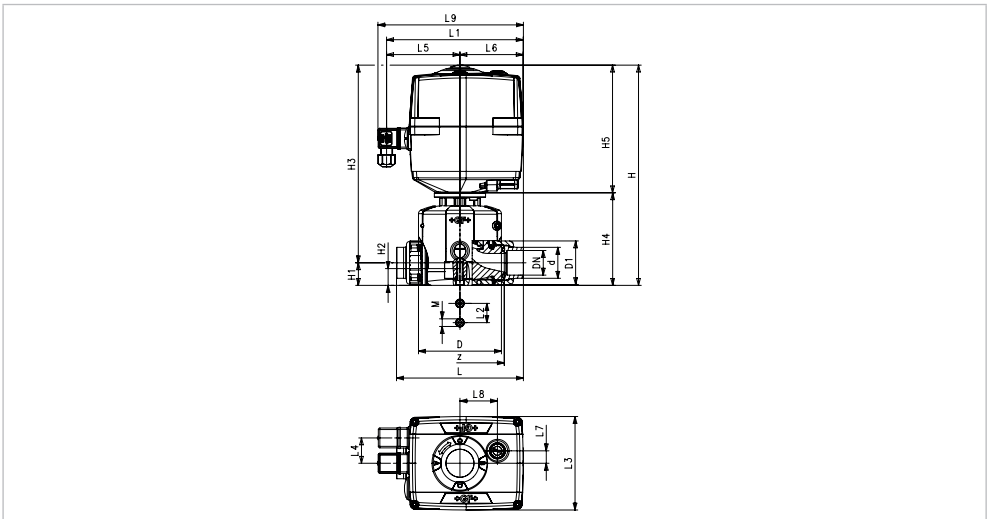
e-DIASTAR type 514 with solvent cement sockets JIS



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	170	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	265	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

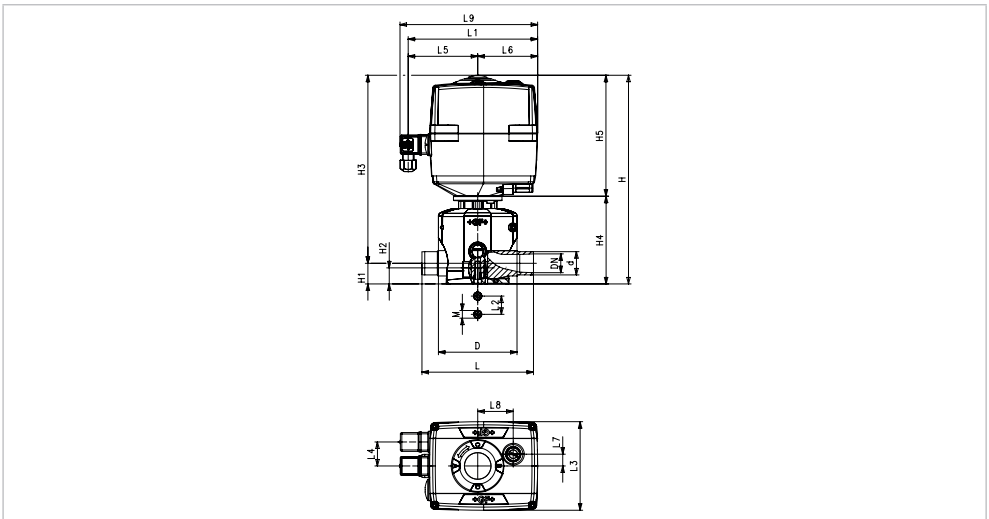
e-DIASTAR type 514 with fusion sockets metric



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	62	287	30	20	256	121	M6	166	180
63	50	2	105	341	52.5	28.5	288.5	176	M8	266	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

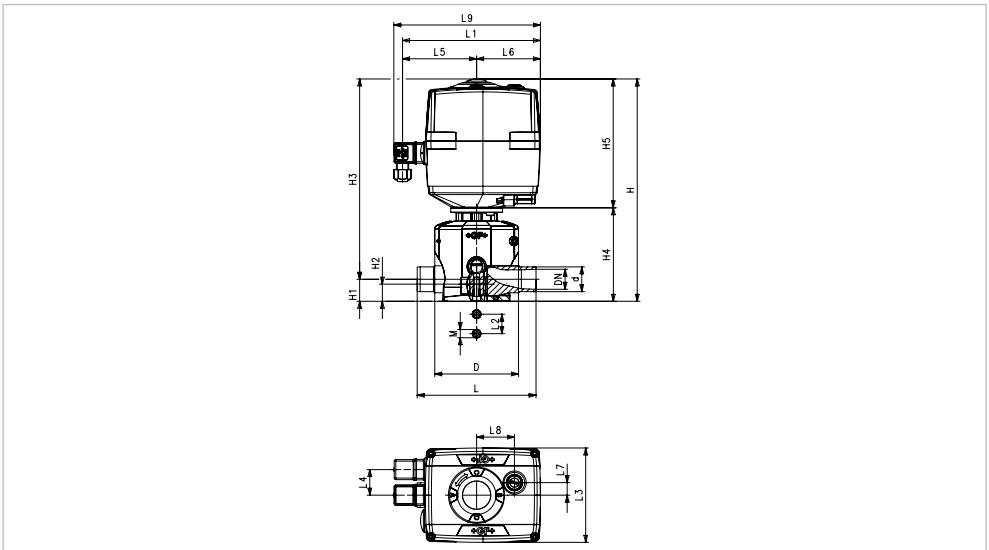
e-DIASTAR type 515 with solvent cement spigots metric



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	154	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	223	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

e-DIASTAR type 51x with socket fusion spigots metric



d (mm)	DN (mm)	DN (inch)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	M (mm)	L (mm)	L1 (mm)
32	25	1	58	286	30	20	256	121	M6	154	180
63	50	2	101	341	52.5	28.5	288.5	176	M8	223	180

d (mm)	DN (mm)	DN (inch)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	D (mm)
32	25	1	25	122	33	97	82.5	16	49	108.5
63	50	2	45	122	33	97	82.5	16	49	168

Kv 100-values

Type 514 – 517

Dim. (mm)	DN (mm)	Inch (")	kv 100 (l/min)	Cv 100 (US gal/min)	kv 100 (m^3/h)
32	25	1	442	31	27
63	50	2	1575	109	95

Accessories

- Fail-safe return unit with integrated battery pack
- External fail-safe return unit
- Positioner 4-20 mA
- EA Demo Box

For further information on accessories, refer to the online product catalog at www.gfps.com

DIASTAR type Six, Ten, TenPlus and Sixteen

			
Six	Ten	TenPlus	Sixteen

Product description

DIASTAR Six

The DIASTAR Six is an affordable solution with a long service life for elastomer diaphragms with up to 6 bar media pressure. The actuator is compact and combines high quality with the basic functions of a pneumatic actuator. It is available with the control function fail safe to close (FC), but does not include any additional accessories.

DIASTAR Ten

Optimally suited for standard applications of up to 10 bar media pressure. Uncomplicated integration into the plant automation possible through the appropriate interface. Available with the control functions fail safe to close (FC), fail safe to open (FO) and double-acting (DA). Option of using PTFE diaphragms for aggressive chemicals.

DIASTAR TenPlus

This actuator is for high performance applications that require high closing forces. Regulation of up to 10 bar media pressure on both sides, such as occurs in ring pipe systems, is possible with this actuator. Available with the control function fail safe to close (FC), as well as in all diaphragm and pipe materials. An accessory interface for simple system integration is integrated.

DIASTAR Sixteen

This is the strongest actuator in the portfolio of GF Piping Systems. The high closing power in combination with the special housing nut guarantees safe regulation of media pressures of up to 16 bar in water applications. The actuator is equipped with an integrated accessory interface for system integration and is also available with the control functions fail safe to close (FC), fail safe to open (FO) and double-acting (DA).

Function

Diaphragm valves from GF Piping Systems are used for regulating, as well as closing, controlling and monitoring volume flows. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and diaphragm come into contact with the medium.

The valve is suited for use with gases and liquids and can be installed in any location and completely drained. By applying pressure to the actuator, and through the force of the integrated spring assemblies (FC, FO), the position of the diaphragms is controlled and regulated.

Benefits/features

- Full plastic pipe valves without metal screws

- No corrosion caused by aggressive media
- Constant leak-tightness in the event of changes in temperature without tightening screws
- Plastic-appropriate, highly stable connection of upper part and valve body by means of a buttress thread
- Simple regulation via maximum flow and linear characteristic curve
- Optimized diaphragm geometry for a longer lifetime
- 90° rotatable air connection for flexible installation

Possible flow media

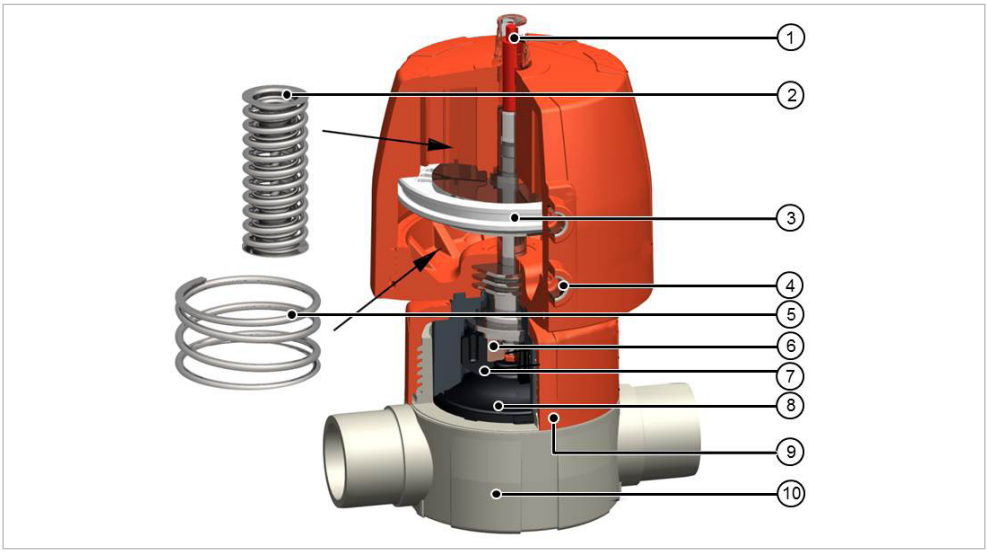
Contaminated, containing solids or ultrapure media.

Liquid and gaseous medium which do not negatively affect the physical and chemical properties of the respective housing and diaphragm material during normal mode. Information on chemical resistance is available from the GF Piping Systems Sales Company or at www.gfps.com.

Applications

- Chemical process industry
- Microelectronics
- Water treatment
- Cooling
- Control applications

Technical data



1 Optical position indicator with cap
2 Pre-loaded spring assemblies for FC mode
3 Lifting piston
4 Air connections
5 Spring for FO mode
6 Diaphragm holder
7 Pressure piece
8 Diaphragms
9 All-plastic housing
10 Valve body

DA mode does not use any springs.

Specification

Approved media		Liquid and gaseous media which, in normal operation, do not adversely affect the physical and chemical properties of the respective housing and diaphragm material. Information on chemical resistance is available from the Georg Fischer Sales Company or at www.gfps.com.				
Dimensions		Type Six	d20/DN15 – d63/DN50, ½" – 2"			
		Type Ten	d20/DN15 – d63/DN50, ½" – 2"			
		Type TenPlus	d20/DN15 – d63/DN50. ½" – 2"			
		Type Sixteen	d20/DN15 – d63/DN50, ½" – 2"			
Materials	**Valve body**	Type Six	PVC-U, PVC-C, ABS, PP-H			
		Type Ten	PVC-U, PVC-C, ABS, PP-H, PP-N, PVDF, PVDF-HP			
		Type TenPlus	PVC-U, PVC-C, ABS, PP-H, PP-N, PVDF, PVDF-HP			
		Type Sixteen	PVC-U, PVC-C, ABS, PVDF, PVDF-HP			
	Housing nut	PPGF 30 for PN10				
		PPSGF40 for PN16 (only for water applications)				
	Gasket/ diaphragm[1]	Membrane O-Ring	NBR EPDM	FKM FKM	EPDM EPDM	PTFE FKM
Operating temperature[2] **(valve body material)**		PVC-U	0 to 60 °C			
		PVC-C	0 to 80 °C			
		ABS	-30 to 60 °C			
		PP	0 to 80 °C			
		PVDF	-20 to 140 °C			
Functions		Type Six	FC			
		Type Ten	FC, FO, DA			
		Type TenPlus	FC			
		Type Sixteen	FC, FO, DA			
Actuation		Pneumatic				
Pressure ratings		Type Six	PN6			
		Type Ten	PN10			
		Type TenPlus	PN10 on both sides			
		Type Sixteen	PN16			
Approvals		ACS, FDA, DIBt, TA Luft, NAMSA				
Product standard		EN ISO 16138				
Test standard		ISO 9393-2, EN 12266-1 (leackage rate A)				
Approvals		ACS, FDA, DIBt				

[1] Other combinations on request.

[2] According to pressure-temperature diagram. Temperature ranges may vary depending on the seal material combination.

Actuator sizes DIASTAR

DN	Six FC	Ten DA/FO/FC	TenPlus FC	Sixteen FC	Sixteen DA/FO
15	 1	 1	 2	 2	 1
20	 2	 2	 2	 2	 2
25	 2	 2	 3	 3	 2
32	 3	 3	 4	 4	 3
40	 3	 4	 5	 5	 4
50	 3	 4	 5	 5	 4

Kv 100 values

Type 514 – 517

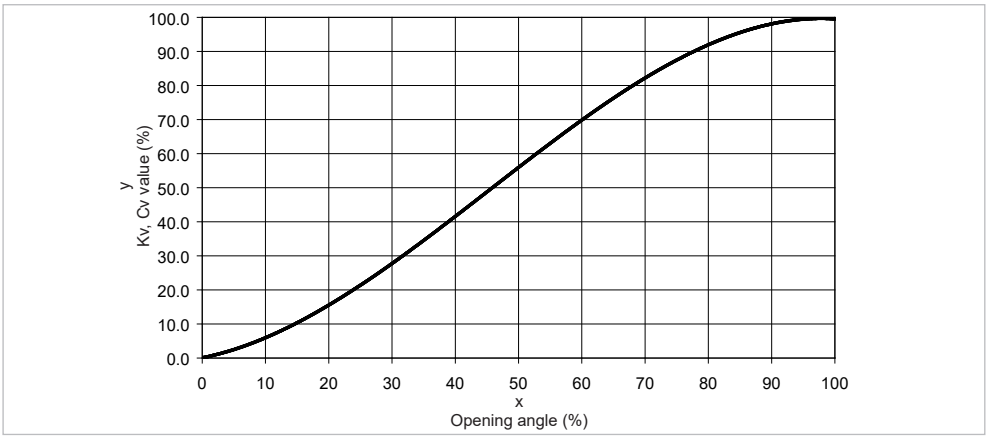
d (mm)	DN (mm)	inch (inch)	kv 100 (l/min)	Cv 100 (US gal/min)	kv 100 (m^3/h)
20	15	½	125	9	8
25	20	¾	271	19	16
32	25	1	481	33	29
40	32	1 ¼	759	52	45
50	40	1 ½	1'263 (960[1)])	87	76
63	50	2	1'728 (1'181[1)])	119	104

Type 519

d (mm)	DN (mm)	Inch (inch)	d1 (mm)	DN1 (mm)	Inch (inch)	kv 100 (l/min)	Cv 100 (US gal/min)	kv 100 (m^3/h)
20	15	½	20	15	½	57	4	3
25	20	¾	20	15	½	89	6	5
25	20	¾	25	20	¾	118	8	7
32	25	1	20	15	½	80	6	5
32	25	1	25	20	¾	105	7	6
32	25	1	32	25	1	231	16	14
40	32	1 ¼	20	15	½	85	6	5
40	32	1 ¼	25	20	¾	119	8	7
40	32	1 ¼	32	25	1	153	11	9
40	32	1 ¼	40	32	1 ¼	187	13	11
50	40	1 ½	20	15	½	86	6	5
50	40	1 ½	25	20	¾	160	11	10
50	40	1 ½	32	25	1	206	14	12
50	40	1 ½	40	32	1 ¼	524	36	31
50	40	1 ½	50	40	1 ½	667	46	40
63	50	2	20	15	½	84	6	5
63	50	2	25	20	¾	150	11	9
63	50	2	32	25	1	184	13	11
63	50	2	40	32	1 ¼	471	32	28
63	50	2	50	40	1 ½	610	42	37
63	50	2	36	50	2	747	52	45
90	80	3	20	15	½	82	6	5
90	80	3	25	20	¾	103	7	6
90	80	3	32	25	1	129	9	8
90	80	3	50	40	1 ½	623	43	37
90	80	3	36	50	2	696	48	42
110	100	4	20	15	½	78	5	4
110	100	4	25	20	¾	103	7	6
110	100	4	32	25	1	131	9	8
110	100	4	50	40	1 ½	604	42	36
110	100	4	36	50	2	661	46	40

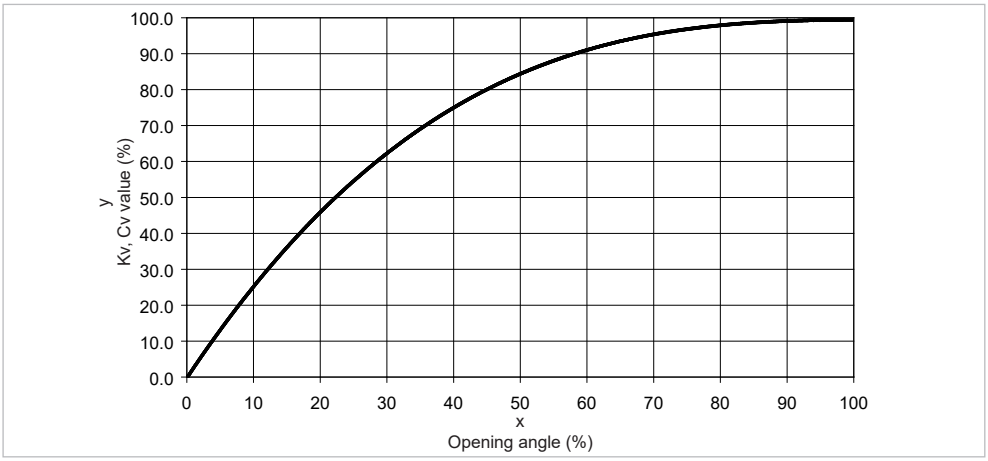
[1)] DIASTAR SIX

Flow characteristics type 514 – 517



x Open angle (%)
y kv, Cv value (%)

Flow characteristics type 519



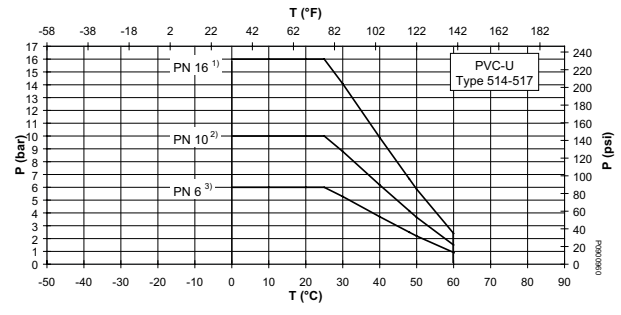
x Open angle (%)
y kv, Cv value (%)

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

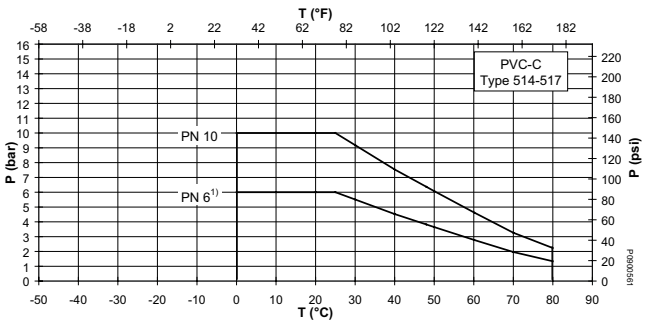
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U



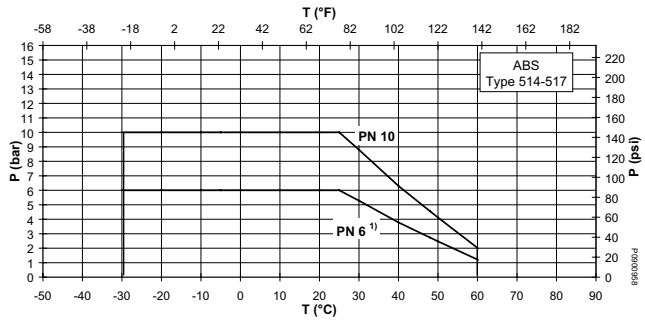
1) Only with black housing nut
2) Depending on the connection type and actuator, the nominal pressure is reduced to PN10
3) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PVC-C



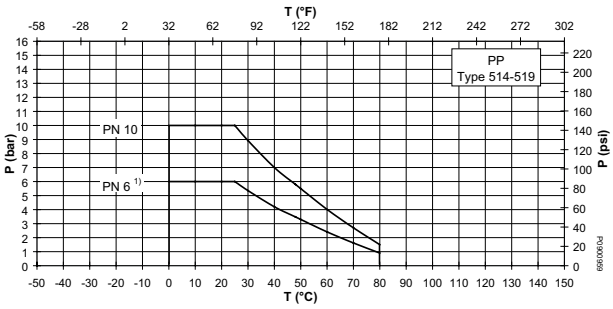
1) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

ABS



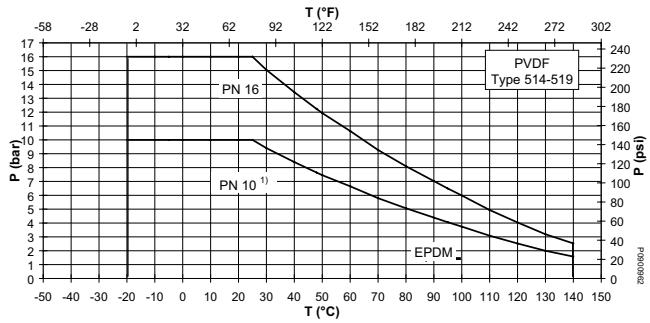
1) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PP



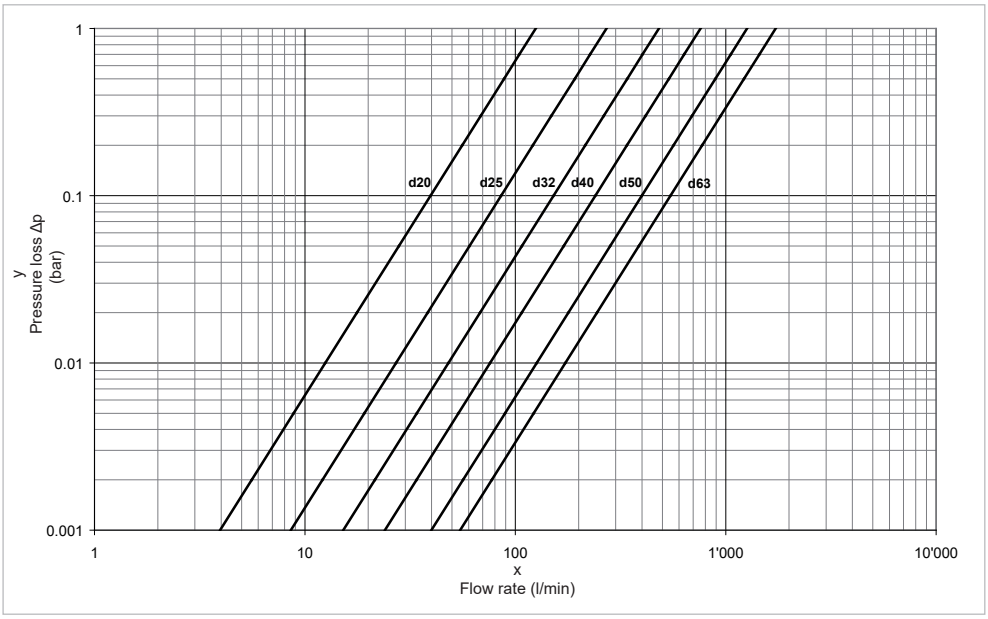
1) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PVDF



1) PN16 only with black PPS housing nut. Depending on the connection type and actuator, the nominal pressure is reduced to PN10

Pressure losses



x Flow rate (l/min, US gal/min)

y Pressure loss Δp (bar, psi)

Air connection

	DIASTAR Six (FC)	DIASTAR Ten (FC/FO/DA)	DIASTAR TenPlus (FC)	DIASTAR Sixteen (FC)	(FO/DA)
20DN15	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
25DN20	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
32DN25	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
40DN32	G 1/8"	G 1/8"	G 1/4"	G 1/4"	G 1/8"
50DN40	G 1/8"	G 1/4"	G 1/4"	G 1/4"	
63DN50	G 1/8"	G 1/4"	G 1/4"	G 1/4"	

Control volume

	DIASTAR Six (FC) [dm^3]	DIASTAR Ten (FC) [dm^3]	DIASTAR Ten (FO) [dm^3]	DIASTAR Ten (DA) [dm^3] close	open	DIASTAR TenPlus (FC) [dm^3]	DIASTAR Six-teen (FC) [dm^3]
20DN15	0.04	0.04	0.07	0.07	0.04	0.10	0.10
25DN20	0.12	0.12	0.20	0.20	0.12	0.12	0.12
32DN25	0.12	0.12	0.23	0.23	0.12	0.22	0.22
40DN32	0.24	0.24	0.44	0.44	0.24	0.40	0.40
50DN40	0.24	0.42	0.86	0.86	0.42	0.70	0.70
63DN50	0.24	0.44	0.86	0.86	0.44	0.80	0.80

Pressure ratings

DIASTAR Six FC

Valve body material	PVC-U, PVC-C, ABS, PP-H, PP-N	
	Pressure rating [bar]	Max. control pressure[2] [bar]
DN	EPDM[1]	
20DN15	6	2.6
25DN20	6	3.8
32DN25	6	3.8
40DN32	6	3.8
50DN40	6	3.8
63DN50	6	5.5
Medium pressure	→ One sided applied	

[1] Also applies to other elastomer diaphragms such as FKM, NBR, etc.

[2] At 0 bar medium pressure.

DIASTAR Ten FC

Valve body material	PVC-U, PVC-C, ABS, PP-H, PVDF, PVDF-HP, PP-N		
	Pressure rating [bar]		Max. control pressure[2] [bar]
DN	EPDM[1]	PTFE	
20DN15	10	10/6*	5.4
25DN20	10	10/6*	5.4
32DN25	10	10/6*	5.4
40DN32	10	10/6*	5.4
50DN40	10	10/6*	5.4
63DN50	10	6/5	5.4
Medium pressure	→ One sided applied	→ One sided applied	

*With medium pressure applied on both sides.

[1] Also applies to other elastomer diaphragms such as FKM, NBR, etc.

[2] At 0 bar medium pressure.

DIASTAR Ten FO/DA

Valve body material	PVC-U, PVC-C, ABS, PP-H, PVDF, PVDF-HP, PP-N			
	Pressure rating [bar]		Max. control pressure[2] [bar]	
DN	EPDM[1]	PTFE	EPDM[1]	PTFE
20DN15	10	10/6*	4.5	3.5
25DN20	10	10/6*	4.5	3
32DN25	10	10/6*	4.5	3.5
40DN32	10	10/6*	4.5	3.5
50DN40	10	10/6*	3.5	3.5
63DN50	10	10/6*	3.5	4.5
Medium pressure	→ One sided applied	→ One sided applied		

*With medium pressure applied on both sides.

[1] Also applies to other elastomer diaphragms such as FKM, NBR, etc.

[2] At 10 bar medium pressure.

DIASTAR TenPlus FC

Valve body material	PVC-U, PVC-C, ABS, P-H, PVDF, PVDF-HP		
	Pressure rating [bar]		Max. control pressure[2] [bar]
DN	EPDM[1]	PTFE	
20DN15	10	10	5.4
25DN20	10	10	5.4
32DN25	10	10	5.4
40DN32	10	10	5.4
50DN40	10	10	5.4
63DN50	10	10	5.4
Medium pressure	↔ Both sides applied	↔ Both sides applied	

[1] Also applies to other elastomer diaphragms such as FKM, NBR, etc.

[2] At 0 bar medium pressure.

DIASTAR Sixteen FC

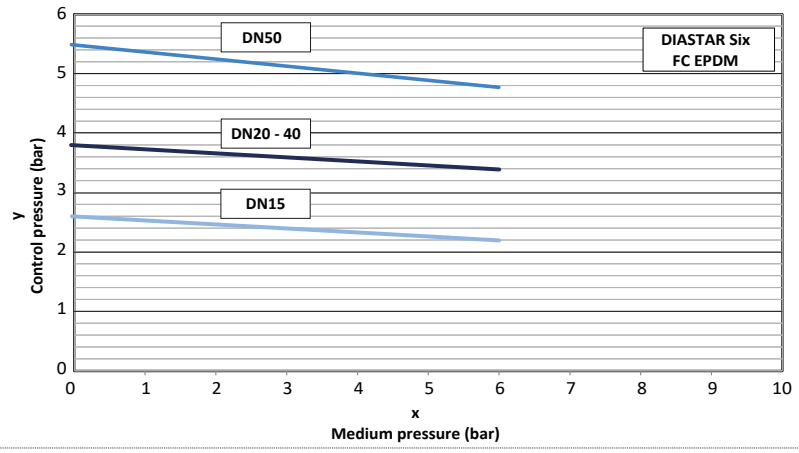
Valve body material	PVC-U, PVDF, PVDF-HP		
	Pressure rating [bar]		Max. control pressure[2] [bar]
DN	EPDM[1]	PTFE	
20DN15	16	16	5.5
25DN20	16	16	5.5
32DN25	16	16	5.5
40DN32	16	16	5.5
50DN40	16	16	5.5
63DN50	16	10	5.5
Medium pressure	→ One sided applied	→ One sided applied	

[1] Also applies to other elastomer diaphragms such as FKM, NBR, etc.

[2] At 0 bar medium pressure.

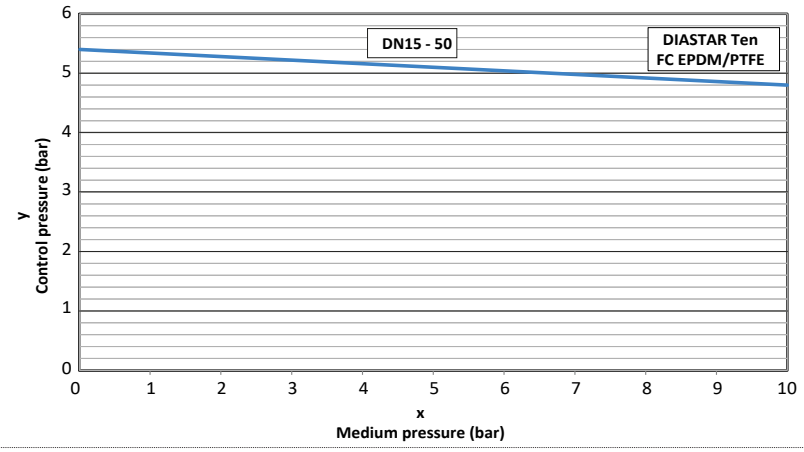
Control pressure diagrams

DIASTAR Six FC with EPDM* diaphragm



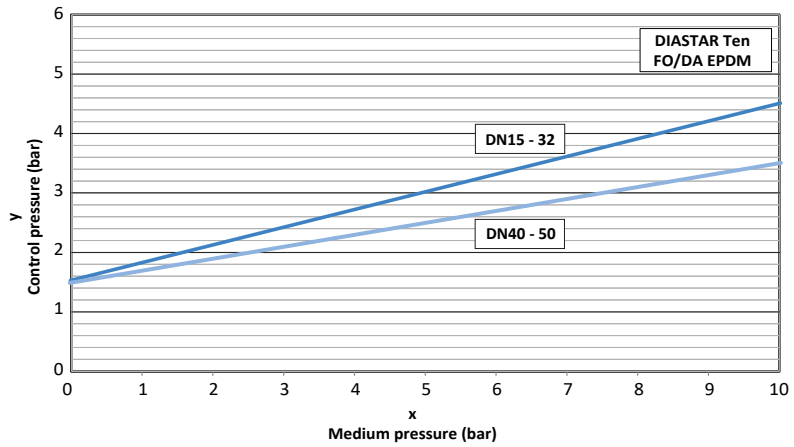
x Media pressure
y Control pressure

DIASTAR Ten FC with EPDM* or PTFE diaphragm



x Media pressure
y Control pressure

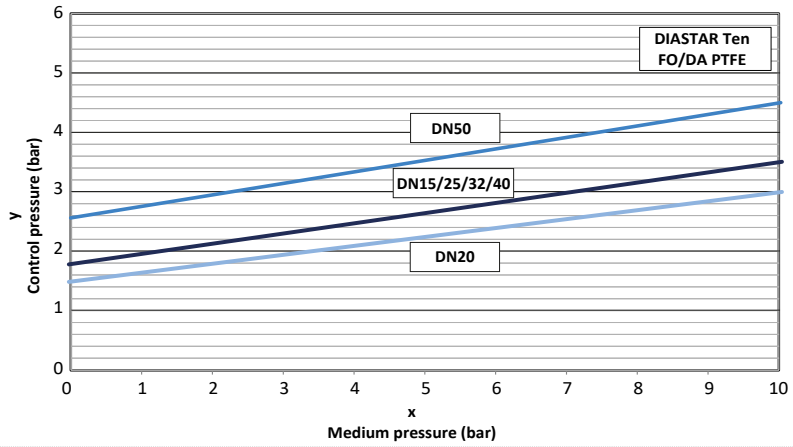
DIASTAR Ten FO and DA with EPDM* diaphragm



x Media pressure
y Control pressure

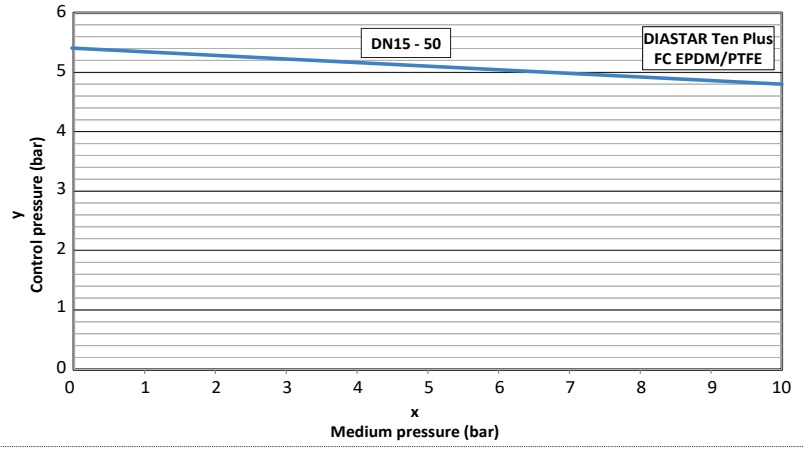
* also applies to other elastomer diaphragms such as FKM, NBR, etc.

DIASTAR Ten FO and DA with PTFE diaphragm



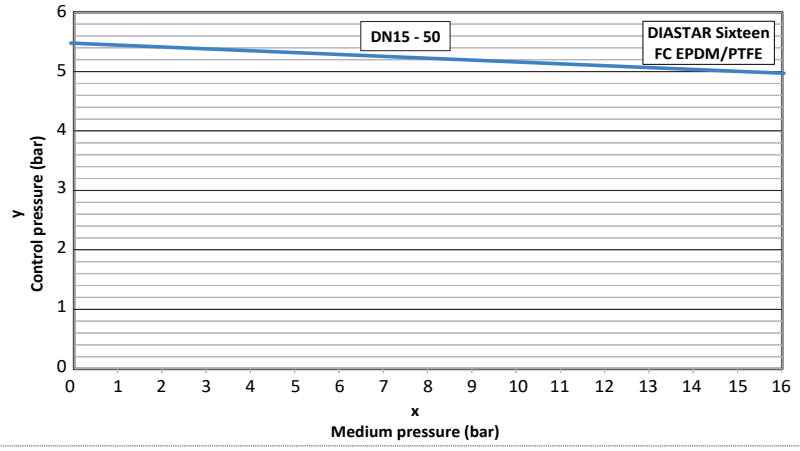
x Media pressure
y Control pressure

DIASTAR TenPlus FC with EPDM* or PTFE diaphragm



x Media pressure
y Control pressure

DIASTAR Sixteen FC with EPDM* or PTFE diaphragm

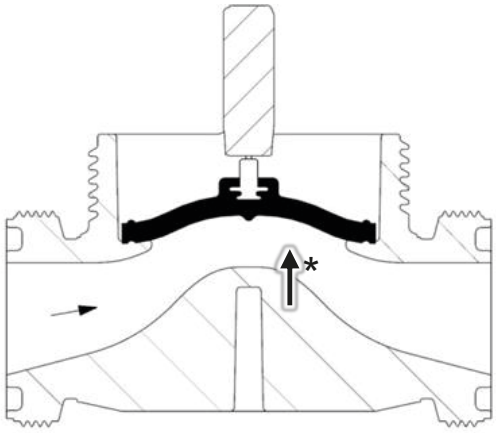


x Media pressure
y Control pressure

* also applies to other elastomer diaphragms such as FKM, NBR, etc.

Valve stroke

Valve stroke



* Max. Valve stroke

DN (mm)	Actuator Size	Version	Valve stroke Reference (mm)
15	1	Six, 604/605	6.0
	1	Ten	6.0
			6.0
	2	Sixteen	6.0
20	2	Six	9.0
	2	Ten	9.0
	2	Sixteen	9.0
25	2	Six	12.0
	2	Ten	12.0
	3	Sixteen	12.0
32	3	Six	14.0
	3	Ten	14.0
	4	Sixteen	14.0
40	3	Six	14.0
	4	Ten	14.0
			14.0
	5	Sixteen	14.0
50	3	Six	14.0
			14.0
			14.0
	4	Ten	22.0
	5	Sixteen	22.0

Technical basics

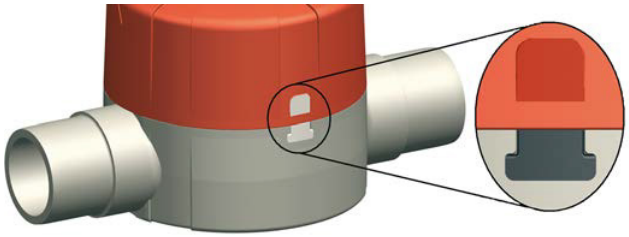
The actuators are available with the functions fail safe to close (FC), fail safe to open (FO) and double-acting (DA). The valves have an integrated optical position indicator. The actuator housings are made of PPGF (fiberglass-reinforced polypropylene). Actuators of the FC design have pre-tensioned spring assemblies made of galvanized steel, for safe operation and safe maintenance of the actuator.

i All diaphragm valves are manufactured in accordance with EN ISO 16138. The upper housing made of PPGF (fiberglass-reinforced polypropylene) is screwed together with the lower housing using a central plastic nut, which avoids exposed metal screws.

Indicator for diaphragm material

The color of the index plate on the valve body shows the type of diaphragm material:

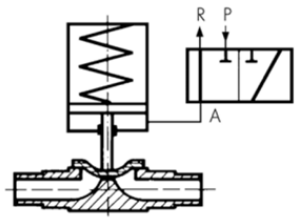
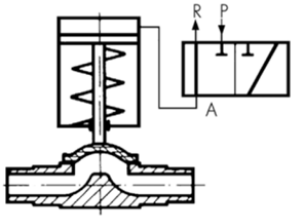
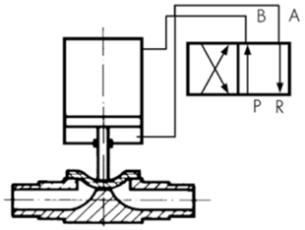
Color	Diaphragm material
Black	EPDM
White	PTFE/EPDM
Green	PTFE/FKM
Red	FKM
Blue	NBR



Differentiation in functionalities – FC, FO, DA

Function	Name
FC	Fail safe to close
FO	Fail safe to open
DA	Fail safe double-acting

FC mode	FO mode	DA mode
In the non-operative state, the valve is closed by means of spring resistance. When the actuator is pressurized with the control pressure (bottom connection), the valve opens. When the control pressure escapes, the valve is closed via spring resistance.	In the non-operative state, the valve is opened by means of spring resistance. When the actuator is pressurized with the control pressure (top connection), the valve closes. When the control pressure escapes, the valve is opened via spring resistance.	The valve has no defined basic position. The valve is opened and closed by applying control pressure to the corresponding connection (top connection for closing, bottom connection for opening).

Selection of the solenoid valve and associated connecting thread		
3/2-way solenoid valves are used to control single acting actuators (FC). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	3/2-way solenoid valves are used to control single acting actuators (FO). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	4/2-way or 5/2-way solenoid valves are used to control double-acting actuators (DA). They can be mounted either directly to the actuator using a NAMUR connector plate or via valve clusters.
		
FC mode with a 3/2-way solenoid valve for bottom connection	FO mode with a 3/2-way solenoid valve for top connection	The DA mode with a 4/2- or 5/2-way solenoid valve. Both connections are used.

Control pressure

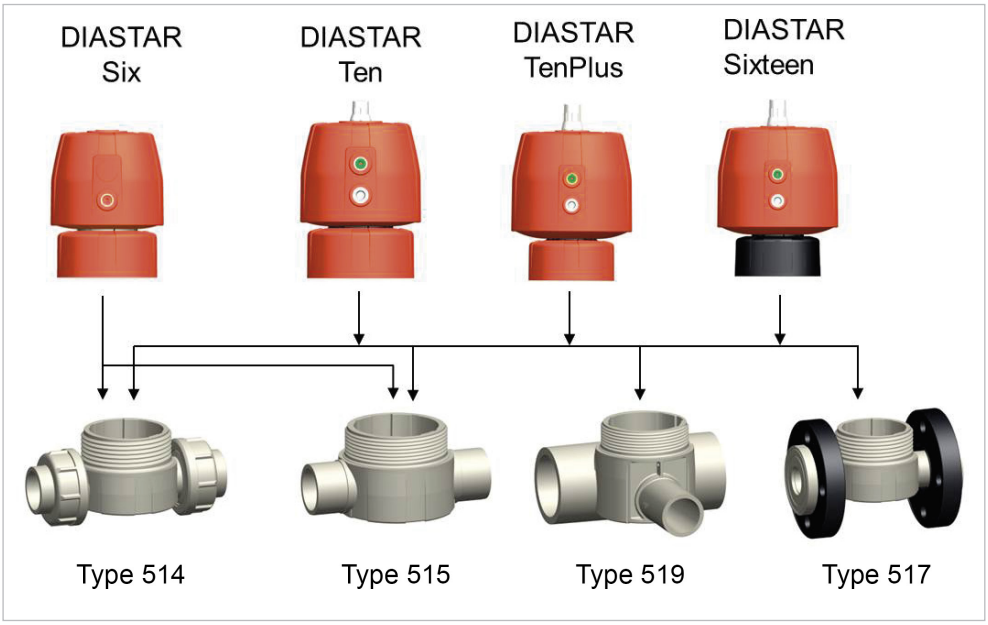
Function FC	Function FO	Function DA
6 bar maximum for function FC; low control pressures possible by reducing the spring assemblies. Depending on dimension, see table of pressure stages and control pressure diagrams.	5 bar maximum for the FO function. For dimension DN50 and from a medium pressure of 10 bar, the max. control pressure is 6 bar. Depending on the dimension, see table of pressure stages and control pressure diagrams.	5 bar maximum for the DA function. For dimension DN50 and from a medium pressure of 10 bar, the max. control pressure is 6 bar. Depending on the dimension, see table of pressure stages and control pressure diagrams.
Compressed air classes (ISO 8573-1) 2 or 3 at -10°C and 3 or 4 at T>0°C	Compressed air classes (ISO 8573-1) 2 or 3 at -10°C and 3 or 4 at T>0°C	Compressed air classes (ISO 8573-1) 2 or 3 at -10°C and 3 or 4 at T>0°C
From a medium pressure of 10 bar, the control pressure must be throttled (set actuator operating time to approx. 3s).	From a medium pressure of 10 bar, the exhaust air of the control pressure must be throttled (set actuator operating time to approx. 3s).	From a medium pressure of 10 bar, the exhaust air of the control pressure must be throttled (set actuator operating time to approx. 3s).
Temperature of the control medium max. 40°C	Temperature of the control medium max. 40°C	Temperature of the control medium max. 40°C
	Depending on the medium pressure, low control pressures can be selected.	Depending on the medium pressure, low control pressures can be selected.

Note: For optimum valve life, it is recommended to set the control pressure based on the medium pressure - see control pressure diagrams.

Diaphragms

Diaphragms in this Valve type are heavily stressed components. In addition to the mechanical stress caused by wear and tear over several actuating cycles, the diaphragms are also subject to wear and tear due to the flow medium. We strongly recommend that you inspect and, if necessary, replace the diaphragms after 50,000 cycles.

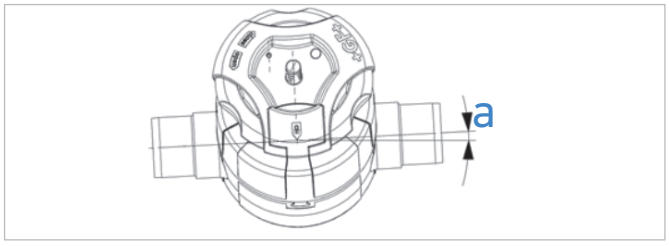
Connections



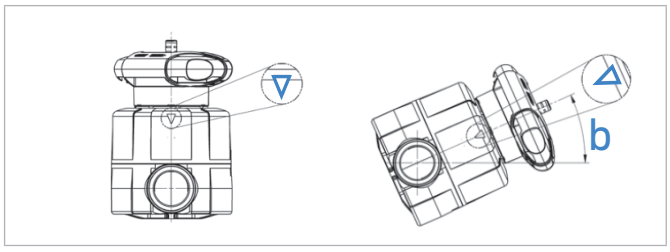
Installation angle for optimal draining of the valve

In order to achieve optimal drainage of these diaphragm valves, GF Piping Systems recommends installing them at the angles (a and b), which correspond to the respective dimension ranges. An installation inclination of about 1° to 2° is not taken into consideration with the stated angles.

Dimension	Angle a for types 514, 515, 517
d20/DN15	2
d25/DN20	2
d32/DN25	3
d40/DN32	4
d50/DN40	5
d63/DN50	7

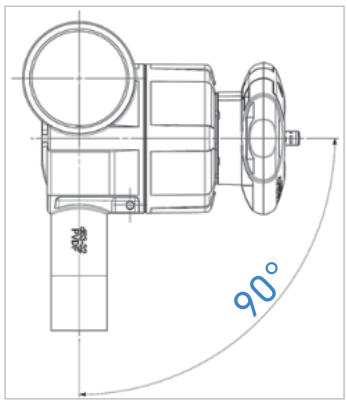


Dimension	Angle a for types 514, 515, 517
d20/DN15	27
d25/DN20	24
d32/DN25	25
d40/DN32	23
d50/DN40	24
d63/DN50	22



Optimum angle with one of the triangle legs horizontal.

Emptying angle for type 519 is 90°, regardless of the dimension



Integrated fastening and PP mounting blocks

Integrated mounting

The diaphragm valve includes an integrated mounting. With this, the forces that can occur when operating the valve (e.g. breakaway torque) are absorbed. Thanks to the integrated mounting, operation forces are not transmitted to the piping system.

PP mounting block for diaphragm valves

The mounting blocks are designed to allow differently sized GF diaphragm valves to be aligned on the same pipe axis by equalizing the different heights from the mounting surface to the pipe axis. The blocks can also be used for the PVC diaphragm Valve type 514 for equalizing the coupling nut with the mounting surface.

- Material: PP-GF15, black
- 5 sizes, numbered from 1 to 5
- Can be plugged together to achieve the desired height

Valve handling

Installation notes

Relation between the pipe pressure and spring assemblies

The closing forces of the actuators were designed for the specified PN pressure level. Operation with low pipe pressure can cause increased diaphragm wear. In order to extend the diaphragm life span, the number of spring assemblies can be reduced. For the specific dimensioning, please contact your representative at GF Piping Systems.



DIASTAR Six
For low pressure applications
- DN20 to DN50
- FC-function
- Cost effective



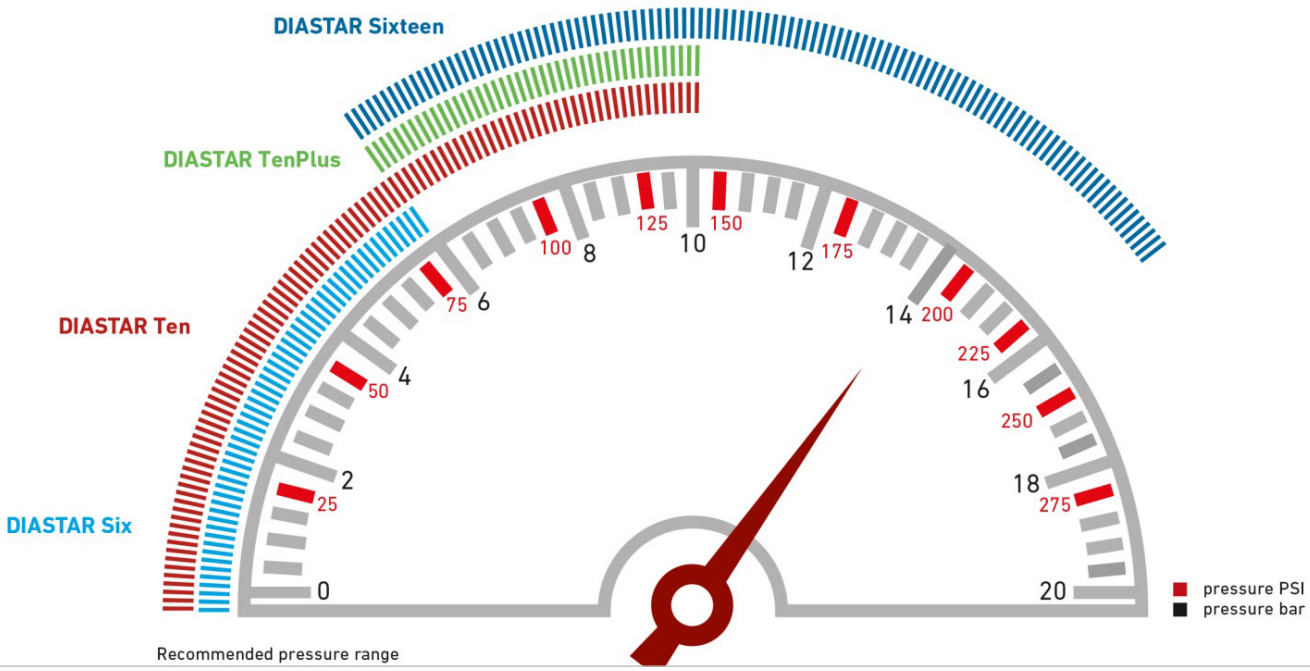
DIASTAR Ten
All-rounder for standard applications
- DN15 to DN50
- FC-, FO and DA-function



DIASTAR TenPlus
Use only when pressure is applied from both sides
- DN15 to DN50
- FC-function



DIASTAR Sixteen
For water applications with high pressure
- DN15 to DN50
- FC-, FO-, DA-function



Line pressure	Pressure direction	DIASTAR Type	Recommendation
0 - 6 bar	→ One-sided pressure	DIASTAR Six	For pipe pressures below 2 bar, reduced spring assemblies should be used to extend the valve's service life.
0 - 10 bar	→ One-sided pressure	DIASTAR Ten	For pipe pressures below 2 bar, reduced spring assemblies should be used to extend the valve's service life.
6 - 10 bar	→← Pressure on both sides	DIASTAR TenPlus	If a pressure between 6 and 10 bar is applied to both valve ports (inlet and outlet), the DIASTAR TenPlus is recommended.
6 - 16 bar	→ One-sided pressure	DIASTAR Sixeen	For pipe pressures below 8 bar, reduced spring assemblies should be used to extend the valve's service life.

Ensure that the diaphragm valve and the spring assemblies are each designed in accordance with the medium pressure. Reducing the spring assemblies leads to a reduced closing force. When the medium pressure rises, the valve cannot close or cannot close completely if spring assemblies are missing. This can have a negative impact on the process.

Maintenance notes

We recommend regular inspection of the diaphragm and the valve body, at the latest after:

- 100,000 operations at less than 10 bar nominal pressure at 20 °C with water
- 50,000 operations at more than 10 bar nominal pressure at 20 °C with water

Should the flow medium show increased temperatures, chemicals, or particles that cause abrasion, we recommend more frequent monitoring. The diaphragm can be controlled by professionally dismounting the housing nut.



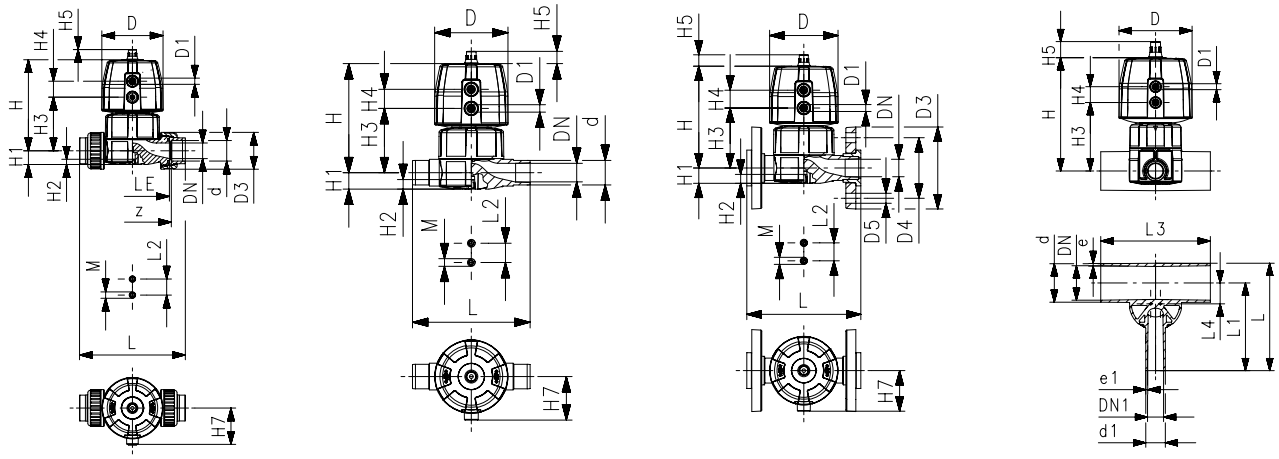
Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual can be downloaded via the QR code on the enclosed quick start guide, see also the online product catalog at www.gfps.com

Tips for installation

- The direction of flow and mounting position may be chosen freely.

Dimensions

Type 514	Type 515	Type 517	Type 519



DIASTAR Six FC (Type 514 – 517)

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (inch)	D4 (mm)	D5 (mm)	L(1) (mm)	L(2) (mm)	L(3) (mm)	L(4) (mm)	L(5) (mm)	L(6) (mm)	L(7) (mm)
20	15	½	68	⅛	65	14	128	128	128	224	196	124	124
25	20	¾	96	⅛	75	14	152	152	150	250	221	144	144
32	25	1	96	⅛	85	14	166	166	162	262	234	154	154
40	32	1 ¼	120	⅛	100	18	192	192	184	296	260	174	174
50	40	1 ½	120	⅛	110	18	222	222	210	328	284	194	194
63	50	2	120	⅛	125	18	266	266	248	370	321	224	224

Dim. (mm)	DN (mm)	Inch (inch)	L(8) (mm)	L(9) (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H7 (mm)	M	Z (mm)	LE	z for L(3)	Hx (mm)
20	15	½	124	130	25	101	14	12	60	43	M6	96	90	100	7
25	20	¾	144	150	25	132	18	12	73	57	M6	114	108	118	10
32	25	1	154	160	25	143	22	12	84	57	M6	122	116	126	13
40	32	1 ¼	174	180	45	173	26	15	99	69	M8	140	134	144	14
50	40	1 ½	194	200	45	193	32	15	119	69	M8	160	154	164	16
63	50	2	224	230	45	205	39	15	132	69	M8	190	184	194	16

DIASTAR Ten FC (Type 514 – 517)

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (inch)	D4 (mm)	D5 (mm)	L(1) (mm)	L(2) (mm)	L(3) (mm)	L(4) (mm)	L(5) (mm)	L(6) (mm)	L(7) (mm)	L(8) (mm)
20	15	½	68	⅛	65	14	128	128	128	224	196	124	124	124
25	20	¾	96	⅛	75	14	152	152	150	250	221	144	144	144
32	25	1	96	⅛	85	14	166	166	162	262	234	154	154	154
40	32	1 ¼	120	⅛	100	18	192	192	184	296	260	174	174	174
50	40	1 ½	150	¼	110	18	222	222	210	328	284	194	194	194
63	50	2	150	¼	125	18	266	266	248	370	321	224	224	224

Dim. (mm)	DN (mm)	inch (inch)	L(9) (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	M	z (mm)	LE	z for L(3)	Hx (mm)
20	15	½	130	25	101	14	12	60	24	16	43	M6	96	90	100	7
25	20	¾	150	25	132	18	12	73	25	16	57	M6	114	108	118	10
32	25	1	160	25	143	22	12	84	25	16	57	M6	122	116	126	13
40	32	1 ¼	180	45	173	26	15	99	26	26	69	M8	140	134	144	15
50	40	1 ½	200	45	214	32	15	119	36	26	88	M8	160	154	164	19
63	50	2	230	45	226	39	15	132	36	26	88	M8	190	184	194	23

DIASTAR Ten FO/DA (Type 514 – 517)

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (inch)	D4 (mm)	D5 (mm)	L(1) (mm)	L(2) (mm)	L(3) (mm)	L(4) (mm)	L(5) (mm)	L(6) (mm)	L(7) (mm)	L(8) (mm)
20	15	½	68	⅛	65	14	128	128	128	224	196	124	124	124
25	20	¾	96	⅛	75	14	152	152	150	250	221	144	144	144
32	25	1	96	⅛	85	14	166	166	168	262	234	154	154	154
40	32	1 ¼	120	⅛	100	18	192	192	184	296	260	174	174	174
50	40	1 ½	150	¼	110	18	222	222	210	328	284	194	194	194
63	50	2	150	¼	125	18	266	266	248	370	321	224	224	224

Dim. (mm)	DN (mm)	Inch (inch)	L(9) (mm)	l2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	M	z (mm)	LE	z for L(3)	Hx (mm)
20	15	½	130	25	101	14	12	60	24	16	43	M6	96	90	100	7
25	20	¾	150	25	132	18	12	73	25	16	57	M6	114	108	118	10
32	25	1	160	25	147	22	12	84	25	16	57	M6	122	116	126	13
40	32	1 ¼	180	45	173	26	15	99	26	26	69	M8	140	134	144	15
50	40	1 ½	200	45	214	32	15	119	36	26	88	M8	160	154	164	19
63	50	2	230	45	226	39	15	132	36	26	88	M8	190	184	194	23

DIASTAR Ten FO/DA (Type 519)

Dim. (mm)	d1 (mm)	DN (mm)	inch (inch)	DN1 (mm)	Inch1 (")	DN2 (mm)	Inch2 (inch)	D (mm)	D1 (inch)	L(6) (mm)	L1 (mm)	L3 (mm)	L4 (mm)	H (mm)	H3 (mm)	H4 (mm)	H5 (mm)	Hx (mm)
20	20	15	½	15	½	15	½	68	⅛	117	96	162	12	104	63	24	16	7
25	20	20	¾	15	½	20	¾	96	⅛	133	108	162	16	131	73	25	16	10
25	25	20	¾	20	¾	20	¾	96	⅛	133	108	162	16	131	73	25	16	10
32	20	25	1	15	½	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	25	25	1	20	¾	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	32	25	1	25	1	25	1	96	⅛	145	120	160	19	143	84	25	16	13
40	20	32	1¼	15	½	25	1	96	⅛	149	128	180	23	151	92	25	16	13
40	25	32	1 ¼	20	¾	25	1	96	⅛	149	128	180	23	151	92	25	16	13
40	32	32	1 ¼	25	1	25	1	96	⅛	149	128	180	23	151	92	25	16	13
40	40	32	1 ¼	32	1 ¼	25	1	96	⅛	174	153	180	23	151	92	25	16	13
50	20	40	1 ½	15	½	20	¾	96	⅛	160	134	180	27	148	90	25	16	10
50	25	40	1 ½	20	¾	25	1	96	⅛	160	134	180	28	156	97	25	16	13
50	32	40	1 ½	25	1	25	1	96	⅛	160	134	180	28	156	97	25	16	13
50	40	40	1 ½	32	1 ¼	50	2	150	¼	209	169	209	33	224	129	36	26	23
50	50	40	1 ½	40	1 ½	50	2	150	¼	209	169	209	33	224	129	36	26	23
63	20	50	2	15	½	20	2	96	⅛	177	144	180	33	155	96	25	16	10
63	25	50	2	20	¾	25	1	96	⅛	177	144	180	35	163	104	25	16	13
63	32	50	2	25	1	25	1	96	⅛	177	144	180	35	163	104	25	16	13
63	40	50	2	32	1 ¼	50	2	150	¼	225	192	220	39	230	136	36	26	23
63	50	50	2	40	1 ½	50	2	150	¼	225	192	220	39	230	136	36	26	23
63	63	50	2	50	2	50	2	150	¼	225	192	220	39	230	136	36	26	23
90	20	80	3	15	½	25	1	96	⅛	205	159	190	47	176	117	25	16	13
90	25	80	3	20	¾	25	1	96	⅛	205	159	190	47	176	117	25	16	13
90	32	80	3	25	1	25	1	96	⅛	205	159	190	47	176	117	25	16	13
90	50	80	3	40	1 ½	50	2	150	¼	254	207	250	51	244	150	36	26	23
90	63	80	3	50	2	50	2	150	¼	254	207	250	51	244	150	36	26	23
110	20	100	4	15	½	25	1	96	⅛	227	171	190	56	185	126	25	16	13
110	25	100	4	20	¾	25	1	96	⅛	227	171	190	56	185	126	25	16	13
110	32	100	4	25	1	25	1	96	⅛	277	171	190	56	185	126	25	16	13
110	50	100	4	40	1 ½	50	2	150	¼	276	219	250	60	254	160	36	26	23
110	63	100	4	50	2	50	2	150	¼	276	219	250	60	254	160	36	26	23

DIASTAR TenPlus FC (Type 514 – 517)

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (inch)	D4 (mm)	D5 (mm)	L(1) (mm)	L(2) (mm)	L(3) (mm)	L(4) (mm)	L(5) (mm)	L(6) (mm)	L(7) (mm)	L(8) (mm)
20	15	½	96	⅛	65	14	128	128	128	224	196	124	124	124
25	20	¾	96	⅛	75	14	152	152	152	250	221	144	144	144
32	25	1	120	⅛	85	14	166	166	166	262	234	154	154	154
40	32	1 ¼	150	¼	100	18	192	192	192	296	260	174	174	174
50	40	1 ½	180	¼	110	18	222	222	222	328	284	194	194	194
63	50	2	180	¼	125	18	266	266	266	370	321	224	224	224

Dim. (mm)	DN (mm)	Inch (inch)	L(9) (mm)	l2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	M	z (mm)	z for L(3)	Hx (mm)
20	15	½	130	25	127	14	12	68	25	16	57	M6	96	100	7
25	20	¾	150	25	132	18	12	73	25	16	57	M6	114	118	10
32	25	1	160	25	167	22	12	93	26	26	69	M6	122	126	13
40	32	1 ¼	180	45	196	26	15	101	36	26	88	M8	140	144	15
50	40	1 ½	200	45	239	32	15	124	37	26	103	M8	160	164	19
63	50	2	230	45	251	39	15	137	37	26	103	M8	190	194	23

DIASTAR TenPlus FC (Type 519)

Dim. (mm)	d1 (mm)	DN (mm)	Inch (inch)	DN1 (mm)	Inch1 (inch)	DN2 (mm)	Inch2 (inch)	D (mm)	D1 (inch)	L(6) (mm)	L1 (mm)	L3 (mm)	L4 (mm)	H (mm)	H3 (mm)	H4 (mm)	H5 (mm)	Hx (mm)
20	20	15	½	15	½	15	½	96	⅛	117	96	162	12	103	71	25	16	7
25	20	20	¾	15	½	20	¾	96	⅛	133	108	162	16	131	72	25	16	10
25	25	20	¾	20	¾	20	¾	96	⅛	133	108	162	16	131	72	25	16	10
32	20	25	1	15	½	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	25	25	1	20	¾	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	32	25	1	25	1	25	1	120	⅛	145	120	160	19	167	93	26	26	13
40	20	32	1 ¼	15	½	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	25	32	1 ¼	20	¾	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	32	32	1 ¼	25	1	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	40	32	1 ¼	32	1 ¼	25	1	120	⅛	174	153	180	23	175	101	26	26	13
50	20	40	1 ½	15	½	20	¾	96	⅛	160	134	180	27	148	90	25	16	10
50	25	40	1 ½	20	¾	25	1	120	⅛	160	134	180	28	180	106	26	26	13
50	32	40	1 ½	25	1	25	1	120	⅛	160	134	180	28	180	106	26	26	13
50	40	40	1 ½	32	1 ¼	50	2	180	¼	209	169	209	33	249	135	37	26	23
50	50	40	1 ½	40	1 ½	50	2	180	¼	209	169	209	33	249	135	37	26	23
63	20	50	2	15	½	20	2	96	⅛	177	144	180	33	155	96	25	16	10
63	25	50	2	20	¾	25	1	120	⅛	177	144	180	35	187	113	26	26	13
63	32	50	2	25	1	25	1	120	⅛	177	144	180	35	187	113	26	26	13
63	40	50	2	32	1 ¼	50	2	180	¼	225	192	220	39	255	141	37	26	23
63	50	50	2	40	1 ½	50	2	180	¼	225	192	220	39	255	141	37	26	23
63	63	50	2	50	2	50	2	180	¼	225	192	220	39	255	141	37	26	23
90	20	80	3	15	½	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	25	80	3	20	¾	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	32	80	3	25	1	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	50	80	3	40	1 ½	50	2	180	¼	254	207	250	51	269	155	37	26	23
90	63	80	3	50	2	50	2	180	¼	254	207	250	51	269	155	37	26	23
110	20	100	4	15	½	25	1	120	⅛	227	171	190	56	209	135	26	26	13
110	25	100	4	20	¾	25	1	120	⅛	227	171	190	56	209	135	26	26	13
110	32	100	4	25	1	25	1	120	⅛	277	171	190	56	209	135	26	26	13
110	50	100	4	40	1 ½	50	2	180	¼	276	219	250	60	279	165	37	26	23
110	63	100	4	50	2	50	2	180	¼	276	219	250	60	279	165	37	26	23

DIASTAR Sixteen FC (Type 514 – 517)

Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (inch)	D4 (mm)	D5 (mm)	L(1) (mm)	L(2) (mm)	L(3) (mm)	L(4) (mm)	L(5) (mm)	L(6) (mm)	L(7) (mm)	L(8) (mm)
20	15	½	96	⅛	65	14	128	128	128	224	196	124	124	124
25	20	¾	96	⅛	75	14	152	152	152	250	221	144	144	144
32	25	1	120	⅛	85	14	166	166	162	262	234	154	154	154
40	32	1 ¼	150	¼	100	18	192	192	184	296	260	174	174	174
50	40	1 ½	180	¼	110	18	222	222	210	328	284	194	194	194
63	50	2	180	¼	125	18	266	266	248	370	321	224	224	224

Dim. (mm)	DN (mm)	Inch (inch)	L(9) (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	M	z (mm)	z for L(3)	Hx (mm)
20	15	½	130	25	127	14	12	68	25	16	57	M6	96	100	7
25	20	¾	150	25	132	18	12	73	25	16	57	M6	114	118	10
32	25	1	160	25	167	22	12	93	26	26	69	M6	122	126	13
40	32	1 ¼	180	45	196	26	15	101	36	26	88	M8	140	144	15
50	40	1 ½	200	45	239	32	15	124	37	26	103	M8	160	164	19
63	50	2	230	45	251	39	15	137	37	26	103	M8	190	194	23

DIASTAR Sixteen FC (Type 519)

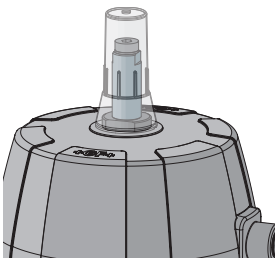
Dim. (mm)	d1 (mm)	DN (mm)	Inch (inch)	DN1 (mm)	Inch1 (inch)	DN2 (mm)	Inch2 (inch)	D (mm)	D1 (inch)	L(6) (mm)	L1 (mm)	L3 (mm)	L4 (mm)	H (mm)	H3 (mm)	H4 (mm)	H5 (mm)	Hx (mm)
20	20	15	½	15	½	15	½	96	⅛	117	96	162	12	130	71	25	16	7
25	20	20	¾	15	½	20	¾	96	⅛	133	108	162	16	131	72	25	16	10
25	25	20	¾	20	¾	20	¾	96	⅛	133	108	162	16	131	72	25	16	10
32	20	25	1	15	½	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	25	25	1	20	¾	20	¾	96	⅛	142	120	162	19	135	76	25	16	10
32	32	25	1	25	1	25	1	120	⅛	145	120	160	19	167	93	26	26	13
40	20	32	1 ¼	15	½	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	25	32	1 ¼	20	¾	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	32	32	1 ¼	25	1	25	1	120	⅛	149	128	180	23	175	101	26	26	13
40	40	32	1 ¼	32	1 ¼	25	1	120	⅛	174	153	180	23	175	101	26	26	13
50	20	40	1 ½	15	½	20	¾	96	⅛	160	134	180	27	148	90	25	16	10
50	25	40	1 ½	20	¾	25	1	120	⅛	160	134	180	28	180	106	26	26	13
50	32	40	1 ½	25	1	25	1	120	⅛	160	134	180	28	180	106	26	26	13
50	40	40	1 ½	32	1 ¼	50	2	180	¼	209	169	209	33	249	135	37	26	23
50	50	40	1 ½	40	1 ½	50	2	180	¼	209	169	209	33	249	135	37	26	23
63	20	50	2	15	½	20	2	96	⅛	177	144	180	33	155	96	25	16	10
63	25	50	2	20	¾	25	1	120	⅛	177	144	180	35	187	113	26	26	13
63	32	50	2	25	1	25	1	120	⅛	177	144	180	35	187	113	26	26	13
63	40	50	2	32	1 ¼	50	2	180	¼	225	192	220	39	255	141	37	26	23
63	50	50	2	40	1 ½	50	2	180	¼	225	192	220	39	255	141	37	26	23
63	63	50	2	50	2	50	2	180	¼	225	192	220	39	255	141	37	26	23
90	20	80	3	15	½	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	25	80	3	20	¾	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	32	80	3	25	1	25	1	120	⅛	205	159	190	47	200	126	26	26	13
90	50	80	3	40	1 ½	50	2	180	¼	254	207	250	51	269	155	37	26	23
90	63	80	3	50	2	50	2	180	¼	254	207	250	51	269	155	37	26	23
110	20	100	4	15	½	25	1	120	⅛	227	171	190	56	209	135	26	26	13
110	25	100	4	20	¾	25	1	120	⅛	227	171	190	56	209	135	26	26	13
110	32	100	4	25	1	25	1	120	⅛	277	171	190	56	209	135	26	26	13
110	50	100	4	40	1 ½	50	2	180	¼	276	219	250	60	279	165	37	26	23
110	63	100	4	50	2	50	2	180	¼	276	219	250	60	279	165	37	26	23

Accessories

- Stroke limiter / emergency manual override
- Solenoid pilot Valve type PV94, PV95, MNL532, PV2000
- Feedback – ER55, ER52 and ER53
- Positioner – type SPC
- Bus communication – AS interface

Stroke limiter/Emergency manual override

The stroke limiter for DIASTAR is used to limit the stroke of the DIASTAR pneumatic diaphragm valve after it has been installed, and as a manual override.

DN (mm)		Six	Ten	TenPlus	Sixteen	Product picture
DN10	FC		199 190 381			
	FO		199 190 381			
	DA		199 190 381			
DN15	FC		199 190 381	199 190 382	199 190 382	
	FO		199 190 381			
	DA		199 190 381			
DN20	FC		199 190 382	199 190 382	199 190 382	
	FO		199 190 382		199 190 382	
	DA		199 190 382			
DN25	FC		199 190 382	199 190 383	199 190 383	
	FO		199 190 382		199 190 382	
	DA		199 190 382			
DN32	FC		199 190 383	199 190 384	199 190 384	
	FO		199 190 383		199 190 383	
	DA		199 190 383			
DN40	FC		199 190 384	199 190 385	199 190 385	
	FO		199 190 384		199 190 384	
	DA		199 190 384			
DN50	FC		199 190 384	199 190 385	199 190 385	
	FO		199 190 384		199 190 384	
	DA		199 190 384			

For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Diaphragm Valve type 604/605



Product description

Diaphragm Valve type 604/605 with integrated pneumatic actuator has a broad range of application, particularly when high actuating cycles, different control functions and chemical-resistant diaphragms are required.

Function

Pneumatic diaphragm valves from GF Piping Systems are used for regulating, as well as closing, controlling and monitoring volume flows. Especially when transporting solid or aggressive media, this Valve type has decisive advantages due to its simple function, compact construction and optimized flow geometry. Only the valve body and diaphragm come into contact with the medium.

Unlike other Valve types, no pressure surges can be caused by closing the diaphragm valve.

Applications

- Chemical process industry
- Dosing applications
- Water distribution

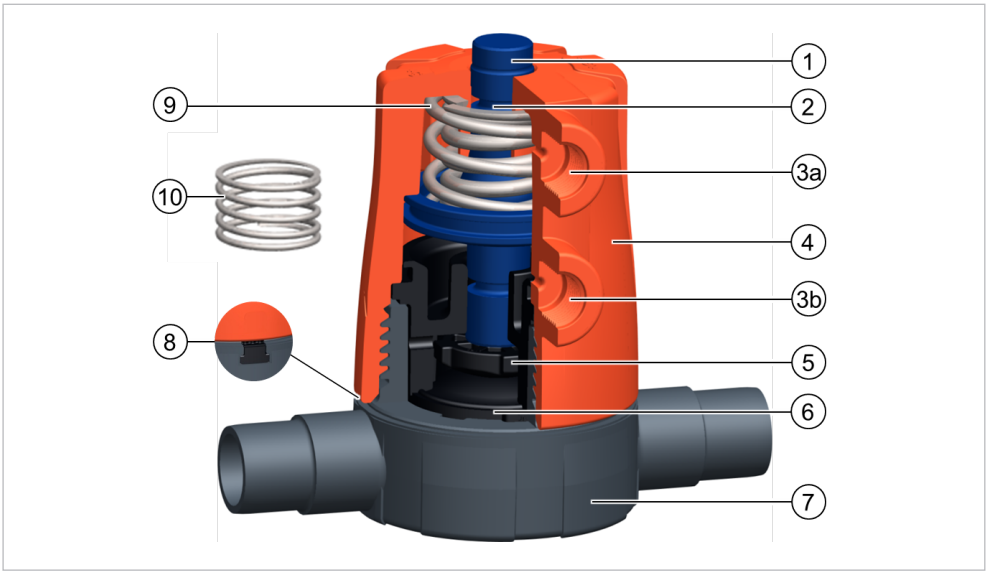
Benefits/features

- High actuating cycles
- Compact construction
- Fully plastic design without metal screws
- No corrosion caused by aggressive media
- Constant leak-tightness in the event of changes in temperature without tightening screws
- Long service life through optimized diaphragm geometry and Longlife variants
- Maintenance-free
- For easy installation and removal
- Maximum flow and linear characteristic curves for easier control

Possible flow media

The valve is suitable for use with gases, as well as solids and aggressive media.

Technical data



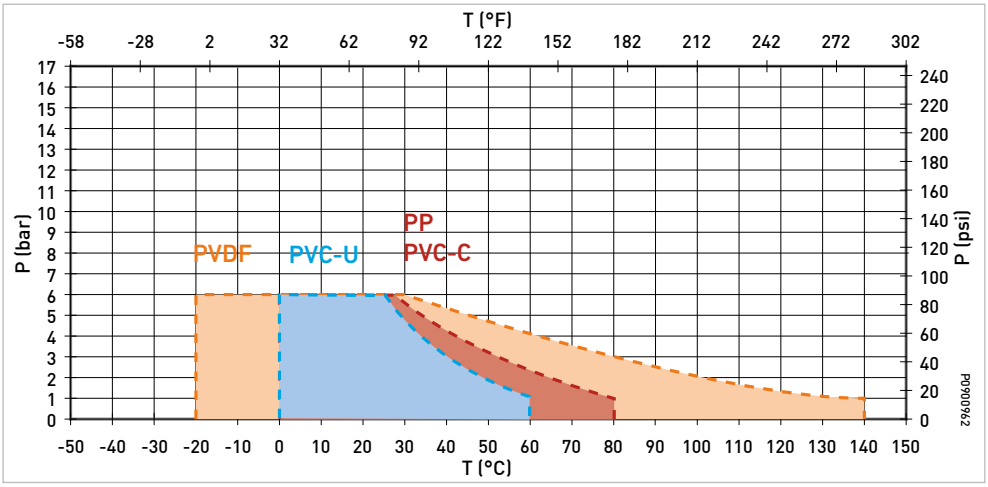
1 Optical position indicator
2 Piston
3 **a** Connection for control air FO
b Connection for control air FC
a + **b** Connection for control air DA
4 Upper part with plastic thread
5 Pressure piece
6 Diaphragm
7 Valve body
8 Indicator for diaphragm material
9 Spring for control function FC
10 Spring for control function FO

Specification		
Dimensions	d20/DN15	
Materials	Valve body	PVC-U, PVC-C, PP-H, PVDF, others upon request
	Diaphragms	EPDM, FKM, PTFE/EPDM, PTFE/FKM
	Spring	Spring steel EN 10270-1 SH (C) Deltatone
Gasket materials	NBR	
Connections	Screw connection with solvent cement sockets, threaded sockets, fusion sockets, butt fusion spigots	
	Solvent cement spigots, butt fusion spigots	
Pressure level	PN6	
Product standard	EN ISO 16138	
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)	
Approvals	ACS, FDA, DIBt	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (L/min)	Kv 100 (m^3/h)	Kv 100 (US gpm)
15	½	20	125	7.5	0.55

Pressure-temperature diagrams



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

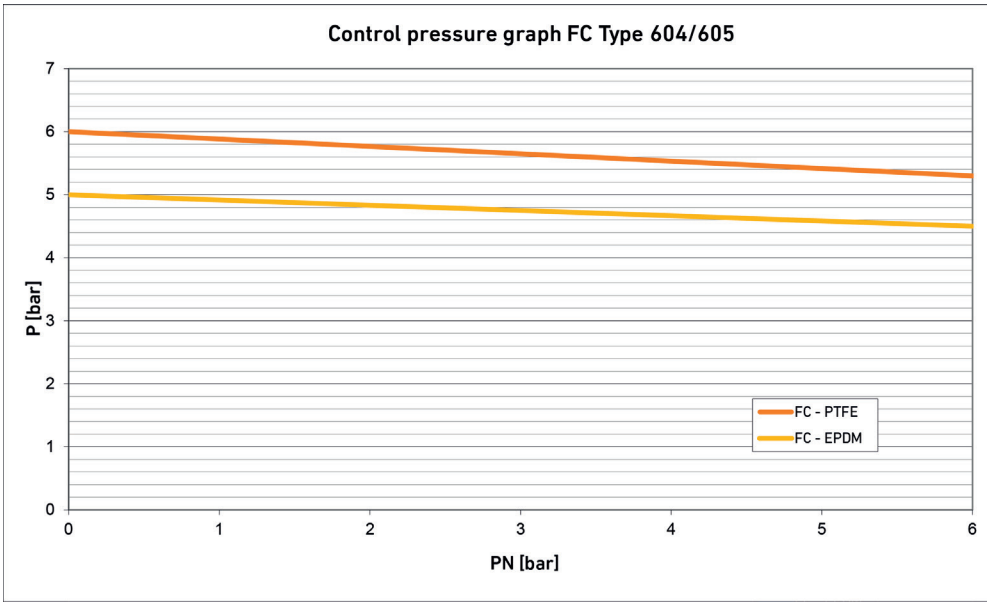
Pressure ratings

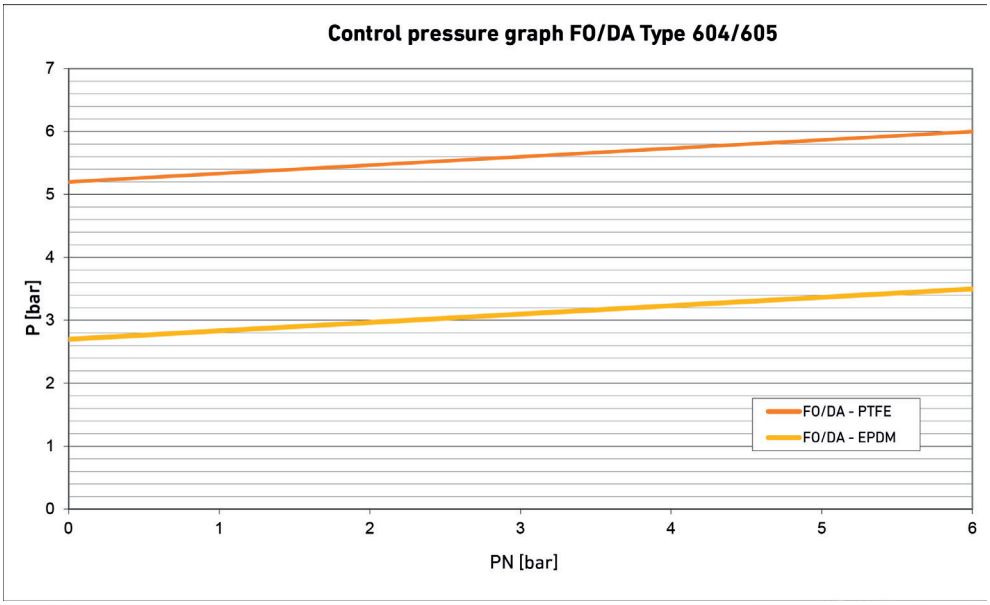
	Pressure rating [bar]	Max. control pressure [bar]			
		FC	FC	FO/DA	FO/DA
DN		EPDM[1)]	PTFE[1)]	EPDM[2)]	PTFE[2)]
20DN15	6	5.0	6.0	3.5	6.0
Medium pressure	→ One sided applied				

[1)] At 0 bar medium pressure

[2)] At 6 bar medium pressure

Control pressure diagrams





Technical basics

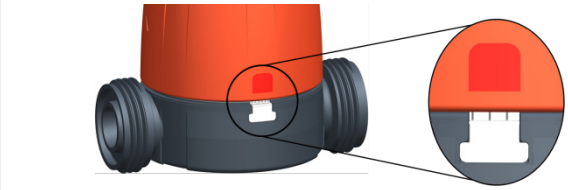
The actuators are available with the functions fail safe to close (FC), fail safe to open (FO) and double-acting (DA). Actuators in the FC design have pre-tensioned spring assemblies made of galvanized steel for safer operation and safer maintenance of the actuator.

i All diaphragm valves are manufactured in accordance with EN ISO 16138. The upper housing made of PPGF (fiberglass-reinforced polypropylene) is screwed together with the lower housing using a central plastic nut, which avoids exposed metal screws.

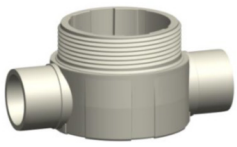
Indicator for diaphragm material

The color of the index plate on the valve body shows the type of diaphragm material:

Diaphragm	Index plate color
EPDM	Black
FKM	Red
PTFE/EPDM	White
PTFE/FKM	Green



Indicator for Valve type

Type 604	Type 605
	
Connection: Union	Connection: Spigot

Differentiation in functionalities – FC, FO, DA

Function	Name
FC	Fail safe to close
FO	Fail safe to open
DA	Fail safe double-acting

FC mode	FO mode	DA mode
In the non-operative state, the valve is closed by means of spring resistance. When the actuator is pressurized with the control medium (bottom connection), the valve opens. When the control medium escapes, the valve is closed via spring resistance.	In the non-operative state, the valve is opened by means of spring resistance. When the actuator is pressurized with the control medium (top connection), the valve closes. When the control medium escapes, the valve is opened via spring resistance.	The valve has no defined basic position. The valve is opened and closed by applying control pressure to the corresponding connection (top connection for closing, bottom connection for opening).

Control medium

FC mode	FO mode	DA mode
	Max. 6 bar	Max. 5 bar
ISO 8573-1 pressurized air classes 2 or 3 at 10 °C, ISO 8573-1 pressurized air classes 3 or 4 at T > 0 °C		
Temperature of control medium: max. 40 °C		
Depending on the operating pressure, lowercontrol pressures can be selected		

Valve handling

Installation notes

Valve failure due to the wrong choice of material

The valve body, gaskets, diaphragms, diaphragm support, housing and mechanical components can be damaged or impaired in their function due to lack of chemical resistance, external influences, wear of the diaphragm or diffusion effects. Please consult the "List of chemical resistance".

Use of lubricants

Use of lubricants on the threaded connection between the housing nut and valve body causes stress fractures. Do not use lubricants on the threaded connection between the housing nut and valve body.

Heat expansion due to changes in temperature

Due to temperature changes, longitudinal or bending forces may occur in the pipes through thermal expansion.

The following points should be noted here:

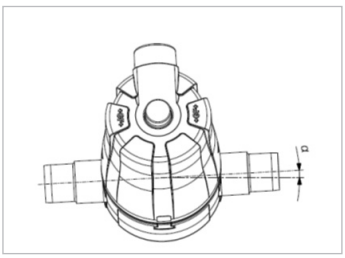
- Mount the diaphragm valve as a fixed point or
- Mount the pipe bracket directly in front of and after the diaphragm valve
- Mount the diaphragm valve and pipe such that they are flush

⚠ The plastic thread must not be tightened to more than 2 Nm at the control air connection. No tapered threads may be used.

Installation angle for optimal draining of the valve

To achieve optimal draining, GF Piping Systems recommends installing the individual dimensions in accordance with the corresponding angle (a and b). An installation inclination of about 1 - 2° is not taken into consideration with the stated angles.

Dimension	Angle a
d20/DN15	2



Integrated fastening and PP mounting blocks

ENSAT® bushings on the underside of the valve allow simple and stable attachment of the diaphragm valve. With this, the forces that can occur when operating the valve (e.g. breakaway torque) are absorbed and therefore not transferred to the piping system.



Diaphragms

Diaphragms in this Valve type are heavily stressed components. In addition to the mechanical stress caused by wear and tear over several actuating cycles, the diaphragms are also subject to wear and tear due to the flow medium. We strongly recommend that you inspect and, if necessary, replace the diaphragms after 50,000 cycles. In the case of abrasive media, the inspection of the diaphragms should take place regularly at short intervals.

Maintenance notes

The valve is nearly maintenance-free with the optimized Longlife diaphragms in FKM or EPDM. In particular when using abrasive and aggressive media, we recommend inspecting the diaphragms after approx. 50,000 cycles.

If necessary, the diaphragms should be exchanged in order to ensure optimal function of the valve. If diaphragms are used under special conditions (e.g., higher temperatures, media with abrasive effect, chemicals), more frequent checks are recommended.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Tips for installation

- The direction of flow and the mounting position may be chosen freely.
- In types with FC or FO mode, the free control air connection contains the bleed bore. Keep this open and protect it from contamination.

Closing times

The most important factors that determine the closing time are:

- Volume of control medium
- Spring resistance

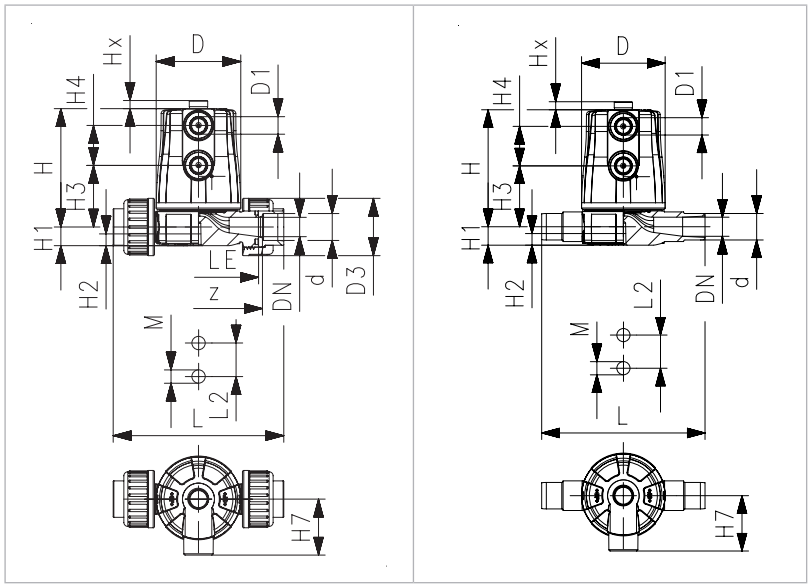
The following options are available for optimizing the closing times:

- Remove upper O-ring on the piston
- Increase the bleed bore from 2 mm to 4 mm

	Volume of compressed air (dm^3)	Closing speed at max. 6 bar (ms)	Lag (ml)
Type 604/605 Standard	0.02	114	238
Larger ventilation bore	0.02	66	138
Without upper O-ring	0.02	77	160

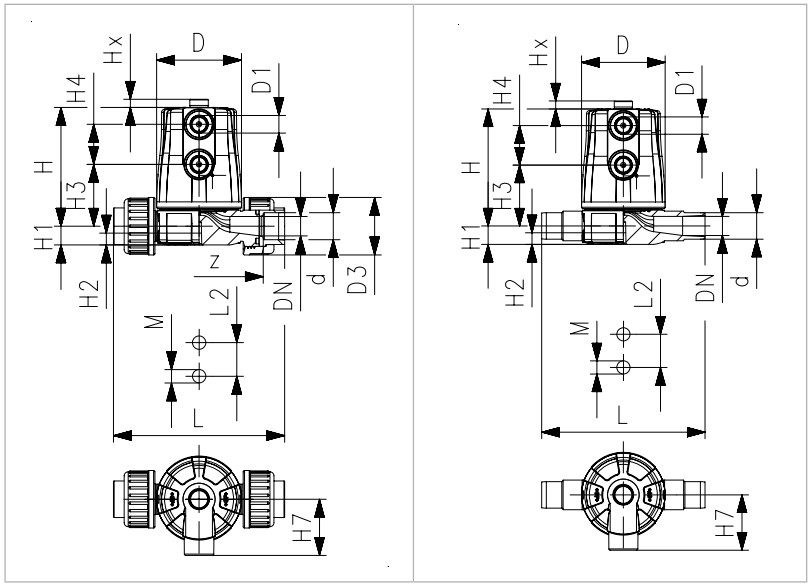
Dimensions

PVC-U



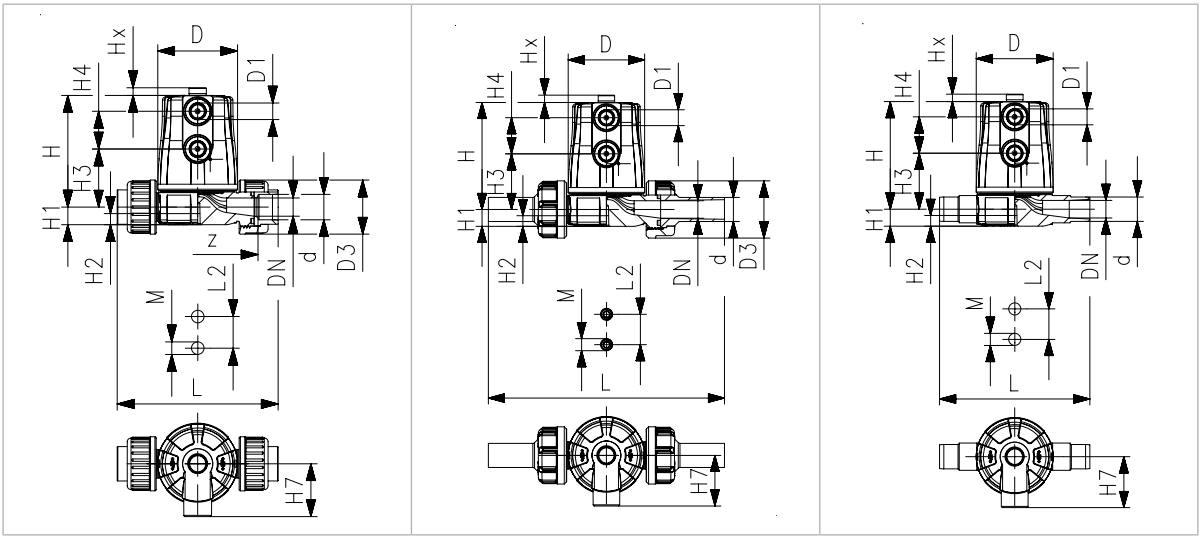
Jointing	d (mm)	DN (mm)	Size (inch)	D (mm)	D1_G (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H7 (mm)	L (mm)	L2 (mm)	M (mm)	Z (mm)	Lift (Hx)
ASTM Socket	20	15	½	65	¼	43	89	14	12	46	30	42	140.6	25	M6	96	6
Metric Socket	20	15	½	65	¼	43	89	14	12	46	30	42	128	25	M6	96	6
Rp Socket	20	15	½	65	¼	43	89	14	12	46	30	42	128	25	M6	102	6
Metric Spigot	20	15	½	65	¼		89	14	12	46	30	42	124	25	M6		6

PVC-C



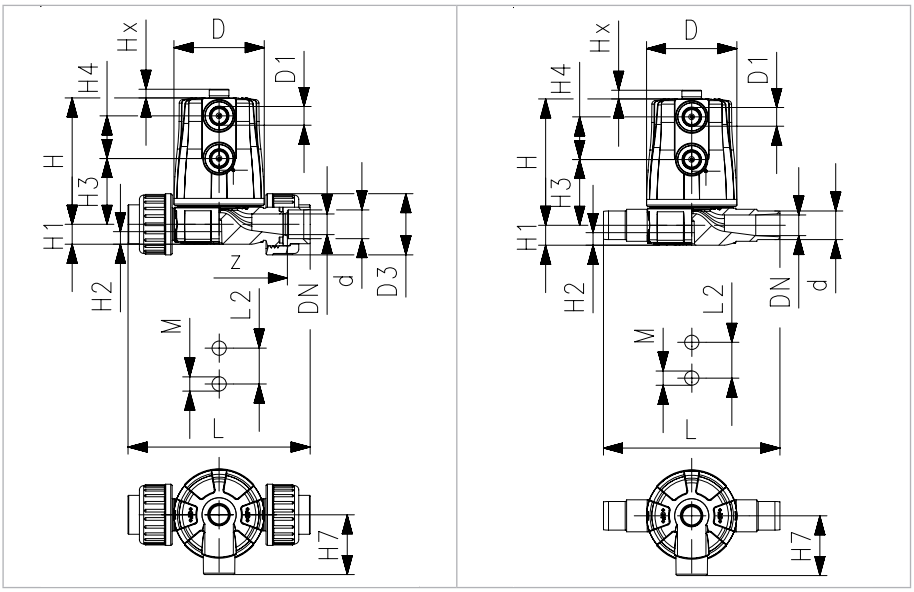
Jointing	d (mm)	DN (mm)	Size (inch)	D (mm)	D1_G (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H7 (mm)	L (mm)	L2 (mm)	M (mm)	Z (mm)	Lift (Hx)
Metric Socket	20	15	½	65	¼	43	89	14	12	46	30	42	131	25	M6	99	6
Metric Spigot	20	15	½	65	¼		89	14	12	46	30	42	124	25	M6		6

PP-H



Jointing	d (mm)	DN (mm)	Size (inch)	D (mm)	D1_G (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H7 (mm)	L (mm)	L2 (mm)	M (mm)	Z (mm)	Lift (Hx)
Metric Socket	20	15	½	65	¼	48	89	14	12	46	30	42	128	25	M6	96	6
Metric Unions Spigot	20	15	½	65	¼	48	89	14	12	46	30	42	196	25	M6	100	6
Metric Spigot	20	15	½	65	¼		89	14	12	46	30	42	124	25	M6	100	6

PVDF



Jointing	d (mm)	DN (mm)	Size (inch)	D (mm)	D1_G (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H7 (mm)	L (mm)	L2 (mm)	M (mm)	Z (mm)	Lift (Hx)
Metric Socket	20	15	½	65	¼	43	89	14	12	46	30	42	128	25	M6	96	6
Metric Unions Spigot	20	15	½	65	¼	43	89	14	12	46	30	42	196	25	M6	100	6
Metric Spigot	20	15	½	65	¼	43	89	14	12	46	30	42	124	25	M6		6

DIASTAR type 025



Product description

The DIASTAR 025 has the highest closing forces in the portfolio of pneumatically actuated diaphragm valves and is available with the functions FC (fail safe to close), FO (fail safe to open) and DA (double-acting).

The valve is thus used wherever high pipe pressures of up to 10 bar need to be controlled on on both sides.

Function

Pneumatic diaphragm valves from GF Piping Systems are used for regulating, as well as closing, controlling and monitoring volume flows. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and diaphragm come into contact with the medium.

Applications

- Control applications
- Controlling pure and ultrapure media
- Water treatment
- Chemical dosing
- Applications with higher viscosity and solids content

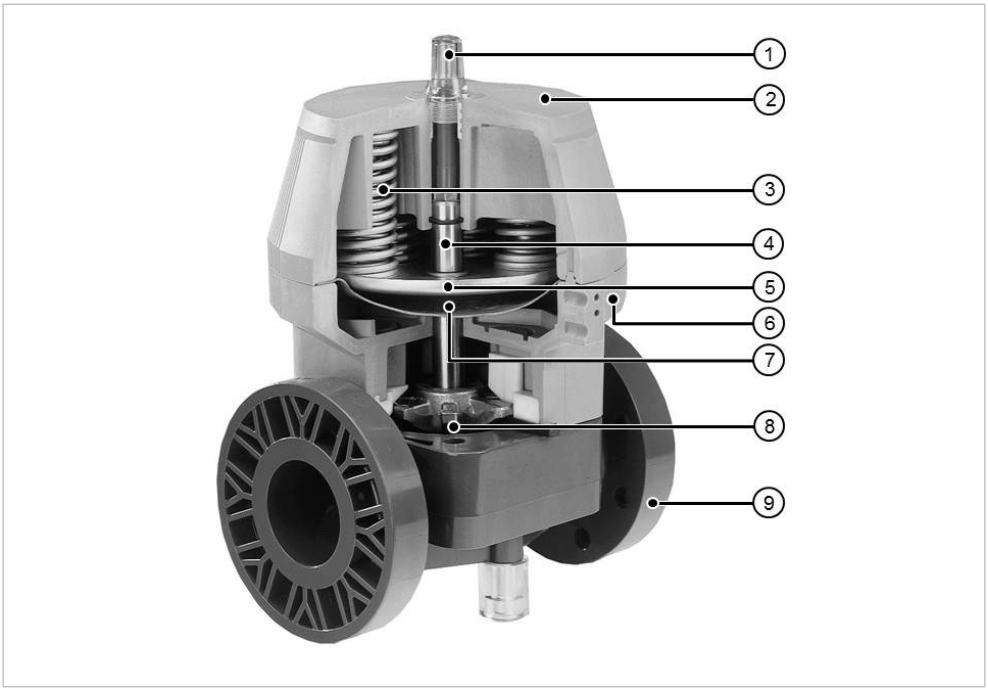
Benefits/features

- Safe transport of aggressive media
- Adapting closing forces to medium pressure through reduction of spring assemblies
- High corrosion resistance
- Maximum system safety
- Safe maintenance and minimal downtime
- Wide range of materials available
- Broad spectrum of applications
- Quick retrofitting through simple integration of accessories

Possible flow media

Contaminated, solid or ultrapure media.

Technical data



1 Optical position indicator
2 All-plastic housing, PP-GF
3 Pre-tensioned springs
4 Lifting spindle group, rust-free steel
5 Diaphragm plate
6 NAMUR interface for control air
7 Control diaphragms
8 Pressure piece
9 Valve body

Specification								
Dimensions	d75/DN65 – d160/DN150, 2 ½“ – 6							
Pressure levels	PN10, from DN100: PN6							
Valve body materials	PVC-U, PVC-C, ABS, PP-H, PVDF, PVDF-HP							
Housing materials	PPGF-30 (polypropylene, 30 % fiberglass-reinforced)							
Piston	PPGF-30 white (polypropylene, 30 % fiberglass-reinforced)							
Pressure spindle	Stainless steel 1.4104							
Metal inserts	Stainless steel 1.4305							
Gaskets	NBR							
Springs	Galvanized steel							
Gasket/diaphragm materials	EPDM, PTFE/EPDM, FKM, FFKM, NBR							
Functions	FC, FO, DA							
Connecting thread control air	G ¼“							
Allowable control pressure	Max. 6 bar for FC mode Max. 5 bar for FO, DA mode							
Control volume for pneumatic actuator	FC		FO		DA			
	d75/DN65 d90/DN80	d110/DN100 d160/DN150	d110/DN100 d160/DN15	d110/DN100, d160/DN 150	d75/DN65 d90/DN80		d110/DN100 d160/DN 150	
	2.2 dm^3	3.8 dm^3	4.4 dm^3	7.6 dm^3	4.4dm^3	2.2 dm^3	7.6 dm^3	3.8 dm^3
Ambient temperature	-10 °C to 50 °C							
Product standard	EN ISO 16138							
Test standard	ISO 9393-2, EN 12266-1 (leackage rate A)							
Approvals	ACS, FDA, DIBt							

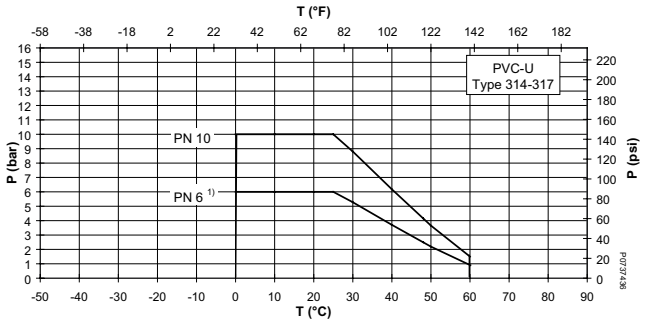
Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

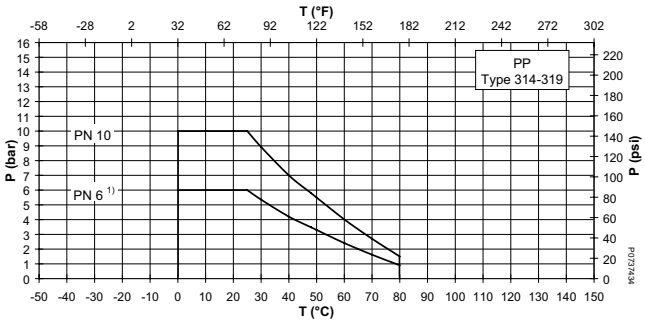
T Temperature (°C, °F)

P Permissible pressure (bar, psi)

PVC-U



PP-H

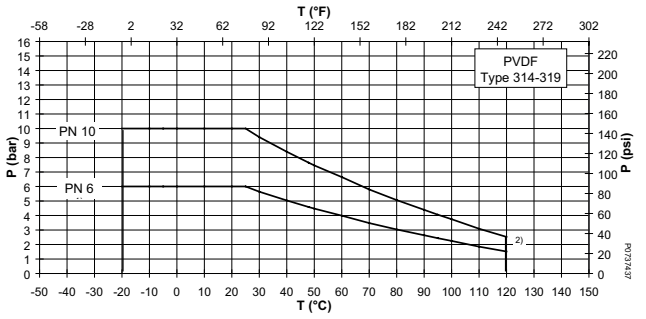


1) DIASTAR 025 DN100 and DN150

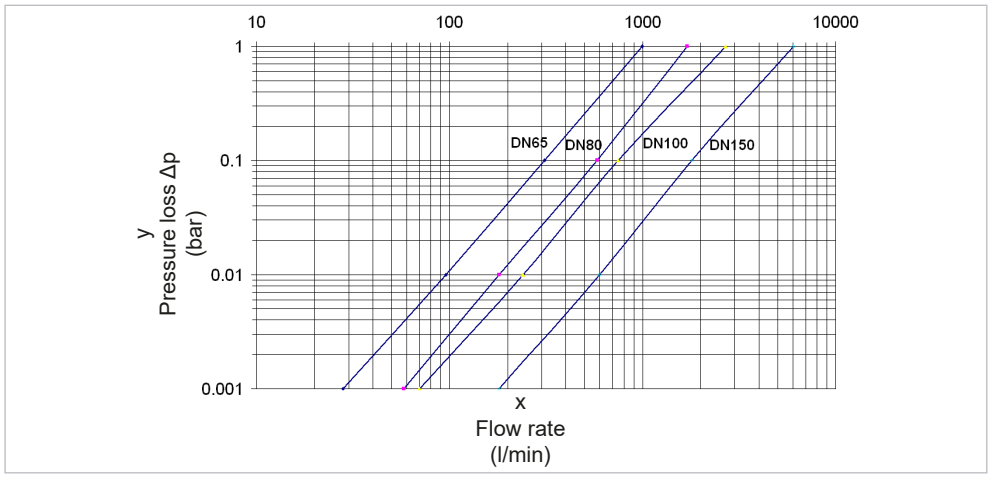
2) Depending on the connection type and actuator, the nominal pressure is reduced to PN10

3) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PVDF



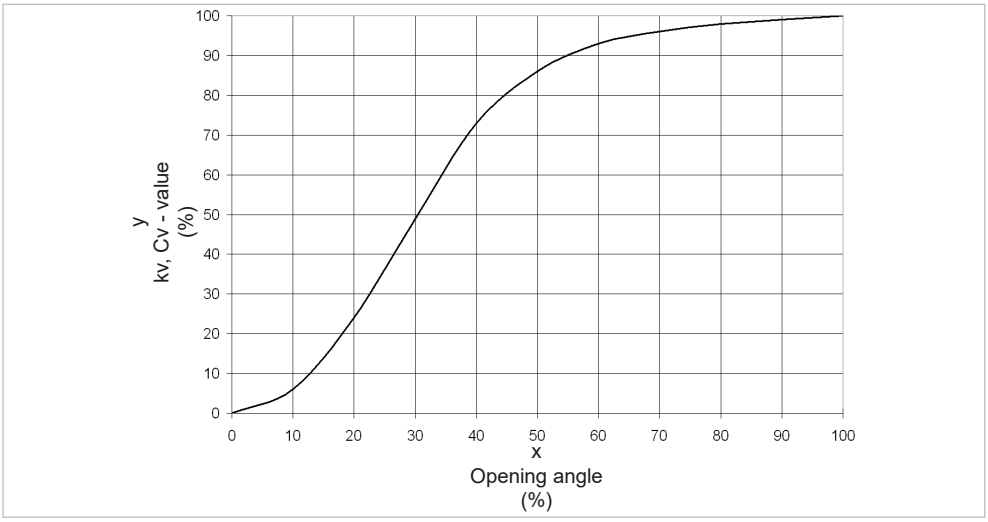
Pressure losses



x Flow rate (l/min, US gal/min)

y Pressure loss Δp (bar, psi)

Flow characteristics



x Open angle (%)
y Kv, Cv value (%)

Pressure ratings

	Pressure rating [bar]	Max. control pressure [bar]		
		FC	FC	FO/DA
DN		EPDM[1]	PTFE[1]	EPDM
75DN65	10	3.8	5.8	3.0[2]
90DN80	10	5.6	5.3	4.0[2]
110DN100	6	5.3	5.3	4.0[3]
160DN150	6	4.8	4.8	5.0[3]
Medium pressure	→ One sided applied			

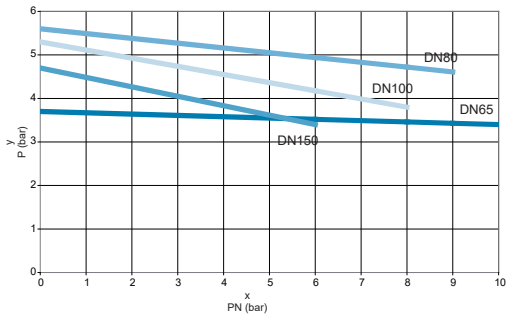
[1] At 0 bar medium pressure

[2] At 10 bar medium pressure

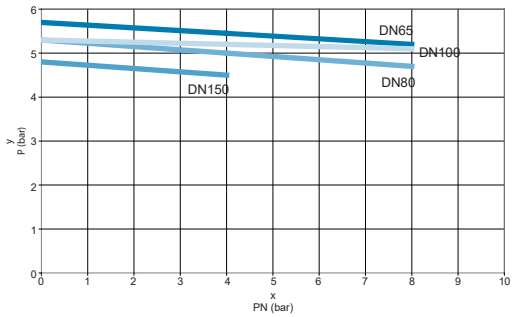
[3] At 6 bar medium pressure

Control pressure diagrams for actuator

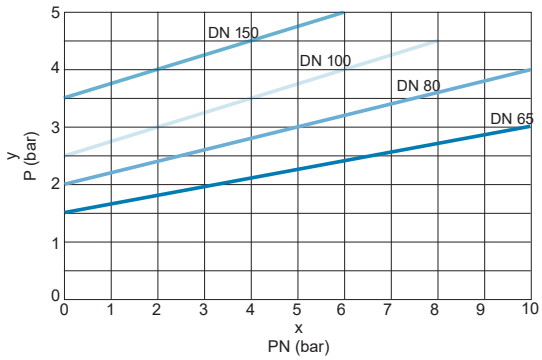
Fail safe to close (FC) with EPDM diaphragm



Fail safe to close (FC) with PTFE diaphragm



Fall safe to open (FO/DA)



Technical basics

The upper part of the housing is made of PPGF (fiberglass-reinforced polypropylene) and is screwed to the lower part of the housing using a central plastic nut, which avoids exposed metal screws. A position indicator integrated into the handle is required for determining the diaphragm position.

All PVC-U diaphragm valves in metric sizes are flange variants DN65 – DN150. All diaphragm valves are manufactured in accordance with EN ISO 16138.

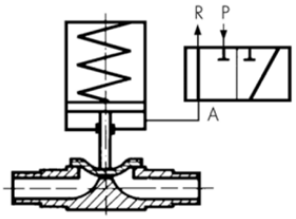
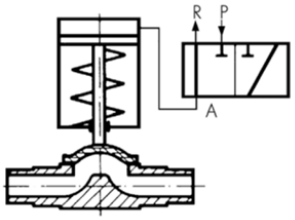
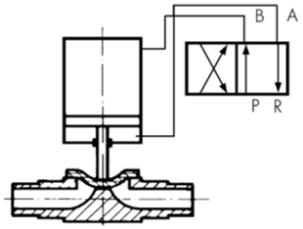
Differentiation in functionalities – FC, FO, DA

Function	Name
FC	Fail safe to close
FO	Fail safe to open
DA	Fail safe double-acting

FC mode	FO mode	DA mode
In the non-operative state, the valve is closed by means of spring resistance. When the actuator is pressurized with the control medium (bottom connection), the valve opens. When the control medium escapes, the valve is closed via spring resistance.	In the non-operative state, the valve is opened by means of spring resistance. When the actuator is pressurized with the control medium (top connection), the valve closes. When the control medium escapes, the valve is opened via spring resistance.	The valve has no defined basic position. The valve is opened and closed by applying control pressure to the corresponding connection (top connection for closing, bottom connection for opening).

Selection of the solenoid valve and associated connecting thread		
3/2-way solenoid valves are used to control single acting actuators (FC). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	3/2-way solenoid valves are used to control single acting actuators (FO). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	4/2-way or 5/2-way solenoid valves are used to control double-acting actuators (DA). They can be mounted either directly to the actuator using a NAMUR connector plate or via valve clusters.

Selection of the solenoid valve and associated connecting thread

		
FC mode of operation with a 3/2-way solenoid valve for bottom connection.	FO mode with a 3/2-way solenoid valve for top connection.	The DA mode with a 4/2- or 5/2-way solenoid valve. Both connections are used.

Relation between pipe pressure and spring assemblies

The closing force of the actuators were designed for the specified PN pressure level. Operation with very low pipe pressure can cause increased diaphragm wear. In order to extend the diaphragm life span with low pipe pressure, the number of spring assemblies can be reduced. For the specific dimensioning, please contact your representative at GF Piping Systems.

Control medium

FC mode	FO mode	DA mode
Compressed air classes (ISO 8573-1): 2 or 3 for -10 °C and 3 or 4 for T > 0 °C	When the medium pressure exceeds 10 bar, the control pressure must be throttled by exhaust air (adjust actuating time to approx. 3 s)	When the medium pressure exceeds 10 bar, the control pressure must be throttled using exhaust air (adjust actuating time to approx. 3 s)
Temperature of control medium: max. 40 °C	Compressed air classes (ISO 8573-1): 2 or 3 for -10 °C and 3 or 4 for T > 0 °C	Compressed air classes (ISO 8573-1): 2 or 3 for -10 °C and 3 or 4 for T > 0 °C
When the medium pressure exceeds 10 bar, the control pressure must be throttled using exhaust air (adjust actuating time to approx. 3 s)	Temperature of control medium: max. 40 °C	Temperature of control medium: max. 40 °C
The corresponding control pressure diagrams can be found in the "Technical data" section	Depending on the working pressure PN, lower control pressures may be selected	Depending on the working pressure PN, lower control pressures may be selected

Tightening torques for valve housing

The valve body and pneumatic actuator are firmly connected by means of metal screws. Due to the different coefficients of thermal expansion of plastic and metal, it is essential – especially in the event of temperature changes within the pipe or if there are large temperature differences between the medium and the ambient temperature – to tighten the screws regularly to guarantee that the valve is continuously leak-tight. Tightening is recommended even after the first change in temperature.

The screws must be tightened crosswise to the stated tightening torques so that the housing is presses together evenly. The valve is open. For valves with a stroke limiter installed, the valve must be reset following replacement.

Tightening torques

Dim. (mm)	DN (mm)	Inch (inch)	Tightening torque
75	65	2 ½	25
90	80	3	30
110	100	4	30
160	150	6	40

Diaphragms

Diaphragms in this Valve type are heavily stressed components. In addition to the mechanical stress caused by wear and tear over several actuating cycles, the diaphragms are also subject to wear and tear due to the flow medium. We strongly recommend that you inspect and, if necessary, replace the diaphragms after 50,000 cycles. In the case of abrasive media, the inspection of the diaphragms should take place regularly at short intervals. An inspection can be quickly performed at any time by opening the connection screws between the actuator and the lower part of the valve. The elastomer diaphragms with threaded bolts can be removed at any time by turning counterclockwise. PTFE diaphragms with bayonet joints can be turned 90° in any direction and then removed.

Changing the gaskets

The pistons and spindle seals can wear after a certain amount of time, depending on the area of use and control medium. This can be noticed through a loss of air or discharge sounds. GF Piping Systems provides replacement gasket sets.

Adapting spring assemblies to operating conditions

Valves with the FC (fail safe to close) control function are equipped with pre-tensioned spring assemblies. By loosening the screws connecting the actuator and flow body, the spring assemblies are relieved to such an extent that the actuator can be opened without additional equipment.

Valves with the control function FO (fail safe to open) have no pre-tensioned spring assemblies, which is why this actuator can only be opened at the factory.

Valve handling

Installation notes

Ensure that the diaphragm valve and spring assemblies are designed for the pipe pressure. Reducing the spring assemblies leads to a reduced closing force. When the pipe pressure rises, the valve cannot close or cannot close completely if spring assemblies are missing. This can have a negative impact on the process.

Maintenance notes

Maintenance interval	Maintenance activity
Regularly	Check the connection between the upper part and valve body for leak-tightness.
1 - 2 x per year	Actuate continuously opened or closed diaphragm valves to check their function.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

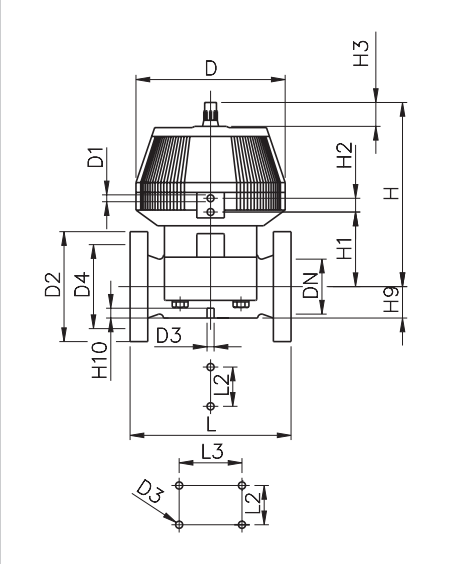
Tips for installation

- The direction of flow and mounting position may be chosen freely.
- The valve is attached via threaded sleeves that are injected into the flow body.
- The actuator can be optionally activated by the control media.
  - Compressed air (oil-free)
  - Neutral gases
  - Liquids upon request

Variable operating and control pressures are possible by adapting the number of spring assemblies to the operating conditions.

Dimensions

DIASTAR 025 DN65 - DN150



Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (G)	D2 (mm)	D3 (mm)	D4 (mm)	L (mm)	L2 (mm)	L3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H9 (mm)	H10 (inch)	Stroke
75	65	2 ½	280	¼	185	M8	145	290	70		298	148	24	46	46	15	30
90	80	3	280	¼	200	M12	160	310	120		302	150	24	46	57	15	35
110	100	4	335	¼"	225	M12	180	350	120		409	176	24	46	69	20	40
160	150	6	335	¼	285	M12	240	480	100	200	201	237	24	46	108	20	40

Weight

DN (mm)	PVC-U (kg)	PP-H (kg)	PVDF (kg)
65	13.6	13.7	14.2
80	17.4	16.0	18.7
100	24.7	22.8	26.5
150	35.0	33.4	38.2

Accessories

- Stroke limiter / emergency manual override
- Solenoid pilot Valve type PV94, PV95, MNL532, PV2000
- Feedback – ER55 ER52 and ER53
- Positioner – type SPC
- Bus communication – AS interface

For further information on accessories, refer to the online product catalog at www.gfps.com

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



Planning Fundamentals

of Valves and Automation

Pressure Control Valves

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Fundamentals of Pressure Control Valves

Technical basics

Pressure control valves are energy self-sufficient control valves. By means of spring pre-tension, a constant input or output pressure can be set, depending on the design. Pressure reducing valves reduce fluctuating, higher input pressures to a largely constant output pressure. Pressure maintaining valves, also called overflow valves, ensure a largely constant input pressure in the case of pressure fluctuations. In the case of overflow valves, the valve is closed until the set threshold value is reached, then the valve is opened and thereby ensures a balancing of pressure on the input side.

Design of pressure reducing valves (also called pressure regulator)

In the valve, the piston/diaphragm is in balance between the outlet pressure P2 (outlet side) and the spring force. If the outlet pressure rises above the set value, the diaphragm is lifted against the spring resistance. The valve starts closing until the equilibrium condition is reached again. If the outlet pressure drops below the nominal value, the diaphragm is pressed down by the spring resistance until the state of equilibrium is reached again. The outlet pressure remains largely constant, independent of an increasing or decreasing inlet pressure (as long as the inlet pressure is higher than the outlet pressure).

Design of pressure retaining valves (also called backpressure/relief valve)

The piston/diaphragm position of the valve is in balance between the inlet pressure P1 (primary side) and the set spring force. If the inlet pressure rises above the set value, the diaphragm is lifted against the spring resistance. The valve opens until a balanced condition is reached again. If the inlet pressure drops below the set value, the diaphragm is pressed down by the spring resistance until a balanced condition is reached again. Hence the inlet pressure remains largely constant independent of increasing or decreasing medium pressure (as long as the inlet pressure is greater than the set pressure).

Hysteresis

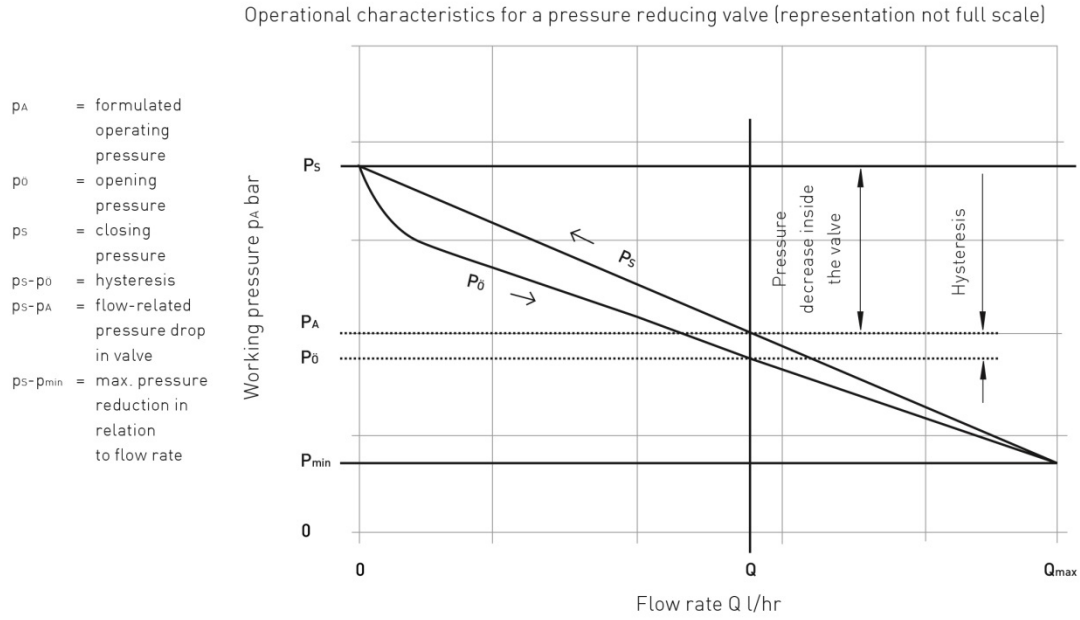
What is hysteresis?

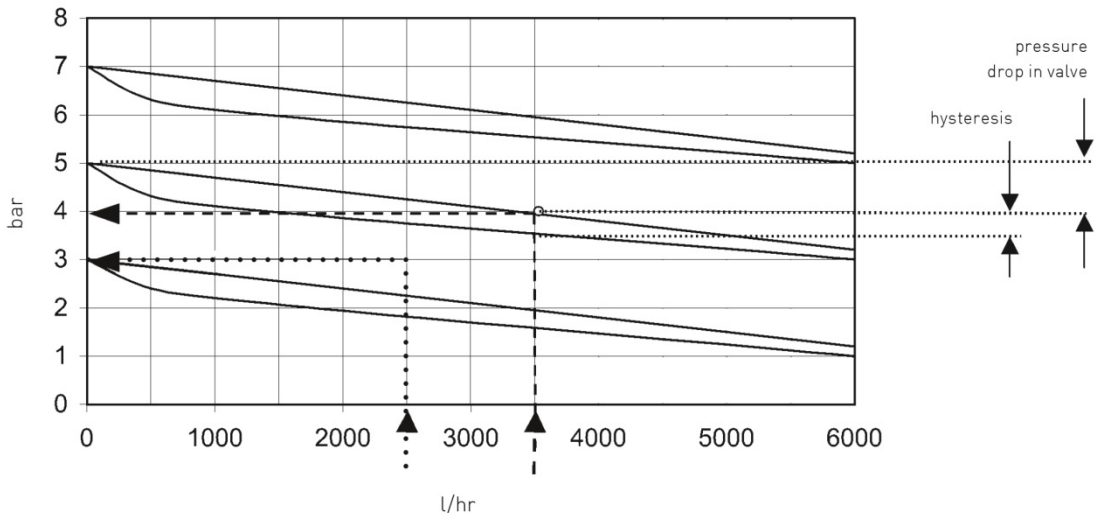
Hysteresis is the difference between opening and closing pressure for a pressure control valve at a given flow rate Q. It is the result of frictional force on the cartridge, flow and spring forces. A small hysteresis will lead to increased accuracy in pressure regulation.

Hysteresis type 582

Difference between opening and closing pressure: approx. 0.1 – 0.4 bar (1.5 – 5.8 psi)

How to measure hysteresis?





Hysteresis curves obtained for a set-pressure (at the outlet) of 7, 5, 3 and 1 bar (both springs) as well as 3 and 1 bar (small spring only). The inlet pressure is held stable at 9 bar. Flow is steadily increased until the maximum is reached and decreased again. To determine hysteresis, the inlet and outlet pressure as well as the flow rate are measured.

i For the detailed characteristics of the valve, please refer to the characteristic curves concerned.

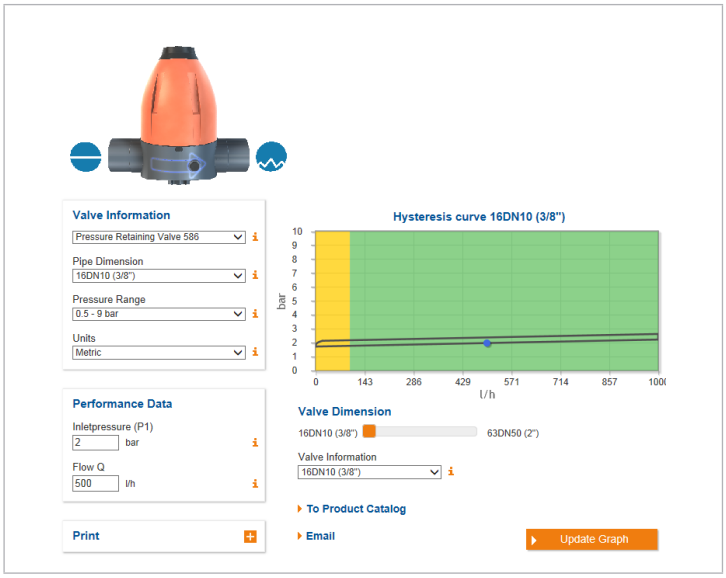
What is pressure drop?

Every piping system produces a pressure drop due to frictional forces acting on the pipe walls, fittings, valves, etc. This pressure drop is unwanted since it essentially is an energy loss for the system. The most important parameters when calculating pressure drop are the flow velocity and the fluid viscosity, although components of the system like valves can also increase energy loss. Drag coefficients ζ therefore have to be taken into consideration when planning a piping system.

Correct valve size

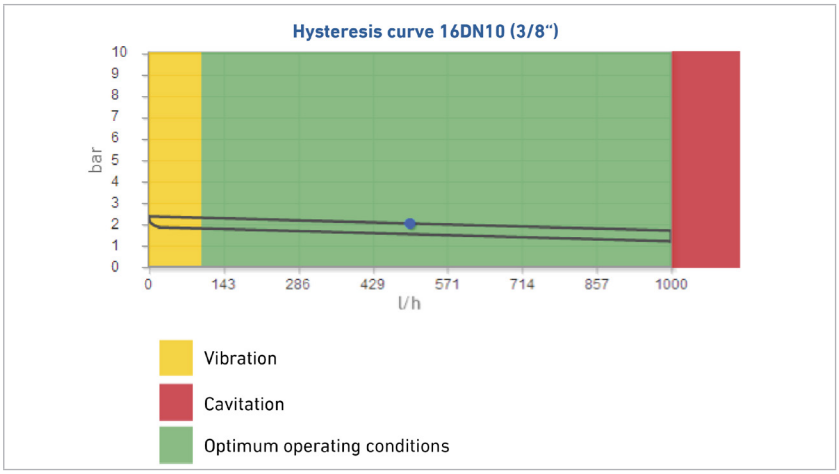
The correct valve size is essential for a system to perform correctly. The dimensions can be determined by simply entering a set of system parameters (pipe size, desired outlet pressure, etc.) into the online tool.

The online tool can be accessed at www.gfps.com/prv or using the QR code

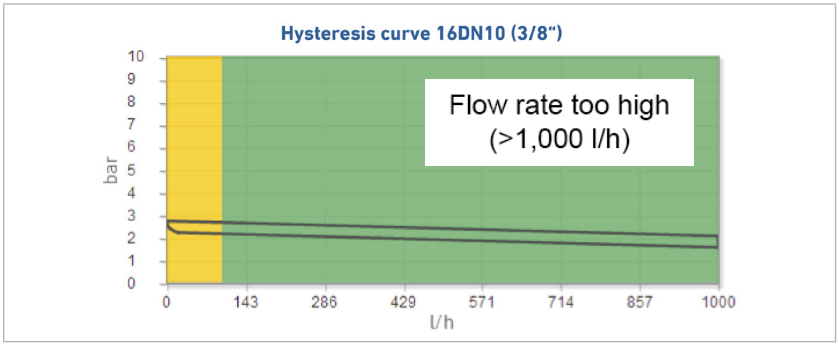


If the online tool is not available, the valve size can also be determined directly using the characteristic curves. The tables show the characteristic curves up to a flow rate of 2 m/s.

In general, a valve size equal to the pipe diameter is a good starting point. Depending on the pressure and flow rate, the operating point will be somewhere on the curve. If this is not the case, your operating conditions might be outside of the valve size flow range (flow rate too high). In addition, if the operating point is within the first 10% of the chart, vibrations may occur. In both of these cases, you will need to choose different valve dimensions for the application.

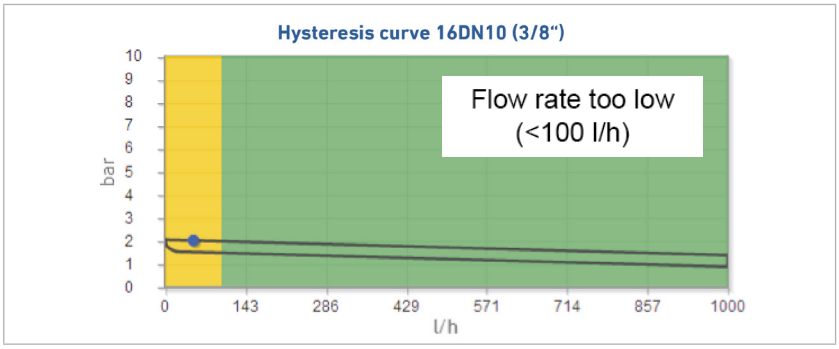


A flow rate that exceeds the maximum value (see graphic below) may lead to cavitation. The selected valve is too small and the next size up should be considered.



If the flow rate is too low (see graphic below), a smaller valve should be chosen for the application.

Valves that are too small lead to vibrations and, as a consequence, reduce the valve lifetime.



Valve handling

General installation notes

- Make sure the pressure and flow rate are within the valve specifications.
- Check valves for damage before installation; do not install damaged valves.
- Ensure tension-free installation of the valves.
- For an optimal flow rate, we recommend installing the valve in an undisturbed area of the pipe and with a 10 x DN minimum distance to manifolds, throttles, other valves, etc.
- The direction of flow is indicated by the arrow on the valve body.
- GF Piping Systems recommends installing a strainer upstream to avoid particles in the flow path.

Installation notes for types V82 and V86

- The direction of flow is indicated by the arrow on the valve body.
- Install strainers in the event of contaminated media or media that contain particulate matter.
- Before putting into operation, check the screw tension on the housing. If necessary, tighten crosswise to the appropriate screw tightening torques.

Maintenance notes

Pressure control valves of require very little maintenance after installation. However, depending on the flow medium, cleaning is sometimes required. For detailed information, please refer to the appropriate user manual. GF Piping Systems suggest using an isolating valve for this purpose. GF Piping Systems offer a wide range of different isolating valves for every application.

Tips for installation

Pressure control Valve type 582 can also be used in combination with check valves, which are a simple and effective way to prevent backflow. Reducing valves always require back pressure to operate. Normally the piping system generates enough by itself. If trying to test with a small piece of pipe, make sure to provide sufficient back pressure, e.g. using a ball valve at the outlet.

Pressure Reducing Valve type 582



Product description

A pressure reducing valve reduces the outlet pressure to a specified value.

Function

Downstream pressure (at the outlet) works against the spring resistance and raises the diaphragm until equilibrium of forces is reached. The desired outlet pressure is regulated by means of the spring pretensioning. The inlet pressure is not directly related to the outlet pressure. The pressure at the outlet thus remains constant, despite fluctuations at the inlet.

The diaphragm is not influenced by pressure peaks, meaning sensitive measuring devices can be protected downstream. The set pressure can be increased or reduced by turning the spindle at the top. Inward-pointing arrows, which visualize the direction of flow and the pressure setting, handling easier. Pressure reducing valves are often used to protect downstream devices against overpressure.

Applications

- Water treatment
- Chemical process industry
- Semiconductor industry
- Solar industry

Benefits/features

Easy assembly

- Compact design allows installation even when space is limited
- Radially dismountable
- Integrated assembling aid enables direct assembly of the valve
- Significantly shorter installation length thanks to union connections

Easy operation

- No re-torquing required thanks to to central housing nut
- Easily adjustable set pressure
- Constant and stable control behavior
- Leak-resistant in the event of temperature fluctuations
- Low maintenance
- Pressure setting possible even during operation

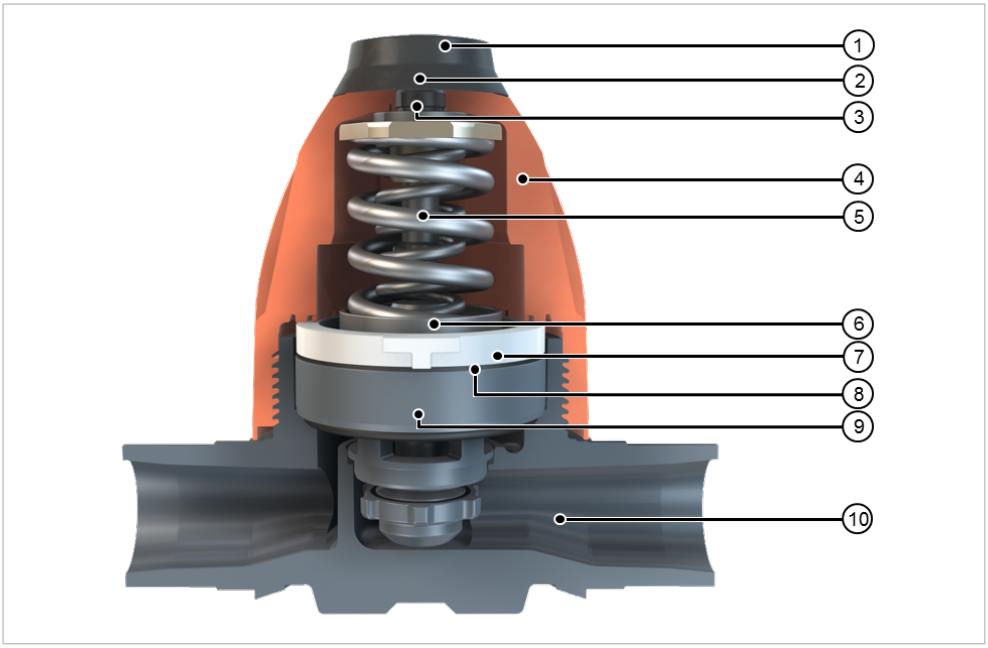
Flexible

- Manometer available as an option for neutral and aggressive media
- Various connection options available thanks to the spigot and union versions
- Low pressure spring set available
- Easy on spare parts thanks to the modular design

Flow media

Neutral and aggressive media with a small amount of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data



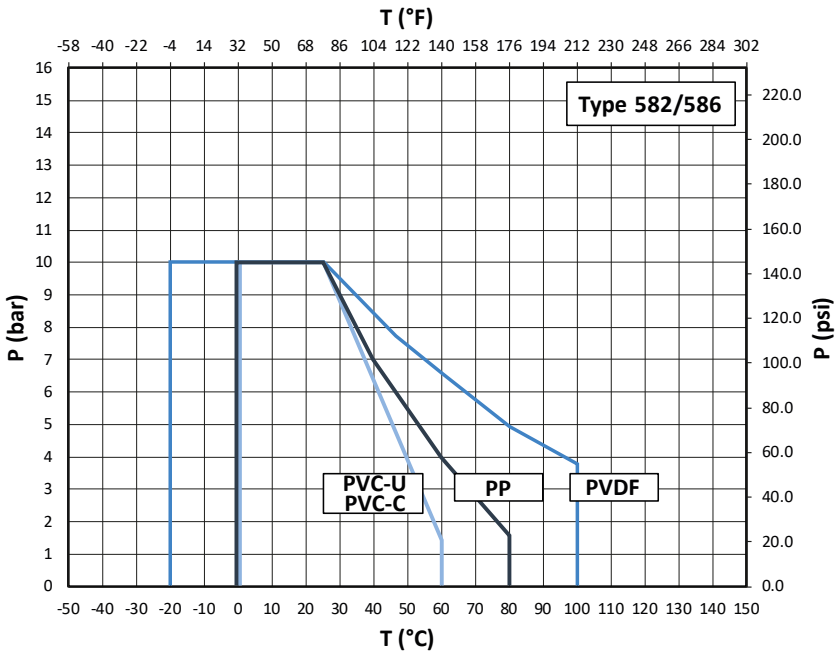
1 Protective cap
2 Central housing nut
3 Spindle
4 Upper part
5 Spring(s)
6 Pressure piece
7 Retaining ring
8 Diaphragm
9 Cartridge with piston
10 Lower part

Specification		
Dimensions	d16/DN10 – d63/DN50, ⅜" – 2"	
Materials	Parts in contact with medium	PVC-U, PVC-C, PP-H, PVDF, PVDF-HP
	Valve upper part	PP-GF (orange)
Gasket materials	EPDM, FKM	
Diaphragm	EPDM/PTFE	
Pressure level	PN10 @ +20°C (150 psi @ 68°F)	
Setting range	Standard	0.5 – 9.0 bar (7 – 130 psi)
	Optional	0.3 – 3 bar (4 – 44 psi)
Hysteresis	Difference between opening and closing pressure: approx. 0.1 – 0.4 bar (1.5 – 5.8 psi)	
Connections	Lower part with cementing or fusion spigots	
	Lower part with true union type connection to match all standard GF unions and inserts	
	Available upon request: Various inserts from the GF range, e.g. transition to metal or PE	
Direction of flow	Always corresponds to the the direction of the arrow on the lower part	
Assembly	Threaded inserts are available for safe assembly	
Test standard	Testing for leak-tightness and function according to ISO 9393, ISO 12266	
Approvals	FDA	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min)	Kv 100 (l/h)	Cv 100 (US gpm)
10	⅜	16	45	2'700	3.1
15	½	20	48	2'850	3.3
20	¾	25	112	6'700	7.8
25	1	32	129	7'730	9.0
32	1 ¼	40	254	15'240	17.7
40	1 ½	50	293	17'590	20.4
50	2	63	319	19'170	22.2

Pressure-temperature diagrams

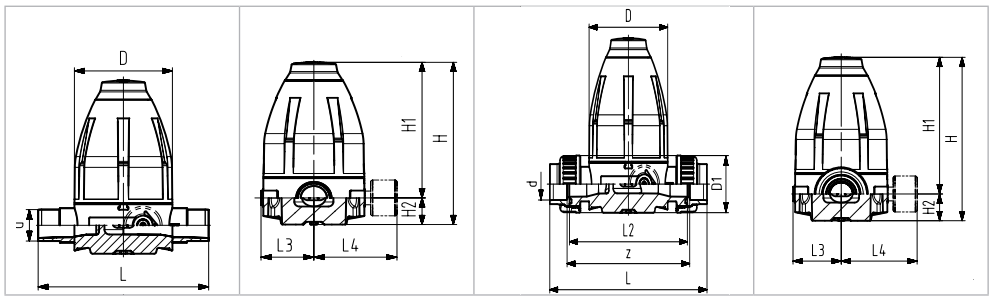


T Temperature (°C, °F)
P Permissible pressure (bar, psi)

The pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

Dimensions

Type 582 with threaded connections, cementable and fusionable spigots



All materials

d (mm)	DN (mm)	Inch (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)
16 | 20	10 | 15	⅜ | ½	79	132	111	21
25 | 32	20 | 25	¾ | 1	100	177	148	29
40 | 50	32 | 40	1¼ | 1½	147	251	207	44
63	50	2	147	251	207	44

All materials if not labeled

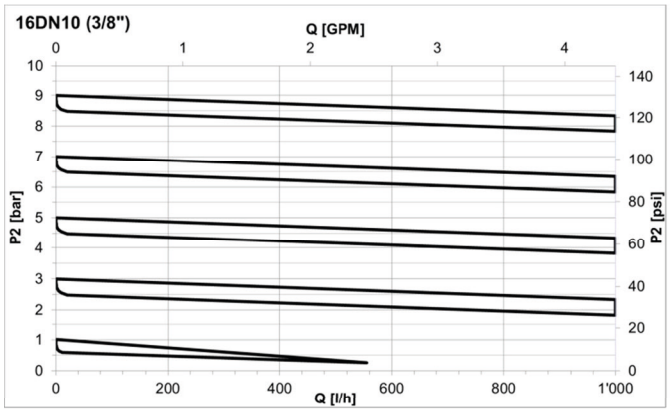
d (mm)	DN (mm)	Inch (inch)	L[1)] PVC/PP (mm)	L[1)] PVDF (mm)	l2 (mm)	l3 (mm)	L4 (mm)	z PVC/PP (mm)	z PVDF (mm)
16 | 20	10 | 15	⅜ | ½	134	150	120	42	77	126	130
25 | 32	20 | 25	¾ | 1	174	190	150	53	88	156	160
40 | 50	32 | 40	1¼ | 1½	224	240	205	76	111	211	215
63	50	2	244	260	205	76	111	211	215

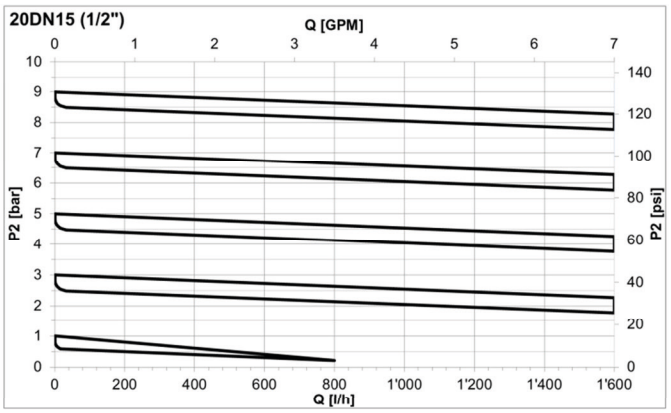
[1)] L only for spigot version

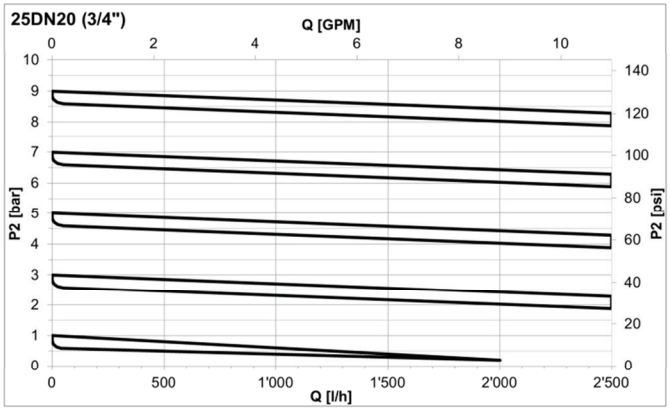
Characteristics type 582

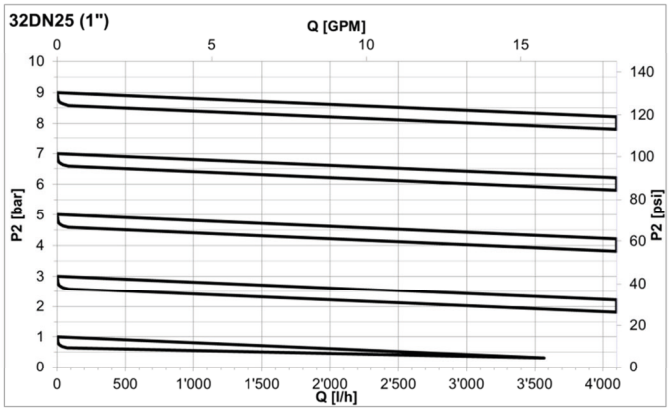
The characteristic curves below are valid for the set range 0.5 – 9.0 bar (7 – 130 psi) and show the secondary or outlet pressure P2 over the flow Q in l/h.

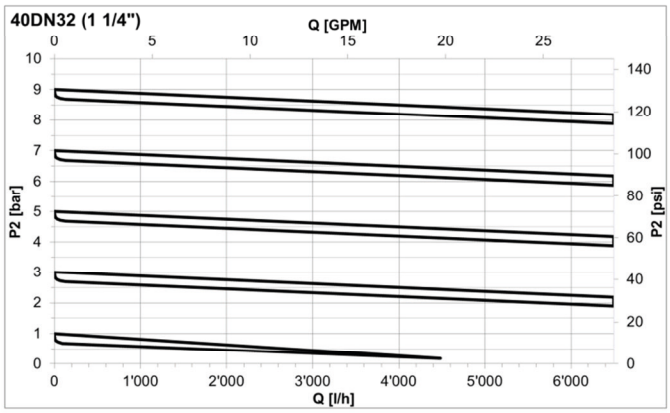
Parameter is the set pressure pE at Q = 0 l/h. The curves are valid for water at +20 °C and a flow velocity of 2 m/s. A special version set range 0.3 – 3 bar (4 – 44 psi) is available on request.

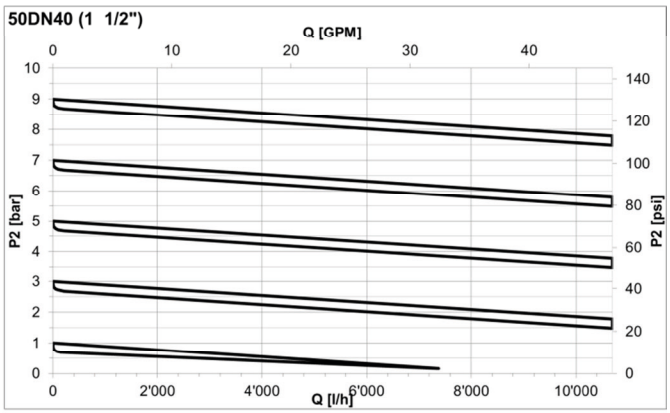


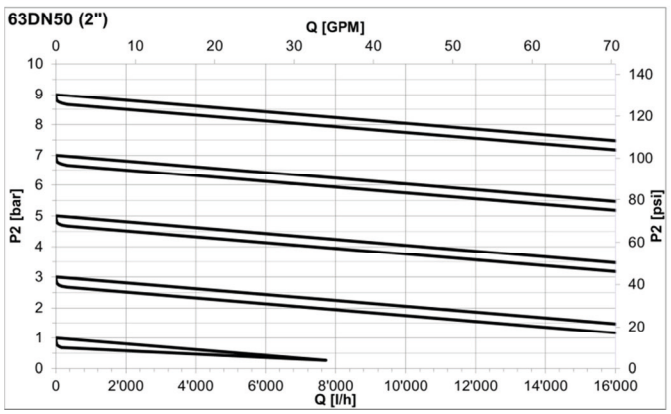












Ordering Information

Accessories

Manometer

Code	Description	Material	O-ring	Pressure range
198806963	Manometer for type 582/586	Brass	EPDM & FKM	0-4 bar
198806962	Manometer for type 582/586	SS	EPDM & FKM	0-4 bar
198806651	Manometer for type 582/586	Brass	EPDM & FKM	0-10 bar
198806652	Manometer for type 582/586	SS	EPDM & FKM	0-10 bar
198806655	Manometer for type 582/586 High Purity	Brass	FKM white (HP)	0-10 bar
198808656	Manometer for type 582/586 High Purity	SS	FKM white (HP)	0-10 bar



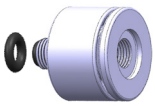
Manometer with manometer adapter

Code	Description	Material	O-ring	Pressure range
700278342	Manometer & adapter for type 582/586	Brass	EPDM & FKM	0-4 bar
700278343	Manometer & adapter for type 582/586	SS	EPDM & FKM	0-4 bar
700278340	Manometer & adapter for type 582/586	Brass	EPDM & FKM	0-10 bar
700278341	Manometer & adapter for type 582/586	SS	EPDM & FKM	0-10 bar
700278920	Manometer with adapter for type 582/586 High Purity	Brass	FKM white (HP)	0-10 bar
700278601	Manometer with adapter for type 582/586 High Purity	SS	FKM white (HP)	0-10 bar



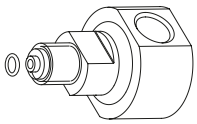
Manometer adapter with medium separation

Code	Description	Material	O-ring
198806650	Manometer adapter with medium separation	PVDF	EPDM & FKM
198806654	Manometer adapter with medium separation	PVDF-HP	FKM



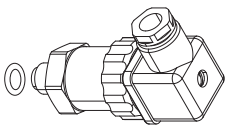
Angled manometer adapter without medium separation

Code	Description	Material	O-ring
700224463	Angled manometer adapter w/o medium sep.	PVC-U	EPDM
700224464	Angled manometer adapter w/o medium sep.	PVC-U	FKM
700224465	Angled manometer adapter w/o medium sep.	PP-H	EPDM
700224466	Angled manometer adapter w/o medium sep.	PP-H	FKM
700224467	Angled manometer adapter w/o medium sep.	PVDF	FKM



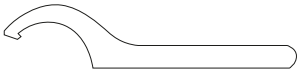
Pressure switch

Code	Description	Material	O-ring
198806658	Pressure switch 1-10 bar	SS	EPDM & FKM



Tools

Code	Description
198806451	Hook Wrench DN10/15
198806452	Hook Wrench DN20/25
198806453	Hook Wrench DN32/40/50



Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Pressure Reducing Valve type V82



Product description

The pressure reducing Valve type V82 reduces the system pressure to a specified value.

Function

By using the differential pressure, the pressure reducing valve adjusts itself to the set working pressure. If the outlet pressure increases or decreases to above/below the desired value, the diaphragm is lifted against the spring resistance or pressed down by the spring resistance by the outlet pressure. The pressure reducing valve begins to close/open until the state of equilibrium is reached again. This means that the outlet pressure remains constant, regardless of the rising or dropping inlet pressure.

Applications

- Microelectronics
- Chemical process industry
- Measurement and control
- Water treatment

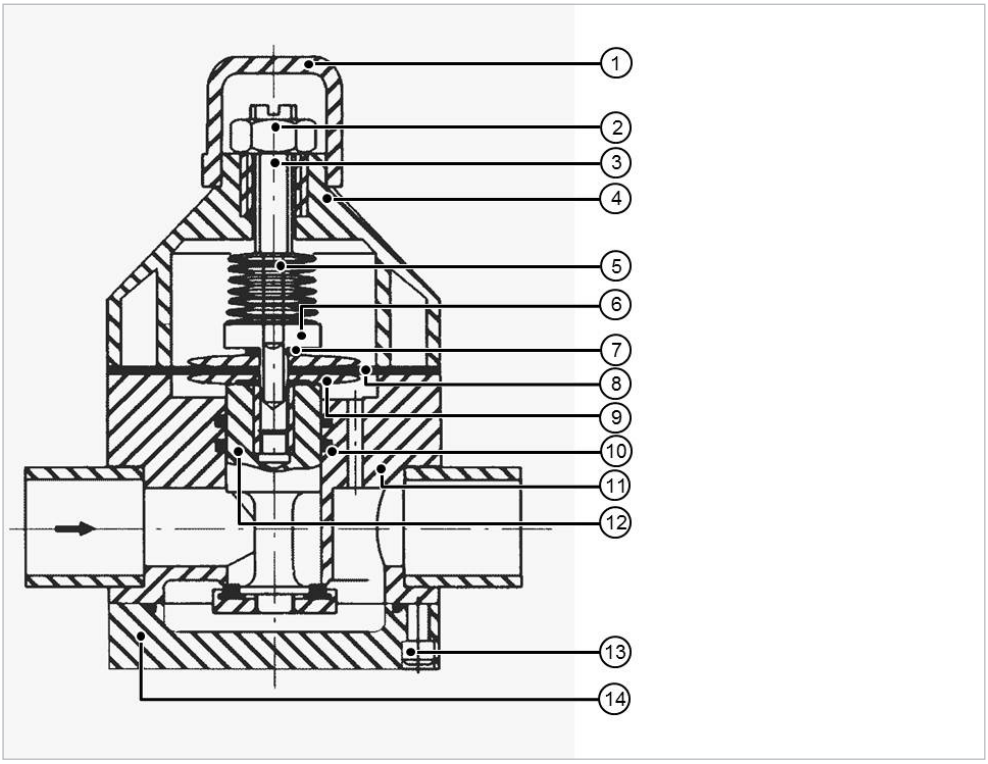
Benefits/features

- No auxiliary energy required
- The working pressure is set with an adjusting screw and locked with a locking nut
- Valves can also be adjusted under working pressure
- Requires practically no maintenance and can be installed in any position
- All parts that come into contact with the medium are made of highly resistant plastics
- The large form of the housing allows good flow values
- Standard version type V82 with manometer separated from the medium

Flow media

Neutral and aggressive media with a small quantity of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data

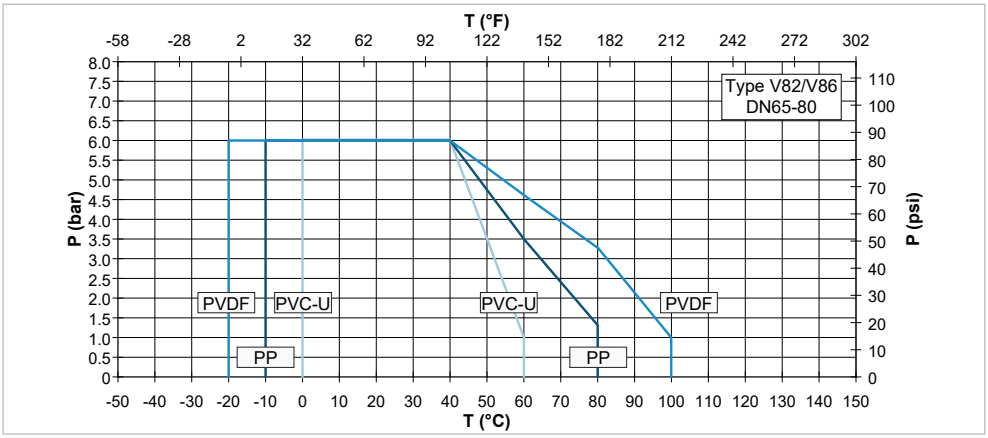


1 Cap
2 Locking nut
3 Adjusting screw
4 Upper valve body
5 Spring assembly
6 Allen screw
7 Washer
8 Diaphragms
9 Pressure plate (bottom and top)
10 O-ring
11 Valve body
12 Piston
13 Allen screws
14 Valve bottom with O-ring

Specification		
Dimensions	d75/DN65 – d110/DN100, 2 ½" – 4"	
Valve body materials	PVC-U, PP, PVDF	
Gasket materials	EPDM	
Diaphragm	EPDM-PTFE-coated	
PN	DN65 – DN80	max. 6 bar
	DN100	max. 4 bar
Adjustment range	DN65 – DN80	0.5 – 5 bar
	DN100	1 – 3 bar
Spring assemblies	Belleville spring	
Connections	Solvent cement spigot	DIN/ISO
	Fusion spigot	DIN/ISO
Standards	Pressure test according to ISO 9393	
	Leak-tightness test according to EN 12260	

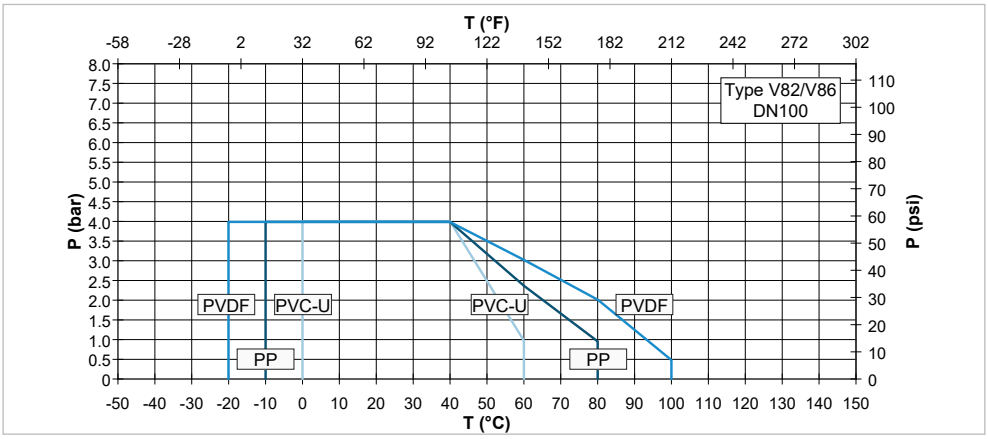
Pressure-temperature diagrams

DN65-80



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

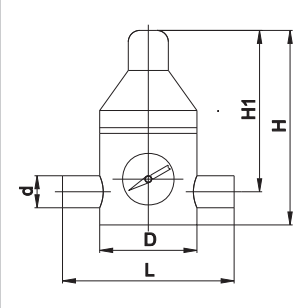
DN100



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

The pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

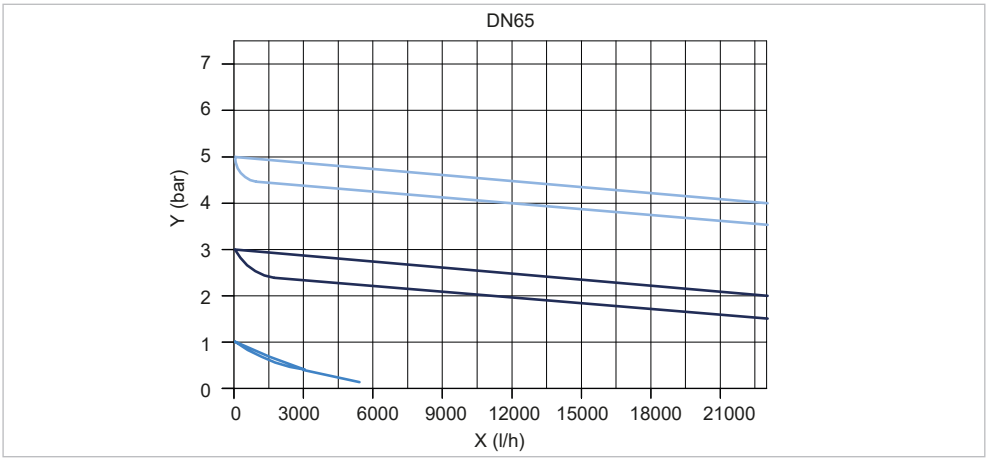
Dimensions



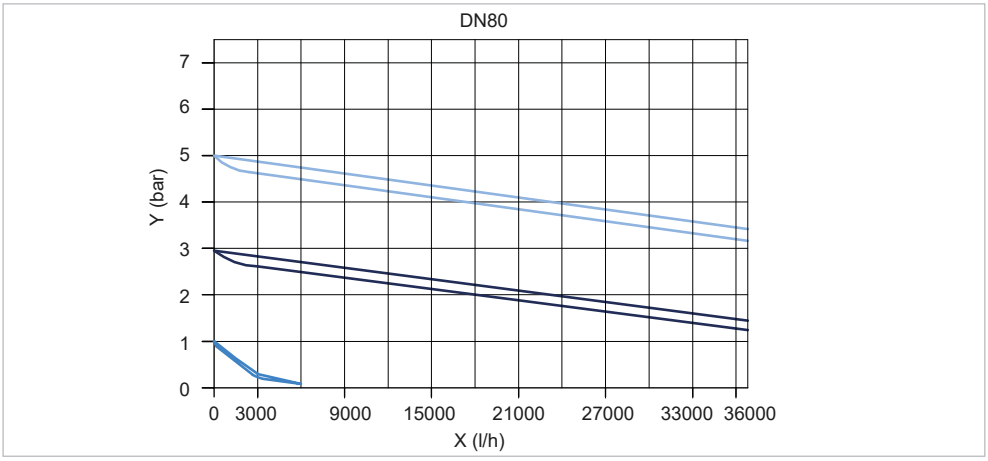
d (mm)	DN (mm)	øD (mm)	h (mm)	H (mm)	PVC-U solvent cement spigots PVDF fusion spigots L (mm)	PVDF-HP/PP butt fusion spigots BCF, IR L (mm)	PVC-U, PP/ PVDF L1 (mm)	PVC-U, PP/PVDF l2 (mm)
75	65	200	250	350	300	300		306
90	80	250	305	425	360	360		370
110	100	300	345	495	420	420		430

L1 With flange
L2 Union bush

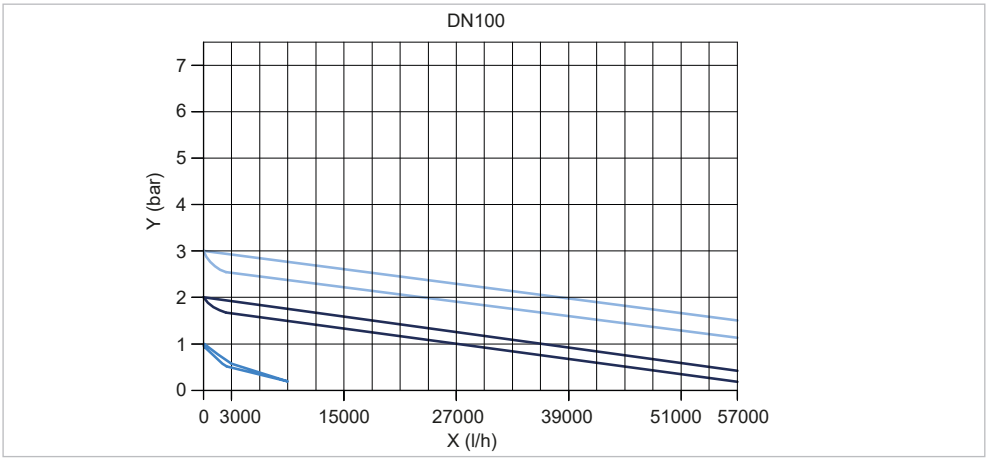
Characteristics type V82



X Flow rate (l/h)
Y Outlet pressure (bar)



X Flow rate (l/h)
Y Outlet pressure (bar)



X Flow rate (l/h)
Y Outlet pressure (bar)

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Pressure Retaining Valve type 586



Product description

The pressure retaining valve, also called an overflow valve, ensures that the pressure at the valve inlet is held constant.

Function

The pressure retaining valve maintains the line pressure to a set value at the valve inlet. The inlet pressure stays largely constant regardless of pressure fluctuations. The inlet pressure is directly related to the flow.

Applications

- Water treatment
- Chemical process industry
- Semiconductor industry
- Solar industry

Benefits/features

Easy assembly

- Compact design enables installation even when space is limited
- Radially dismountable
- Integrated assembling aid enables direct assembly of the valve
- Significantly shorter installation length thanks to union connections

Easy operation

- No re-torquing required thanks to central housing nut; nominal pressure can be set easily
- Constant and stable control behavior
- Leak-resistant in the event of temperature fluctuations
- Low maintenance
- Pressure setting possible even during operation

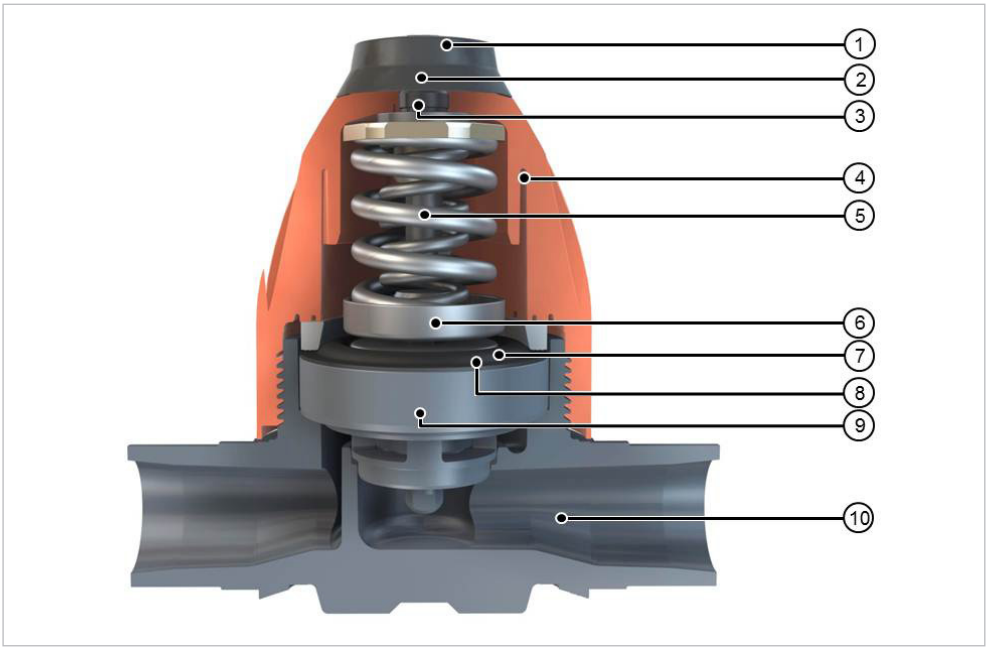
Flexible

- Manometer available as an option for neutral and aggressive media
- Various connection options available thanks to the spigot and union versions
- Low pressure spring set available
- Easy on spare parts thanks to the modular design

Flow media

Neutral and aggressive media with a small quantity of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data



1 Protective cap
2 Central housing nut
3 Spindle
4 Upper part
5 Spring(s)
6 Pressure piece
7 Retaining ring
8 Diaphragm
9 Cartridge with piston
10 Lower part

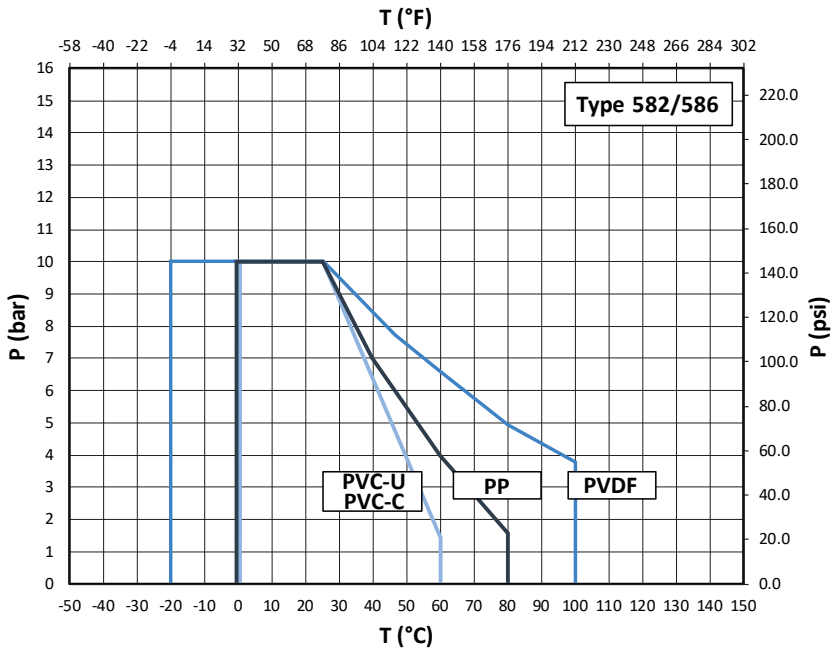
Specification		
Dimensions	d16/DN10 – d63/DN50, ⅜" – 2"	
Materials	Parts in contact with medium	PVC-U, PVC-C, PP-H, PVDF, PVDF-HP
	Valve upper part	PP-GF (orange)
Gasket materials	EPDM, FKM	
Diaphragm	EPDM/PTFE	
Pressure level	PN10 @ +20°C (150 psi @ 68°F)	
Setting range	Standard	0.5 – 9.0 bar (7 – 130 psi)
	Optional	0.3 – 3 bar (4 – 44 psi)
Hysteresis	Difference between opening and closing pressure: approx. 0.1 – 0.4 bar (1.5 – 5.8 psi)	
Connections	Body with cementing or fusion spigots	
	Lower part with true union type connection to match all standard GF unions and inserts	
	Available upon request Various inserts from the GF range, for example, transition from metal to PE	
Direction of flow	Always corresponds to the the direction of the arrow on the lower part	
Assembly	Threaded inserts are available for safe assembly	
Test standard	Testing for leak-tightness and function according to ISO 9393, ISO 12266	
Approvals	FDA	

Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv100 (l/min)	Kv100 (l/h)	Cv100 (US gal/min)
10	3/8	16	50	3'020	3.5
15	½	20	53	3'150	3.6
20	¾	25	114	6'840	7.9
25	1	32	125	7'500	8.6
32	1 ¼	40	263	15'760	18.1
40	1 ½	50	286	17'140	19.7
50	2	63	293	17'610	20.2

Kv100 at delta p = 1 bar
Cv100 at delta p = 1 psi

Pressure-temperature diagrams

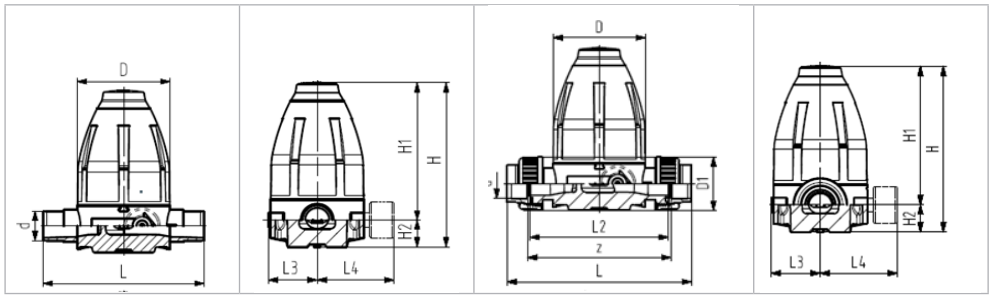


T Temperature (°C, °F)
P Permissible pressure (bar, psi)

The pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

Dimensions

Type 586 with threaded connections, cementable and fusionable spigots



A ll materials

d (mm)		DN (mm)		Inch (inch)		D (mm)	H (mm)	H1 (mm)	H2 (mm)
16	20	10	15	⅜	½	79	132	111	21
25	32	20	25	¾	1	100	177	148	29
40	50	32	40	1 ¼	1 ½	147	251	207	44
63		50		2		147	251	207	44

All materials if not labeled

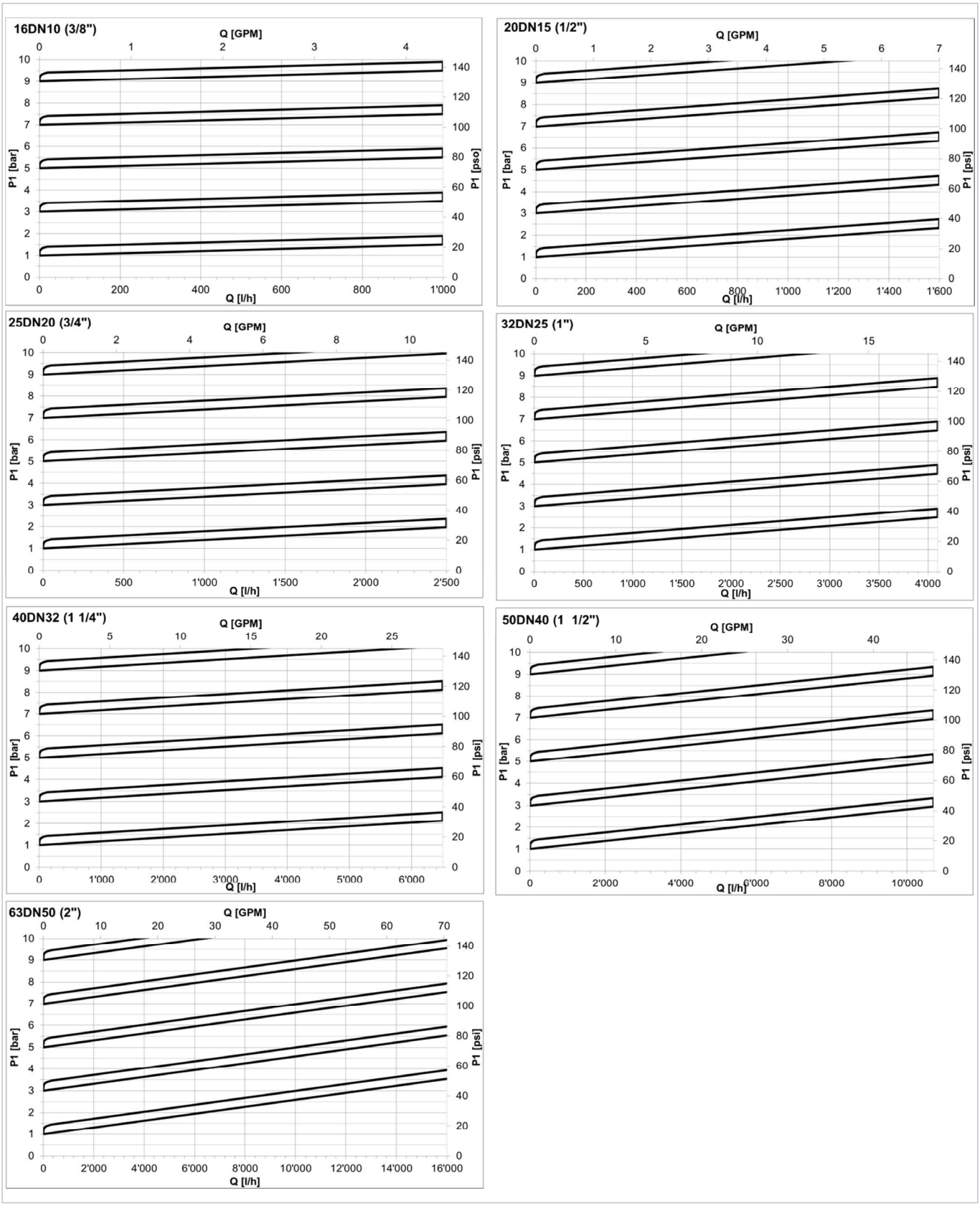
d (mm)		DN (mm)		Inch (inch)		L[1)] PVC/PP	L[1)] PVDF	l2 (mm)	l3 (mm)	L4 (mm)	z PVC/PP	z PVDF
16	20	10	15	⅜	½	134	150	120	42	77	126	130
25	32	20	25	¾	1	174	190	150	53	88	156	160
40	50	32	40	1 ¼	1 ½	224	240	205	76	111	211	215
63		50		2		244	260	205	76	111	211	215

[1)] L only for spigot version

Characteristics type 586

The characteristic curves below are valid for the set range 0.5 – 9.0 bar (7 – 130 psi) and show the inlet pressure P1 over the flow Q in l/h.

Parameter is the set pressure pE at Q = 0 l/h. There curves are valid for water at +20 °C and a flow velocity of 2 m/s. A special version set range 0.3 – 3 bar (4 – 44 psi) is available on request.



Ordering Information

Accessories

Manometer

Code	Description	Material	O-ring	Pressure range
198806963	Manometer for type 582/586	Brass	EPDM & FKM	0-4 bar
198806962	Manometer for type 582/586	SS	EPDM & FKM	0-4 bar
198806651	Manometer for type 582/586	Brass	EPDM & FKM	0-10 bar
198806652	Manometer for type 582/586	SS	EPDM & FKM	0-10 bar
198806655	Manometer for type 582/586 High Purity	Brass	FKM white (HP)	0-10 bar
198808656	Manometer for type 582/586 High Purity	SS	FKM white (HP)	0-10 bar



Manometer with manometer adapter

Code	Description	Material	O-ring	Pressure range
700278342	Manometer & adapter for type 582/586	Brass	EPDM & FKM	0-4 bar
700278343	Manometer & adapter for type 582/586	SS	EPDM & FKM	0-4 bar
700278340	Manometer & adapter for type 582/586	Brass	EPDM & FKM	0-10 bar
700278341	Manometer & adapter for type 582/586	SS	EPDM & FKM	0-10 bar
700278920	Manometer with adapter for type 582/586 High Purity	Brass	FKM white (HP)	0-10 bar
700278601	Manometer with adapter for type 582/586 High Purity	SS	FKM white (HP)	0-10 bar



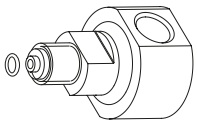
Manometer adapter with medium separation

Code	Description	Material	O-ring
198806650	Manometer adapter with medium separation	PVDF	EPDM & FKM
198806654	Manometer adapter with medium separation	PVDF-HP	FKM



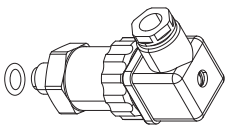
Angled manometer adapter without medium separation

Code	Description	Material	O-ring
700224463	Angled manometer adapter w/o medium sep.	PVC-U	EPDM
700224464	Angled manometer adapter w/o medium sep.	PVC-U	FKM
700224465	Angled manometer adapter w/o medium sep.	PP-H	EPDM
700224466	Angled manometer adapter w/o medium sep.	PP-H	FKM
700224467	Angled manometer adapter w/o medium sep.	PVDF	FKM



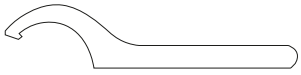
Pressure switch

Code	Description	Material	O-ring
198806658	Pressure switch 1-10 bar	SS	EPDM & FKM



Tools

Code	Description
198806451	Hook Wrench DN10/15
198806452	Hook Wrench DN20/25
198806453	Hook Wrench DN32/40/50



Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Pressure Retaining Valve type V86



Product description

The V86 pressure retaining valve serves to keep the working or system-related pressures constant, to balance out pressure pulsation and to reduce pressure peaks in chemical process systems.

Function

If the inlet pressure rises above the set value, the pressurized valve piston is lifted against the spring resistance. As a result, the valve opens and the pressure in the outlet pipe is reduced. The valve closes as soon as the inlet pressure sinks below the pre-set spring tension.

Applications

- Chemical process industry
- Measurement and control
- Water treatment
- Microelectronics

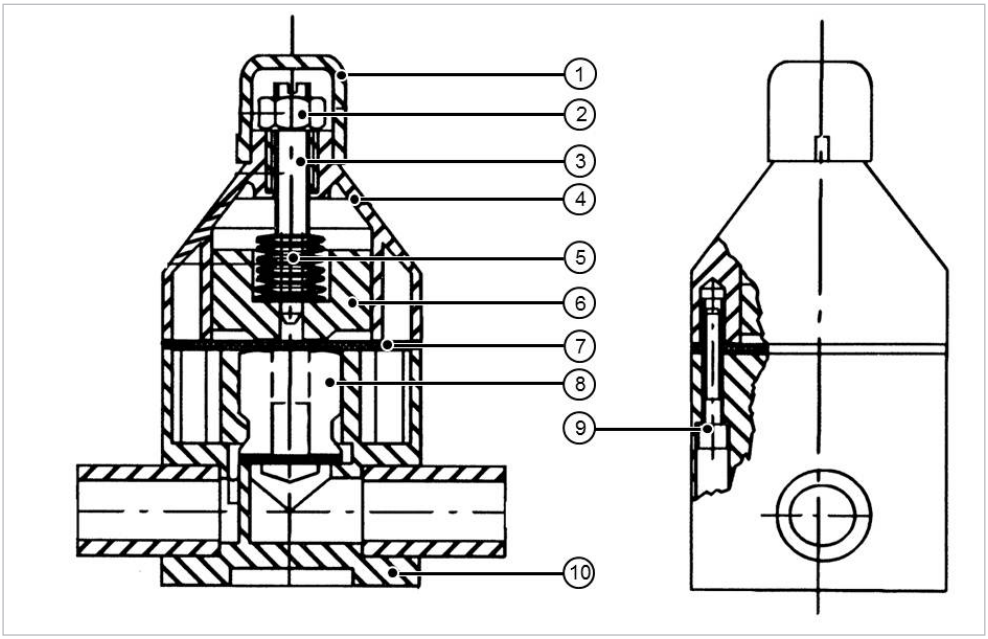
Benefits/features

- No auxiliary energy required
- The working pressure is set with an adjusting screw and locked with a locking nut.
- Valves can also be adjusted under working pressure
- Requires practically no maintenance and can be installed in any position
- All parts that come into contact with the medium are made of highly resistant plastics
- The large form of the housing allows good flow values

Flow media

Neutral and aggressive media with a small quantity of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data

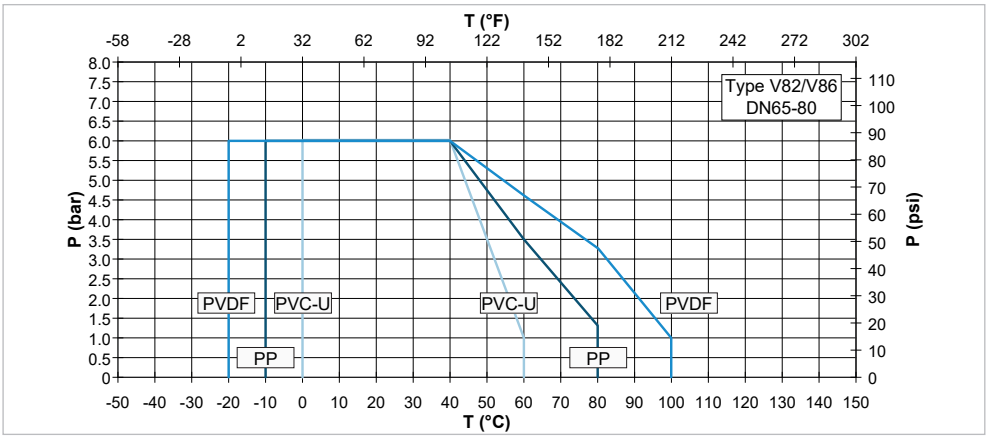


1 Cap
2 Locking nut
3 Adjusting screw
4 Upper valve body
5 Spring assembly)
6 Pressure piece
7 Diaphragms
8 Piston
9 Cylinder screw
10 Lower valve body

Specification		
Dimensions	d75/DN65 – d110/DN100, 2 ½" – 4"	
Materials	PVC-U, PP, PVDF	
Gasket materials	EPDM	
Diaphragm	EPDM-PTFE-coated	
Pressure level	DN65–DN80	PN6
	DN100	PN4
Setting range	DN65–DN80	1 – 6 bar
	DN100	1 – 4 bar
Connections	Solvent cement spigot	DIN/ISO
	Fusion spigot	DIN/ISO
Standards	Pressure test according to ISO 9393	
	Leak-tightness test according to EN 12260	

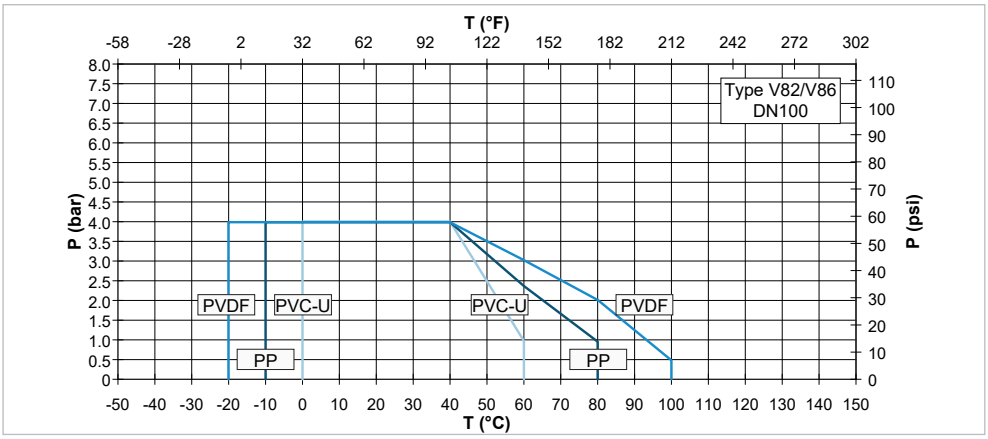
Pressure-temperature diagrams

DN65-80



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

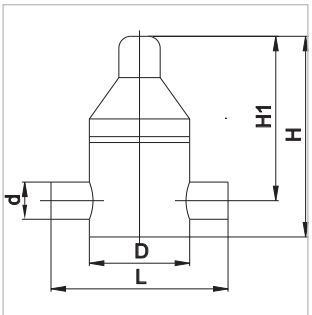
DN100



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

The pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

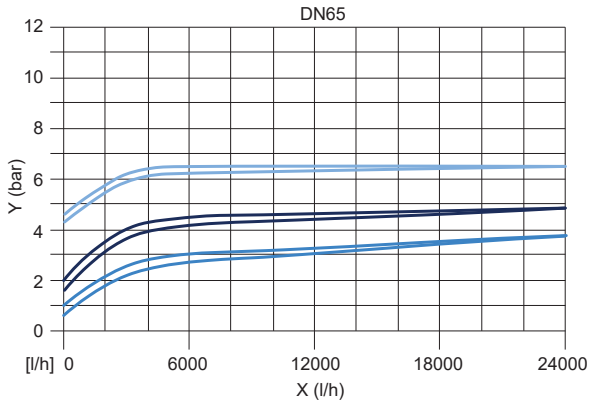
Dimensions



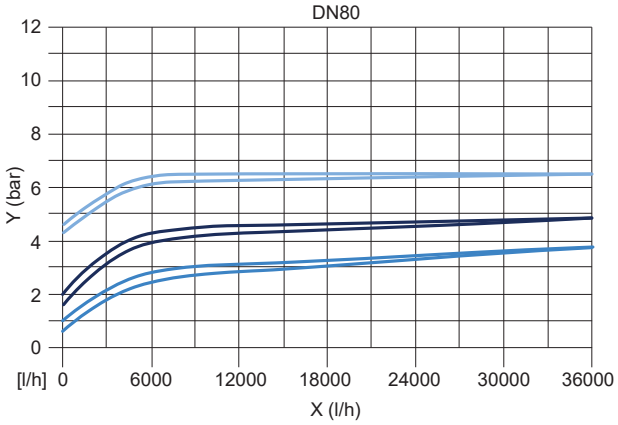
DN (mm)	PVC-U Solvent cement spigot PVDF fusion spigots L (mm)	PVDF-HP/PP Butt fusion spigots BCF/IR L (mm)	L1 (mm)	l2 (mm)	øD (mm)	H (mm)	h (mm)
10	134		140	154	83	137	20
15/20	134	158	140	154	83	137	20
25	174	198	180	185	112	199	27
32	174	202	230	248	165	199	43
40	224	256	230	248	165	290	43
50	244	256	250	252	165	290	43
65	284	284	290	280	180	275	230
80	360	360	310		250	410	320
100	380	380	390		250	485	415

L1 With flange
L2 Union bush

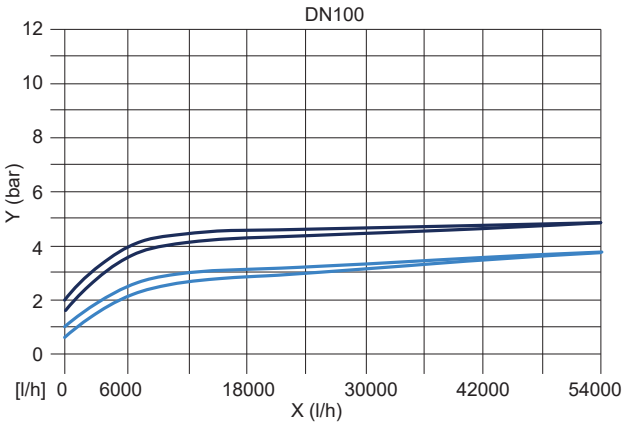
Characteristics type V86



X Flow rate (l/h)
Y Outlet pressure (bar)



X Flow rate (l/h)
Y Outlet pressure (bar)



X Flow rate (l/h)
Y Outlet pressure (bar)

Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools

Planning Fundamentals

of Valves and Automation

Solenoid Valves

Content

Solenoid Valve type 157 386
Solenoid Valve type 160/161 390
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Solenoid Valve type 166 398

Solenoid Valve type 157



Product description

Type 157 is a high-quality, direct-acting 2/2-way pivoted armature solenoid valve that can be used for opening or closing. The magnetic system and the media chamber are separated from one another by a separating diaphragm system. The solenoid coils are moulded with a chemically resistant epoxy. The valve is especially suitable for aggressive media.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to release, shut off, dose, distribute or mix gases and liquids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

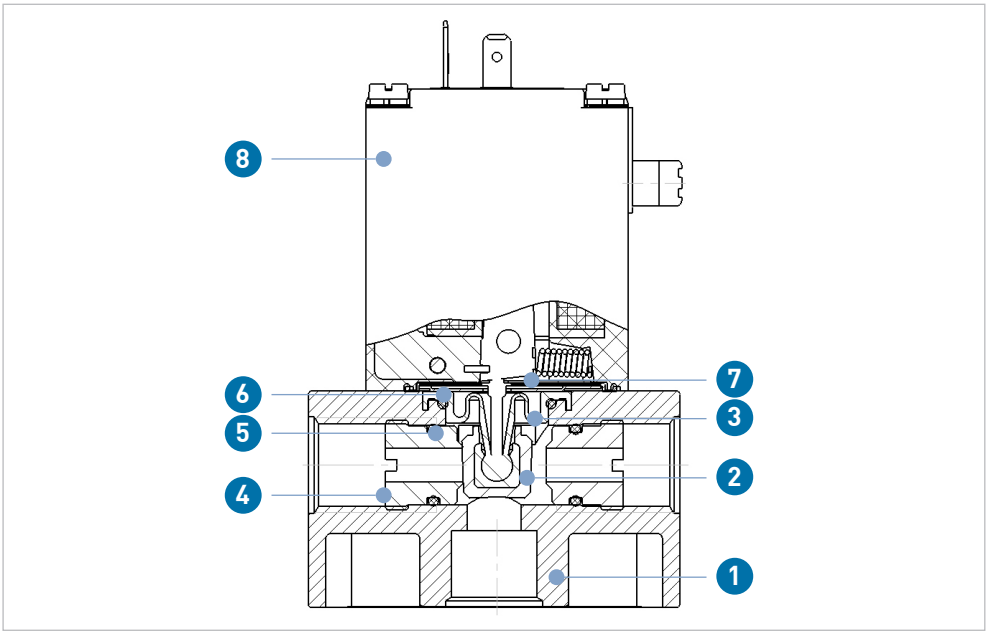
Benefits/features

- PVC-U material: threaded socket with cylindrical female pipe thread Rp
- Circuit functions: A (normally closed - FC) and B (normally open - FO)
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Service-friendly and robust manual override
- Direct-acting with isolating diaphragm
- Gasket materials are highly media-resistant
- Maintenance-free pivoted armature technology
- Vibration-proof, block screwed coil system

Flow media

Suited for aggressive media

Technical data



1 PVC valve housing
2 FKM gasket
3 PTFE rotating stem
4 PVC seat
5 FKM/EPDM O-Ring
6 PTFE gasket
7 FKM/EPDM isolating membrane
8 Epoxy coil

Specification		
Nominal diameter	DN2 – DN8	
Valve housing	PVC (resistant according to DIN 8062, 8061)	
Seal material media	FKM	Oxydizing acids and substances, hot oils with additives, salt solutions, waste gases
	EPDM	Alkalis, acids up to medium concentration, alkaline washing and bleaching lyes
Media temperatures Housing + gasket (combination of materials)	PVC + FKM	-10 to +50 °C
	PVC + EPDM	-30 to +50 °C
Ambient temperature	Max. +50 °C	
Viscosity	Max. 37 mm 2/s	
Voltage range	24V 50 Hz, 230V 50Hz, 24V UC*	
Voltage tolerance	±10%	
Switching frequency	Max. 100/min for AC Max. 10/min for UC (high-capacity electronic)	
Rated duty	100 % ED for high-capacity electronic	
	40 % ED (10 min)	
Electrical connection with AC and DC	Plug in accordance with DIN EN 17301-803 Form A for cable plugs	
Protection rating	IP65 with cable plug	
Thermal insulation class of the coil	H	
Mounting position	As desired, preferably with actuator on top	
Weight	0.38 kg	

*UC = Universal Current = AC/DC

Flow rate, pressure range and electrical power consumption

Nominal diameter (mm)	Mechanism	Kv value[1] water (l/min)	Pressure range[2]		Power consumption Inrush (electrical)		Power consumption Operation(electrical)	
			AC (bar)[3]	DC (bar)[3]	AC (VA)	UC (W)	AC (VA/W)	UC (W)
4	A	5[4]	0-4	0-2	30	40	15/8	8-12
6	A	10[5]	0-2	0-1	30	40	15/8	8-12
8	A	16.7	0-1	0-0.8	30	40	15/8	8-12

[1] Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet
[2] Pressure data (bar) excess pressure to atmospheric pressure
[3] Heat output 8W
[4] The Kv value is reduced to 4 l/min with sealing material FKM
[5] The Kv value is reduced to 8 l/min with sealing material FKM

Switching time

Frequency: AC		Frequency: UC	
Open (ms)	Close (ms)	Open (ms)	Close (ms)
20	11	11	8

Switching time (ms): Measurement at valve outlet at 6 bar and +20 °C. Open: Pressure build-up 0% to 90%. Close: Pressure build-up 100% to 10%.

Technical basics

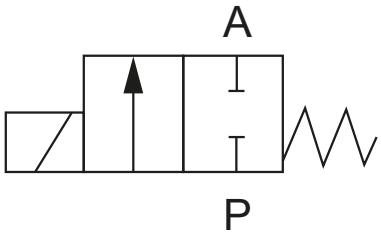
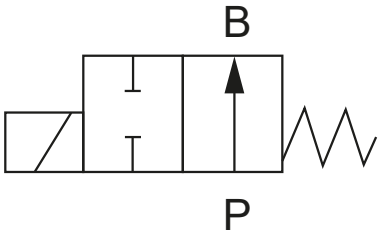
Valve handling

Electrical connection

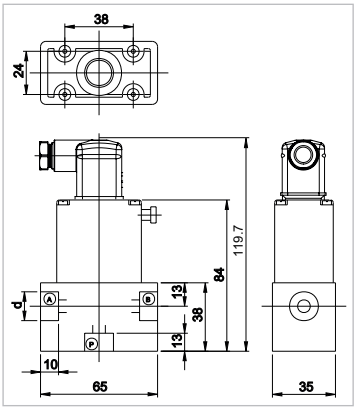
Observe the voltage and type of current as specified on the type plate.
Voltage tolerance ± 10 %. Connection via cable plug, protection rating IP65.
Cable 3 x 0.75 mm^2. Flat pin terminal = ground connection.
Cable plug insert can be rotated by 4 x 90 °.
Tightening torque for cable plug attachment 1 Nm.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

Switching functions

Circuit function A	Circuit function B
	
2/2-way valve (FC, Fail safe to close)	2/2-way valve (FO, Fail safe to open)

Dimensions



Housing material	Inch (inch)	B (mm)	E (mm)	F (mm)
PVC	G ⅜	91	35	65

Possible connections

Mode of operation	Port 1	Port 2
A	A	P
B	P	B

For further information on accessories, refer to the online product catalog at www.gfps.com

Solenoid Valve type 160/161



Type 160



Type 161

Product description

Type 160/161 works according to the leverage principle and can therefore switch large nominal diameters directly. It is available in both the 2/2-way and the 3/2-way valve designs. It can be used for a wide range of functions, such as opening, locking, dosing, mixing and dispensing. The anchor operates horizontally on a permanently coupled rocker. The sealing cylinder on the lower lever is pressed to the valves seats through the horizontal movement. The plastic-coated metal lever forms one unit with the gas-tight diaphragm bushing. Through this construction, the actuator media is kept separate from the fluid housing.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, they guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as a servo valve.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

Benefits/features

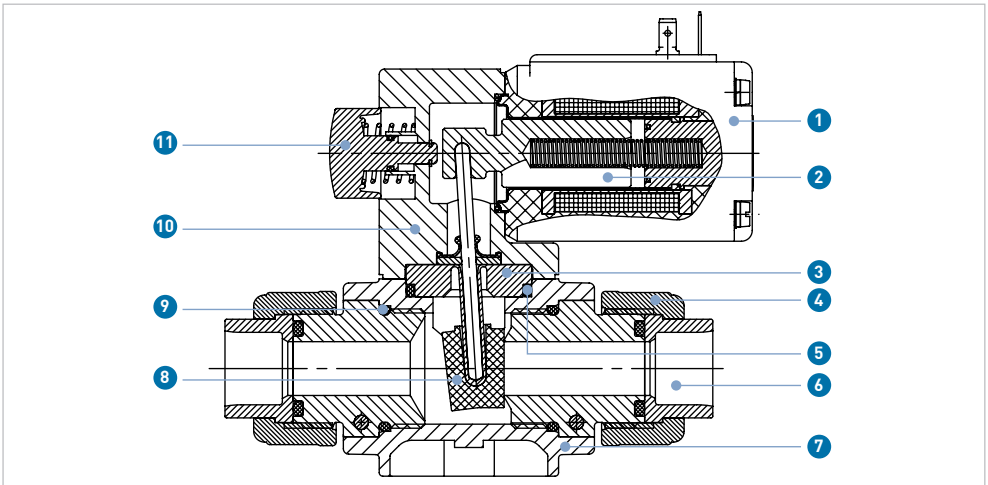
- With solvent cement socket, metric
- Circuit functions: A and B (Type 160), E and F (Type 161)
- PN 0 – 3bar
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Directly-acting valve up to nominal diameter DN20, separated from media
- Vibration-resistant, block-connected coil system
- Energy-efficient decrease in power in all DC models
- Robust, service-friendly manual override

Flow media

Suited for aggressive, abrasive and slightly contaminated media.

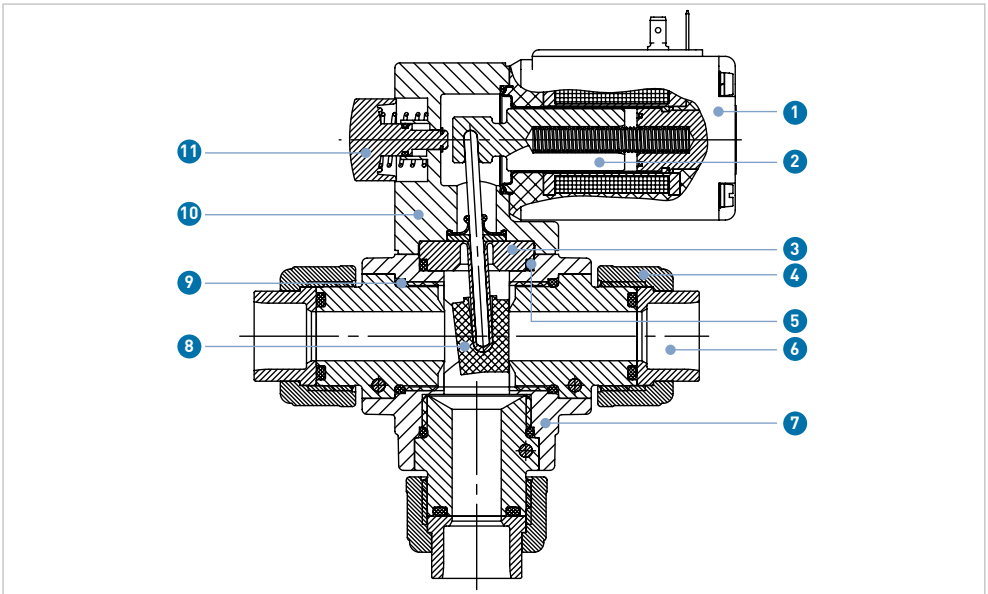
Technical data

2/2-way with union nut and connection fitting



1 Coil (epoxy)
2 Core (stainless steel 1.4105)
3 Rotating stem (PTFE)
4 Union nut (PVC)
5 O-ring (FKM, EPDM)
6 Connection fitting (solvent cement socket)
7 Housing (PVC)
8 Valve cone (FKM, EPDM)
9 O-ring (FKM, EPDM)
10 Angle flange (PC)
11 With manual override with locking function

3/2-way with union nut and connection fitting



1 Coil (epoxy)
2 Core (stainless steel 1.4105)
3 Rotating stem (PTFE)
4 Union nut (PVC)
5 O-ring (FKM, EPDM)
6 Connection fitting (solvent cement socket)
7 Housing (PVC)
8 Valve cone (FKM, EPDM)
9 O-ring (FKM, EPDM)
10 Angle flange (PC)
11 With manual override with locking function

Specification		
Nominal diameter	DN10-20	
Housing material	PVC	
Sealing material	EPDM, FKM	
Media	Aggressive and non-aggressive liquids, neutral gases, aggressive gases according to their diffusion characteristics	
Media temperature (Housing and gasket)	PVC / EPDM	-10 to +50 °C
	PVC / FKM	-10 to +50 °C
Ambient temperature	Max. +50 °C	
Viscosity	37mm²/s	
Supply voltage	24 V / UC*, 230 V / 50 Hz	
Voltage tolerance	±10 %	
Switching frequency	AC	60/min
	UC	Max. 6/min
Rated duty	ED 100 %	
Electrical connection	Cable plug, according to DIN EN 175301-803, form A	
Protection rating	IP 65 with cable plug	
Mounting position	As desired, preferably with actuator on top	

*UC = Universal Current = AC/DC

Electrical power consumption

Nominal diameter (mm)	Kv value water[1] (l/min)	Pressure range[2]				Power consumption Inrush (electrical)		Power consumption Operation(electrical)		Weight
		A (bar)	B (bar)	E (bar)	F (bar)	AC (VA)	UC (W)	AC (VA/W)	UC (W)	(kg)
10	33	0-3	0-2	0-0.6	0-1	100 - 120	100	48/16	9	1.2
15	75	0-1	0-1	0-0.3	0-0.5	100 - 120	100	48/16	9	1.2
20	100	0-0.5	0-0.5	0-0.15	0-0.25	100 - 120	100	48/16	9	1.2

[1] Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet

[2] Pressure data (bar) gauge pressure

Switching time

Open	Close
(ms)	(ms)
10 - 20	40 - 60

Switching time (ms): Measurement at valve outlet at 6 bar and +20 °C. Open: Pressure build-up 0% to 90%. Close: Pressure build-up 100% to 10%.

Technical basics

Valve handling

Installation notes

- Turn off pressure and vent pipes before removing pipes and valves.
- Switch off power and secure from reconnection before performing any procedures on the device or system.
- Observe the applicable accident prevention and safety regulations for electrical devices.
- Keep the device away from easily flammable materials and media and do not touch with bare hands.
- Risk of injury due to component failure of valves with AC power.
- Assembly may be performed only by authorized specialists using appropriate tools

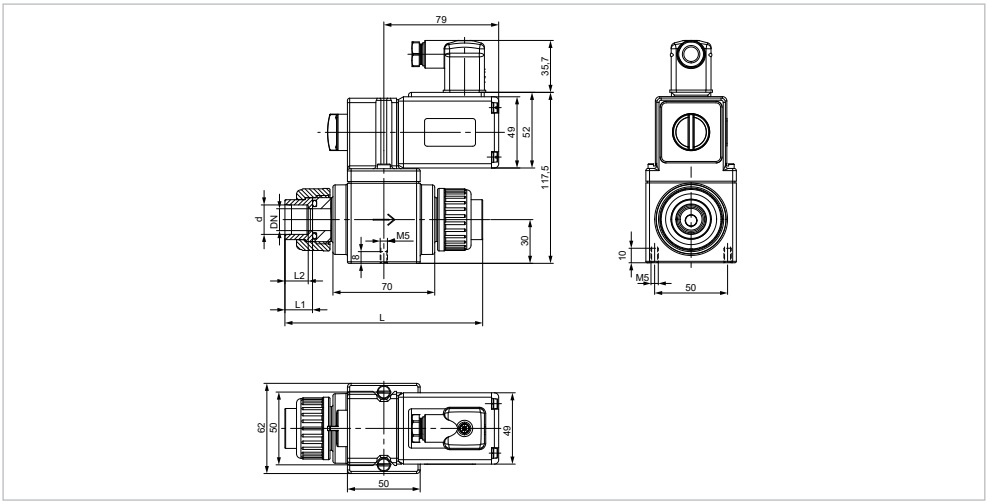
Electrical connection

Observe the voltage and type of current as specified on the type plate.
Voltage tolerance ± 10 %. Connection via cable plug, protection rating IP65.
Cable 3 x 0.75 mm^2. Flat pin terminal = ground connection.
Cable plug insert can be rotated by 4 x 90°. Tightening torque for cable plug attachment 1 Nm.

⚠ Installation and maintenance must be performed in accordance with the corresponding and current issue installation manual. The installation manual is provided with the product and also available from our document library in the on-line product catalogue at www.gfps.com

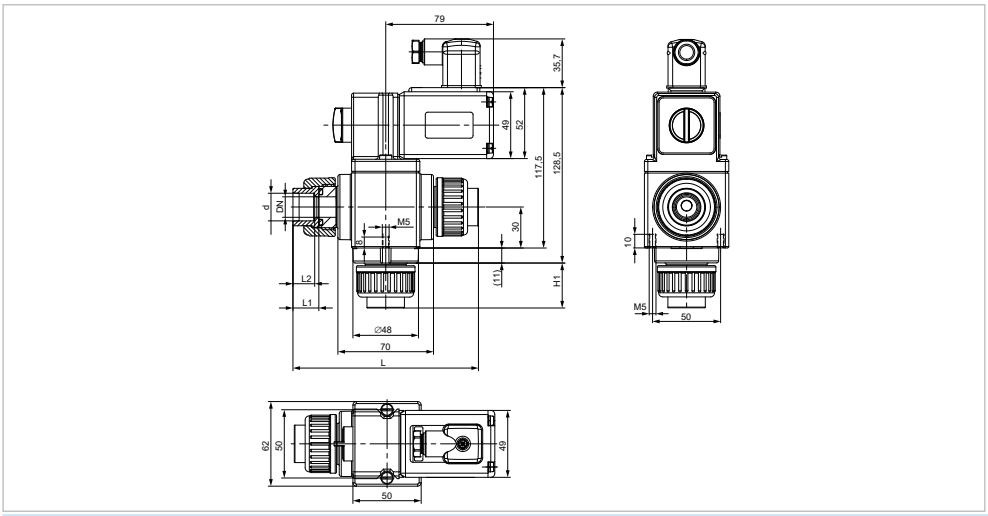
Dimensions

2/2-way with union nut and connection fitting



Material	DN (mm)	Process connection	L1 (mm)	L2 (mm)	d (mm)	L (mm)
PVC	10	Solvent cement socket	17	14	16	130
	10 (with connection for DN15)	Solvent cement socket	19	16	20	134
	15	Solvent cement socket	19	16	20	136
	15 (with connection for DN20)	Solvent cement socket	22	19	25	142
	20	Solvent cement socket	22	19	25	144

3/2-way with union nut and connection fitting



Material	DN (mm)	Process connection	H1 (mm)	L1 (mm)	L2 (mm)	d (mm)	L (mm)
PVC	10	Solvent cement socket	30	17	14	16	130
	10 (with connection for DN15)	Solvent cement socket	32	19	16	20	134
	15	Solvent cement socket	33	19	16	20	136
	15 (with connection for DN20)	Solvent cement socket	36	22	19	25	142
	20	Solvent cement socket	37	22	19	25	144

Solenoid Valve type 165



Product description

The pilot-controlled gate Valve type 165 with servo diaphragm is closed when there is no current. A minimum differential pressure of 0.5 bar is required to fully open and close the valve. Actuator and media chamber are separated by a diaphragm. The solenoid coils are encapsulated with a highly chemically resistant epoxy.

Servo assisted solenoid valves have less power consumption than direct acting solenoid valves in the same dimension.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

Benefits/features

- Function: A
- PN 0.5 – 6 bar
- Pilot-controlled valve with servo diaphragm
- Separate from media
- No metal internal parts
- Pivoted armature pilot control with lockable emergency manual override
- Simple installation and removal
- Plastic valve for aggressive and contaminated media
- Service-friendly manual operation

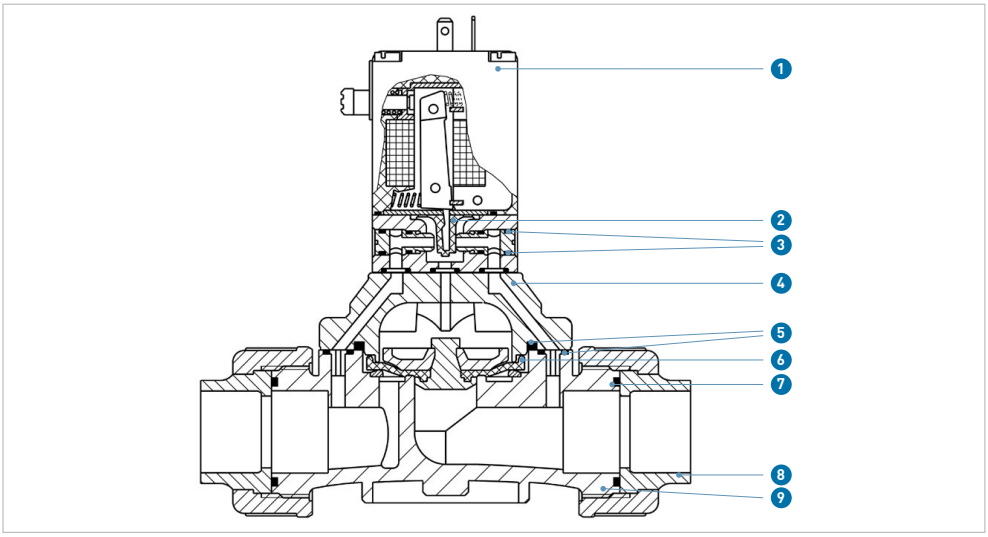
Limitations

- Sensitive to solids
- Δp of 0.5 bar absolutely necessary

Flow media

Clean liquids without solid particles (neutral or aggressive)

Technical data



1 Reel housing (Epoxy)
2 Diaphragms (EPDM, FKM)
3 O-ring (EPDM, FKM)
4 Cover (PVC)
5 O-ring (EPDM, FKM)
6 Diaphragms (EPDM, FKM)
7 O-ring (EPDM, FKM)
8 Insert (sleeve) (PVC)
9 Housing (PVC)

Specification		
Nominal diameter	DN15 – DN50	
Housing material	PVC	
Gasket material	EPDM, FKM	
Media	EPDM	Alkalines, detergent and bleach solutions
	FKM	Oxidizing acids and substances
Media temperature	PVC housing	0 to +50 °C
Ambient temperature	PVC housing	0 to +40 °C
Viscosity	21 mm^2/s	
Supply voltage	24V DC, 230V 50Hz/60Hz, 115V 50Hz/60Hz	
Voltage tolerance	±10%	
Nominal mode of operation	Continuous operation 100 % ED	
Electrical connection	Cable plug for ø 7 mm cable in accordance with DIN EN 175301-803 form A (included in scope of delivery)	
Protection rating	IP65 with appliance plug	
Insulation class coil	Class H	
Air connection	Sleeve	
Mounting position	As desired, preferably with actuator on top	

Kv 100 values

Nominal diameter (mm)	Mode of operation	Kv value[1] water (l/min)	Pressure range[2] (bar)	Power consumption Inrush (electrical)		Power consumption Operation (electrical)	
				AC (VA)	DC (W)	AC (VA/W)	DC (W)
15	A	83	0.5 - 6	20	5	11/5	5
20	A	100	0.5 - 6	20	5	11/5	5
25	A	233	0.5 - 6	20	5	11/5	5
32	A	267	0.5 - 6	20	5	11/5	5
40	A	500	0.5 - 6	20	5	11/5	5
50	A	600	0.5 - 6	20	5	11/5	5

1) Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet
2) Pressure data (bar) gauge pressure

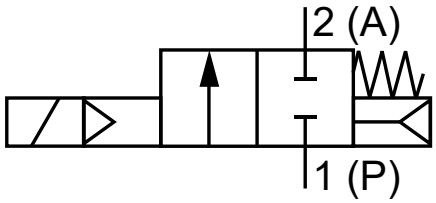
Switching time

Open	Close
(ms)	(ms)
100 - 800	1'000 - 4'000

Switching time (ms): Measurement at valve outlet at 6 bar and +20 °C. Open: Pressure build-up 0% to 90%. Close: Pressure build-up 100% to 10%.

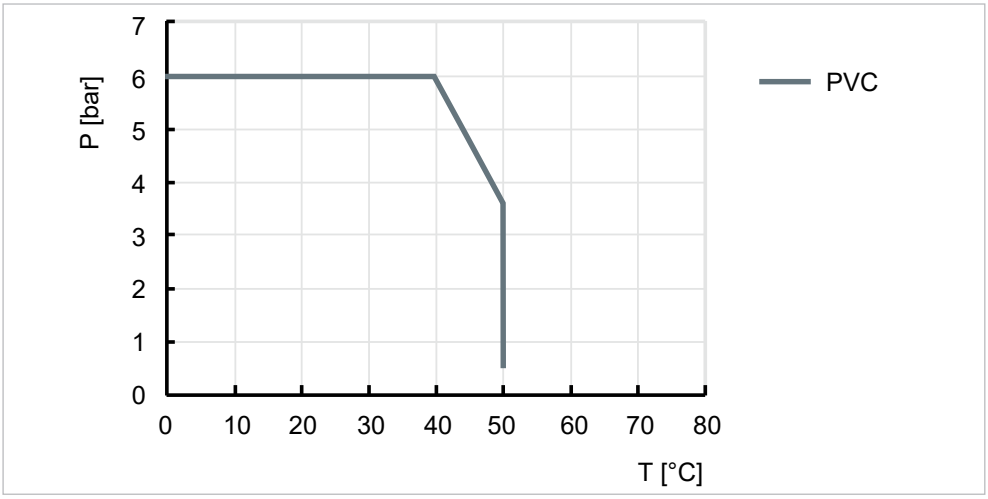
Switching functions

Circuit function A



2/2-way valve
(FC, Fail safe to close)

Pressure-temperature diagrams



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

Technical basics

Valve handling

Installation notes

Electrical connection

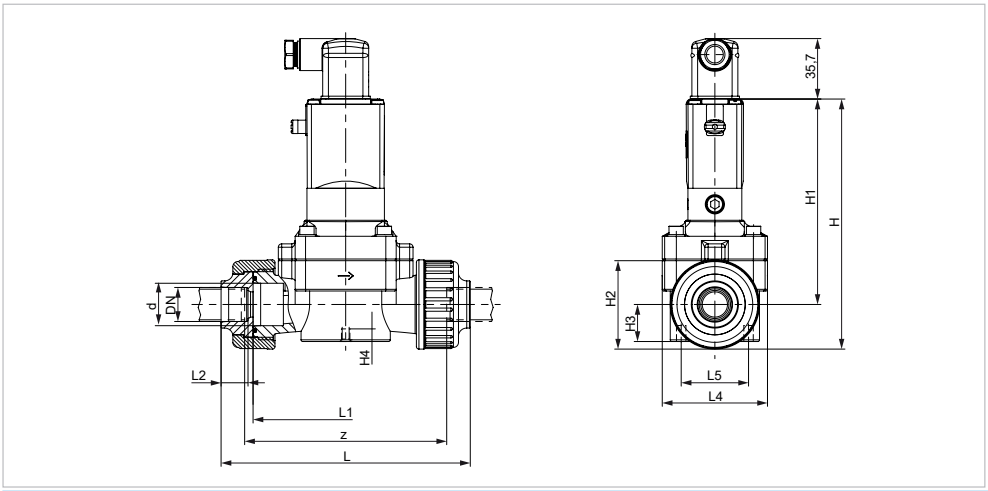
Observe the voltage and type of current as given on the type plate.
Voltage tolerance ± 10 %. Connection via cable plug, protection rating IP65.
Cable 3 x 0.75 mm^2. Flat pin terminal = ground connection.
Cable plug insert can be rotated by 4 x 90°. Tightening torque for cable plug attachment 1 Nm.

Maintenance notes

- Maintenance may be performed only by authorized specialists using appropriate tools.
- Secure the system against unintentional operation.
- Ensure a controlled restart after maintenance.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

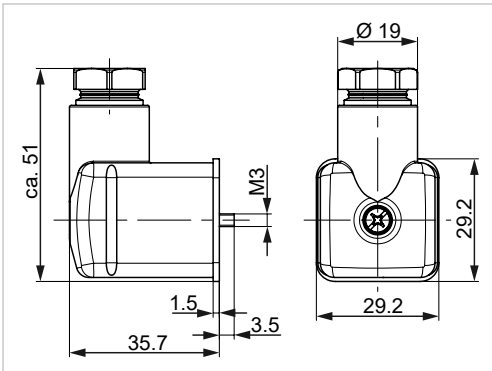
Dimensions



Alle Ausführungen

DN (mm)	d (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	L1 (mm)	L4 (mm)	L5 (mm)	z (mm)	L (mm)	L2 (mm)
15	20	148	122	53	22	8	110	63	40	116	148	16
20	25	148	122	53	22	8	110	62	40	116	154	19
25	32	175	137	76	31	15	141	85	45	147	190	22
32	40	175	137	76	31	15	141	85	45	147	198	26
40	50	212	160	105	42	15	192	115	45	198	254	31
50	63	212	160	105	42	15	192	115	45	198	268	38

Cable plug dimensions



Solenoid Valve type 166



Product description

Type 166 is a direct-acting 2/2 or 3/2-way pivoted armature valve. Available with various mechanisms for opening, closing, dosing, mixing and distributing. The solenoid system and medium chamber are separated from one another by means of an isolating diaphragm system. The valve thus has a long service life, even with dry runs. Due to the use of PP and PVDF as housing materials, type 166 is especially suitable for aggressive media. The solenoid coils are encapsulated with a highly chemically resistant epoxy. The valve is mounted via a G ¼" union. The valve is available in the nominal diameters DN3, DN4 and DN5.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

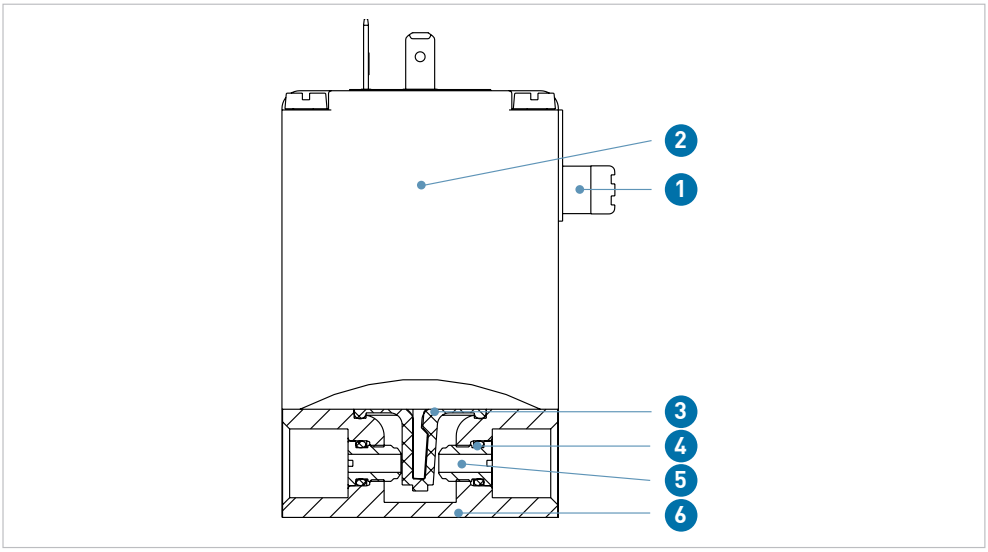
Benefits/features

- Mechanisms: A, E and F
- PN0 – PN 10 bar
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Service-friendly, robust
- Emergency manual override
- Direct-acting with isolating membrane
- Maintenance-free pivoted armature technology
- Vibration-resistant, block-bolted coil system

Flow media

Suited for aggressive media

Technical data



1 Manual override
2 Coil (Epoxy)
3 Diaphragm (EPDM, FKM)
4 O-ring (EPDM, FKM)
5 Valve body (PP-H, PVDF)

Specification		
Nominal diameter	DN3 - DN5	
Port connection	G 1/4"	
Housing and seat materials	PP-H, PVDF	
Coil material	Epoxy	
Sealing material	EPDM, FKM	
Media	EPDM	Alkalines, acids up to medium concentration, detergent and bleach solutions
	FKM	Oxidizing acids and substances, oils and saline solutions, exhaust gases, oxygen
Medium temperature	EPDM	-30 to +80 °C
	FKM	0 to +80 °C
Viscosity	37 mm^2/s	
Ambient temperature	Max. +55 °C	
Voltages	24V AC/DC, 24V DC, 230V 50 Hz	
Voltage tolerance	±10%	
Rated duty	Intermittent operation	40 % ED (30 min) in 8 W designs
	Continuous duty	100 % ED in 5 W design (upon request)
Electrical connection	Pin terminal according to DIN EN 175301-803 form A for cable plug	
Protection rating	IP65 with cable plug	
Thermal insulation class coil	H	
Mounting position	As desired, preferably with actuator on top	

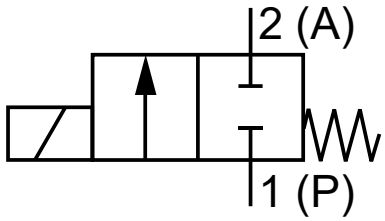
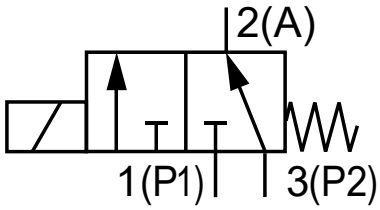
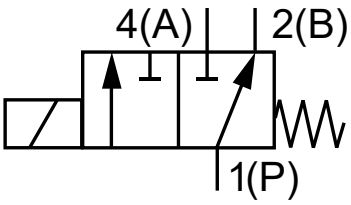
Electrical power consumption

Nominal diameter (mm)	Mechanism	Kv value[1] water (l/min)	Pressure range[2]		Power consumption Inrush (electrical)		Power consumption Operation(electrical)		Weight
			AC (bar)	DC (bar)	AC (VA)	DC (W)	AC (VA/W)	DC (W)	(kg)
3	A	4.2	0-10	0-8	30	8	15/8	8-11	0.4
	F		0-10	0-8	30	8	15/8	8-11	0.4
	E		0-6	0-4	30	8	15/8	8-11	0.4
4	A	5.0	0-5	0-4	30	8	15/8	8-11	0.4
	F		0-5	0-4	30	8	15/8	8-11	0.4
	E		0-3	0-2	30	8	15/8	8-11	0.4
5	A	6.7	0-4.5	0-3	30	8	15/8	8-11	0.4

[1] Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet. At frequency DC the Kv-value is reduced till 10 % to fulfil the function.

[2] Pressure data (bar) gauge pressure. Rated power consumption 8 W.

Switching functions

Circuit function A	Circuit function E	Circuit function F
		
2/2-way valve (FC, Fail safe to close)	3/2 way mixing valve	3/2 way distribution valve

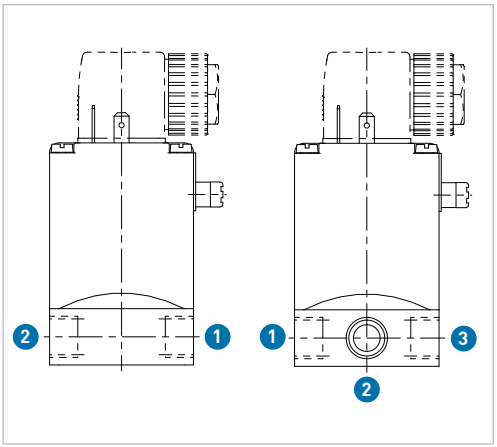
Switching time

Open		Close	
AC (ms)	DC (ms)	AC (ms)	DC (ms)
8 - 12	10 - 20	8 - 15	10 - 20

Switching time (ms): Measurement at valve outlet at 6 bar and +20 °C. Open: Pressure build-up 0% to 90%. Close: Pressure build-up 100% to 10%.

Possible port connections

The ports marked with 1, 2 and 3 are labelled in the drawing according to the circuit function table.



Circuit function	Port 1	Port 2	Port 3
A	P	A	
E	P1	A	P2
F	A	P	B

Technical basics

Valve handling

Installation notes

- Turn off pressure and vent pipes before removing pipes and valves.
- Switch off power and secure from reconnection before performing any procedures on the device or system.
- Observe the applicable accident prevention and safety regulations for electrical devices.
- Keep the device away from easily flammable materials and media and do not touch with bare hands.
- Risk of injury due to component failure of valves with AC power.
- Assembly may be performed only by authorized specialists using appropriate tools!

Electrical connection

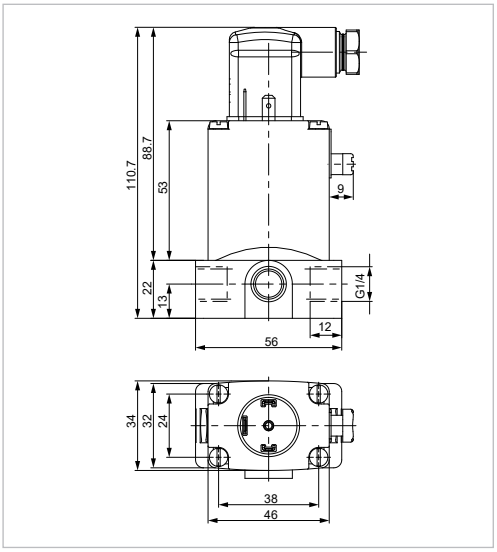
Observe the voltage and type of current as specified on the type plate.
Voltage tolerance ± 10 %. Connection via cable plug, protection rating IP65.
Cable 3 x 0.75 mm^2. Flat pin terminal = ground connection.
Cable plug insert can be rotated by 4 x 90°. Tightening torque for cable plug attachment 1 Nm.

Maintenance notes

- Maintenance may be performed only by authorized specialists using appropriate tools.
- Secure the system against unintentional operation.
- Ensure a controlled restart after maintenance.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Dimensions



Mounting: By drilling M4 × 8 (metal housing) or self-tapping screws (plastic housing) on underside of the housing on the hole pattern 38 × 24.

Planning Fundamentals

of Valves and Automation

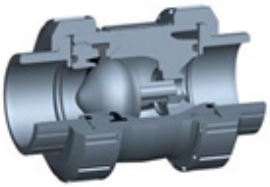
Check Valves

Content

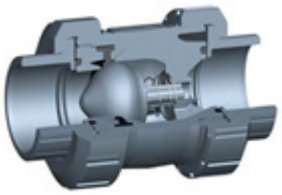
Cone Check Valve type 561/562 405
Check Valve type 369 413
Angle Seat Check Valve type 303/304 421

Cone Check Valve type 561/562





Type 561 (without spring)



Type 562 (with spring)

Product description

The innovative check valve design combines increased safety and efficiency with easy handling. The two cone check valves of type 561 and type 562 easily fit in all piping systems worldwide thanks to our comprehensive product range. The self-closing function and the silent operation of the valve support safety and comfort.

Function

The cone check valve is a component that allows the flow of the medium in one direction only.

Applications

- Microelectronics
- Chemical process industry
- Food and beverages
- Ship building
- Water treatment
- Cooling processes

Flow media

Media that are free of foreign particles, viscous, thick and gaseous media.

Benefits/features

Security

- Type 561 (no spring) is already 100 % leak-proof at a water column of 2 m
- The spring within the valve (type 562) guarantees 100 % leak-tightness when the valve is in idle mode, even without a water column and when installed horizontally
- The gasket is always fixed in the same position. This prevents the gasket from slipping, bending or being washed out
- Corrosion-resistant
- Autonomous self-closing mechanism without an additional energy source
- Self-cleaning design – minimizes cleaning and maintenance
- Optimized flow design
- Corrosion-resistant and high pressure rating
- Wide range of materials for optimum chemical resistance
- High degree of safety and efficiency

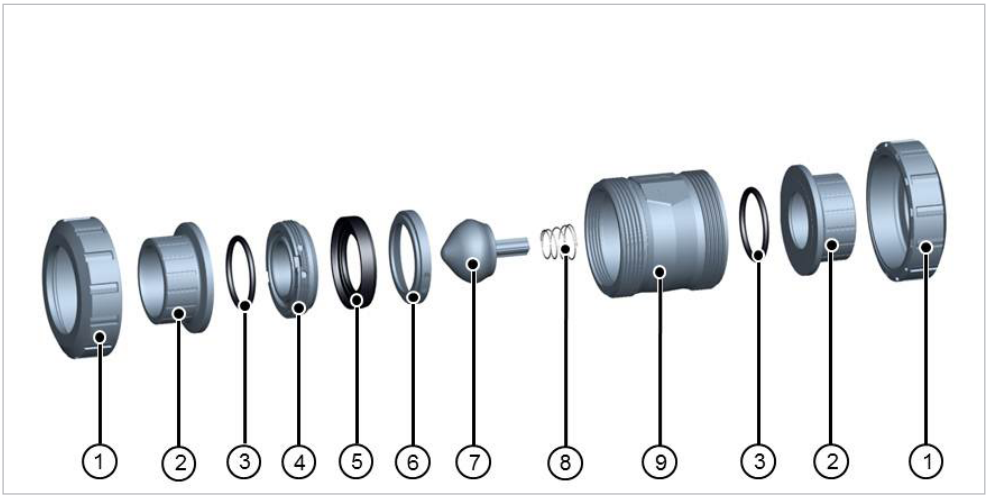
Simplicity

The cone check valves of type 561 and 562 are self-closing. This means that no other energy source is needed than the pressure in the pipe.

Efficiency

Thanks to the aerodynamic design of the check cone, the valve permits a far higher flow rate than standard check valves with a ball.

Technical data



1 Coupling nut
2 Connecting part
3 O-ring
4 Screw-in ring
5 Sealing ring
6 Back-up ring
7 Cone
8 Spring (Type 562)
9 Housing

Specification			
Dimensions	d16/DN10 - d110/DN100, ⅜" - 4"		
Materials	Valve body		PVC-U, PVC-C, ABS, PP-H, PVDF
	Spring type 562	Standard	V2A
		Optional	• Nimonic 90 • V2A with HALAR coating
Gasket materials and O-rings	EPDM, FKM, FFKM, FEP coated		
Pressure levels	PVC-U, PVC-C, PVDF		PN16
	PP-H, ABS		PN10
Connections	Solvent cement sockets ISO, BS, ASTM/ANSI, JIS		
	Solvent cement spigots ISO		
	Threaded sockets ISO, BS, ASTM/ANSI		
	Fixed flange ISO, BS		
	Butt fusion spigots, long, PE100 SDR17 ISO		
Product standard	EN ISO 16137		
Test standard	ISO 9393-2, EN 12266-1		
Approvals	ACS, FDA, DIBt, TA-Luft, NAMSA		

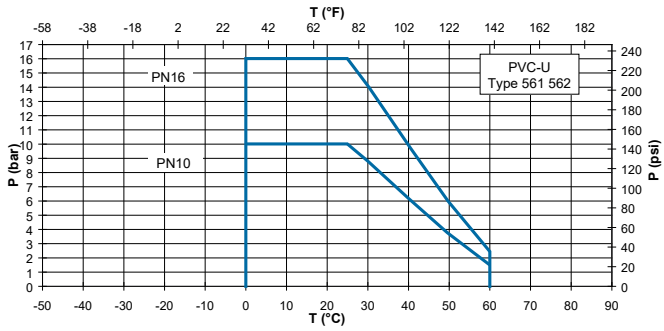
Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min)	Cv 100 (gal/min)	Kv 100 (m^3/h)
10	⅜	16	190	13	11
15	½	20	190	13	11
20	¾	25	380	26	23
25	1	32	460	32	28
32	1¼	40	850	59	51
40	1½	50	1'080	75	65
50	2	63	1'670	115	100
65	2½	75	2'950	204	177
80	3	90	3'600	248	216
100	4	110	4'150	286	249

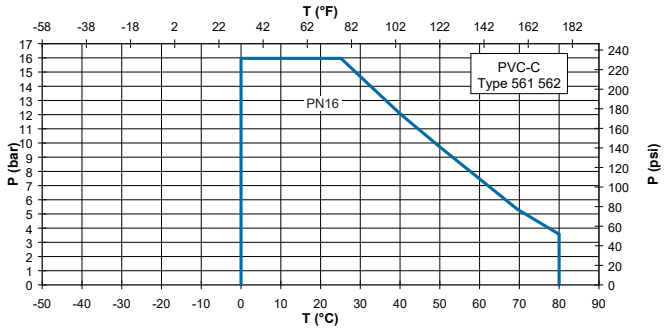
Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

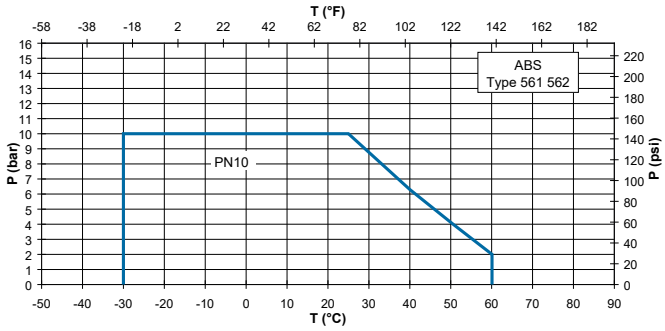
PVC-U



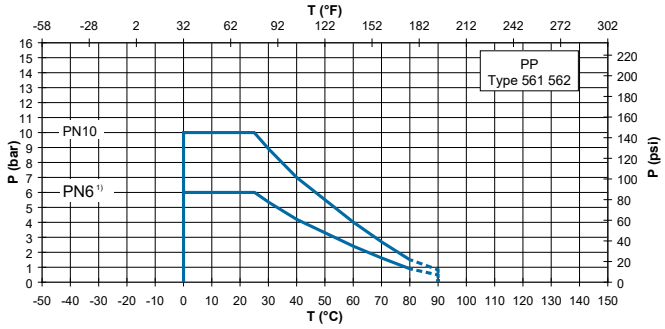
PVC-C



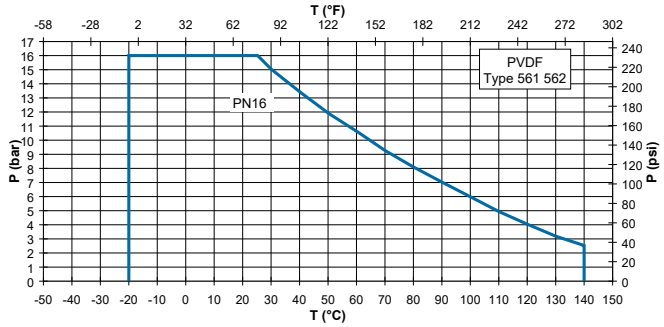
ABS



PP

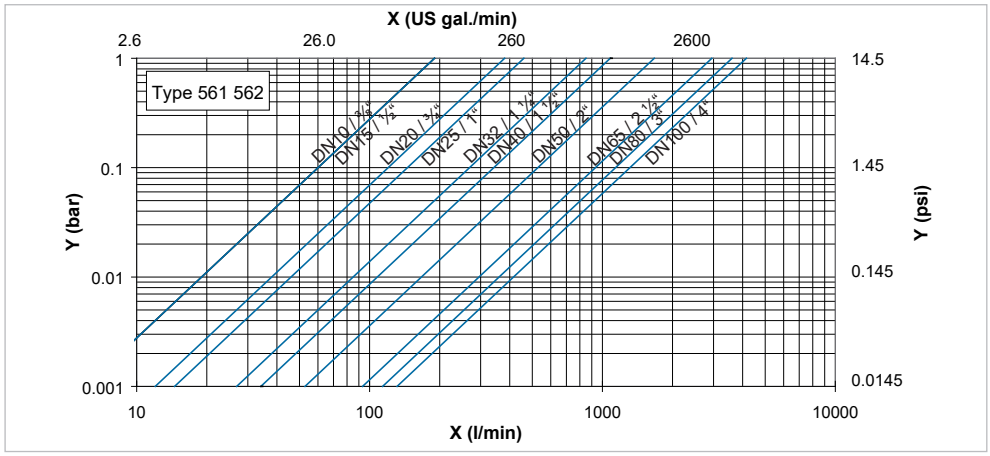


PVDF



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

Pressure losses



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

DN	Open (vertical installation)				Close[1]	
(mm)	Differential pressure for lifting the cone (bar)	Differential pressure for full stroke of the cone (bar)	Flow for full stroke of the cone (l/min)	Min. flow rate for full stroke (m/sec)	Leak-tight starting at (bar)	Type 562 leak-tight starting at (bar)
10	0.006	0.01	8	0.7	0.2	0.1
15	0.006	0.01	9	0.7	0.2	0.1
20	0.006	0.01	13	0.7	0.2	0.1
25	0.01	0.01	18	0.8	0.2	0.1
32	0.01	0.01	35	0.8	0.2	0.1
40	0.015	0.01	70	0.8	0.2	0.1
50	0.015	0.01	100	0.8	0.2	0.1
65	0.02	0.01	120	0.9	0.2	0.1
80	0.02	0.01	170	0.9	0.2	0.1
100	0.025	0.08	250	1.0	0.2	0.1

[1] Vertical and horizontal installation.

The information in the table apply to water or water-like media with a density of approximately 1g/cm^3. If media with a higher density are used, please note that, depending on the material used, the cone may float and the closing function of the cone is no longer guaranteed. This is dependent on the material used. The values for the opening conditions apply to vertical installation (recommended installation location). In the case of horizontal installation, the valve opens at much lower differential pressures.

Material	Density (g/cm^3)
ABS	1.03
PP-TV 20 (cone: PP-talk)	1.05
PVC-U	1.38
PVC-C	1.50
PVDF	1.78

Pressure for raising cone type 562

DN (mm)	Differential pressure for raising the cone (bar)
10	0.04
15	0.04
20	0.04
25	0.04
32	0.05
40	0.05
50	0.05
65	0.06
80	0.07
100	0.08

Reference values for tightening torque of screws

d (mm)	DN (mm)	inch (inch)	Total number of screws	Torque flat gasket		Torque profile flat gasket	
				(Nm)	(lb-ft)	(Nm)	(lb-ft)
20	15	½	4 x M12 x 50	10	7.4	10	7.4
25	20	¾	4 x M12 x 55	10	7.4	10	7.4
32	25	1	4 x M12 x 60	15	11	10	7.4
40	32	1¼	4 x M16 x 65	20	15	15	11
50	40	1½	4 x M16 x 70	25	18	15	11
63	50	2	4 x M16 x 75	35	26	20	15
75	65	2½	4 x M16 x 90	50	37	25	18
90	80	3	8 x M16 x 100	30	22	15	11
110	100	4	8 x M16 x 130	35	26	20	15

Technical basics

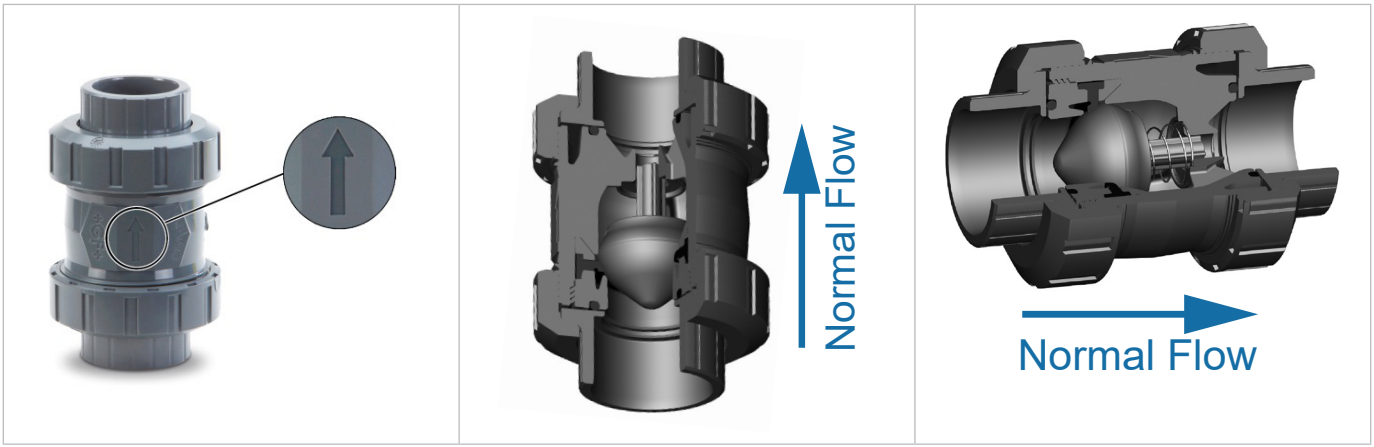
Valve handling

Installation notes

- Before or after pumps, other valves or changes of direction, a turbulence-free section of 10xDN before and 5xDN after the valve must be provided.
- Check valves are not suitable for use with media containing solids. When selecting a check valve, make sure that the density (specific weight) of the cone is greater than that of the medium (exception: bleed valve).
- When used as a bleed valve, the density of the cone must be less than the density of the medium.
- The flow of the fluid must be even across the entire cross-section of the check valve in order for it to work properly. If necessary (after pumps, changes in direction) a damping zone should be allowed for. Cavitation should be avoided.
- Threaded parts have a reverse thread in order to avoid unintended opening when connecting components with threads are removed from the pipe.
- GF Piping Systems recommends that you do not use cone check valves of type 561 and 562 as ventilating and bleed valves. Instead, use the ventilating and bleed valves of type 595 and 591 that were specially developed for this purpose.

Arrows

- The arrow on the valve housing indicates the direction of the flow. For applications with vertical flow, only an upward flow is permitted, i.e. the arrow must point upward. If installed in the opposite direction, the shut-off function is not guaranteed.



Jointing technology

Only identical materials may be joined together via fusion or adhesive joints. Sections of pipework with adhesive joints must be rinsed with non-pressurized water as soon as possible after completion of the joints. Hand-tighten the coupling nuts on the valve.

Opening and closing conditions

The values for the opening conditions apply to vertical installation (recommended mounting position). In the case of horizontal installation, the valve opens at much lower differential pressures.

Maintenance notes

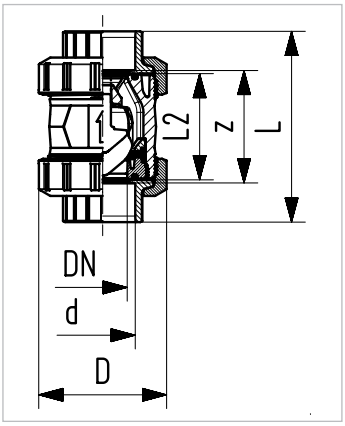
Check valves require no maintenance under normal operating conditions. It is sufficient to check periodically that there is no leakage. Should leakage or other malfunctions occur, follow the instructions under “Safety information”. We recommend performing a function test for check valves that are kept permanently in the same position 1 or 2 times per year to check their function.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Dimensions

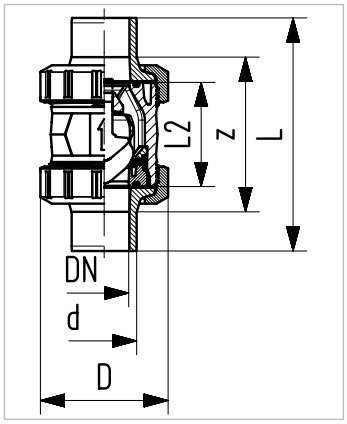
Type 561/562 with solvent cement sockets, metric

d (mm)	DN (mm)	D (mm)	L (mm)	l2 (mm)	z (mm)	closest (inch)
16	10	50	92	56	64	⅜
20	15	50	95	56	64	½
25	20	58	110	65	72	¾
32	25	68	123	71	79	1
40	32	84	146	85	94	1 ¼
50	40	97	157	89	95	1 ½
63	50	124	183	101	107	2
75	65	166	233	136	144	2 ½
90	80	200	254	141	151	3
110	100	238	301	164	174	4



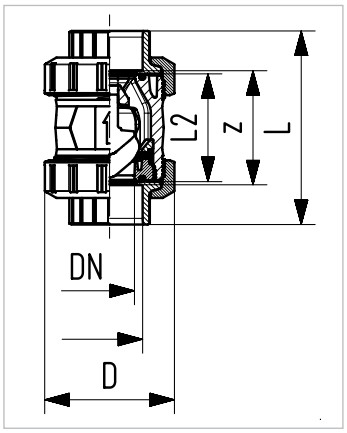
Type 561/562 with solvent cement spigots, metric

d (mm)	DN (mm)	D (mm)	L (mm)	l2 (mm)	z (mm)	closest (inch)
16	10	50	114	56	56	⅜
20	15	50	124	56	56	½
25	20	58	144	65	65	¾
32	25	68	154	71	71	1
40	32	84	174	85	85	1 ¼
50	40	97	194	89	89	1 ½
63	50	124	224	101	101	2
75	65	166	284	136	136	2 ½
90	80	200	300	141	141	3
110	100	238	340	164	164	4



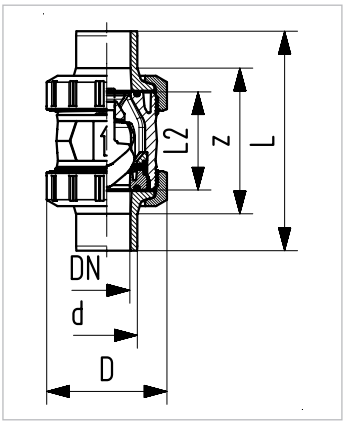
Type 561/562 with threaded socket, Rp

DN (mm)	D (mm)	L (mm)	l2 (mm)	z (mm)	Rp (inch)
10	50	95	56	69	⅜
15	50	100	56	67	½
20	58	114	65	78	¾
25	68	127	71	85	1
32	84	146	85	100	1 ¼
40	97	152	89	106	1 ½
50	124	177	101	121	2
65	166	233	136	144	2 ½
80	200	254	141	151	3
100	238	301	164	174	4



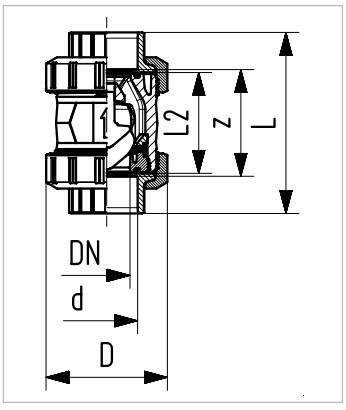
Type 561/562 with socket fusion spigot, metric

d (mm)	DN (mm)	D (mm)	L (mm)	l2 (mm)	closest (inch)
16	10	50	110	56	⅜
20	15	50	120	56	½
25	20	58	139	65	¾
32	25	68	150	71	1
40	32	84	170	85	1 ¼
50	40	97	190	89	1 ½
63	50	124	220	101	2
75	65	166	280	136	2 ½
90	80	200	296	141	3
110	100	238	336	164	4



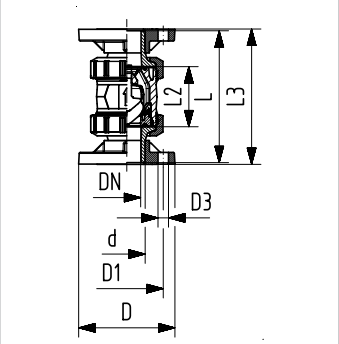
Type 561/562 with fusion sockets, metric

d (mm)	DN (mm)	D (mm)	L (mm)	l2 (mm)	z (mm)	closest (inch)
16	10	50	93	56	67	⅜
20	15	50	95	56	66	½
25	20	58	109	65	77	¾
32	25	68	119	71	83	1
40	32	84	135	85	99	1 ¼
50	40	97	147	89	105	1 ½
63	50	124	168	101	117	2
75	65	166	233	136	167	2 ½
90	80	200	254	141	180	3
110	100	238	301	164	215	4



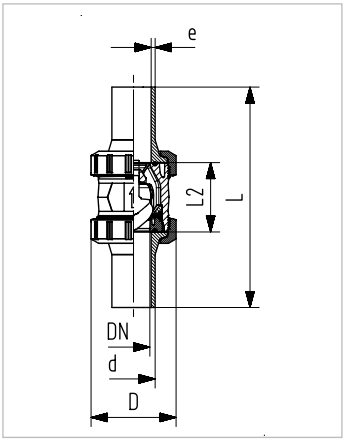
Type 561/562 with fixed flange, metric

d (mm)	DN (mm)	D (mm)	D1 (mm)	D3 (mm)	L (mm)	l2 (mm)	l3 (mm)	closest (inch)
20	15	95	65	14	124	56	130	½
25	20	105	75	14	144	65	150	¾
32	25	115	85	14	154	71	160	1
40	32	140	100	18	174	85	180	1 ¼
50	40	150	110	18	194	89	200	1 ½
63	50	165	125	18	224	101	230	2



Type 561/562 with butt fusion spigot, long, metric

d (mm)	DN (mm)	D (mm)	L (mm)	l2 (mm)	e (mm)	closest (inch)
20	15	50	193	56	2.3	½
25	20	58	216	65	2.3	¾
32	25	68	223	71	3	1
40	32	84	249	85	3.7	1 ¼
50	40	97	271	89	4.6	1 ½
63	50	124	321	101	5.8	2



Accessories

- Foot valve with suction basket as protection against contamination

For further information on accessories, refer to the online product catalogue at www.gfps.com

Check Valve type 369



Product description

GF Piping Systems flap traps of type 369 are designed especially for large installations, require little servicing and effort and are extremely compact. The design is optimized for installations between ISO/DIN as well as ANSI/BS connections. The flap traps can be installed either horizontally or vertically. If a medium flows in the flow direction, it opens up the plate of the flap trap, allowing the medium to flow through. If the medium pressure falls below a certain threshold, the flap closes again.

Function

After installation in piping systems, the flap traps of type 369 are intended exclusively for preventing media from flowing back within the allowable pressure and temperature range.

The flap traps are available with or without a return spring made of V4A or Hastelloy. They are suitable for horizontal or vertical installation.

Applications

- Water treatment
- Chemical process industry

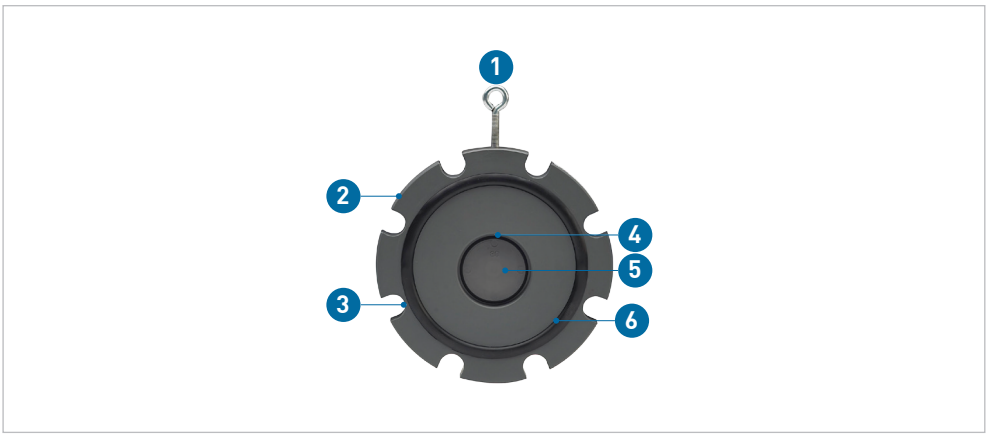
Benefits/features

- Self-closing check valve for horizontal or vertical installation (water column / gravity / optional spring)
- Suitable for installation between both ISO/DIN and ANSI/BS connecting elements
- Simple installation between standard flanges
- Only highly resistant materials
- Robust and maintenance-free design
- All parts that come into contact with media are made in highly resistant plastics and elastomers
- Optimized special flange gasket made of EPDM or FKM already installed in the valve housing are suited for fluted connecting elements
- Disc seals are available in EPDM or FKM and are installed in plates
- For pulsating flow, flap traps with reset spring (made of stainless steel V4A or Hastelloy C) are available. This reduces noise development

Flow media

Media that are free of foreign particles, media containing solids, as well as crystallizing, viscous, thick and gaseous media.

Technical data

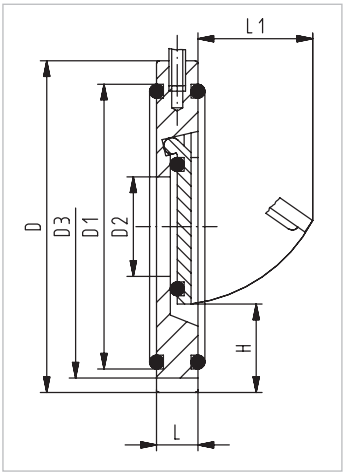


1 Supporting eylets
2 Housing
3 Cut-out for centering
4 Fastening for disc
5 Disc
6 Sealing

Specification	
Dimensions	d40/DN32 – d315/DN300 / 1¼" – 12" to DN600 / 24" available upon request
	PVC-U, PP-H, PVDF
Gasket materials	EPDM, FKM
Pressure level	PN6/PN10
Connections	Flange joints
Product standard	EN ISO 16137
Test standard	ISO 9393-2, EN 12266-1
Approvals	KTW UBA, DVGW W 270, WRAS, NSF, FDA

Dimensions

d (mm)	DN (mm)	inch (inch)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	L (mm)	L1 (mm)	H (mm)
40	32	1¼	85	59	18		15	22	25
50	40	1½	105	77	22	95	16	27	27
63	50	2	124	92	32	109	18	40	29
75	65	2½	137	111	40	129	20	55	31
90	80	3	175	131	54	144	20	67	32
110	100	4	175	153	70	164	23	77	31
140	125	5	195	185	92		23	94	35
160	150	6	222	198	105	220	26	100	41
225	200	8	279	259	154	275	34	152	38
280	250	10	340	311	192	330	40	180	41
315	300	12	410	347	227	380	45	215	41



Kv 100 values

DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min) (Δp = 1 bar)	Cv 100 (US gal./min) (Δp = 1 psi)	Kv 100 (m^3/h) (Δp = 1 bar)
32	1¼	40	270	18.9	16.2
40	1½	50	370	25.9	22.2
50	2	63	900	63	54
65	2½	75	1'140	79.8	68
80	3	90	1'870	130.9	112
100	4	110	2'870	200.9	172
125	5	140	5'700	399.0	342
150	6	160	6'900	483.0	414
200	8	225	18'800	1'316.0	1'128
250	10	280	25'000	1'750.0	1'500
300	12	315	27'600	1'932.0	1'656

PP with outlet flange adapter PP/PE, SDR11, PN10

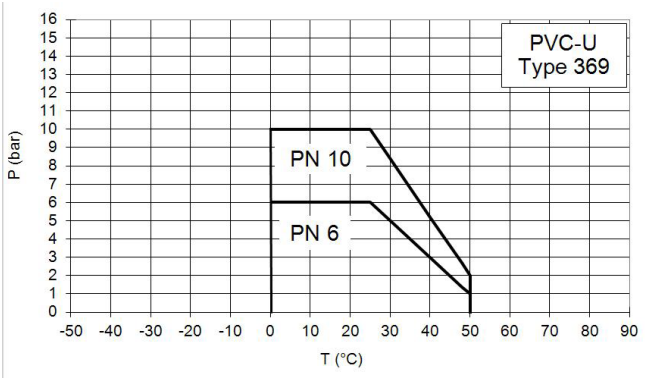
DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min) (Δp = 1 bar)	Cv 100 (US gal./min) (Δp = 1 psi)	Kv 100 (m^3/h) (Δp = 1 bar)
32	1¼	40	280	19.6	16.8
40	1½	50	340	23.8	20.4
50	2	63	610	42.7	36.6
65	2½	75	1'230	86.1	74
80	3	90	2'610	182.7	157
100	4	110	3'930	275.1	236
125	5	140	7'120	498.4	427
150	6	160	9'180	642.6	551
200	8	225	17'600	1'232.0	1'056
250	10	280	24'400	1'708.0	1'464
300	12	315	31'900	2'233.0	1'914

PVDF, pipe PN16 SDR26, PN10 SDR33 from d90

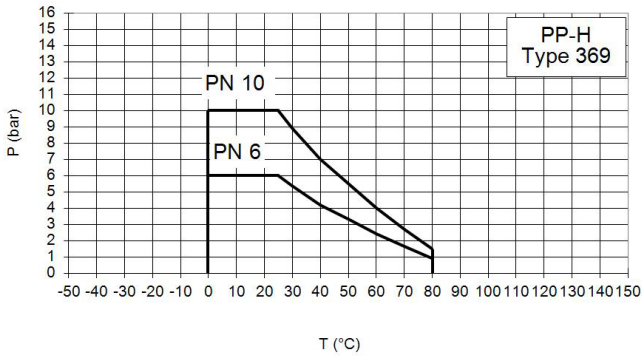
DN (mm)	inch (inch)	d (mm)	Kv 100 (l/min) (Δp = 1 bar)	Cv 100 (US gal./min) (Δp = 1 psi)	Kv 100 (m^3/h) (Δp = 1 bar)
32	1¼	40	280	19.6	16.8
40	1½	50	340	23.8	20.4
50	2	63	610	42.7	36.6
65	2½	75	1'230	86.1	74
80	3	90	2'610	182.7	157
100	4	110	3'930	275.1	236
125	5	140	7'120	498.4	427
150	6	160	9'180	642.6	551
200	8	225	17'600	1'232.0	1'056
250	10	280	24'400	1'708.0	1'464
300	12	315	31'900	2'233.0	1'914

Pressure-temperature diagrams

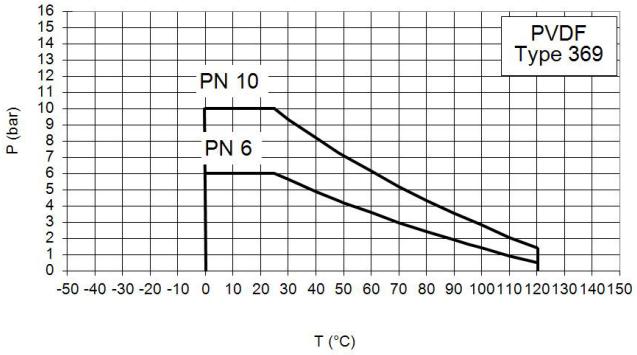
PVC-U



PP-H



PVDF



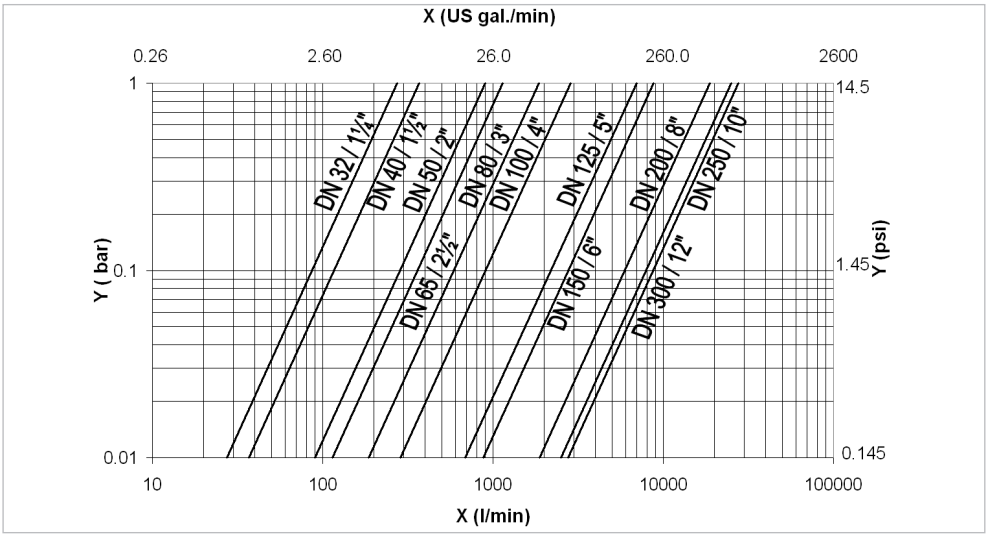
T Temperature (°C, °F)
P Permissible pressure (bar, psi)

Opening pressure / leak-tightness

DN (mm)	Opening pressure (mbar)				Tightness of water column (m)	
	Vertical without spring	Vertical with spring	Horizontal without spring	Horizontal with spring	PVC-U, PVDF	PP
32	2	4	0.2	2	2	3
40	2	4	0.2	2	2	3
50	3	5	0.2	2	2	3
65	3	5	0.2	2	2	3
80	3	5	0.2	2	2	3
100	3	5	0.2	2	2	3
125	3	5	0.2	2	2	3
150	3	5	0.2	2	2	3
200	4	6	0.2	2	2	3
250	4	6	0.2	2	2	3
300	4	6	0.2	2	2	3

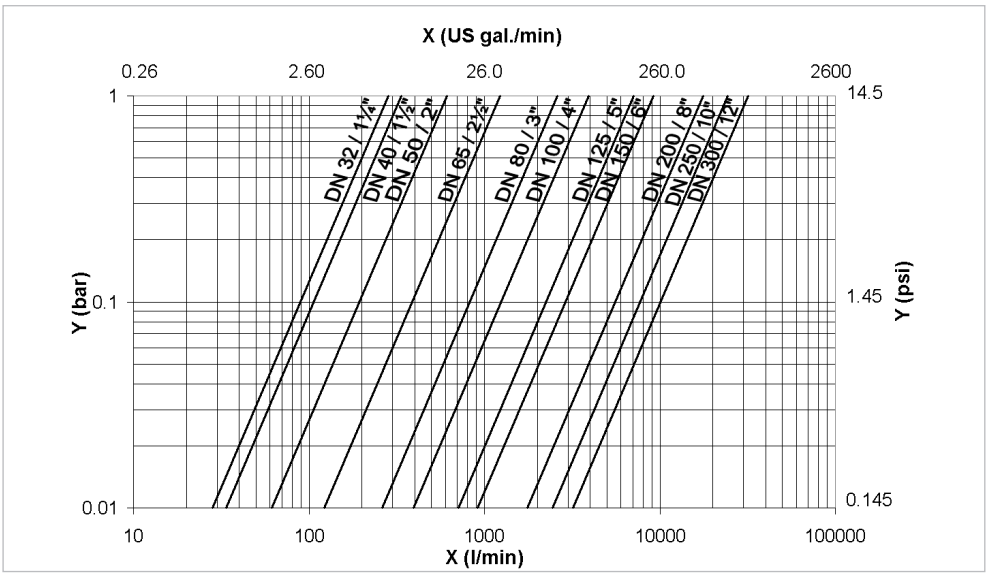
Pressure losses

PVC-U, pipe PN10



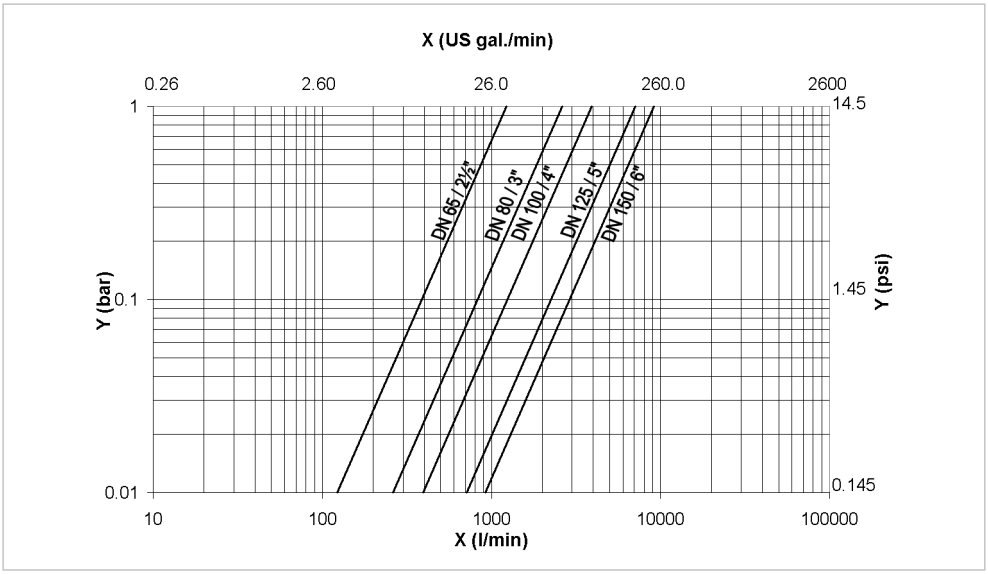
Medium: water 20 °C
X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

PP with outlet flange adapter PP/PE, SDR11 (PN10)



Medium: water 20 °C
X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

PVDF, pipe PN10



Medium: water 20 °C
X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Reference values for tightening torque of screws

Metric flange adapter

d (mm)	DN (mm)	Inch (inch)	Total number of screws	Max. screw tightening torque	
				(Nm)	(lb-ft)
40	32	1¼	4 x M16 x 85	15	133
50	40	1½	4 x M16 x 85	15	133
63	50	2	4 x M16 x 95	20	177
75	65	2½	4 x M16 x 100	25	221
90	80	3	8 x M16 x 110	25	221
110	100	4	8 x M16 x 130	30	266
140	125	5	8 x M16 x 130	35	310
160	150	6	8 x M20 x 180	40	354
225	200	8	8 x M20 x 180	50	442
280	250	10	12 x M20 x 180	55	487
315	300	12	12 x M20 x 180	60	531

ANSI/BS flange adapters

d (mm)	DN (mm)	Inch (inch)	Total number of screws	Max. closing torque	
				(Nm)	(lb-ft)
50	40	2	4 x UNC5/8" x 3½"	20	177
63	50	2½	4 x UNC5/8" x 4"	25	221
75	65	3	4 x UNC5/8" x 4"	25	221
90	80	4	8 x UNC5/8" x 4½"	30	266
110	100	4	8 x UNC5/8" x 4½"	30	266
160	150	6	8 x UNC3/4" x 5"	40	354
225	200	8	8 x UNC3/4" x 6"	50	442
280	250	10	12 x UNC7/8" x 6½"	55	487
315	300	12	12 x UNC7/8" x 7"	60	531

Technical basics

Installation notes



1 Screw and washer
2 Flange
3 Valve end / flange adapter
4 Flange seal
5 Flap trap
6 Nut and washer

- Install between ISO/DIN (all dimensions) and ANSI/BS valve ends (all except DN32 and DN125).
- Installation with ANSI/BS valve ends: for flap traps in the dimensions DN40 to DN80, ANSI/BS valve ends of the next larger dimension must be used (example DN40 flap trap between DN50 ANSI/BS valve ends).
- Centering through housing diameter (ISO/DIN through D3, ANSI/BS through D).
- Sealing with special flange gasket (except DN32, o-ring).

- Before and after the flap trap, a damping zone of at least 5 times the nominal diameter (DN) should be planned for (we recommend 10 times the nominal diameter).
- Do not install directly on pump flange or subsequent bend.
- PVC-U: The using of PVC-U pipe PN16 is only possible up to d63.
- Wafer Check Valves without spring are not recommended for pulsating flow conditions (noise generation).
- Pay attention on installation between ANSI/BS flange adaptors. The WCV DN32 does not fit together with ANSI/BS flange adaptors. For wafer check valve in the dimensions DN40 to DN80 the next larger size of ANSI/BS flange adapter has to be used (example: a DN40 valve has to be mounted between DN 50 ANSI/BS flange adaptors).
- PP and PE: To ensure the proper function of the valve in PP and PE piping systems, a suitable outlet adaptor is required on the outlet side. Please contact your local GF sales representative for further information.
- PVDF: GF recommends for PVDF piping systems the use of a fusion neck one size larger than the pipeline or the use of a wafer check valve one size smaller than the pipe. (example: two d110 fusion necks should be used for the wafer check valve d90).

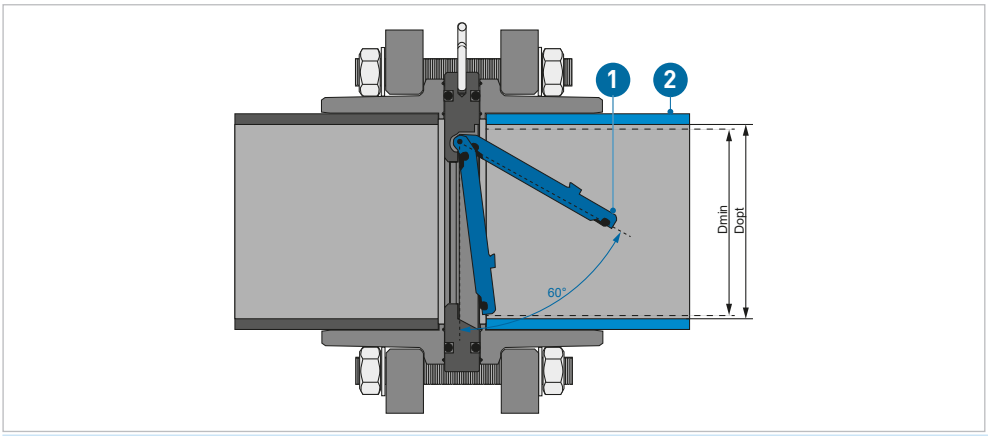
Flange dimensions

Dopt: Optimum inner diameter of connecting element.

- Opening angle of the disc approx. 60° (maximum flow).
- Minimized mechanical stress
- Ideal Kv value

Dmin: Minimum inner diameter at which the disc opens properly.

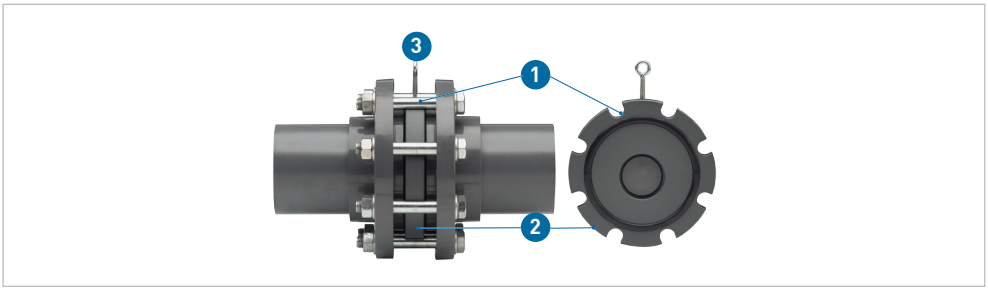
⚠ Since the disc is in contact with the inside of the pipe of the connecting element when it is open, the inside diameter of the connecting element can influence the Kv value.



1 Disc
2 Connecting element

Flange dimension			ISO/DIN		ANSI/BS	
D (mm)	d (mm)	D (inch)	Dmin (mm)	Dopt (mm)	Dmin (mm)	Dopt (mm)
DN32	40	1¼	34	37		
DN40	50	1½	39	43	39	43
DN50	63	2	53.5	54	53.5	54
DN65	75	2½	69	70	69	70
DN80	90	3	81	82	81	82
DN100	110	4	104	106	104	106
DN125	140	5	125.5	131		
DN150	160	6	142	144	142	144
DN200	225	8	201	207	201	207
DN250	280	10	250	260	250	260
DN300	315	12	300	309	300	309

Centering and Opening Angle of The Valve



1 Cut-out
2 External diameter
3 Supporting eylet

Make sure that the disk attach on the inner pipe wall. It is not allowed that the disk attach on the limit stop of the valve.

Selection of lubricant

Using incorrect lubricants can corrode the material of the check valve or the gaskets.

- Mineral oil-based lubricants and Vaseline (petrolatum) are not appropriate.
- All gaskets should be lubricated with silicon- or polyol-based grease.

Maintenance notes

In normal operation, flap traps do not need maintenance. It is sufficient to check periodically that there is no leakage. If media exits at the flange connections, the flange connections must be tightened or replaced in accordance with the tables in "Guidelines for fastening screws".

Accessories

- Spring made of stainless steel V4A (1.4408) or Hastelloy C
- Appropriate outlet flange adapter from GF Piping Systems

i For further information on accessories, refer to the online product catalogue at www.gfps.com

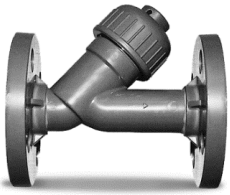
Angle Seat Check Valve type 303/304



Type 303
Solvent cement spigot, metric



Type 303
Solvent cement socket, JIS



Type 303
Fixed flange, JIS

Product description

Angle seat check valves of types 303 and 304 are distinguished by their reliability and ability to function regardless of position. The design has evolved its strengths over many years. Because of its ability to function regardless of position and the simple maintenance process, the valve guarantees a high degree of process reliability. The maximum operating time is 25 years.

Function

These GF Piping Systems angle seat check valves of types 303 and 304 are intended exclusively for shutting off and conducting media within the allowable pressure and temperature range following installation in piping systems.

Applications

- Water treatment
- Chemical process industry
- Cooling processes

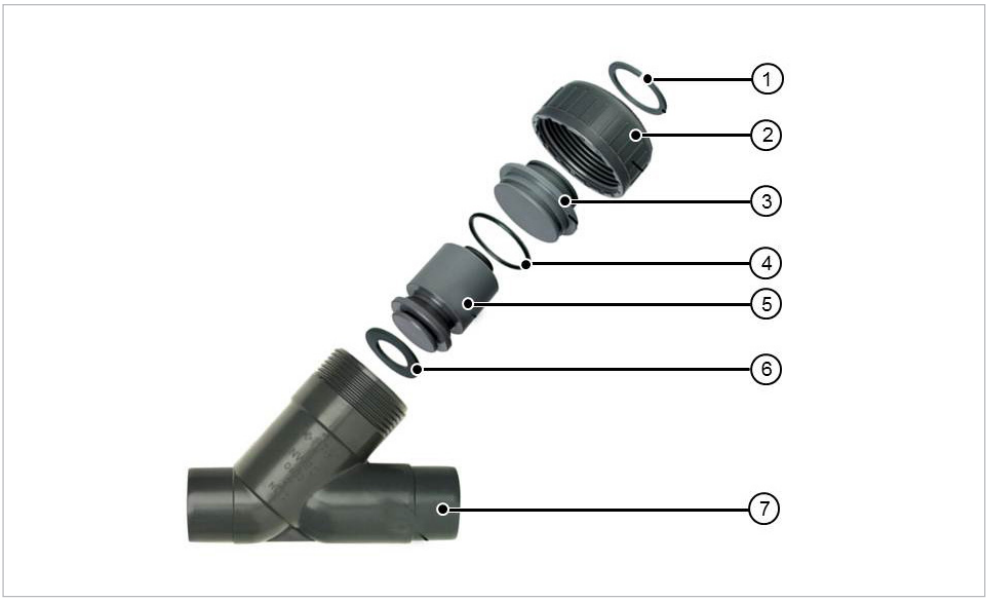
Benefits/features

- Self-closing piston check valve
- For horizontal and vertical use
- Simple maintenance of the check element without dismantling the valve
- Overall length according to EN 588

Flow media

Media that are free of foreign particles, as well as viscous and thick media.

Technical data



1 Circlip
2 Cap nut
3 Plug
4 O-ring
5 Piston
6 Compartment seal
7 Housing

Specification	
Dimensions	d15/DN10 bis d90/DN80, ⅜" - 3"
Valve body materials	PVC-U, ABS, transparent PVC-U
Gasket materials	EPDM, FKM
Pressure level	PN 10
Connections	Solvent cement socket, ISO
	Solvent cement spigot, JIS
	Fixed flange, JIS
Actuation variants	Self-closing
Product standard	EN ISO 16137
Test standard	ISO 9393-2, EN 12266-1

Kv 100 values

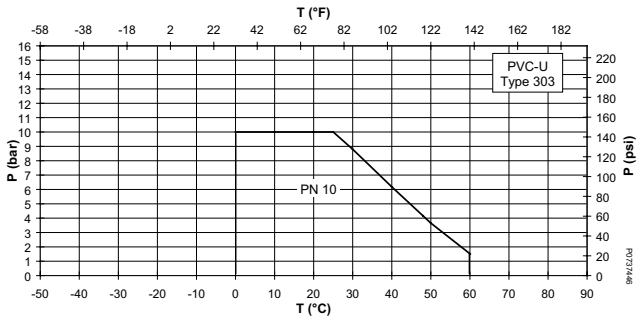
d (mm)	DN (inch)	inch (inch)	kv 100 (l/min (Δp = 1 bar))	Cv 100 (US gal./min)	kv 100 (m^3/h(Δp = 1 bar))
16	10	⅜	45	3.2	2.7
20	15	½	95	6.7	5.7
25	20	¾	170	11.9	10.2
32	25	1	300	21.0	18.0
40	32	1 ¼	440	30.8	26.4
50	40	1 ½	700	49.0	42.0
63	50	2	1'100	77.0	66.0
75	65	2 ½	1'700	119.0	102.0
90	80	3	2'400	168.0	144.0

Pressure-temperature diagrams

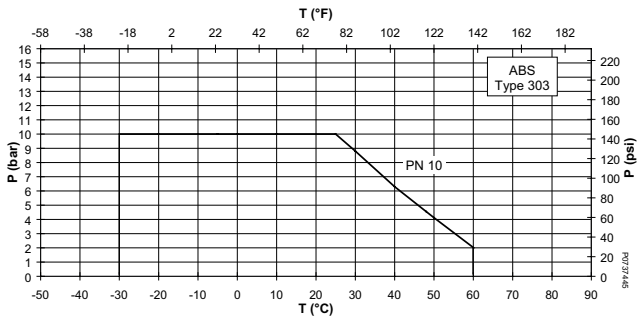
The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

PVC-U

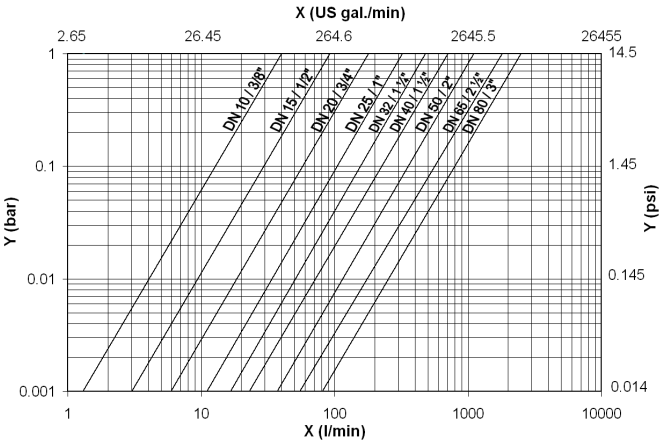


ABS



Pressure losses

Medium: water 20 °C



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

DN	Open			Close
	Differential preferential for full stroke	Minimum flow for full stroke	Minimum flow rate for full stroke	Leak-tight starting at
(mm)	(bar)	(l/min)	(m/sec)	(bar)
10	0.02	5	1.1	0.2
15	0.02	10	1.1	0.2
20	0.02	18	1.1	0.2
25	0.02	28	1.1	0.2
32	0.02	50	1.2	0.2
40	0.03	95	1.4	0.2
50	0.03	200	1.5	0.2
65	0.03	280	1.8	0.2
80	0.03	420	1.8	0.2

Technical basics

Use

For the angle seat check valve to function properly, the flow must be evenly distributed over the pipe cross-section. If necessary (after pumps, changes in direction) a damping zone section should be allowed for. Cavitation should be avoided.

⚠ Check valves are not suitable for use with media containing solids.

Arrows

The arrow on the valve housing indicates the direction of the flow. For applications with vertical flow, only an upward flow is permitted, i.e. the arrow must point upward. If installed in the opposite direction, the shut-off function is not guaranteed, and serious injuries may result. The 45° angled piston part must always point upwards.

Valve handling

Selection of lubricant

All gaskets should be lubricated with a silicon- or polyol-based grease. Using the wrong lubricants can damage the material of the ball valve or gaskets.

- Mineral oil-based lubricants and Vaseline (petrolatum) are not appropriate.
- For silicon-free ball valves, please consult the special manufacturer‘s instructions.

Maintenance notes

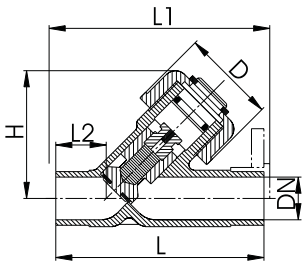
Angle seat check valves require no maintenance under normal operating conditions. It is sufficient to check periodically that there is no leakage. Should leakage or other malfunctions occur, follow the instructions under “Safety information”. We recommend performing a function test for angle seat check valves that are kept continuously in the same position once or twice a year to check their function.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Dimensions

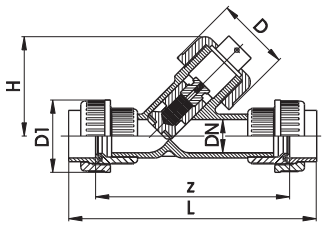
Angle seat check Valve type 303 with solvent cement spigot, metric

d (mm)	DN (mm)	Inch (inch)	D (mm)	L (mm)	L1 (mm)	l2 (mm)	H (mm)
16	10	⅜	39	114	120	24	58
20	15	½	43	124	130	28	65
25	20	¾	47	144	150	37	75
32	25	1	56	154	160	37	90
40	32	1 ¼	64	174	180	44	102
50	40	1 ½	82	194	200	48	123
63	50	2	95	224	230	60	144
75	65	2 ½	92	284	290	74	186
90	80	3	104	300	310	85	204



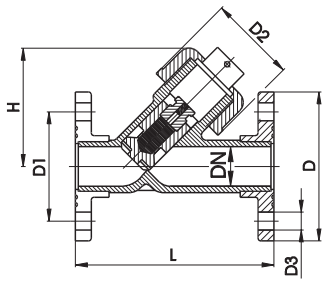
Angle seat check Valve type 303 with solvent cement socket, JIS

Inch (inch)	DN (mm)	z (inch)	D (mm)	D1 (mm)	L (mm)	H (mm)
½	15	162	43	53	194	65
¾	20	170	47	53	208	75
1	25	180	56	53	224	90
1 ¼	32	204	64	74	256	102
1 ½	40	228	82	83	290	123
2	50	266	95	103	342	144



Angle seat check Valve type 303 with fixed flange, JIS

Inch (inch)	DN (mm)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	L (mm)	H (mm)
½	15	95	70	48	15	130	65
¾	20	100	75	54	15	150	75
1	25	125	90	62	19	160	90
1 ¼	32	135	100	71	19	180	102
1 ½	40	140	105	88	19	200	123
2	50	155	120	103	19	230	144
2 ½	65	185	140	106	19	290	186
3	80	200	150	120	19	310	204



For further information on accessories, refer to the online product catalogue at www.gfps.com

Planning Fundamentals

of Valves and Automation

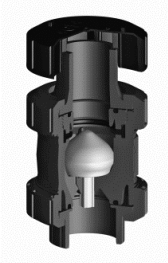
Ventilating and Bleed Valves

Content

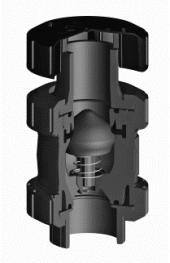
Ventilating and Bleed Valve type 591 and Ventilating Valve type 595 428

Ventilating and Bleed Valve type 591 and Ventilating Valve type 595





Type 591 (without spring)



Type 595 (with spring)

Product description

Ventilating and bleed valves can emit gases from containers and piping systems and vacuums can be avoided by supplying air - automatically and without using external energy. Types 591 and 595 fit all common plastic piping systems thanks to an extensive assortment.

Function

Type 591 function

Bleeding when filling, venting when draining. Depending on the filling rate, the float is raised by the rising fluid level. Simultaneously, the gases are removed from the system through the valve. When the pipe is completely filled, the float is pressed into the profile gasket and closes the valve.

⚠ Note: Not suitable for continuous operation! A closed valve under operating pressure cannot vent!

Type 595 function

Ventilating when draining. The ventilating Valve type 595 was developed especially for the ventilation process and is used when a safe and controlled supply of air must be guaranteed. This prevents gases/liquids from being emitted into the surroundings. The cone is continuously pressed into the profile seal and does not open until a vacuum is created in the pipe or container.

Applications

- Microelectronics
- Chemical process industry
- Food and beverages
- Water treatment
- Cooling processes

Advantages

- Self-acting bleeding and venting
- No auxiliary energy required for operation
- Wide range of materials for optimum chemical resistance
- Complete and reliable bleeding of the piping system
- Controlled supply of air
- High efficiency and precision

Characteristics

Safety

The new valve of types 591 and 595 control the venting and bleeding of piping systems and tanks with high precision and completely reliably. They contribute significantly to the safety and protection of your system, for example by avoiding the unwanted buildup of a vacuum when emptying piping systems and tanks.

Simplicity

The valves are a impressive by virtue of their simple installation and are practically maintenance-free. This is a result of their compact construction and innovative details of their construction, which are designed for safety, ergonomics and efficiency.

Flexibility

The many different dimensions and optimal sizes allow the valves to be used under almost all space conditions and in any system design. The valves are positioned at the absolute or temporary high points in the system, after pumps and at turning points.

Flow media

Media that are free of foreign particles, viscous, thick and gaseous media.

Technical data



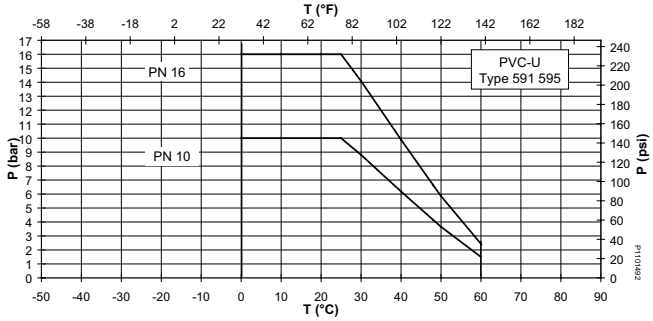
1 Protection cap
2 Coupling nut
3 Spigot
4 O-ring
5 Screw-in ring
6 Sealing ring
7 Back-up ring
8 Float
9 Spring (Type 595)
10 Housing
11 Connecting part

Specification		
Dimensions	d16/DN10 – d110/DN100, ⅜" – 4"	
Materials	Valve body	PVC-U, PVC-C, ABS, PP-H, PVDF
	Spring for type 595	Standard: Halar (ECTFE) coated
		Optional: Nimonic 90, Stainless steel V2A
Gasket materials	EPDM, FKM	
Pressure levels	PVC-U, PVC-C, PVDF	PN16
	PP-H, ABS	PN10
Product standard	EN ISO 16137	
Test standard	ISO 9393-2, EN 12266-1	
Approvals	ACS, FDA, DIBt, TA Luft, NAMSA	

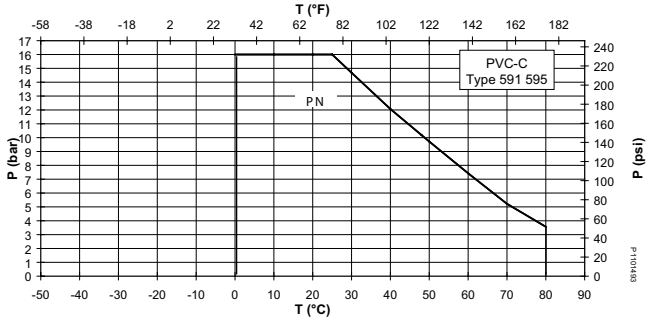
Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

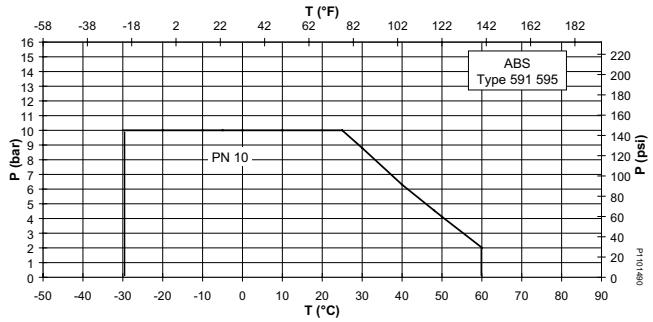
PVC-U



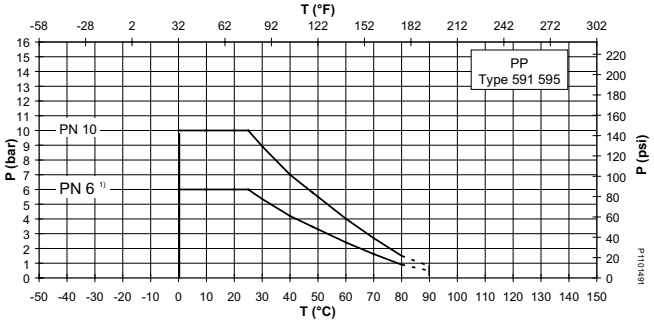
PVC-C



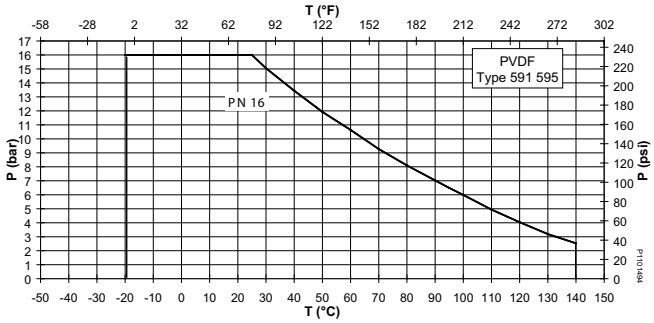
ABS



PP



PVDF



T Temperature (°C, °F)

P Permissible pressure (bar, psi)

1) E.g. check valves with PP or PE100 SDR17 butt fusion spigots. For applications in the dotted temperature range, please contact the responsible GF representative.

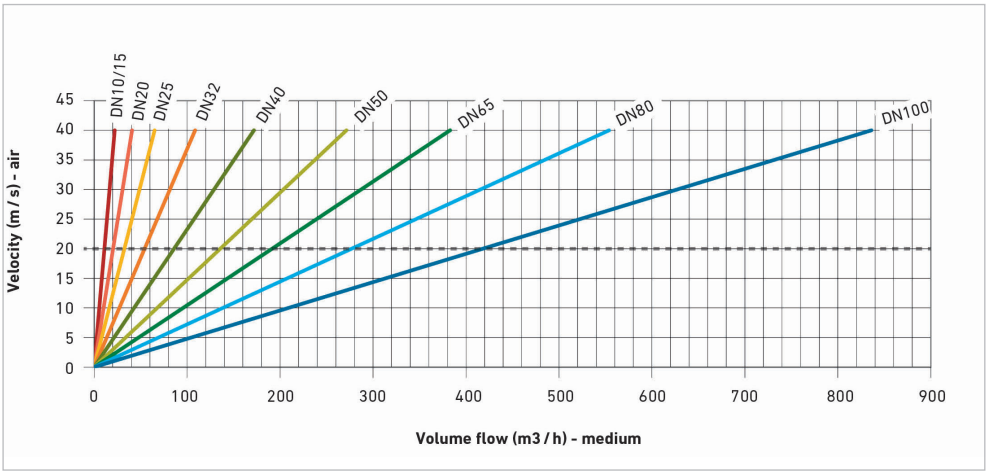
Calculations for valve configuration

To select the correct valve size, the max. flow (Q in m^3/h) is first calculated. To do this, the flow velocity of the medium (Vr in m/s) is required, as is the inner diameter of the medium-conveying pipe (di in mm).

$$Q = Vr \cdot \pi \cdot \frac{di^2}{4} \cdot 0.001 \cdot 3.6$$

The volume flow of the medium can be equated with the gas volume to be discharged or filled. If several aerating or deaerating valves are used, each valve must be configured for the maximum flow velocity. With the calculated volume flow, the correct valve dimension can be determined from the air volume diagram. The velocity in this diagram corresponds to the discharge velocity of the gases at the valve. It is recommended that, if possible, 20m/s is not exceeded to prevent excessive wear on the valve.

Air volume diagram



The escape velocity of the air must not exceed 20 m/s.

Pressure for raising cone type 595

DN (mm)	10	15	20	25	32	40	50	65	80	100
Differential pressure for raising cone (bar)	0.028	0.028	0.030	0.030	0.035	0.040	0.050	0.060	0.060	0.060

Technical basics

Causes of air in the piping system

- During operation, air can be released into the system through pumps, valves, molded parts and other pipe components.
- When filling tanks and pipelines, air inclusions may occur.
- Pressure drops or temperature increases can release air.

Positioning of the valves

- At absolute and temporary high points
- After pumps
- At turning points

Valve handling

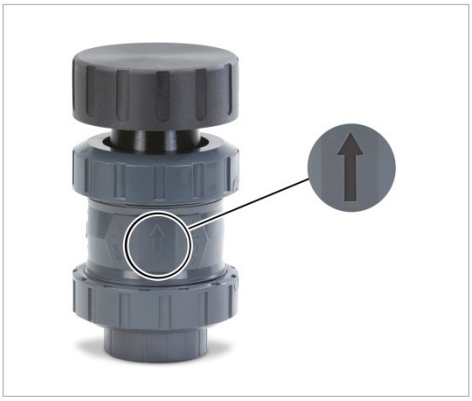
Installation notes

Only identical materials may be joined together via fusion or adhesive joints.

- Sections of pipework with adhesive joints must be rinsed with non-pressurized water as soon as possible after completion of the joints.
- Hand-tighten the coupling nuts on the check valve.

Mounting orientation

- The arrow on the housing of the valve indicates the direction of installation and must point upwards.
- The valve must be installed in a vertical position.
- Reliable ventilation and safe pressure equalization are only guaranteed if the valve is properly installed. Any other installation may impair the function of the valve.



Maintenance notes

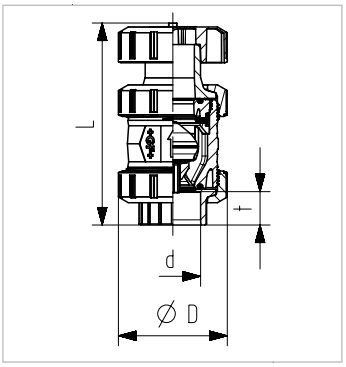
The automatic operation of the valve requires maintenance to ensure that it functions without problems.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Dimensions

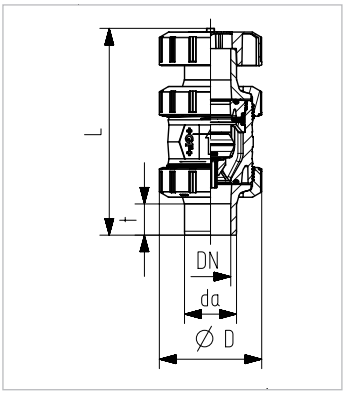
Type 591, Type 595 with solvent cement sockets, metric

d (mm)	DN (mm)	D (mm)	L (mm)	t (mm)	closest (inch)
16	10	50	118	14	⅜
20	15	50	124	16	½
25	20	58	142	19	¾
32	25	68	157	22	1
40	32	84	179	26	1 ¼
50	40	97	197	31	1 ½
63	50	124	229	38	2
75	65	166	258	45	2 ½
90	80	200	277	52	3
110	100	238	320	64	4



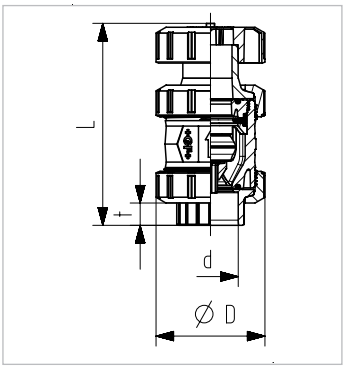
Type 591, Type 595 with solvent cement spigot, metric

d (mm)	DN (mm)	D (mm)	L (mm)	t (mm)	closest (inch)
16	10	50	129	14	⅜
20	15	50	139	16	½
25	20	58	160	19	¾
32	25	68	172	22	1
40	32	84	193	26	1 ¼
50	40	97	215	31	1 ½
63	50	124	249	38	2
75	65	166	284	44	2 ½
90	80	200	300	52	3
110	100	238	340	61	4



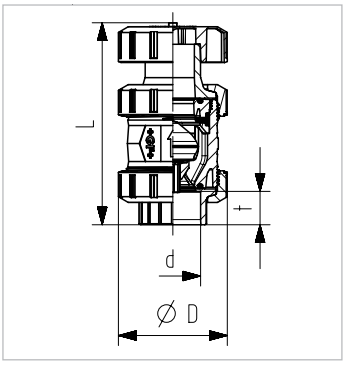
Type 591, Type 595 with solvent cement sockets, inch BS

Inch	DN (mm)	D (mm)	L (mm)	t (mm)
⅜	10	50	118	16
½	15	50	124	18
¾	20	58	142	21
1	25	68	157	24
1 ¼	32	84	179	29
1 ½	40	97	197	30
2	50	124	229	36
2 ½	65	166	258	45
3	80	200	277	51
4	100	238	320	64



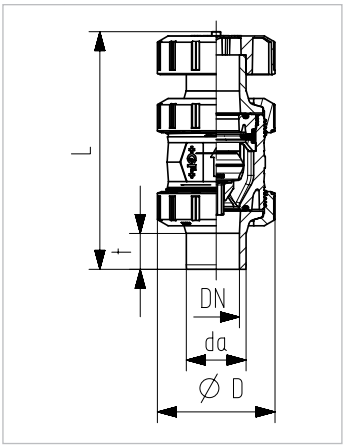
Type 591, Type 595 with solvent cement sockets, inch ASTM incl. 2 threaded sockets, NPT

inch	DN (mm)	D (mm)	L (mm)	t (mm)
⅜	10	50	111	19
½	15	50	119	23
¾	20	58	137	25
1	25	68	152	28
1 ¼	32	84	176	31
1 ½	40	97	193	35
2	50	124	229	38
2 ½	65	166	258	45
3	80	200	277	48
4	100	238	320	58



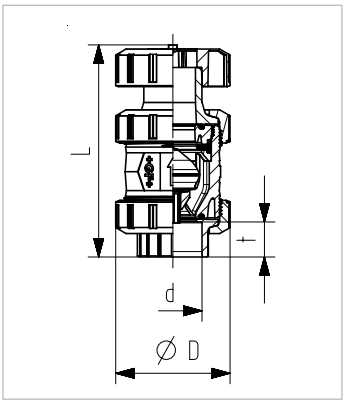
Type 591, Type 595 with fusion spigot

d (mm)	closest (inch)	DN (mm)	PN (bar)	D (mm)	L (mm)	t (mm)
16	3/8	10	10	50	135	13
20	½	15	10	50	140	14
25	¾	20	10	58	157	16
32	1	25	10	68	168	18
40	1 ¼	32	10	84	183	20
50	1 ½	40	10	97	211	23
63	2	50	10	124	245	27
75	2 ½	65	10	166	280	48
90	3	80	10	200	296	49
110	4	100	10	238	336	54



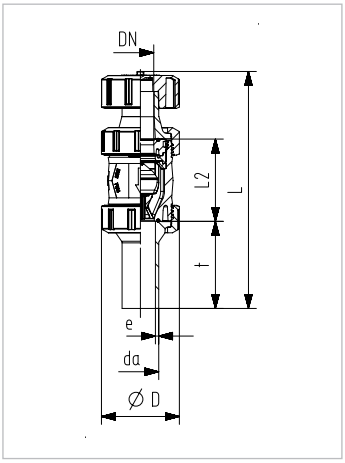
Type 591, Type 595 with fusion socket

d (mm)	closest (inch)	DN (mm)	PN (bar)	D (mm)	L (mm)	t (mm)
16	⅜	10	10	50	126	14
20	½	15	10	50	127	15
25	¾	20	10	58	142	16
32	1	25	10	68	153	18
40	1 ¼	32	10	84	171	19
50	1 ½	40	10	97	190	21
63	2	50	10	124	219	28
75	2 ½	65	10	166	256	29
90	3	80	10	200	275	33
110	4	100	10	238	318	39



Type 591, Type 595 with butt fusion spigot, SDR11 PE100

d (mm)	closest (inch)	DN (mm)	PN (bar)	D (mm)	L (mm)	l2 (mm)	t (mm)	e (mm)
20	½	15	16	50	175	56	69	2.25
25	¾	20	16	58	195	65	76	2.30
32	1	25	16	68	207	71	76	2.90
40	1 ¼	32	16	84	230	85	82	3.70
50	1 ½	40	16	97	254	89	91	4.60
63	2	50	16	124	298	101	110	5.80
75	2 ½	65	16	166	334	136	125	6.80
90	3	80	16	200	360	141	140	8.20
110	4	100	16	238	411	164	160	10.000



Planning Fundamentals

of Valves and Automation

Other Valves

Content

Strainer type 305 438
Throttle Valve type V251 444
Water Jet Suction Pump type P20 448

Strainer type 305



Product description

To protect valves, sensors and pumps from pollutants, we recommend the use of strainers of type 305. This ensures reliable operation and extended service life for your components. The broad product range includes various materials, end connectors and standards, suitable for a wide variety of applications.

Function

The media flow is conducted through the sieve in the strainer from the inside to the outside. This keeps back and collects the dirt particles.

Applications

- Chemical process industry
- Industrial plant engineering
- Cooling processes
- Water treatment

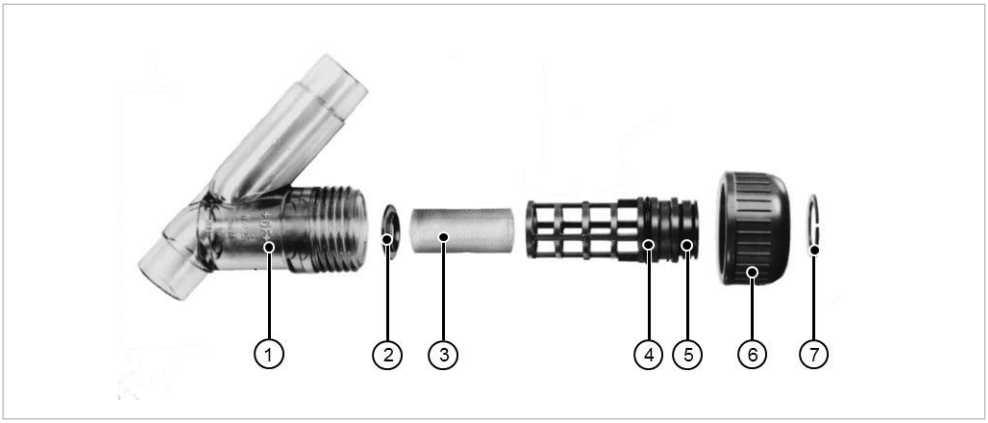
Benefits/features

- Simple and quick installation
- Transparent design (transparent PVC) for checking the amount of contamination visually
- All parts that come into contact with the medium are manufactured using highly resistant thermoplastics
- Radially removable (PP-H)
- Easy dismantling for cleaning or replacing the filter
- Integrated threaded connections
- Guarantees reliable operation of the plant through simple dismantling
- The components used extend service life

Flow media

Neutral and aggressive liquid or gaseous media, as long as the components of the valve that come into contact with the media are resistant at the operating temperature in question according to the resistance table.

Technical data



1 Housing
2 Support ring
3 Slotted casing
4 Body seal
5 Screen cage
6 Cap nut
7 Circlip

Specification		
Dimensions	d20/DN15 – d63/DN50, ½" – 2"	
	PVC-U: d20/DN15 - d90/DN80, ½" – 3"	
Valve body materials	PVC-U, PVC-C, ABS, PP-H, transparent PVC-U	
Gasket materials	EPDM, FKM	
Pressure level	PN10	
Hole diameter	PVC-U slotted casing	0.5 mm, 0.8 mm, 1.4 mm, 2.2 mm
	Stainless steel slotted casing	0.5 mm
Connections	Solvent cement sockets	
	Solvent cement spigots	
	Fusion sockets	
Product standard	EN ISO 21787	
Test standard	ISO 9393-2, EN 12266-1	
Approvals	KTW 2013	

Kv 100 values

PVC-U/PP screen hole diameter 0.5 – 2.2 mm

DN (mm)	Inch (inch)	d #(mm)	Kv 100 (l/min) (Δp = 1 bar)	Cv 100 (US gal./min) (Δp = 1 psi)	kv 100 (m^3/h) (Δp = 1 bar)
15	½	20	35	2.5	2.1
20	¾	25	65	4.6	3.9
25	1	32	90	6.3	5.4
32	1¼	40	155	10.9	9.3
40	1½	50	225	15.8	13.5
50	2	63	370	25.9	22.2
65	2½	75	575	40.3	34.5
80	3	90	955	66.9	57.5

Stainless steel screen mesh size 0.5 mm

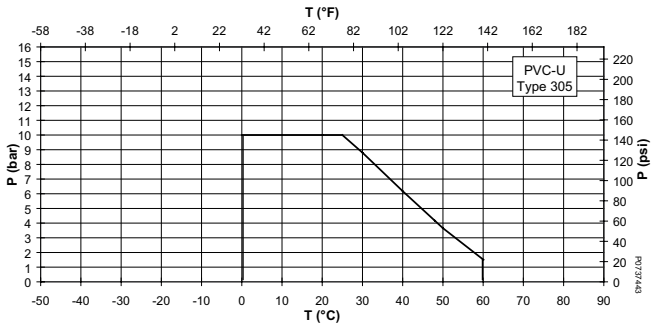
DN (mm)	Inch (inch)	d (mm)	Kv 100 (l/min) (Δp = 1 bar)	Cv 100 (US gal./min) (Δp = 1 psi)	kv 100 (m^3/h) (Δp = 1 bar)
15	½	20	35	2.5	2.1
20	¾	25	60	4.2	3.6
25	1	32	85	6.0	5.1
32	1¼	40	130	9.1	7.8
40	1½	50	200	14.0	12.0
50	2	63	330	23.1	19.8
65	2½	75	460	32.2	27.6
80	3	90	665	46.6	40.0

Pressure-temperature diagrams

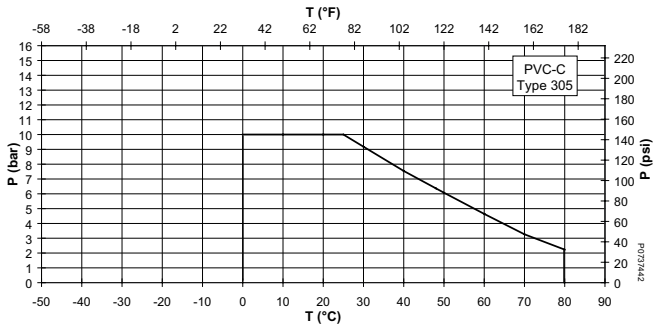
The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

T Temperature (°C, °F)
P Permissible pressure (bar, psi)

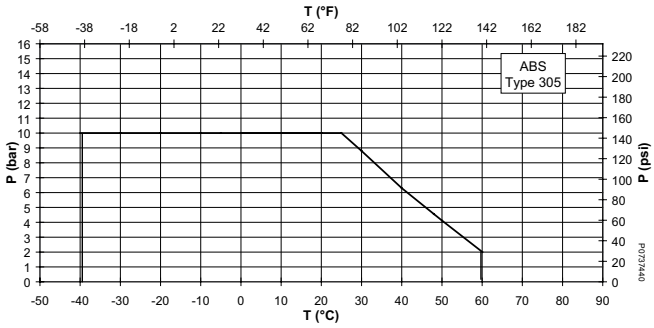
PVC-U



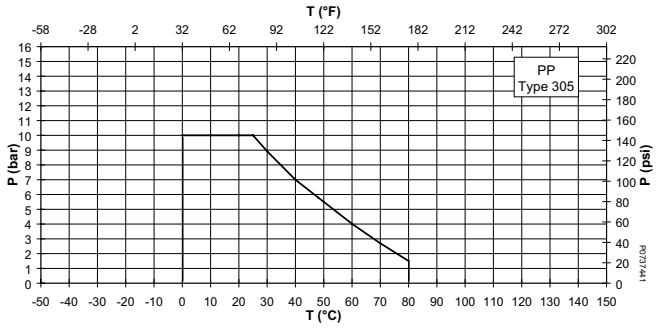
PVC-C



ABS

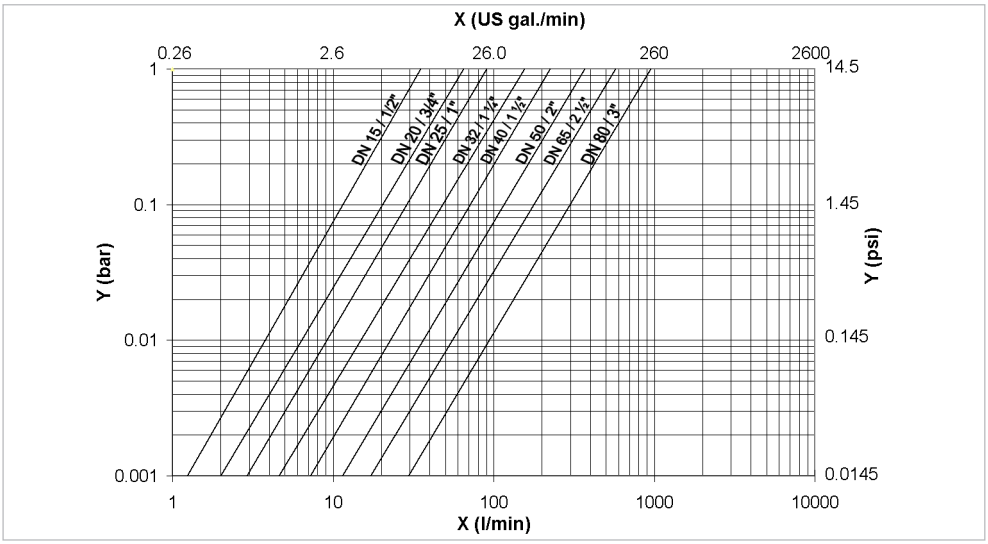


PP



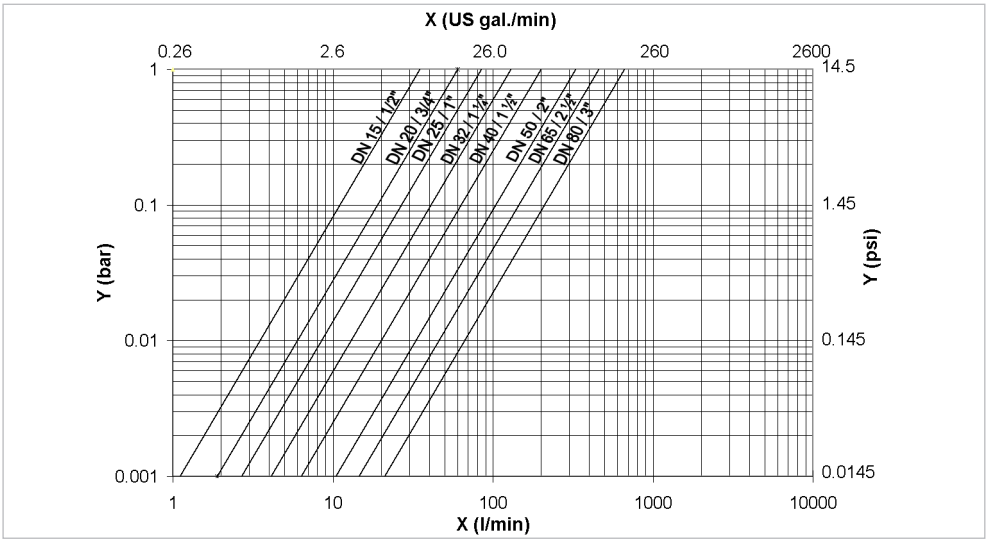
Pressure losses

PVC-U/PP screens (hole diameter 0.5 – 2.2 mm)



X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Stainless steel screens (mesh size: ca. 0.5 mm)

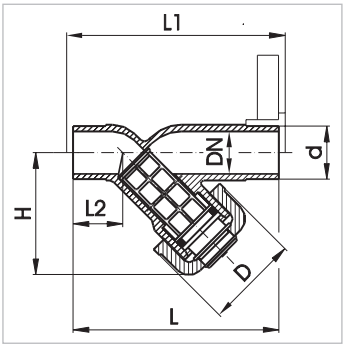


X Flow rate (l/min, US gal/min)
Y Pressure loss Δp (bar, psi)

Dimensions

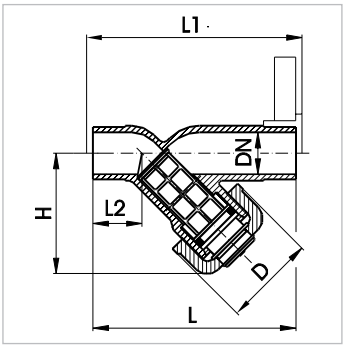
PVC-U, PVC-C solvent cement spigot, metric

DN (mm)	d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	H (mm)	Inch (")
15	20	43	124	130	28	65	½
20	25	47	144	150	37	76	¾
25	32	56	154	160	37	90	1
32	40	64	174	180	44	104	1 ¼
40	50	82	194	200	48	124	1 ½
50	63	95	224	230	60	148	2
65	75	106	284	290	74	188	2 ½
80	90	120	300	310	85	205	3



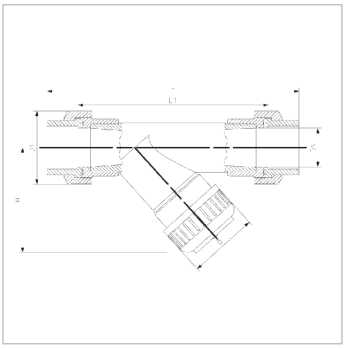
PVC-U solvent cement spigot, ASTM

DN (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	H (mm)	Inch (")
15	43	143	149	37	65	½
20	47	160	466	45	76	¾
25	56	174	180	47	90	1
32	64	188	194	53	104	1 ¼
40	82	205	211	54	124	1 ½
50	95	225	231	63	148	2
80	120	311	321	90	205	3



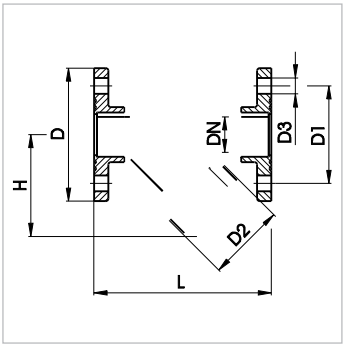
PVC-U solvent cement unions, JIS

DN (mm)	d (mm)	D (mm)	L (mm)	L1 (mm)	H (mm)	Inch (")
15	20	43	1954	164	65	½
20	25	47	210.1	170	76	¾
25	32	56	228.0	180	90	1
32	40	64	261.5	204	102	1 ¼
40	50	82	294.3	228	123	1 ½
50	63	95	348.3	226	147	2



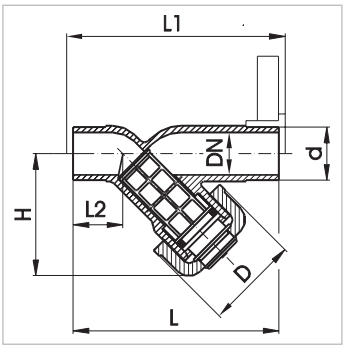
PVC-U fixed flanges, JIS

DN (mm)	d (mm)	D (mm)	L (mm)	H (mm)	Inch (")
15	20	95	130	65	½
20	25	100	150	76	¾
25	32	125	160	90	1
32	40	135	180	102	1 ¼
40	50	140	200	123	1 ½
50	63	155	230	147	2
65	75	185	290	188	2 ½
80	90	200	310	205	3



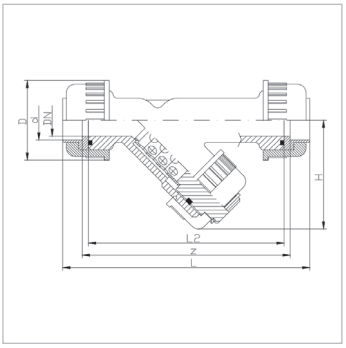
ABS solvent cement spigot, metric

DN (mm)	d (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	H (mm)	Inch (")
15	20	48	124	130	28	65	½
20	25	54	144	150	37	76	¾
25	32	62	154	160	37	90	1
32	40	71	174	180	44	104	1 ¼
40	50	88	194	200	48	124	1 ½
50	63	103	224	230	60	148	2



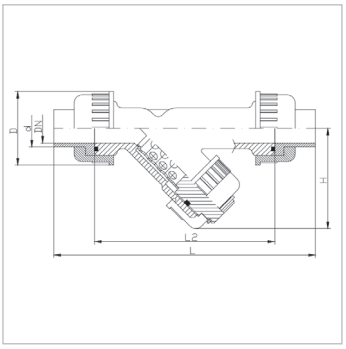
PP-H fusion sockets, metric

DN (mm)	d (mm)	D (mm)	L (mm)	L2 (mm)	H (mm)	Inch (")
15	20	52	168	130	75	½
20	25	62	192	150	80	¾
25	32	68	206	160	90	1
32	40	85	230	180	110	1 ¼
40	50	85	256	200	125	1 ½
50	63	102	294	230	150	2



PP-H butt fuion spigots, metric

DN (mm)	d (mm)	D (mm)	L (mm)	L2 (mm)	H (mm)	Inch (")
15	20	52	238	130	75	½
20	25	62	264	150	80	¾
25	32	68	280	160	90	1
32	40	85	306	180	110	1 ¼
40	50	85	332	200	125	1 ½
50	63	102	368	230	150	2



Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Throttle Valve type V251



Product description

Throttle valves are used wherever fluids or gases need to be throttled in pipelines. The compact design, simple and robust construction and good control characteristics ensure high operational safety.

Function

A spindle with cone narrows the cross-section of the opening in the housing, thus restricting the volume flow to the desired value. The setting must be made using a tool (screwdriver or flat material), which has the advantage that the set value cannot be changed unintentionally.

Applications

- Chemical dosing
- Water treatment

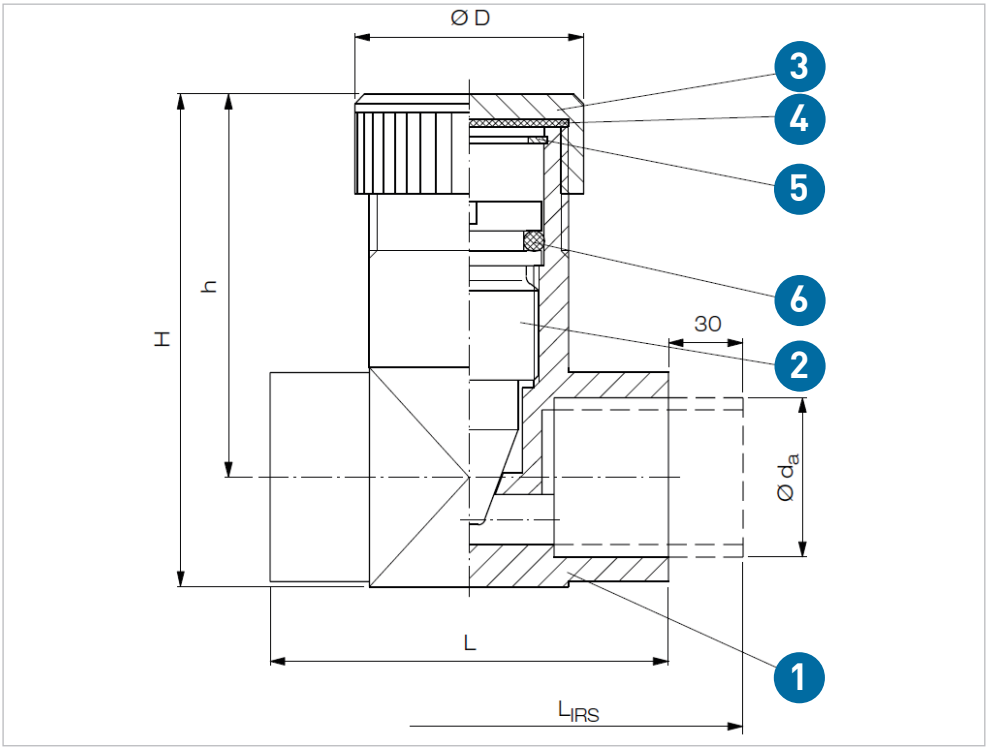
Benefits/features

- Good chemical resistance thanks to highly resistant plastics (PVC, PP, PVDF)
- Requires practically no maintenance and can be installed in any position
- High operational safety thanks to compact and robust construction
- Good control characteristics

Flow media

Neutral and aggressive media with a small quantity of particles/solids. The chemical resistance depends on the selected valve material (see online tool ChemRes PLUS).

Technical data

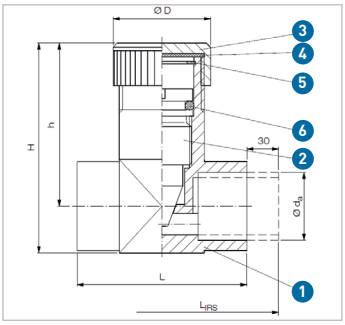


1 Housing
2 Spindle
3 Cap
4 Gasket
5 Stop ring
6 O-ring

Specification	
Dimensions	d16/DN10 – d63/DN50
Materials	PVC-U
	PP
	PVDF
Gasket materials	EPDM/FKM (PVDF: FKM)
Pressure level	PN10
Setting range	100 - 20 000 l/h
Connections	Cement and fusion socket
Assembly	Unrestricted
Product standard	EN ISO 21787
Test standard	ISO 9393-2, EN 12266-1

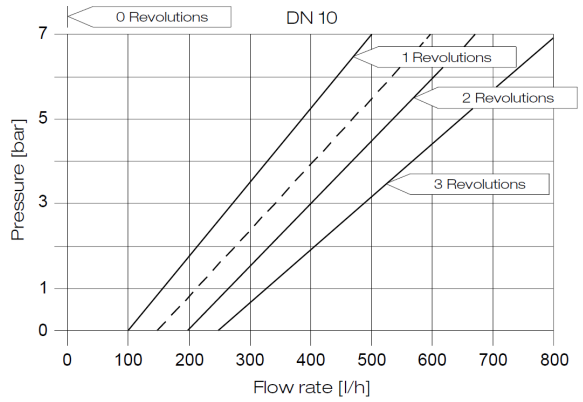
Dimensions

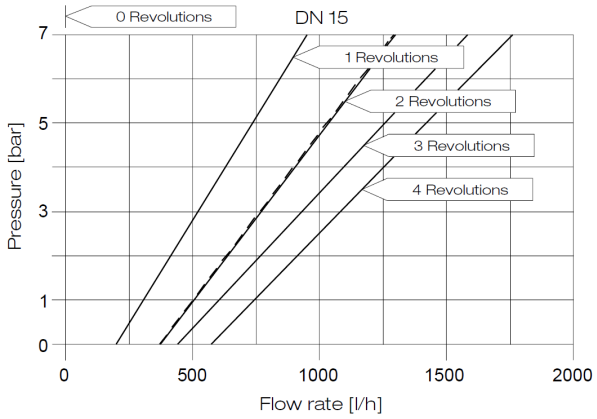
d (mm)	DN (mm)	L (mm)	H (mm)	h (mm)	D (mm)
16	10	47	57	45	29
20	15	55	66	51	35
25	20	66	80	62.5	40
32	25	80	96	74.5	47
40	32	100	111	86	56
50	40	120	133	101	70
63	50	146	158	118	88

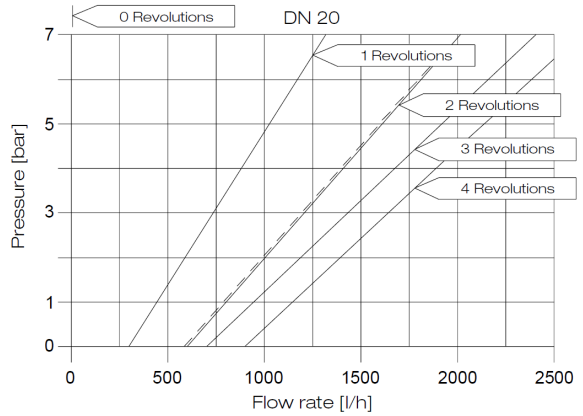


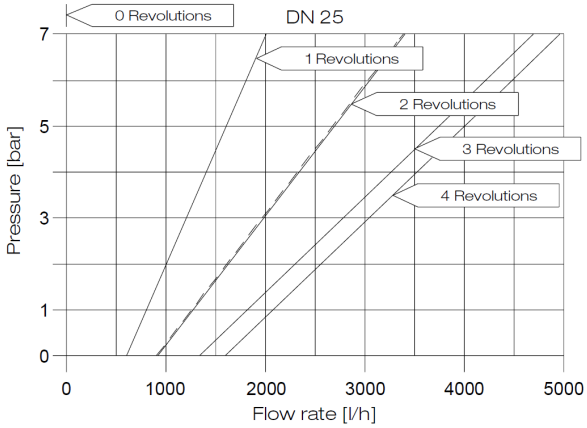
Flow characteristics

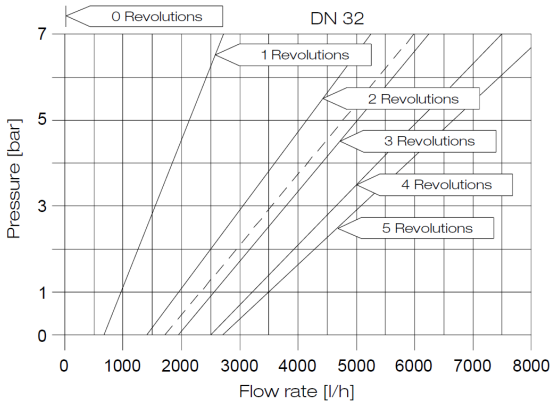
X Kv, Cv value (l/hr)
Y Medium pressure (bar)

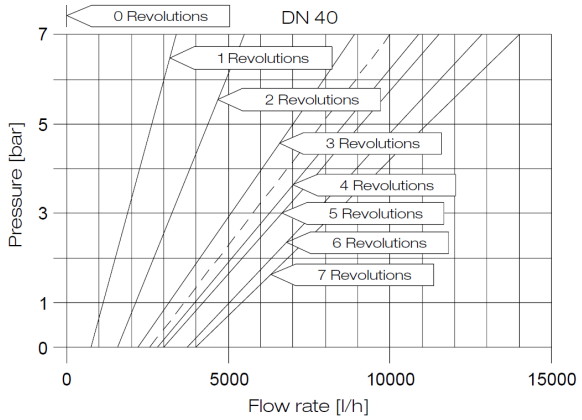


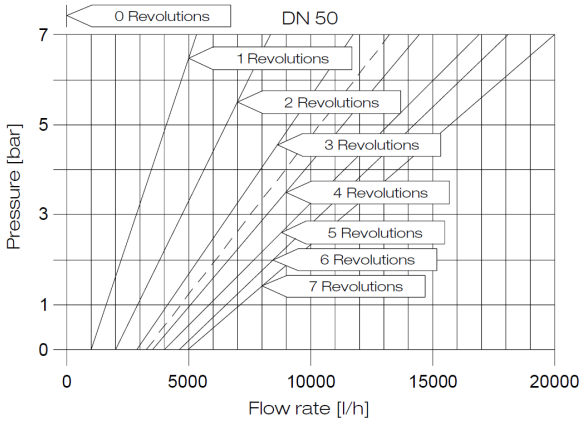












Example

Pressure upstream: 3 bar

Desired flow: 2,000 l/h

- Diagram for DN25, with the set screw opened 2 revolutions and a flow of 2,000 l/h.
- The nominal diameter DN25 is well suited for this purpose.

Tips for installation

To dimension the nominal diameter, we recommend using the given values with a half-opened throttle valve.

Water Jet Suction Pump type P20



Product description

The P20 water jet suction pump can be used in cases where liquid that is under pressure is present as a propellant. They are used for transporting and mixing liquids. They are self-priming and have no mechanically moving parts.

Function

The basic principle of the water jet suction pump is that the propellant liquid passes through a nozzle and draws in with it the liquid or gaseous medium from the suction line, increasing its velocity. The result of this is that the propellant and the medium that is sucked in are mixed together. The amount of liquid propelled is a function of the propellant pressure and the size of the nozzle. The amount of medium drawn in can be seen from the diagrams. The results shown are only guidelines and depend on the method of operation.

Applications

- Aquariums
- Chemical process industry
- Industrial water treatment
- Swimming pools

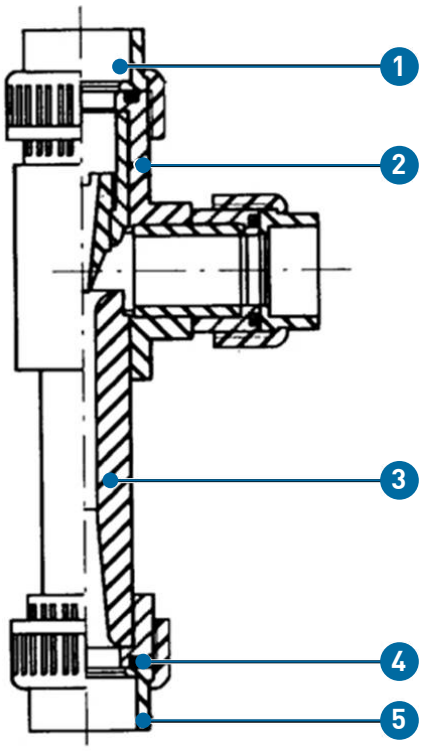
Benefits/features

- No external energy required for operation
- Ideal for mixing, dosing and transporting liquids
- No mechanically moving parts
- Self-priming

Flow media

Neutral and aggressive media free of particles/solids. The chemical resistance depends on the selected material (see online tool ChemRes PLUS).

Technical data



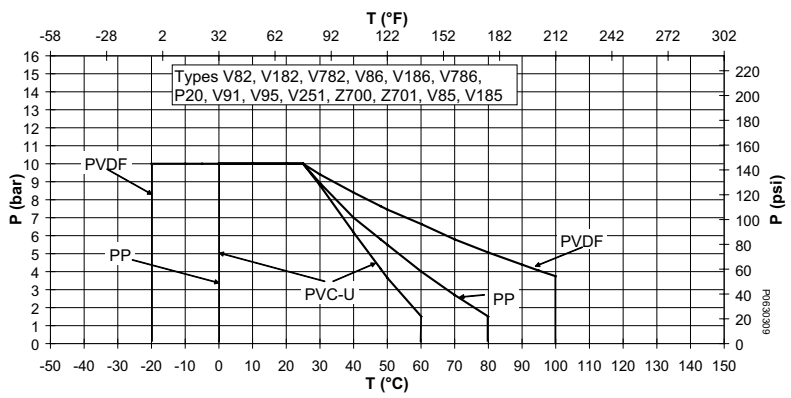
1 Coupling nut
2 Nozzle
3 Water jet suction pump
4 O-ring
5 Insert

Specification		
Dimensions	d16/DN10 – d90/DN80, ⅜" – 3"	
Materials	PVC-U, PP-H, PVDF	
Gasket materials	EPDM, FKM	
Connections	DN10 – DN20	Threads DIN/ISO
	DN20 – DN50	Screws DIN/ISO
	DN65 – DN80	Cement spigots DIN/ISO
Nominal pressure	PN10	
Product standard	EN ISO 21787	
Test standard	ISO 9393-2, EN 12266-1	

Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

PVC-U, PP-H, PVDF



T Temperature (°C, °F)
P Permissible pressure (bar, psi)

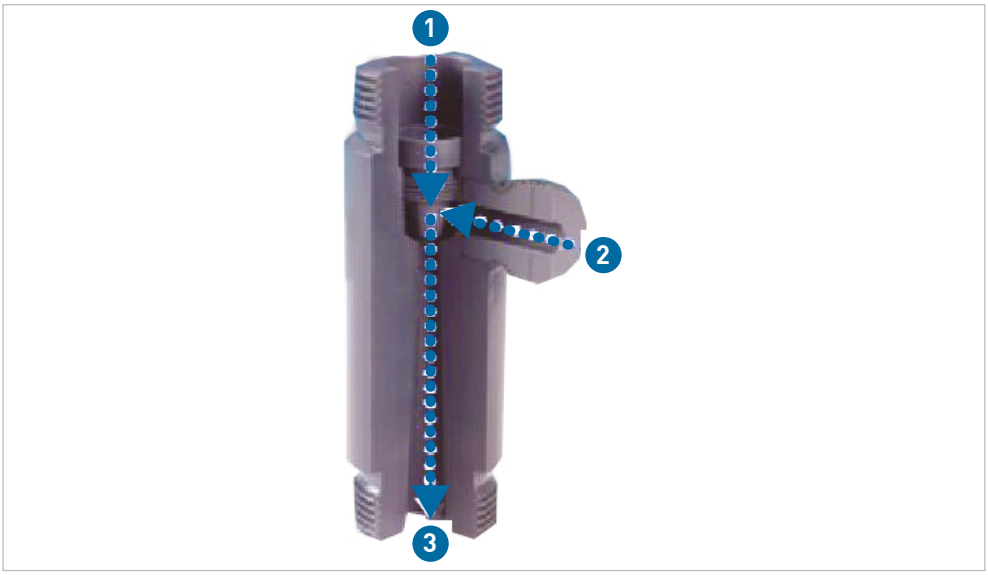
Technical basics

Principle of functionality

The propellant (liquid) flows though a nozzle. Due to this, a negative pressure (vacuum) is created. The liquid or gas suction medium is sucked out through an increase in speed.

The propellant and the suction medium are ideally mixed. The amount of liquid propelled is a function of the propellant pressure and the size of the nozzle. The amount of liquid drawn in can be seen from the diagrams. The results shown are only guidelines and depend on the method of operation.

A throttle is connected to the suction pipe to enable optimal dosing.



1 Propellant
2 Suction medium (suction pipe)
3 Mixture of propellant and suction medium (outlet)

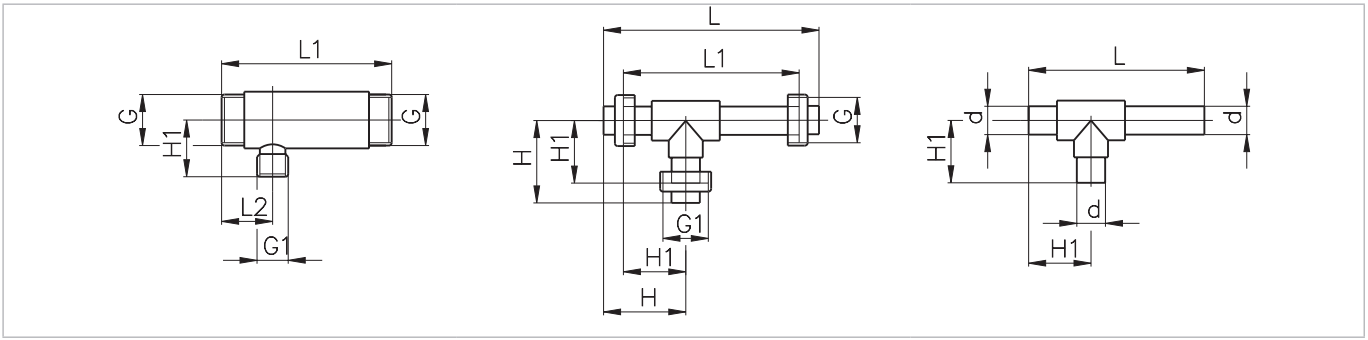
Valve handling

Installation notes

- We recommend installing the water jet pump between two detachable pipe sections. With a view to subsequent dismantling, it is useful to provide shut-off devices.
- Relaxation zones of at least 5 x DN are to be provided upstream and downstream of the pump.
- It is recommend to instal a flow meter in the suction pipe to provide information on the suction power of the pump.
- It is useful to install manometers upstream and downstream of the jet pump for reading the inlet pressure and the back pressure.
- The suction time can be significantly reduced by installing a check valve in the suction pipe.
- Inlet and outlet pipes must have at least the nominal diameter of the pump.
- An exact dosing of the propellant and suction flow is guaranteed through the installation of throttle valves.

⚠ Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalogue at www.gfps.com

Dimensions



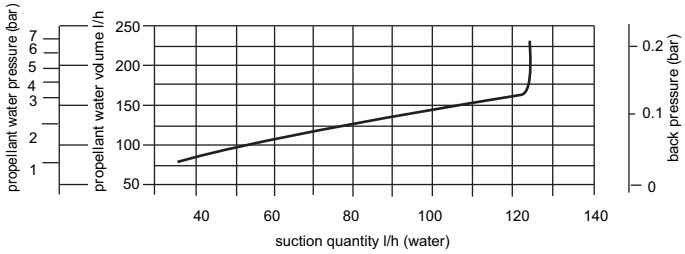
DN10 – DN20 | DN25 – DN50 | DN65 – DN80

	da (mm)	DN (mm)	G	G1	L (mm)	L1 (mm)	t (mm)	H (mm)	h (mm)
P 20.10 - 1.5	16	10	R ¾"	R ¾"		110	40		35
P 20.10 - 2.0									
P 20.15 - 2.0	20	15	R 1"	R ¾"		125	40		35
P 20.15 - 3.0									
P 20.15 - 4.0									
P 20.20 - 3.0	25	20	R 1 ¼"	R ¾"		145	45		45
P 20.20 - 4.5									
P 20.20 - 6.0									
P 20.25 - 2.5	32	25	R 1 ½"	R 1 ½"	245	195		96	71
P 20.25 - 4.0									
P 20.25 - 5.0									
P 20.32 - 3.0	40	32	R 2"	R 2"	297	239		116	87
P 20.32 - 4.5									
P 20.32 - 6.0									
P 20.40 - 3.5	50	40	R 2 ¼"	R 2 ¼"	369	301		139	105
P 20.40 - 5.5									
P 20.40 - 7.5									
P 20.50 - 5.0	63	50	R 2 ¾"	R 2 ¾"	433	351		169	128
P 20.50 - 7.0									
P 20.50 - 9.0									
P 20.65 - 6.5	75	65			388				115
P 20.65 - 9.0									
P 20.65 - 11.5									
P 20.80 - 8.0	90	80			465				149
P 20.80 - 11.0									
P 20.80 - 14.0									

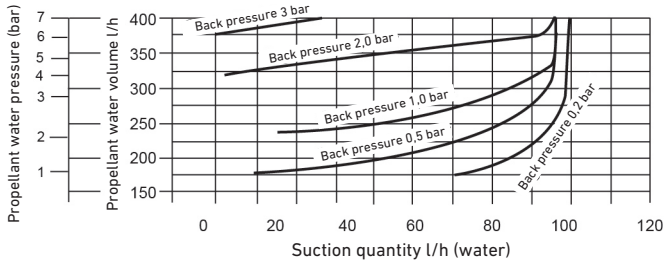
Characteristic curves

Suction medium: water

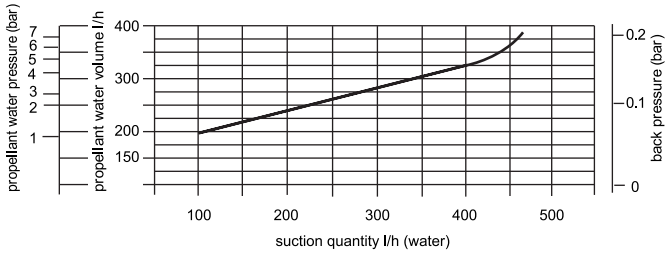
DN10, nozzle size 1.5



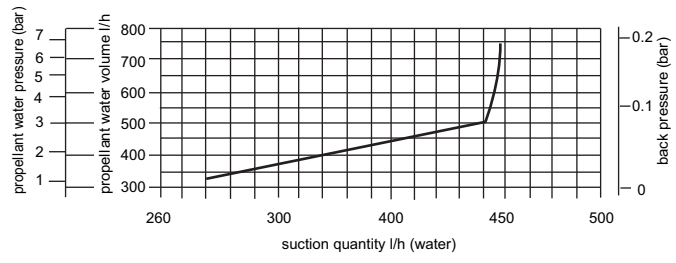
DN10, nozzle size 2.5



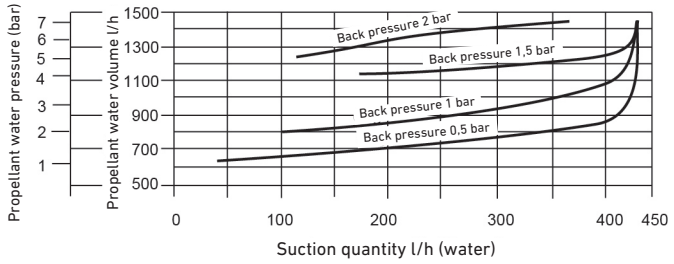
DN15, nozzle size 2.0



DN15, nozzle size 3.0

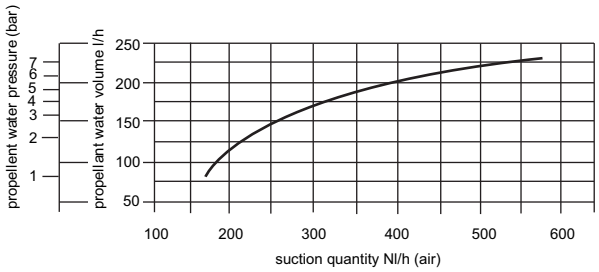


DN15, nozzle size 4.0

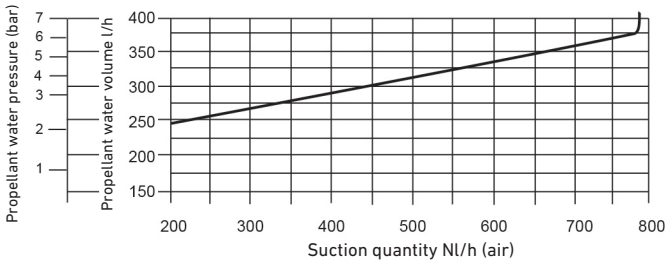


Suction medium: air

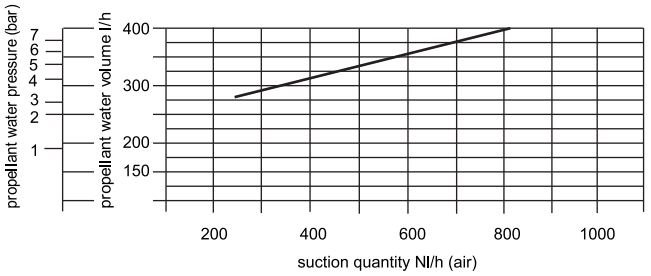
DN10, nozzle size 1.5



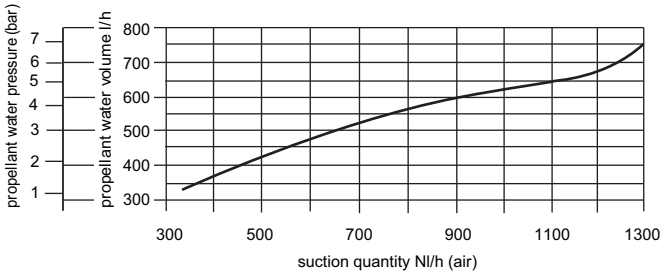
DN10, nozzle size 2.5



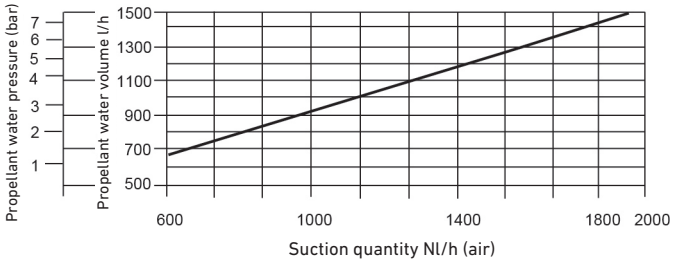
DN15, nozzle size 2.0



DN15, nozzle size 3.0

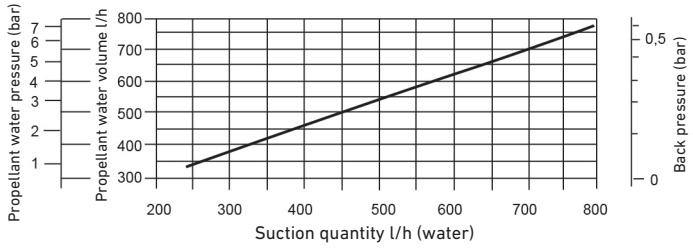


DN15, nozzle size 4.0

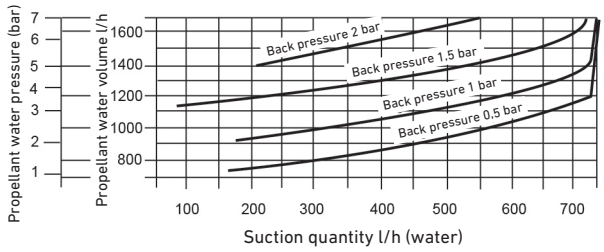


Suction medium: water

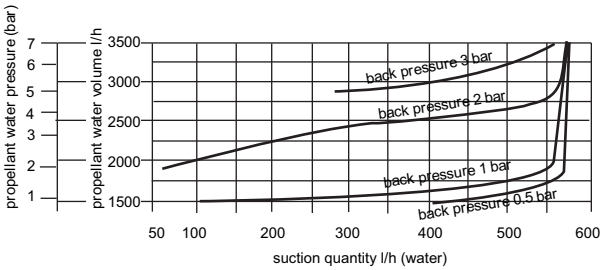
DN20, nozzle size 3.0



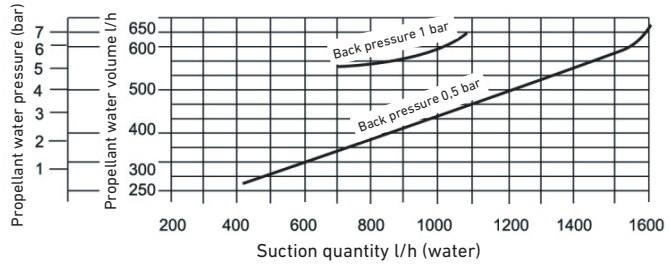
DN20, nozzle size 4.5



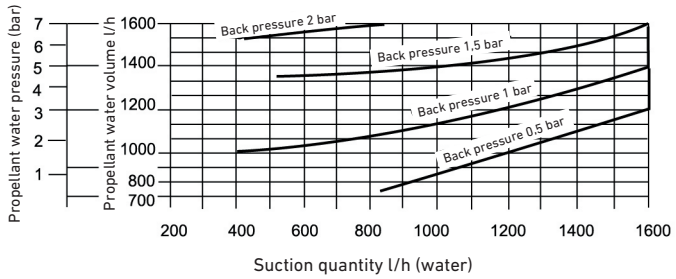
DN20, nozzle size 6.0



DN25, nozzle size 2.5

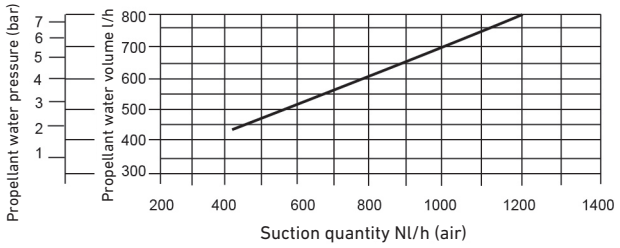


DN25, nozzle size 4.0

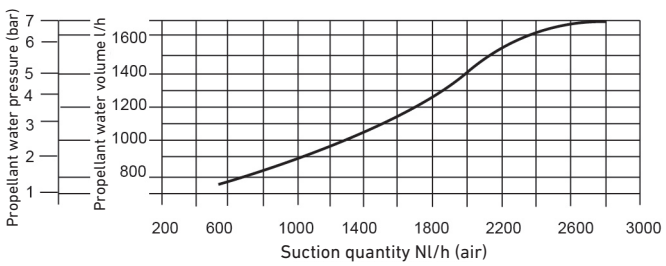


Suction medium: air

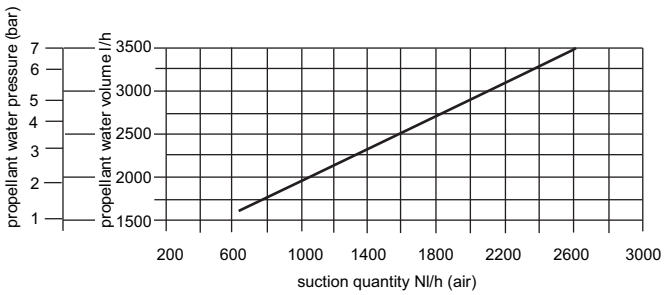
DN20, nozzle size 3.0



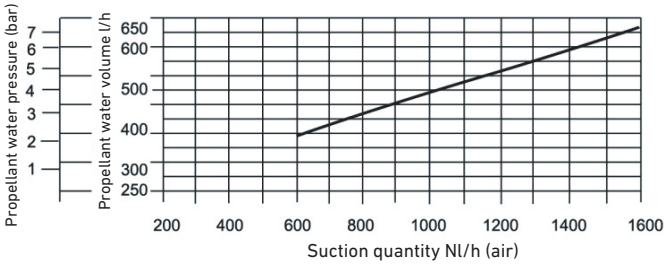
DN20, nozzle size 4.5



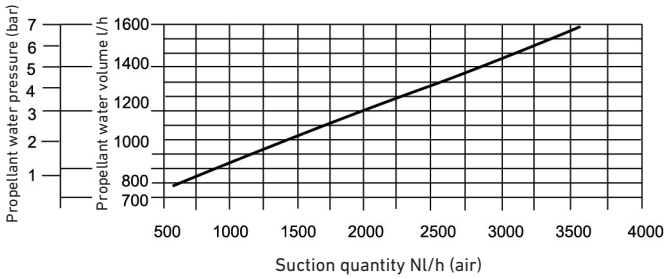
DN20, nozzle size 6.0



DN25, nozzle size 2.5

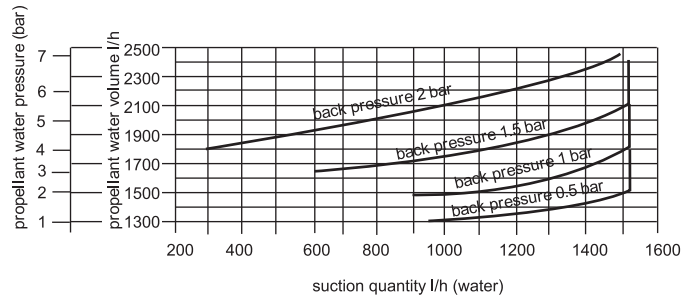


DN25, nozzle size 4.0

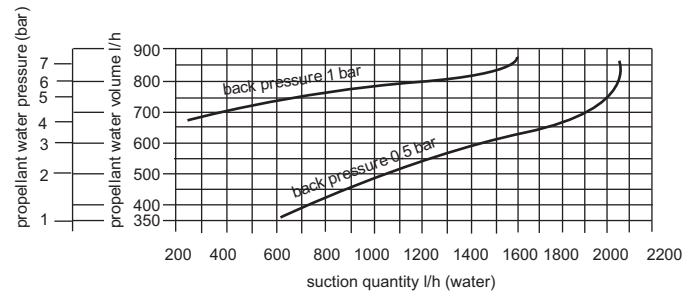


Suction medium: water

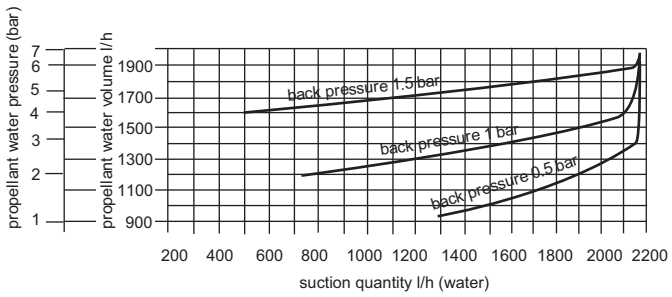
DN25, nozzle size 5.0



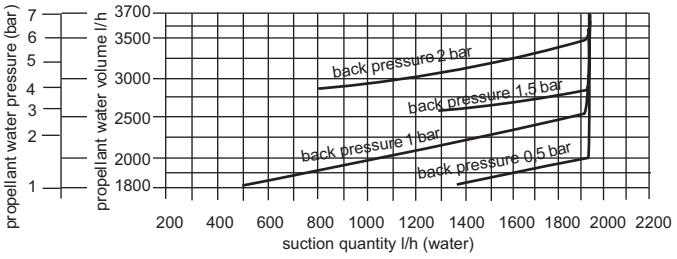
DN32, nozzle size 3.0



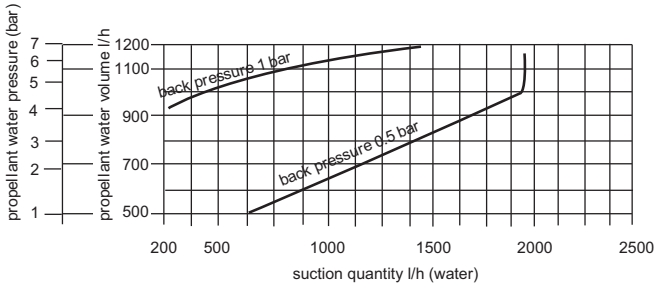
DN32, nozzle size 4.5



DN32, nozzle size 6.0

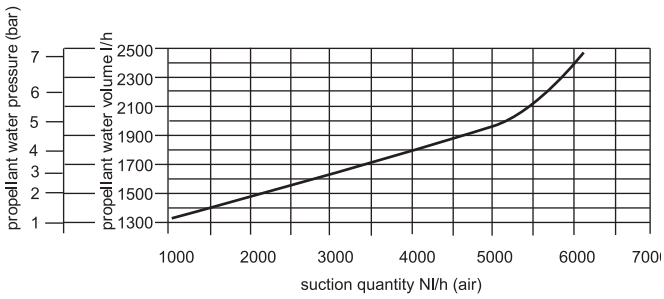


DN40, nozzle size 3.5

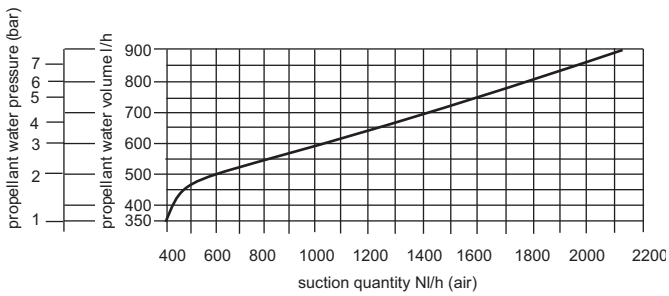


Suction medium: air

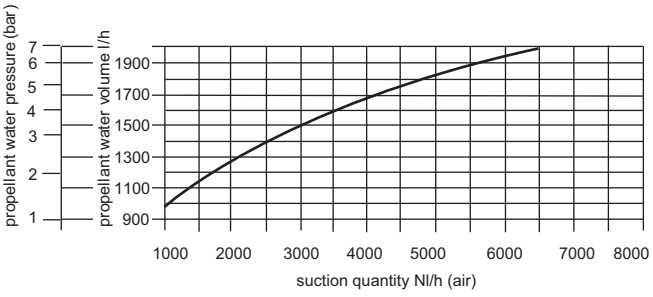
DN25, nozzle size 5.0



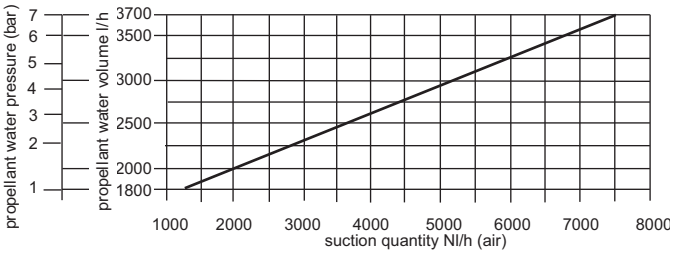
DN32, nozzle size 3.0



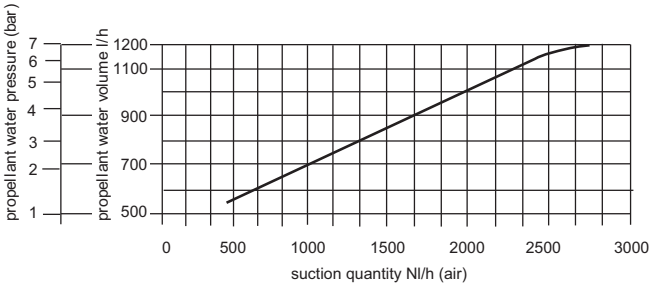
DN32, nozzle size 4.5



DN32, nozzle size 6.0

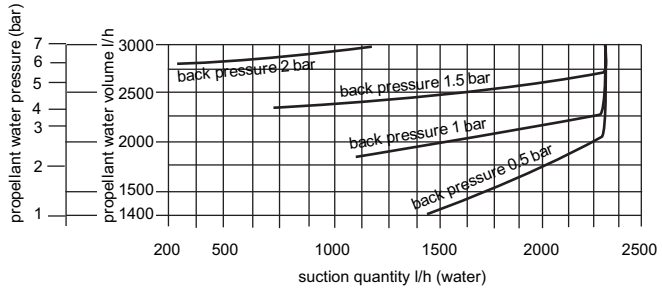


DN40, nozzle size 3.5

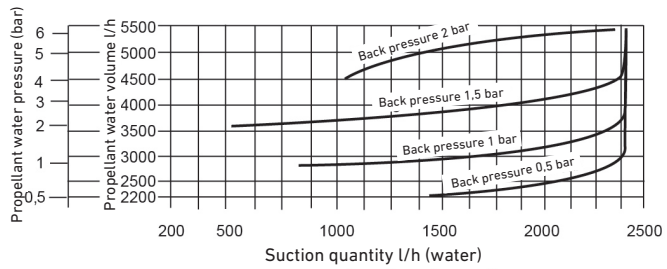


Suction medium: water

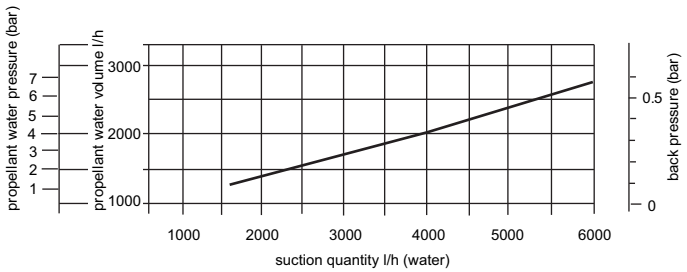
DN40, nozzle size 5.5



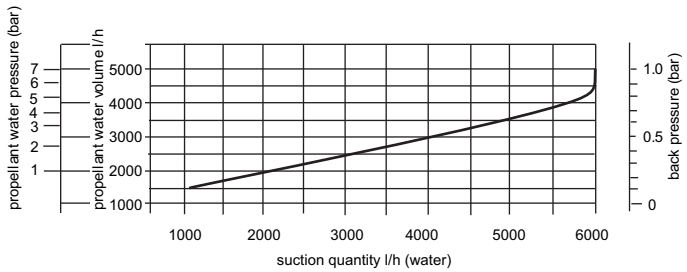
DN40, nozzle size 7.5



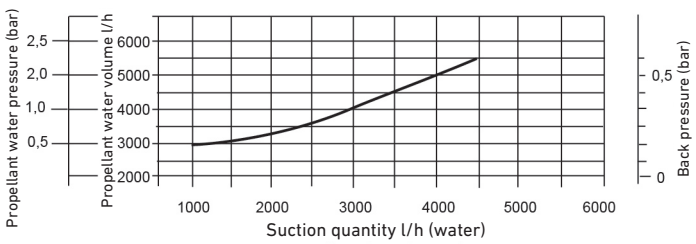
DN50, nozzle size 5.0



DN50, nozzle size 7.0

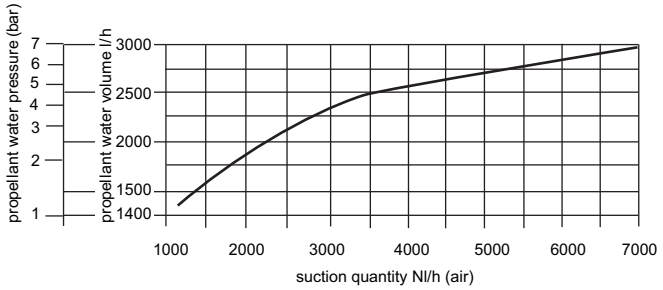


DN50, nozzle size 9.0

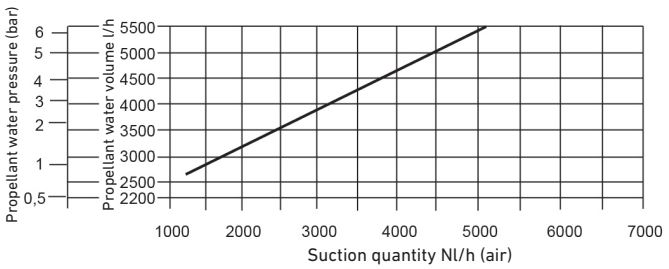


Suction medium: air

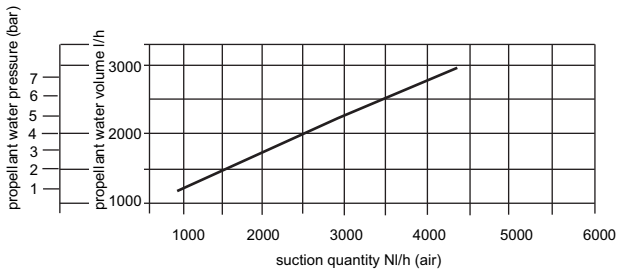
DN40, nozzle size 5.5



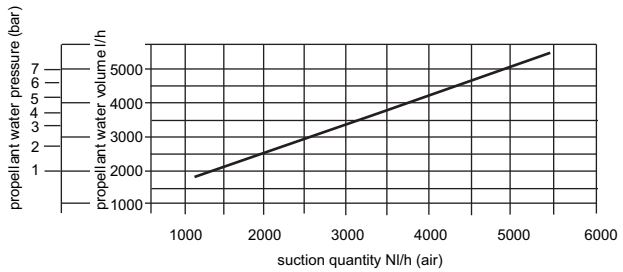
DN40, nozzle size 7.5



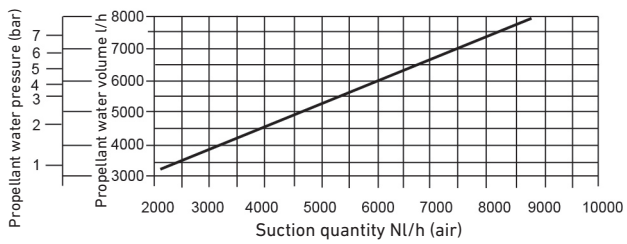
DN50, nozzle size 5.0



DN50, nozzle size 7.0

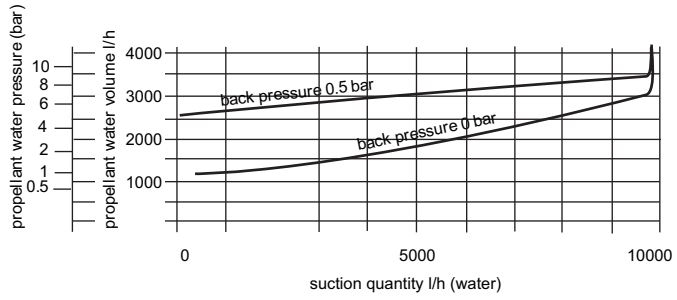


DN50, nozzle size 9.0

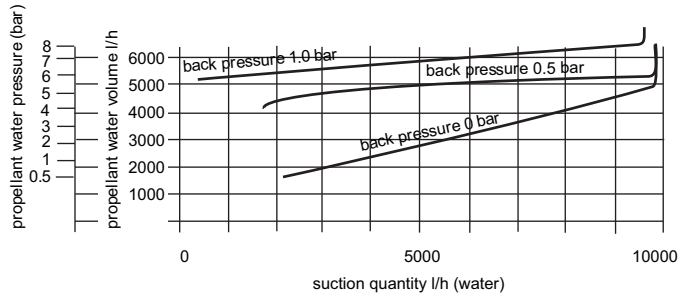


Suction medium: water

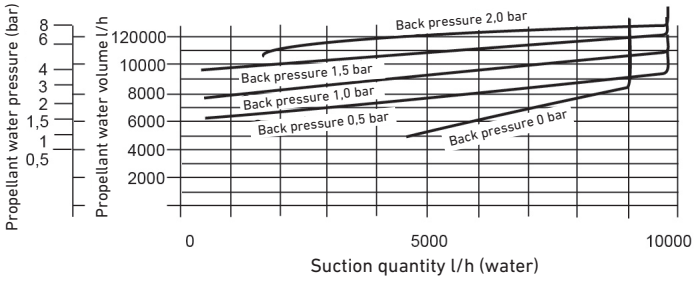
DN65, nozzle size 6.5



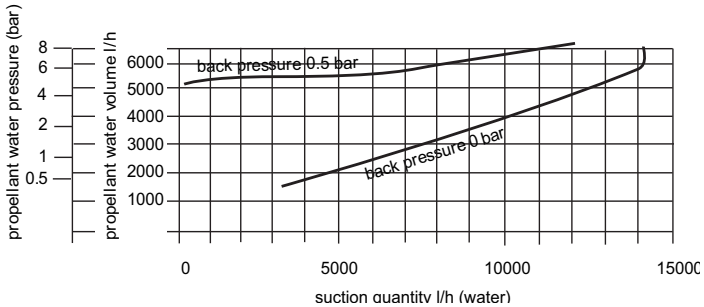
DN65, nozzle size 9.0



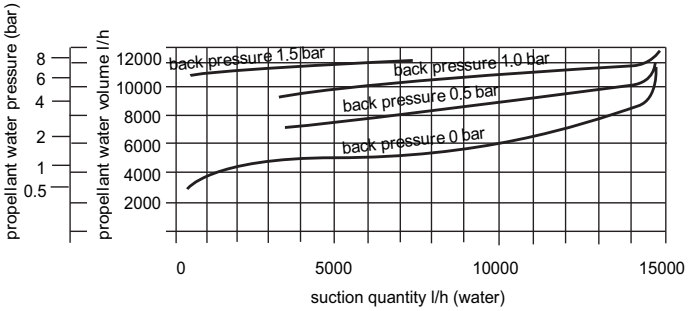
DN65, nozzle size 11.5



DN80, nozzle size 8.0

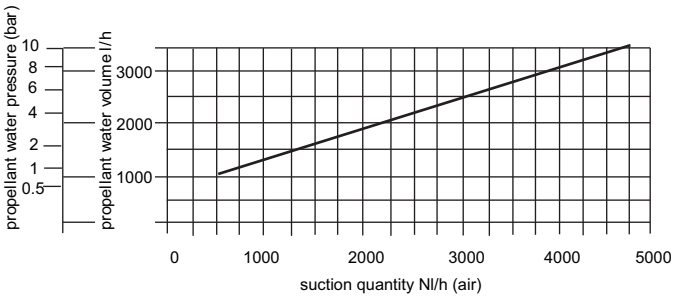


DN80, nozzle size 11.0

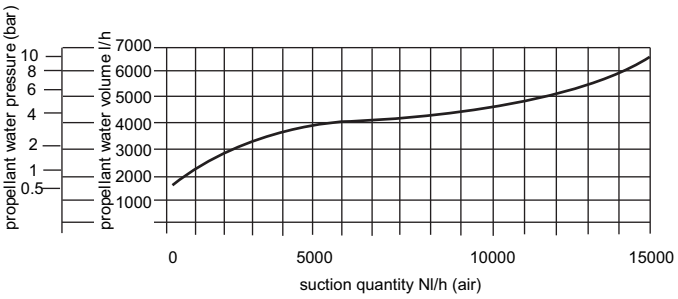


Suction medium: air

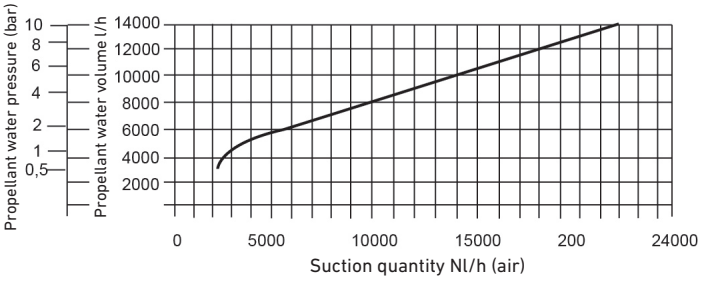
DN65, nozzle size 6.5



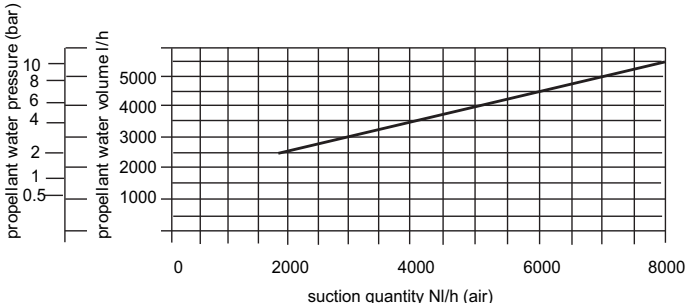
DN65, nozzle size 9.0



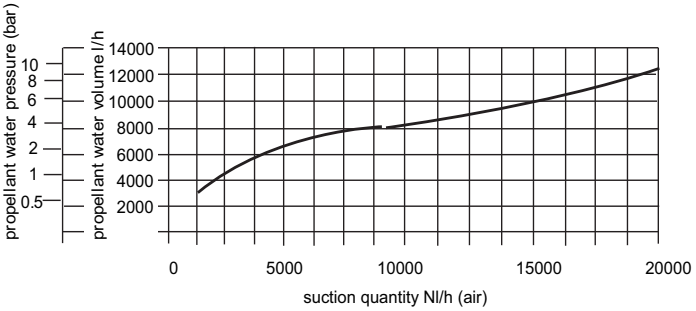
DN65, nozzle size 11.5



DN80, nozzle size 8.0

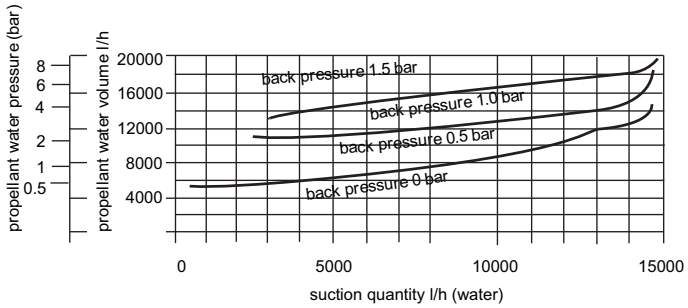


DN80, nozzle size 11.0



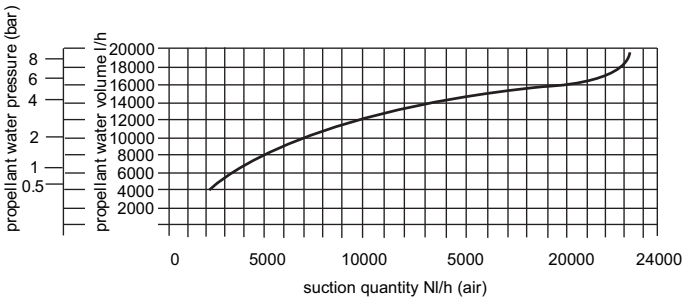
Suction medium: water

DN80, nozzle size 14.0



Suction medium: air

DN80, nozzle size 14.0



Planning Fundamentals

of Valves and Automation

Accessories for Valves

Content

Type DCI/DTM Double sensor for electrical position feedback 460
Electric position indicator ER52/53 468
Electric position indicator type ER55 473

Type DCI/DTM Double sensor for electrical position feedback



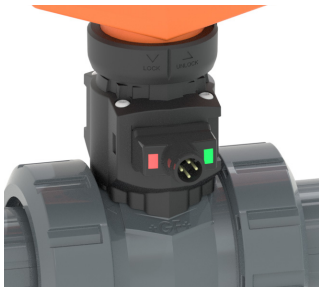
Double sensor DCI



Double sensor DTM



Double sensor, mounted on Butterfly Valve type 565



Double sensor, mounted on Ball Valve Type 546 Pro

Product description

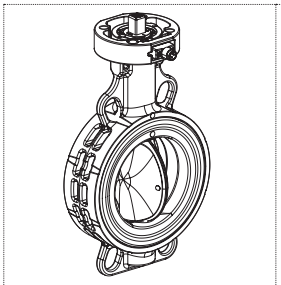
The double sensor is used to signal the closed or open position of a ball valve or a butterfly valve. The switching states are output via two integrated LEDs and forwarded as an electrical signal to a control unit or similar system provided by the customer.

ATEX version: The ATEX double sensor can be used in potentially explosive areas with flammable gas, vapor, mist and dust.

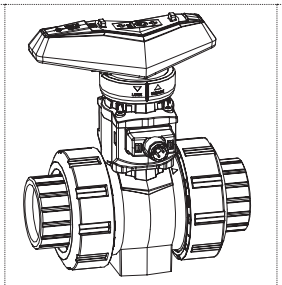
Advantages

- Detection of two switching states open/closed
- Switching status indication via integrated LEDs
- Type DCI: Simple installation, without tools
- Various common versions PNP, NPN, NAMUR, opening and closing procedures available

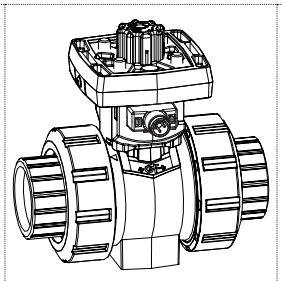
Application examples



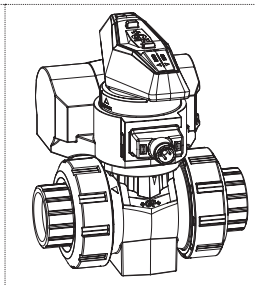
Double sensor type DCI on butterfly valve Type 565W/Type 565L



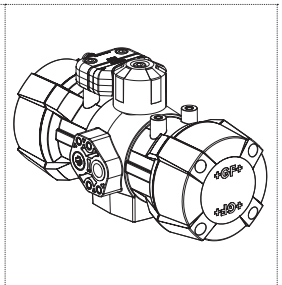
Double sensor type DCI on ball valve Type 546 Pro/ Type 543 Pro with interface module, manually operated



Double sensor type DCI on ball valve type 546 Pro/ type 543 Pro with interface module, automatically actuated



Double sensor type DCI on ball valve type 546 Pro/ type 543 Pro with spring return unit



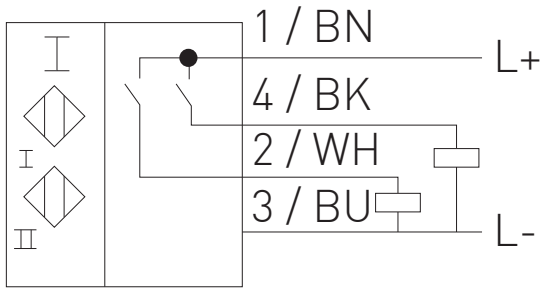
Double sensor type DTM on pneumatic actuator type PPA 08-80

Technical data

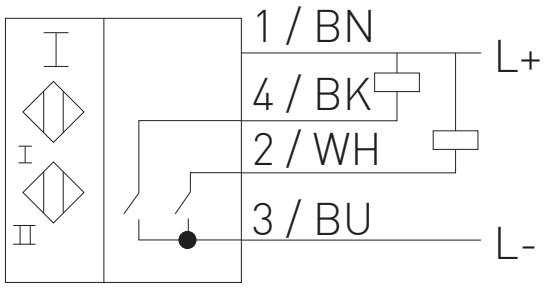
Specifications type	DCI 12	DCI 12	DTM 12	DTM CG
Output circuit	NAMUR	PNP, NPN	PNP	PNP
Output function	2x Normally Closed (NC)	2x Normally Open (NO)		
Technology	Inductive			
Hysteresis (typical)	10%	5%		
Switching frequency	<1000 Hz	<500 Hz	<1000 Hz	
Operating voltage indicator			LED green	
Valve position indicator	LED red/LED green		LED yellow	
Operating voltage range +Vs	8.2 V	10...30 VDC		
Operating current		0...150 mA	0...200 mA	
Voltage drop (Ud)		≤3 V	≤2.5 V	
DC current (Ir)		0...0.5 mA typ. 0.1 µA @25°C		
No-load current (I0)	≥ 3 mA	≤ 25 mA	≤ 22.5 mA	
MTTFd	2122 a	780 a	860 a	
Short-circuit proof	Cycling			
Reverse-polarity protected	Yes			
Protection class	IP67			
Housing material	PBT			
Operating temperature	-25...70 °C (-13...158°F)			
Connection	M12x1,4-pin			Screw terminal M20x1.5 cable gland

Connection diagrams

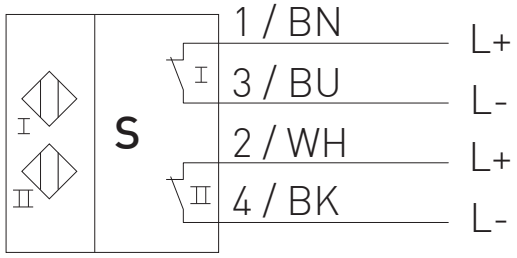
PNP



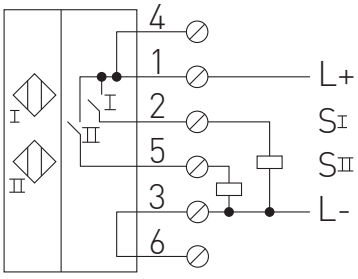
NPN



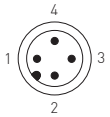
NAMUR



Cable terminal M20x1.5 cable gland

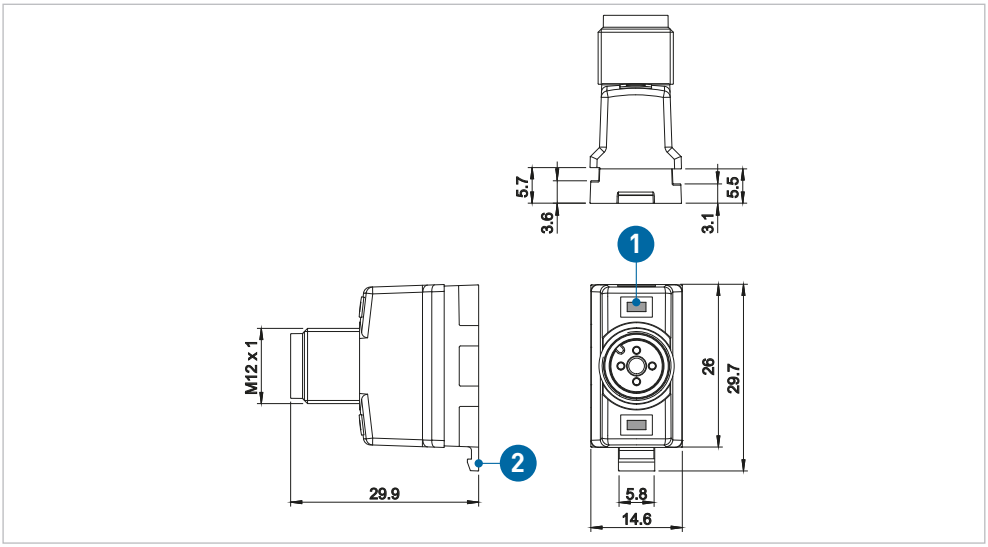


Connector pin assignment

Pin	Color coding	Color	Connector diagram
1	BN	brown	
2	WH	white	
3	BU	blue	
4	BK	black	

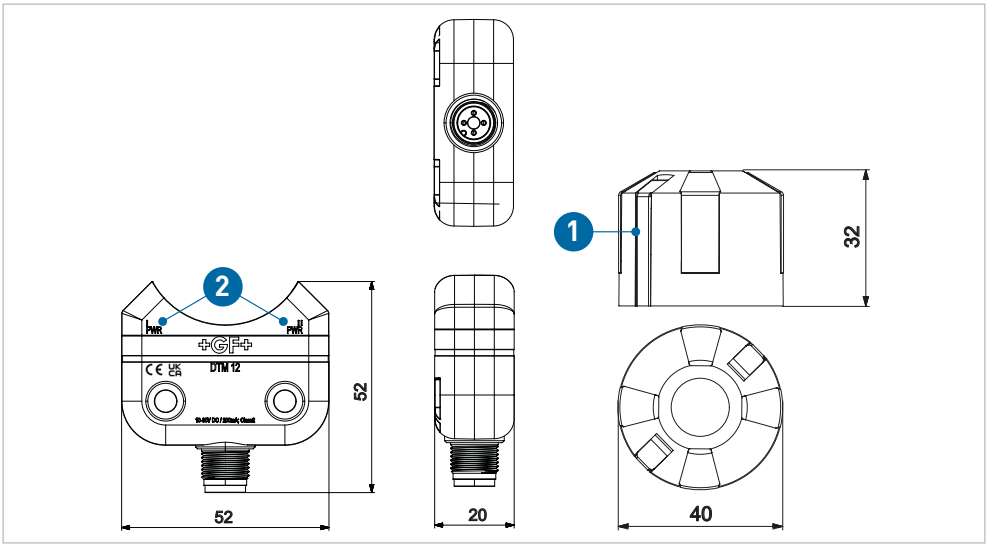
Dimensions

Type DCI 12



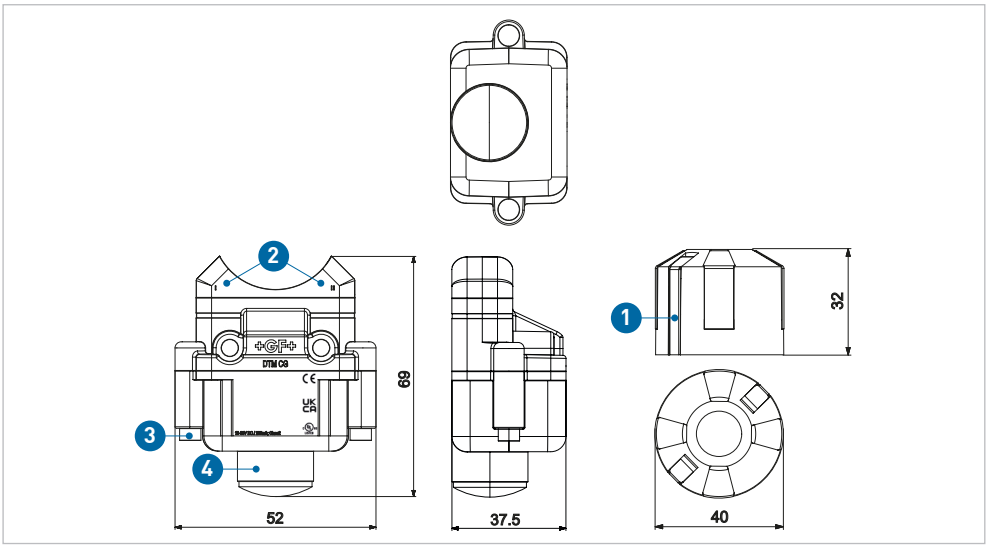
1 Status LED
2 Snapper

Type DTM 12



1 Puck
2 Status/Output LED's

Type DTM CG



1 Puck
2 Status/Output LED's
3 Housing Screws
4 Screw terminal, cable gland M20 x 1,5

Article overview

Compatibility overview

	Type		DCI	DTM
Butterfly valve	Type 565		X	
	Type 567/578*		X	
Ball valve	Type 546 Pro	DN10-DN100*	X	
	Type 543 Pro	DN10-DN50*	X	
Pneumatic actuator	PPA 08-80	FC/FO/DA		X
	PA 30-40	FC/FO		X
	PA 30-50	DA		X

*Additional interface module or intermediate elements needed

Typ DCI

Code	Output circuit	LED indicator output 1	LED indicator output 2	Connection	Product picture
198 546 001	PNP	LED red	LED green	M12x1, 4-pin	
198 546 002	PNP	LED green	LED red	M12x1, 4-pin	
198 546 005	NPN	LED red	LED green	M12x1, 4-pin	
198 546 006	NPN	LED green	LED red	M12x1, 4-pin	
198 546 003	NAMUR	LED green	LED red	M12x1, 4-pin	
198 546 004	NAMUR	LED red	LED green	M12x1, 4-pin	

Typ DTM 12

Code	Output circuit	LED indicator output 1	LED indicator output 2	Connection	Product picture
198 546 007	PNP	LED yellow	LED yellow	M12x1, 4-pin	

Typ DTM CG

Code	Output circuit	LED indicator output 1	LED indicator output 2	Connection	Product picture
198 546 008	PNP	LED yellow	LED yellow	Screw terminal, cable gland M20 x 1,5	

Puck for type DTM

Code		Product picture
198 546 009	Puck (activator) for pneumatic actuators with double sensor type DTM incl. mounting screw.	

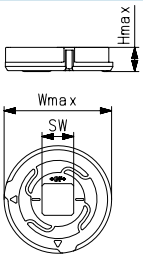
Accessories

Connection cables

Suitable connection cables are available as accessories:

DN (mm)	LED signal color
198546150	M12x1, 4-pin, plug, without cable
198546151	M12x1, 4-pin, PVC, 5m
198546152	M12x1, 4-pin, PVC, 10m
198546153	M12x1, 4-pin, PUR, 5m
198546154	M12x1, 4-pin, PUR, 10m

Switching ring for double sensor (For manually operated type 565 butterfly valves)

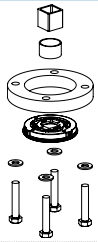
DN (mm)	Code	Acc. to ISO 5211	SW (mm)	Wmax (mm)	Hmax (mm)	Dimensions	Product picture
50 - 80	199 565 900	F07	11	57.7	12.5		
100 - 125	199 565 901	F07	14	57.7	12.5		
150 - 200	199 565 902	F07	17	57.7	12.5		
250 - 300	199 565 903	F10	22.1	79.8	12.5		

The additional switching ring is required for manually operated butterfly valves type 565. The switching ring is already pre-assembled for electrically or pneumatically actuated valves.

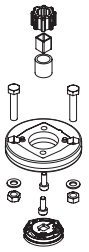
Intermediate elements type 567/578

Intermediate elements are required as a connection between type 567/578 valve and Actuator. The intemediate elements include different screws, hexagon nuts, washer, switching rings, etc. (depends on actuator and dimension).

Intermediate elements for Reduction Gear

DN (mm)	Code	Reduction gear	Acc. to ISO 5211	Product picture example
50 - 80	198 000 621	161 483 471	F07	
100 - 125	198 000 622	161 483 471	F07	
150 - 200	198 000 599	161 483 471	F07	
250 - 300	198 000 732	161 483 472	F07	

Intermediate elements for Electric Actuators EA45-250, dEA45-250

DN (mm)	Code	Actuator Type	Acc. to ISO 5211	Product picture example
50 - 65	198 000 943	EA45	F05/F07	
80	198 000 601	xEA120	F07	
100 - 125	198 000 602	xEA120	F07	
150	198 000 600	xEA120	F07	
200 - 250	198 000 603	xEA250	F07	
300	198 000 732	xEA250	F07/F10	

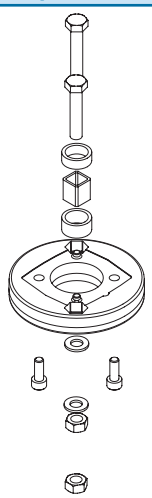
Intermediate elements for Pneumatic Actuators PPA, function FC/FO

DN (mm)	Code	Typ	Acc. to ISO 5211	Product picture example
50 - 65	198 000 950	PPA40	F05/F07	
80	198 000 949	PPA80	F05/F07	
100 - 125	198 000 948	PPA80	F05/F07	

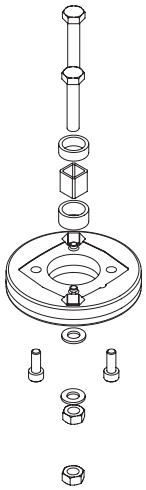
Intermediate elements for Pneumatic Actuators PPA, function DA

DN (mm)	Code	Typ	Acc. to ISO 5211	Product picture example
50 - 65	198 000 950	PPA40	F05/F07	
80	198 000 950	PPA80	F05/F07	
100 - 125	198 000 948	PPA80	F05/F07	

Intermediate elements for Pneumatic Actuators PA30-90, function FC/FO

DN (mm)	Butterfly valve type	Code	Type	Acc. to ISO 5211	Product picture example
50	567/578	198 000 791	PA30	F05/F07	
65	567/578	198 000 791	PA30	F05/F07	
80	567/578	198 000 793	PA35	F05/F07	
100	567/578	198 000 794	PA40	F07	
125	567/578	198 000 795	PA45	F07	
150	567/578	198 000 796	PA50	F07	
200	567/578	198 000 798	PA55	F07	
250	567	198 000 760	PA65	F10	
250	578	198 000 945	PA65	F10	
300	567	198 000 225	PA70	F10	
300	578	198 000 946	PA70	F10	

Intermediate elements for Pneumatic Actuators PA30-90, function DA

DN (mm)	Butterfly valve type	Code	Type	Acc. to ISO 5211	Product picture example
50	567/578	198 000 595	PA35	F05/F07	
65	567/578	198 000 595	PA35	F05/F07	
80	567/578	198 000 791	PA40	F07	
100	567/578	198 000 794	PA45	F07	
125	567/578	198 000 797	PA45	F07	
150	567/578	198 000 796	PA55	F07	
200	567/578	198 000 796	PA55	F07	
250	567	198 000 731	PA65	F10	
250	578	198 000 944	PA65	F10	
300	567	198 000 731	PA65	F10	
300	578	198 000 944	PA65	F10	

Type 543 Pro & type 546 Pro Interface module, manual actuated

The manually operated interface module can be used to transmit the open or closed position of the type 546 Pro or type 543 Pro ball valve to a customer control system via an electrical signal from the double sensor.

DN (mm)	Code	
DN10/15	198546102	
DN20/25	198546103	
DN32/40	198546105	
DN50	198546107	

Type 543 Pro & type 546 Pro Spring reset unit (dead man's switch)

The spring reset unit (dead man's switch) is installed onto the ball valve type 546 Pro or type 543 Pro and ensures that the ball valve is closed automatically as soon as the handle is released. It is opened against the spring force. The spring reset unit can be used to transmit the open or closed position of the type 546 Pro or type 543 Pro ball valve to a customer control system via an electrical signal from the double sensor.

DN (mm)	Code	
DN10/15	198546082	
DN20/25	198546083	

Type 543 Pro & type 546 Pro Interface module, automatic actuated

With the help of the automatically actuated interface module, electric or pneumatic actuators can be attached on the ball valve type 546 Pro or type 543 Pro, which allows the automation of the ball valve's change of position. In addition, an interface is available for the installation of the double sensor for electrical position feedback.

DN (mm)	Code Pneumatic GF actuators PPA	Code Electric GF actuators EA15/EA25/dEA	Code Ring for type 543 Pro
DN10/15	198546162	198546142	198543000
DN20	198546163	198546143	198543001
DN25	198546164	198546144	198543001
DN32	198546135	198546145	198543002
DN40	198546136	198546146	198543002
DN50	198546137	198546147	198543003



DN (mm)	SW	Code Norm actuators according to ISO 5211
DN10/15	SW09	198546122
DN10/15	SW11/14	198546123
DN20/25	SW09	198546124
DN20/25	SW11/14	198546125
DN32-40	SW11/14	198546126
DN50	SW11/14	198546127



Electric position indicator ER52/53



General

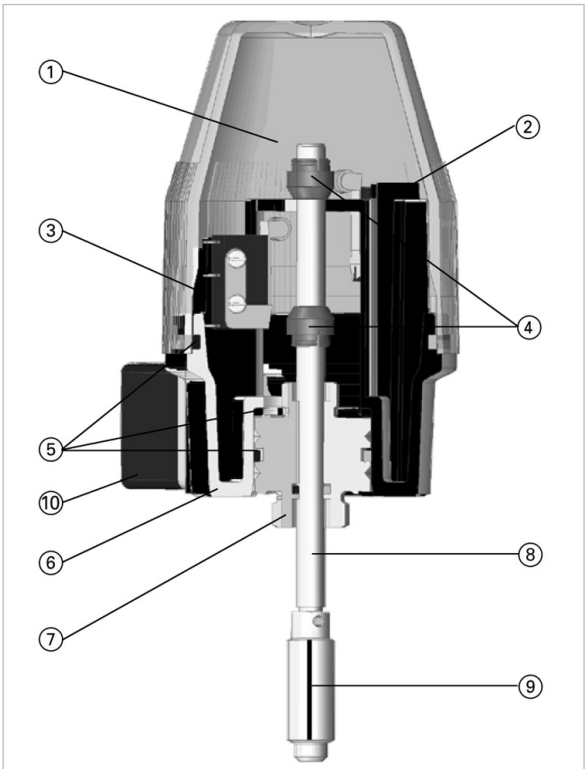
The electrical position indicator is used to indicate the valve position of GF diaphragm valves type DIASTAR. The position indicator can be screwed directly onto the diaphragm valve type DIASTAR.

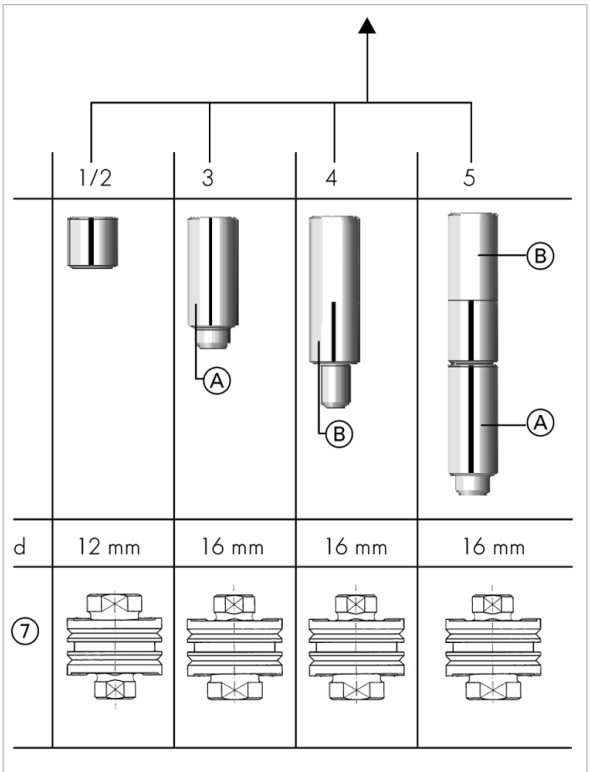
- For pneumatic stroke actuators
- For DIASTAR Ten, Ten Plus, Sixteen, 025
- Mechanical switches (AgNi or Au)
- NPN/PNP, NAMUR
- With optical position indicator

Insert

- Type ER52 d20 – 63 DN15 – DN50
- Type ER53 d75 – 160 DN65 – DN150

Design of the position indicator
Type ER52 (DN15 – 50) type ER53 (DN65 – DN150)





1 Cover SAN
2 Microswitch Closed
3 Microswitch Open
4 Cams PA
5 O-ring NBR
6 Housing PP
7 Brass base
8 Spindle of stainless steel
9 Connecting piece stainless steel (differs depending on actuator size)*
10 Unit plug 3P + E/EN 43650
* Connecting pieces

Electrical connections

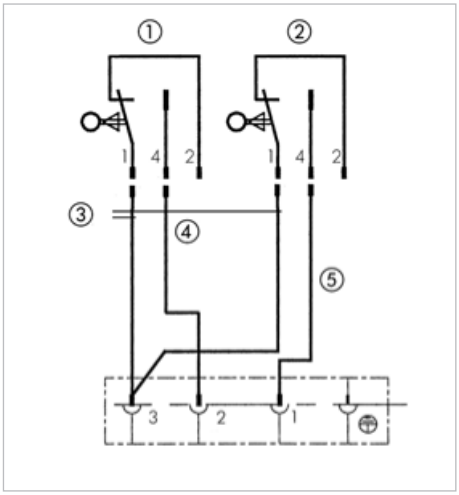
The position indicator is connected in standard version with unit plug.

Electric position indicator type ER52 / ER53

Type		Type of switch	Switching capacity
ER52-1	ER53-1	Microswitch AgNi	250 V~/6 A
ER52-2	ER53-2	Microswitch with gold-plated Au	4 V – 30 V=/1 – 100 mA
ER52-3	ER53-3	Inductive switch NPN	5 – 30 V=/0.1 A
ER52-4	ER53-4	Inductive switch PNP	5 – 30 V=/0.1 A
ER52-5	ER53-5	Inductive switch NAMUR	8 V =
ER52-6	ER53-6	Microswitch Eexd	250 V~/5 A
ER52-7	ER53-7	Analog position sensor	15 V– 30 V=/4 mA – 20 mA

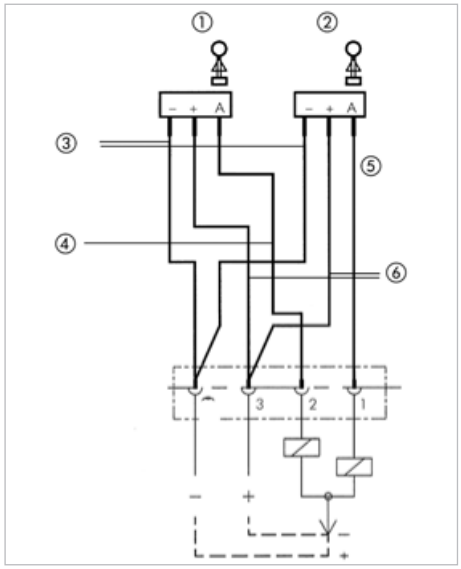
Connection diagrams

ER52-1, ER52-2, ER53-1, ER53-2



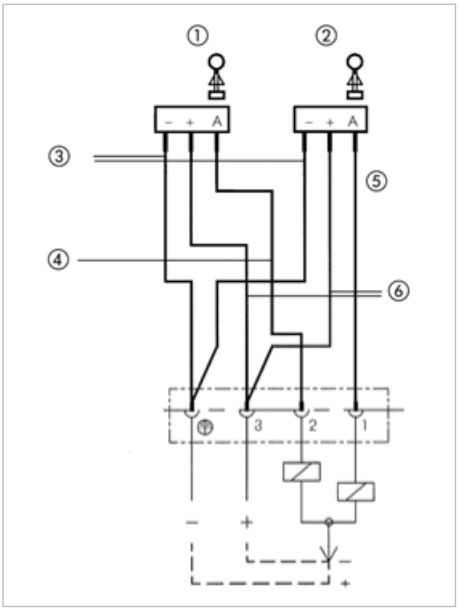
1 Closed
2 Opened
3 Black
4 White
5 Red

ER52-3, ER52-4



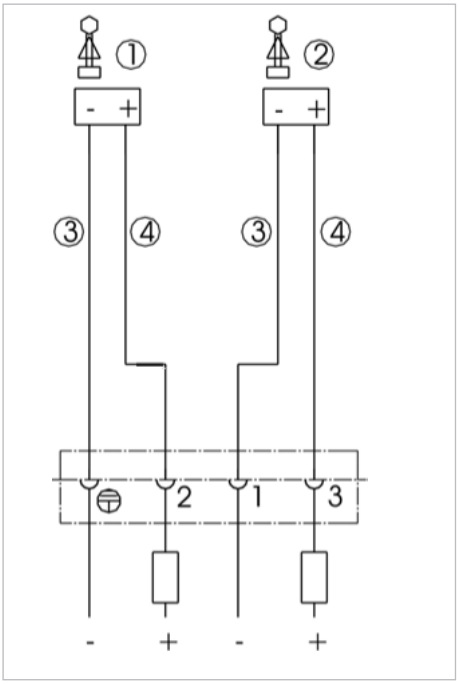
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2 Opened
3 Blue
4 Black
5 Black
6 Brown

ER53-3, ER53-4



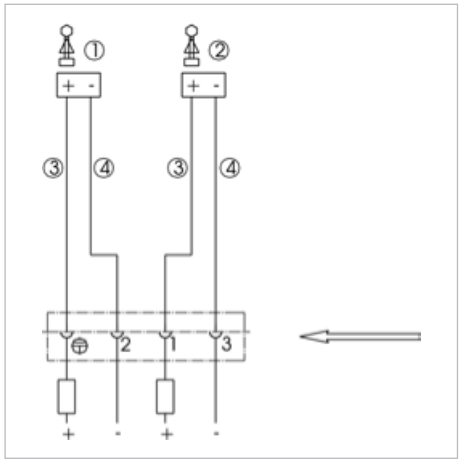
1 Closed
2 Opened
3 White
4 Red
5 Green
6 Black

ER52-5



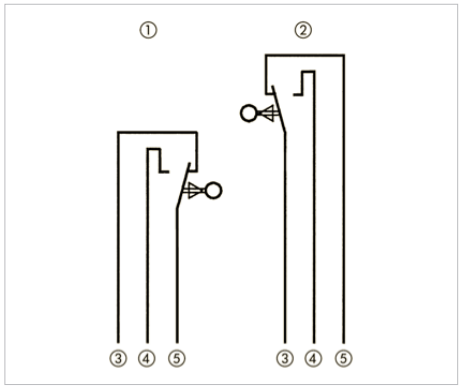
1 Closed
2 Opened
3 Blue
4 Brown

ER53-5



1 Closed
2 Opened
3 Black
4 White

ER52-6, ER53-6



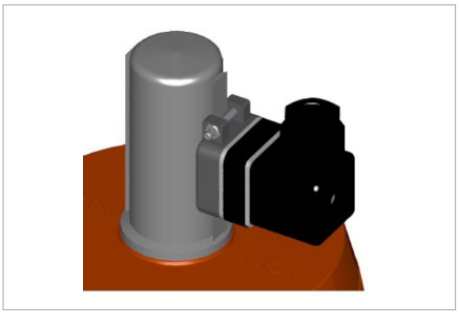
1 Closed
2 Opened
3 Green
4 Brown
5 White

Actuator sizes DIASTAR DN15 – DN50

DN (mm)	Six – FC	Ten – FC	Sixteen – FC	Ten – FO/DA
15	1	1	2	1
20	2	2	2	2
25	2	2	3	2
32	3	3	4	3
40	3	4	5	4
50	3	4	5	4

i For more information on pneumatic Stroke actuator DIASTAR, see Planning Fundamentals, chapter „Pneumatic diaphragm valve“.

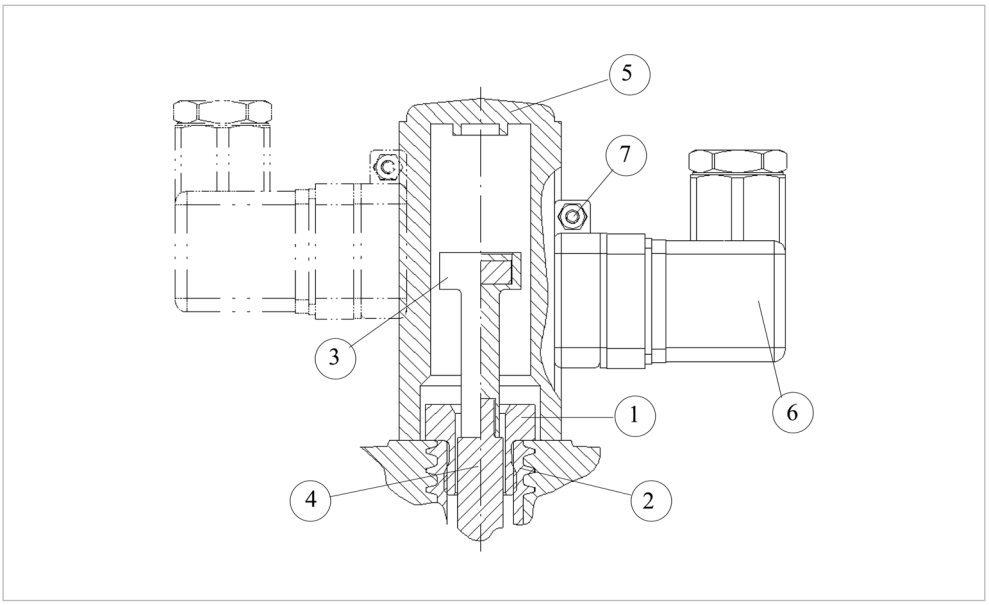
Electric position indicator type ER55



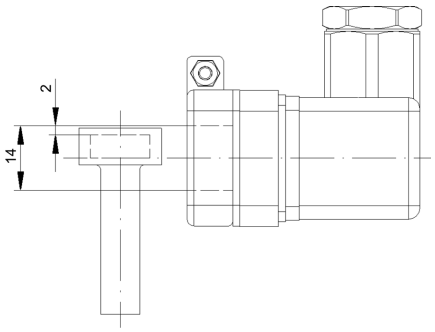
General

Electric position indicators are used to signal the valve positions. The GF position indicator type ER55 can be screwed directly into the diaphragm valve series DIASTAR type Ten and Sixteen and can indicate a valve position, open or closed. The switching point can be easily set with the adjustable Reed contact.

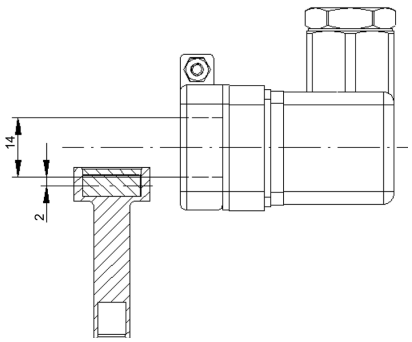
Design



1 Adaptors
2 Insert
3 Magnetic holder
4 Position indicator
5 Cover
6 Reed contact
7 Screw
Valve OPEN contact open
Valve CLOSED contact closed



Valve in OPEN position

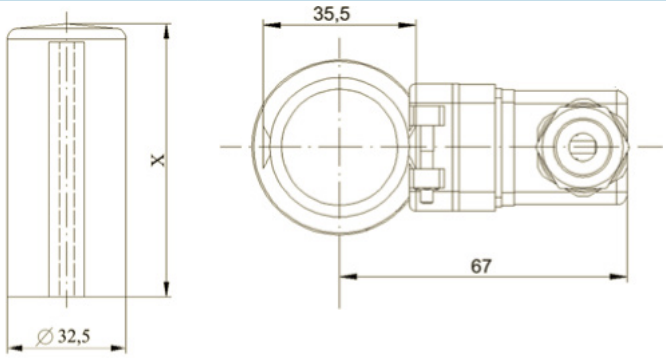


Valve in CLOSED position

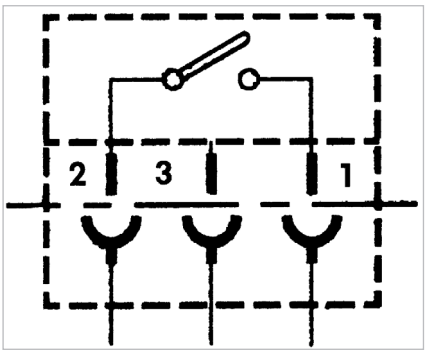
Technical data

Technical data	
Rated voltage	250 V, 50 – 60 Hz max.
Max. continuous current	200 mA
Peak-switch-on current	500 mA (use contact protection relay in case of inductive load)
Contact fitted	Monostable Reed contact
Electrical connection	Standard plug DIN EN 175301-803
Protection class	IP65 as per IEC EN 60529

Dimensions

	Product	Height X (mm)
	199 190 462	75

Connection wiring diagram



Actuators

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Pneumatic Actuators **516**

Accessories for Pneumatic Actuators **537**

Planning Fundamentals

of Valves and Automation

Electric Actuators

Content

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Smart electric Actuators type dEA 489
Electric multiturn actuators type EAMT 496

Electric Actuators type EA15–250



Product description

The electric actuators type EA15, EA25, EA45, EA120 and EA250 are not only excellent equipped, they also feature very high torques ranging from 20 Nm to 250 Nm. This makes it possible to automate a wide range of valves.

Function

Electric actuators are used to operate valves with a swiveling movement from 90° to 180°. The actuator can be installed on any common valves with an ISO 5211 interface.

The addition of accessories allows the actuator to be used not only as an open/close actuator, but also in continuously controlled operation.

Applications

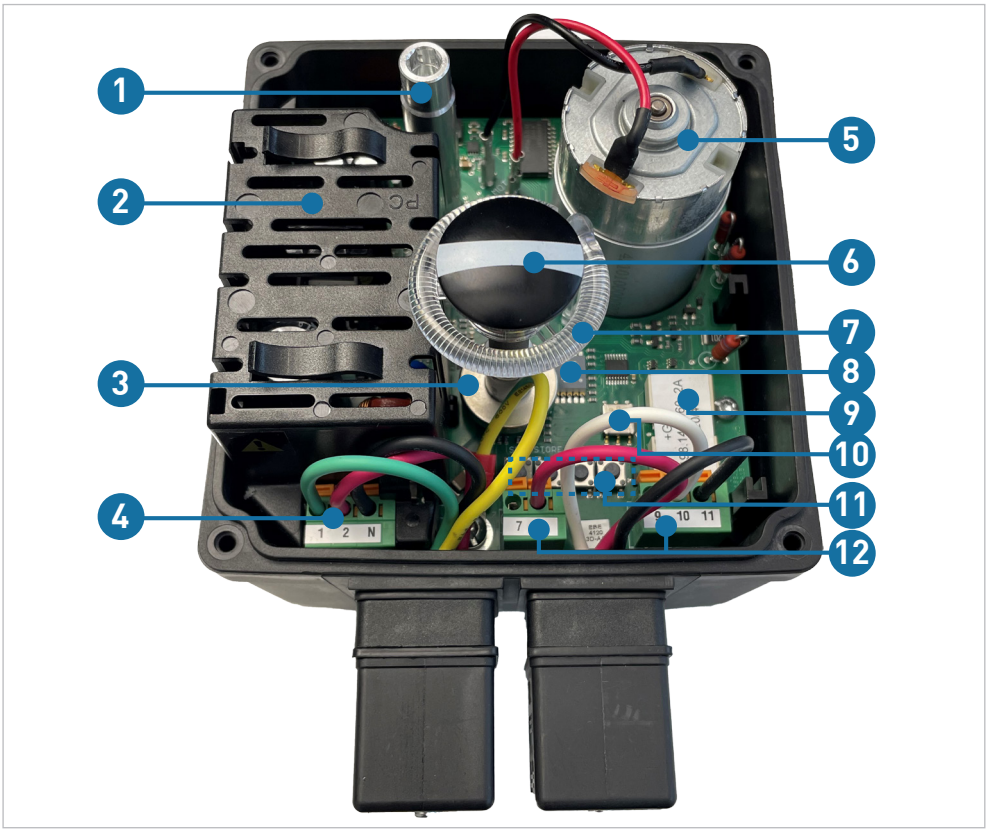
- Chemical process industry
- Water treatment
- Refrigeration

Benefits/features

- Position feedback via relays (open/close/middle)
- Integrated heating element to prevent condensation
- Optical position indicator with LED status monitoring
- Third position between „open“ and „closed“ optional
- Relay output for „ready to operate“ and 7-segment error display
- Integrated emergency manual override with magnetic lock
- Robust PP-GF housing with very good chemical resistance
- Long service life due to robust design and superior electronics
- Flexible configuration thanks to modular concept
- Numerous monitoring and control options
- Simple handling
- Can be used anywhere thanks to universal power supply and standard interfaces

Overview EA15

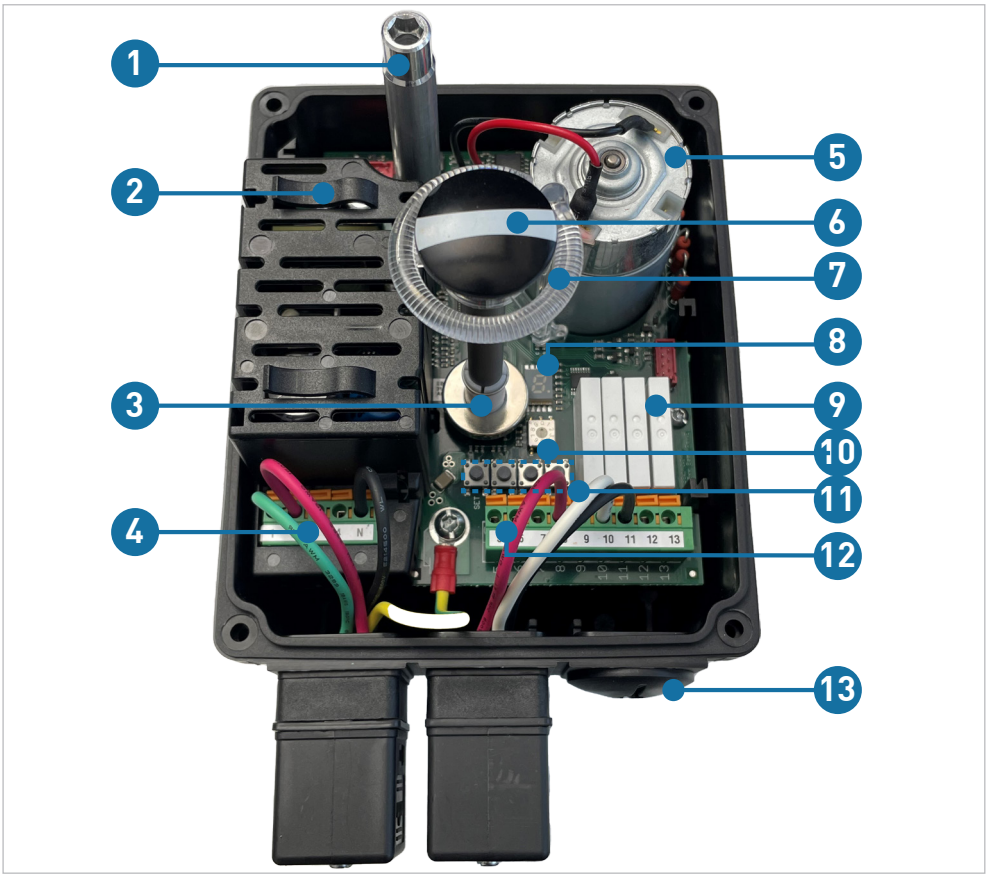
The standard version of the EA15 electric actuator consists of the following elements:



1 Shaft for emergency manual override
2 Power supply unit with contact-protection installed at 230 V version
3 Digital position detection
4 Control for OPEN/CLOSED
5 DC motor
6 Optical position indicator
7 Light tube for LED status feedback
8 7-segment error display
9 Feedback via relay for OPEN/CLOSED
10 Heating element (temperature threshold regulator)
11 Button for end stop adjustment
12 Signal output „ready-to-operate“ connection options for DIN plugs (Standard types only) & Cable glands (Standard & cULus types)

Overview EA25-250

The standard version of the EA25/45/120/250 electric actuator consists of the following elements:



1 Shaft for emergency manual override
2 Power supply unit with contact-protection installed at 230 V version
3 Digital position detection
4 Control for OPEN/CLOSED/MIDDLE position
5 DC motor
6 Optical position indicator
7 Light tube for LED status feedback
8 7-segment error display
9 Feedback via relay for OPEN/CLOSED/MIDDLE
10 Heating element (temperature threshold regulator)
11 Button for end position adjustment
12 Terminal block to connect position feedback"
13 Connection options for DIN plugs (standard types only) or cable glands (standard & cULus types)

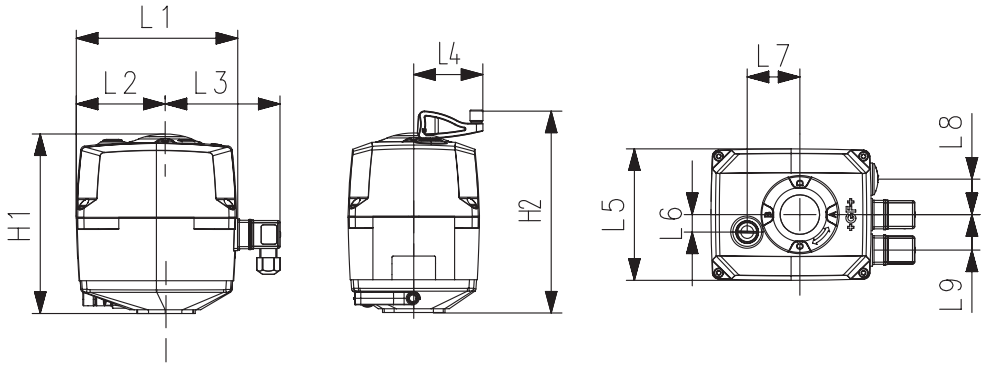
Technical data

Specifications	EA15	EA25	EA45	EA120	EA250
Power input max.*	45 VA	50 VA	70 VA	65 VA	75 VA
Current (calculated)	0.3A at 100V 0.13A at 230V	0.35A at 100V 0.15A at 230V	0.55A at 100V 0.24A at 230V	0.5A at 100V 0.22A v 230V	0.55A at 100V 0.26A at 230V
	1.7A at 24V	1.7A at 24V	2.5A at 24V	2.3A at 24V	2.7A at 24V
Nominal torque Mdn (peak)**	10 (20) Nm	10 (25) Nm	20 (45) Nm	60 (120) Nm	100 (250) Nm
Duty cycle	40% @ 25°C/ 15min	100 %	50 %	50 %	35 %
Cycle time s/90° at Mdn	5 s	7 s	7 s	17 s	23 s
Flange fitting	F05	F05	F05	F07	F07
Tested cycles (at 20 °C and Mdn)	150 000	250 000	100 000	100 000	75 000
Weight	1.9 kg	2.1 kg	2.2 kg	3.3 kg	5.0 kg
Feedback relays	Bistable changeo-ver contacts; max. 2A at 30V DC	Mono-stable change-over contacts Either max 6A @ 230VAC or 24VDC, no mixed voltage potentials allowed!			
Actuating angle	Max. 355°, set to 90°				
Power Supply	AC: 100 – 230 V, 50/60 Hz				
	AC/DC: 24 V, 50/60 Hz				
Supply voltage tolerance	+15 % / -10 %				
Protection class	IP68 per EN 60529*** Designed for wet & dry locations (NEC) Designed for indoor use (UV light may cause discoloration)****				
Pollution degree	Operation: Pollution Level 3 Commissioning (open cover): Only in controlled environments of pollution level 2				
Overload protection	Current/time dependent, resetting				
Overvoltage category	II				
Fuse	Internal: SMD fuse 2 A, not replaceable. Req. external breakers on all live wires: Rated Current: max. 16A Trip Curve: C, Standards Compliance: cUL 489, CSA C22.2 No. 5.1, IEC 60947-2				
Ambient temp.	-10 °C to +50 °C (14°F to 122°F)				
Max. installation altitude	2000m above sea level (AMSL)				
Required connecting cable	AWG 18-16, UL/cUL AWM 4486 min. 125°C 600V				
	Cable glands (UL)	Outside diameter 7-12 mm. Mounting torque: 6-8 Nm. Mounting torque: 7 mm cable diameter: 6 Nm; 8 mm cable diameter: 5.5 Nm; 9 mm cable diameter: 4.2 Nm.			
	DIN-connector	Outside diameter 4-9mm.			
Allowable humidity	Max. 90 % relative humidity, non condensing				
Housing material	Housing: PP-GF (POLYFLAM, RPP 4225 CS1) Inspection glass: Udel P-1700 (CL2611)				

* Only for EA25-250: Operating the electric actuator with a charged battery pack and without using an Ethernet interface card will result in a reduction of the maximum input power of 5VA. EA25: 45VA, EA45: 65VA; EA120: 60VA, EA250: 70VA
** EA15-250 electric actuators meet the requirements for a load profile of more than 30% of the maximum torque according to EN ISO 22153 at rated voltage. According to the standard, the duration of the peak torque is 9% of the rotation cycle.
*** Immersion in water with 1m depth for 2 hours.
**** UL types only

Dimensions

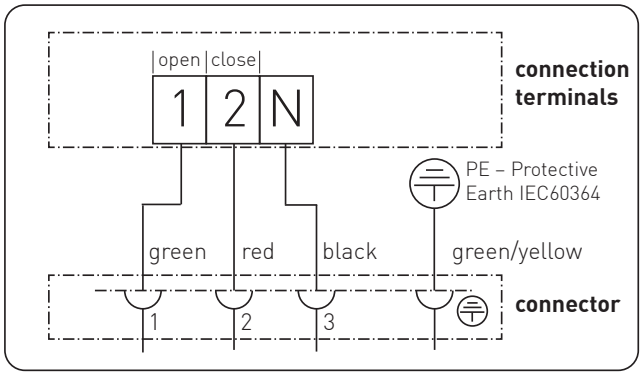
Actuator dimensions



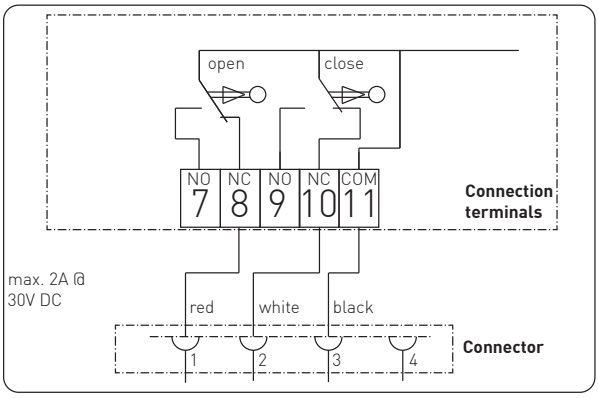
EA	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	L9 (mm)	H1 (mm)	H2 (mm)
EA15	122	83	77	64	122	16	49		33	137	158
EA25	150	83	108	64	122	16	49	33	33	167	189
EA45	150	83	108	64	122	16	49	33	33	167	189
EA120	150	83	108	64	122	16	49	33	33	190	212
EA250	150	83	108	64	122	16	49	33	33	200	221

Connection diagram for standard version

EA15

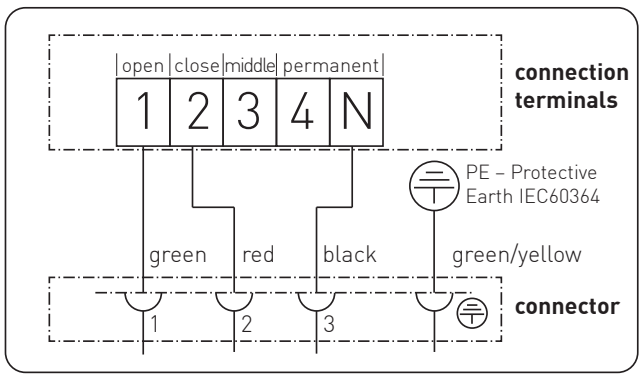


Actuator power

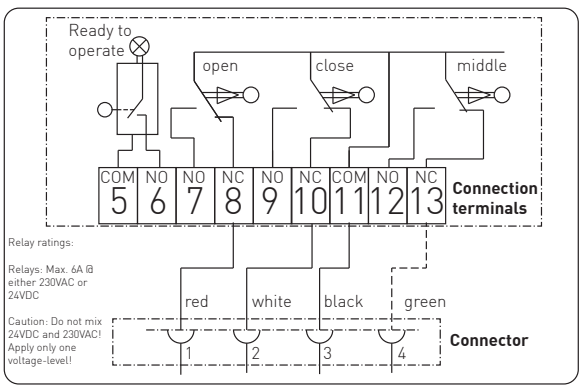


Feedback signals

EA25/45/120/250

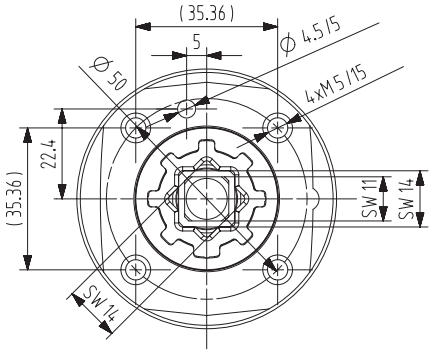
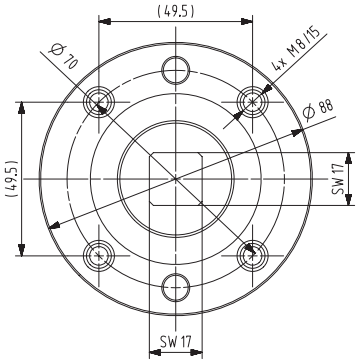
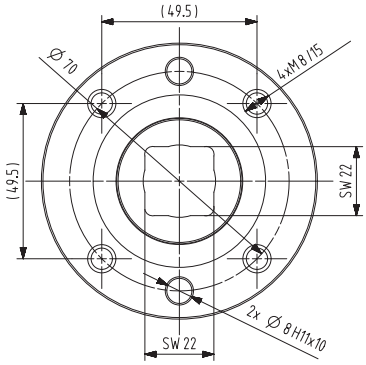


Actuator power



Feedback signals

Flange fitting

EA15-EA45	EA120	EA250
		

Compatibility with valves

The actuators have a standard ISO 5211 interface, and can therefore be mounted on all valves that are provided with this interface and the appropriate torques. The assembly using valves from GF Piping Systems with suitable coupling piece and adapter is possible in accordance with the following table:

Valve type	Nominal diameter (mm)	d (mm)	Nominal diame-ter (inch)	EA15	EA25	EA45	EA120	EA250
								
2-way ball valve Type 546 Pro	DN10-50	20-63	¾"-2"	X	X			
	DN65	75	2½"			X		
	DN80	90	3"			X		
	DN100	110	4"				X	
3-way ball valve Type 543 Pro	DN10-50	20-63	¾"-2"	X	X			
Plastic butterfly valve Type 565	DN50	63	2"			X		
	DN50-125	63-140	2"-5"				X	
	DN150-300	160-315	6"-12"					X
Plastic butterfly valve Type 567/578	DN50-65	63-75	2"-2½"			X		
	DN80-150	90-160	3"-6"				X	
	DN200-300	225-315	8"-12"					X
Metal butterfly valve Type 038/039	DN50-65	63-75	2"-2½"			X		
	DN80-125	90-140	3"-5"				X	
	DN150-300	160-315	6"-12"					X

Electric actuated ball valve types

Type 127

Type 127 ball valves are based on the type 546 Pro ball valve and the EA15 (DN10 – DN50).

Ball valve, electric	Actuator, electric	Ball valve, manually operated	Dimensions	Materials	Standards
Type 127	EA15	Type 546 Pro	DN10 – DN50	PVC-U, PVC-C, PP-h, ABS, PVDF	ISO/DIN, BS ASTM/ANSI,JIS

Type 179 – 184

Type 179 – 184 ball valves are based on the type 546 Pro ball valve and the EA25 (DN10 – DN50), EA45 (DN65 – DN80) or EA120 (DN90 – DN100) electric actuator. The 179 – 184 series is designed for applications with special process requirements.

Ball valve, electric	Actuator, electric	Ball valve, manually operated	Dimensions	Materials	Standards
Type 179	EA25/45/120	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C, ABS	ISO/DIN
Type 180	EA25/45/120	Type 546 Pro	DN10 – DN100	PP	ISO/DIN
Type 181	EA25/45/120	Type 546 Pro	DN10 – DN100	PVDF	ISO/DIN
Type 182	EA25/45/120	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C	ASTM/ANSI
Type 183	EA25/45/120	Type 546 Pro	DN10 – DN100	PVC-U	BS
Type 184	EA25/45/120	Type 546 Pro	DN10 – DN100	PVC-U	JIS

Type 167 – 170

Type 167 – 170 ball valves are based on the type 543 Pro ball valve and the EA25 electric actuator.

Ball valve, electric	Actuator, electric	Ball valve, manually operated	Dimensions	Materials	Standards
Type 167	EA25	Type 543 Pro, horizontal	DN10 – DN50	PVC-U, ABS	ISO/DIN, ATSM/ANSI, JIS
Type 168	EA25	Type 543 Pro, horizontal	DN10 – DN50	PP	ISO/DIN
Type 170	EA25	Type 543 Pro, vertical	DN10 – DN50	PVC-U	ISO/DIN, JIS

Electric actuated butterfly valve types

Type 145 – 147

The type 145 electric butterfly valve is intended for wafer style installation and is adaptable to a variety of applications. With the optional positioner, its functional options range from a simple open/close valve to a precise flow control device.

The type 146/147 electric butterfly valve is intended for lug type or wafer style installation and is adaptable to a variety of applications. With the optional positioner, its functional options range from a simple open/close valve to a precise flow control device.

Butterfly valve, electric	Actuator, electric	Butterfly valve, manually operated	Dimensions	Materials	Standards
Type 145	EA45/120/250	Type 567	DN50 – DN300	All	All standards
Type 146	EA45/120/250	Type 578	DN50 – DN300	All	ISO/DIN
Type 147	EA45/120/250	Type 578	DN50 – DN300	All	ASTM/ANSI

Technical basics

Differentiation of actuators

Compared to the basic EA15 model, the actuator type EA25 has a ready-to-operate signal and a duty cycle of 100 %. The standard version of the EA15 is only equipped with the necessary, but can be complemented with a Fail-safe return unit as an accessory. For the EA25, EA45, EA120 and EA250 is also a monitoring board (with cycle time extension, cycle time monitoring, cycle counter, motor curren monitoring) and positionar as accessories available. In addition the EA45, EA120 and EA250 electric actuators are not only well equipped with extras, but also feature very high torques. This makes it possible to automate a wide range of valves. While the EA45 features a peak torque of up to 45 Nm, the EA120 goes up to 120 Nm, and the EA250 peaks at 250 Nm. All actuators are ideally equipped for all kinds of control tasks. The EA25, EA45, EA120 and EA250 can also be equipped with a Profibus and thus easily be integrated into an existing Profibus network.

Operation

The electric actuators are available in 24 V AC/DC versions as well as versions equipped with a 100 to 230 V DC universal power supply. Since everything is transformed to 24 V within the device, accessories are equally suited for all actuators. The end positions are defined via digital position monitoring. If the actuator is to be placed at a 180° opening angle instead of a 90° opening angle, this can simply be redefined by the buttons on the base board.

Overload protection

The power supply unit for the EA15, EA25, EA45, EA120 and EA250 is equipped with overload protection to protect the DC motor and the power supply circuit board from overheating. The overload protection is activated as soon as the load exceeds the torque range. As soon as the load returns to the allowable torque range and the temperature has dropped, the actuator returns to operation.

Heating element

The integrated heating element prevents condensation or icing inside the housing. It starts heating from a preset value depends on the ambient temperature, at which the actuator is operated, and can be set manually.

By default the heating element starts heating from a device temperature of 0°C and switches off at 5 °C. The switch-on threshold can be set within steps of 5 °C up to 40 °C. Then the heating switches off again at 45 °C.

Safety position

In the event of power outage, the actuator remains in whatever position it is in at the time. If in this case the actuator is equipped with the „failsafe return unit“ accessory, it automatically returns to a previously defined safe position (OPEN/CLOSE).

Handling

Installation notes

- If the actuator is connected directly to the power supply, an isolating switch must be installed on site (do not disconnect the ground cable). The wire gauge of the supply line must be between 0.75mm2 and 1.5 mm2. To prevent water from penetrating into the actuator, make sure that the cable entry is not facing upward.
- The EA25/45/120/250 actuators are equipped with healthy monitoring (ready-to-operate signal).
- When the actuator is first swiched on, the power supply capacitor charging may cause current surges for a few microseconds.
- Don’t switch power off in end positions. Use e.g. changeover contacts.
- For EA25/45/120/250 only: Actuators must be permanently powered to maintain feedback (otherwise feedback relay will be de-engergized).

Maintenance notes

- Inspect regularly to ensure all housing screws are properly installed.
- Ensure that the emergency override cover is installed.
- Check whether the control signal and the visual display match, if not, readjust the end positions.

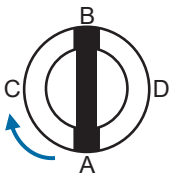
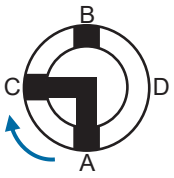
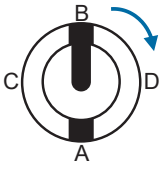
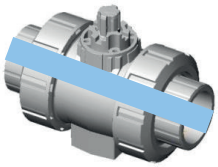
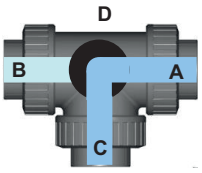
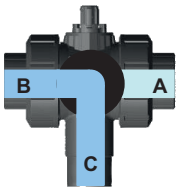
! Installation and maintenance must be performed as specified in the installation manual. The document is provided with the product, see also the online catalog at www.gfps.com

Installation tips

- Max. connection wire gauge: 1.5 mm^2; Min. connection wire gauge 0.75mm^2
- Fuse rating: > 6 A
- Install control and signal lines in separate cable conduits

Position indicator

The position indicator shows the valve position. The valve positions can be read on the fitted cover. When the cover is fitted, the following image can be seen (Example ball valve):

	2-way	3-way horizontal (L)	3-way vertical (L)
Image of position indicator in valve position 1			
Valve function			
Actuating angle	0° - 90°	0° - 90°	0° - 180°
Valve position 1	A – B (OPEN) See image	A – C (Flow right side, outlet to the front) See image	B – C (Flow left side, bottom outlet) See image
Valve position 2	C – D (CLOSE)	B – C (Flow left side, outlet to the front)	A – C (Flow right side, bottom outlet)

By teaching in a „Middle position“ different possibilities can be achieved depending on the valve and the application. For example:

- 2-way ball valve: Middle position describes a position, permitting no 100% flow but for instance only half as strong.
- 3-way ball valve: Middle position describes a position of the ball in which both passages are slightly opened.
- 3-way ball valve: Middle position describes a position of the ball which closes both passages.

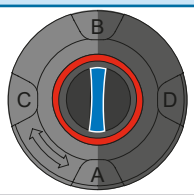
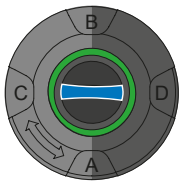
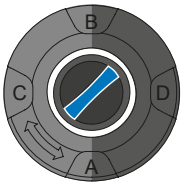
Ball valve and ball-type	3-way horizontal (L-ball)	3-way horizontal (L-ball)	3-way vertikal (L-ball)
Function of the middle position	CLOSE (on both sides no flow)	„Mixing“ (both passages slightly opened)	CLOSE (on both sides no flow)
Actuating angle	0° – 180°	0° - 90°	0° - 180°
Position 1 Position 2 Position 3	A – C (OPEN right) B – C (OPEN left) 90° B – D (CLOSE) 180°	A – C (OPEN right) A/C – B/C (partly opened) 45° B – C (OPEN left) 90°	B (-C) (OPEN left) (C-) D (CLOSE) 90° A (-C) (OPEN right) 180°

(Function of the middle position as „Mixing“ with the 3-way ball valve vertical is only possible with the T-ball)

LED status feedback

The LED status feedback shows the valve positions and the current status of the actuator.

The following table shows the color assignment of the LED:

Color	Meaning	
Red	Open	
Green	Closed	
White	Middle	
Flashes white	Actuator moves	
Flashes yellow	Error	
Flashes blue	Adjustment mode	
Green/yellow	Setpoint value reached (at positioner)	
Turquoise	Adjustment run / operation of colour inversion	

If the plant standard requires an inversion of the color assignment, the customer can adjust this afterwards.

Accessories

Designation	Function	Code No.	Compatibility
Fail-safe return unit with integrated battery pack	In case of a power outage, the fail-safe return unit can be used to move to a preset safe position (OPEN/CLOSE). Assembly in the housing actuator	199 190 610 199 190 601	EA15 EA25-250
External fail-safe return unit	In case of a power outage, the fail-safe return unit can be used to move to a preset safe position (OPEN/CLOSE). Voltage supply (24 V DC) implemented externally	199 190 611 199 190 604	EA15 EA25-250
Positioner	For continuous control operation (4-20 mA / 0-10 V)	199 190 603	EA25-250
Monitoring	For monitoring control time and motor current, as well as for extending the control times and counting the control cycles (even without bus system) via a collective alarm	199 190 602	EA25-250
Profibus	For integrating the actuator into a Profibus DP network	199 190 605	EA25-250
Diagnostic tool	For reading various data for a first error diagnosis via USB	199 190 600	
AS-Interface module ASEV 2400	Connection to an AS-i network (supply in combination with limit switch kit)	199 190 562	
Adapter SW 11 for F04	Modification for valves with F04 interface	198 000 587	
Adapter SW 14 for F05	Modification for valves with F05 interface	198 204 057	
Reducer bushing WS 11 for F05	Adjustment for valves with F05 interface and wrench size 11	198 803 145	
Standard plug set	For the connection of accessories	198 000 502	
Plug set 4 pin	For connection of MIDDLE position feedback	199 190 606	EA25-250
EA Demo Box	Box to demonstrate all functions of EA	199 190 607	
Display 2-way	Optical position display for 2-way valve (10 pcs)	199 190 612	
Display 3-way “L” horizontal	Optical position display for 3-way valve (10 pcs)	199 190 613	EA25-250
Display 3-way “T” horizontal	Optical position display for 3-way valve (10 pcs)	199 190 614	EA25-250
Display 3-way “L” vertical	Optical position display for 3-way valve (10 pcs)	199 190 615	EA25-250
Display 3-way “T” vertical	Optical position display for 3-way valve (10 pcs)	199 190 616	EA25-250
Modbus RTU Interface Card	Modbus RTU Interface board for Electric Actuators Type EA25 - EA250	199 190 617	EA25-250
Modbus TCP Interface Card	Modbus TCP Interface board for Electric Actuators Type EA25 - EA250	199 190 660	EA25-250
EtherNet/IP Interface Card	EtherNet/IP Interface board for Electric Actuators Type EA25 - EA250	199 190 661	EA25-250
PROFINET Interface Card	PROFINET Interface board for Electric Actuators Type EA25 - EA250	199 190 662	EA25-250
M12 Ethernet Adapter Set	Ethernet adapter set for version with M12 connector	199 190 663	EA25-250

i For further information on accessories, refer to “Accessories for Electrical Actuators”, and the online product catalog at www.gfps.com

Smart electric Actuators type dEA



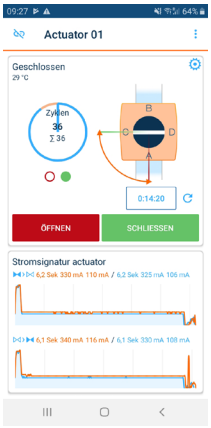
Product description

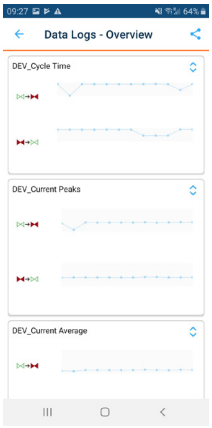
The smart electric actuator dEA is the first product that can be controlled fully by an app. Furthermore it is not only smart and excellently equipped, it also features very high peak torques ranging from 25 Nm to 250 Nm. Therefore, it is able to automate a wide range of valves.



Function

Electric actuators are used to operate valves with a rotating angle from 90° to 180°. The smart actuators dEA can be installed on any common valves with interface according to ISO 5211. Thanks to the app you can access the actuator via Smarthphone - to read data, for control or for system diagnosis. Operating data such as the number of cycles or current drawn is available directly in the app.





Applications

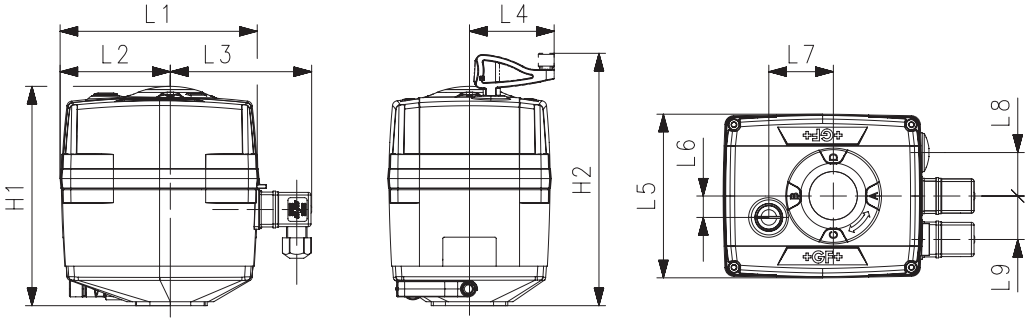
- Chemical process industry
- Water treatment
- Refrigeration

Benefits/features

- Connectivity via NFC and Wi-Fi Direct ensuring control, identification and visibility without opening the case
- Most relevant asset data visualized in the app
- Connection and control via app possible
- LED stripe for visual open/close 360° feedback
- Heating element
- Position feedback (Open/Close/ Middle)
- Optical position indicator with
- LED status monitoring
- Third position between „OPEN“ and „CLOSE“ optional
- Relay output „ready to operate“
- Integrated emergency manual override with magnetic lock
- Robust PP-GF housing with very good chemical resistance
- Flexible configuration thanks to modular concept

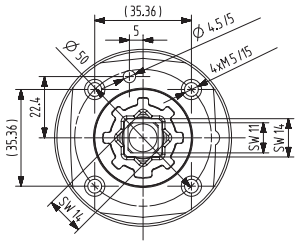
Dimensions

Actauator dimensions

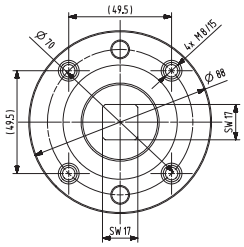


EA	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	L9 (mm)	H1 (mm)	H2 (mm)
dEA25	150	82.5	107	64.3	122	16	49	33	33	167	188
dEA45	150	82.5	107	64.3	122	16	49	33	33	167	188
dEA120	150	82.5	107	64.3	122	16	49	33	33	190	212
dEA250	150	82.5	107	64.3	122	16	49	33	33	200	221

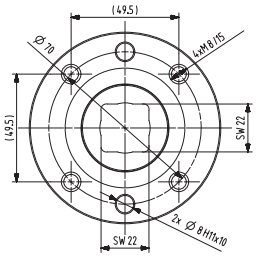
dEA25-45



dEA120

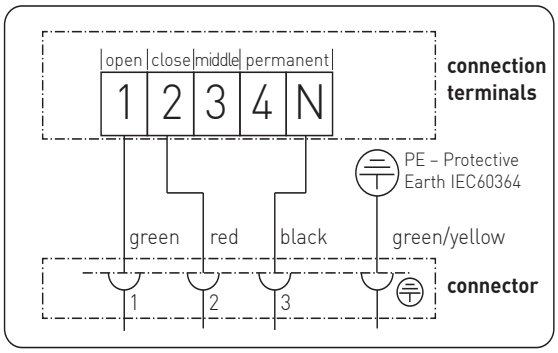
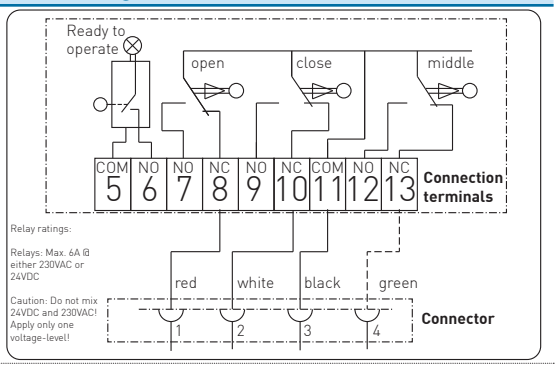


dEA250



Connection diagram for standard version

For a proper use of the Actuator with standard functions, you can use the following connection diagrams:

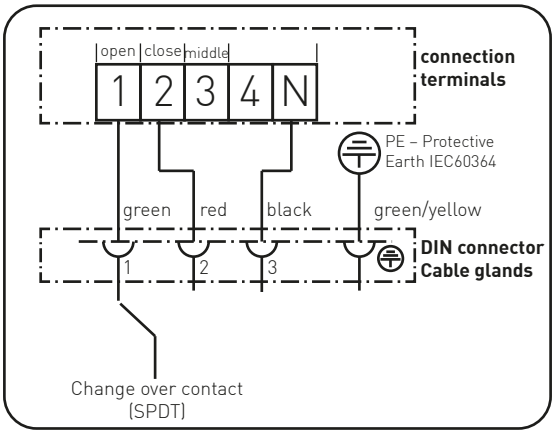
	Actuator activation	Feedback signals
Connection diagram		

Connection diagram for using the smart functions

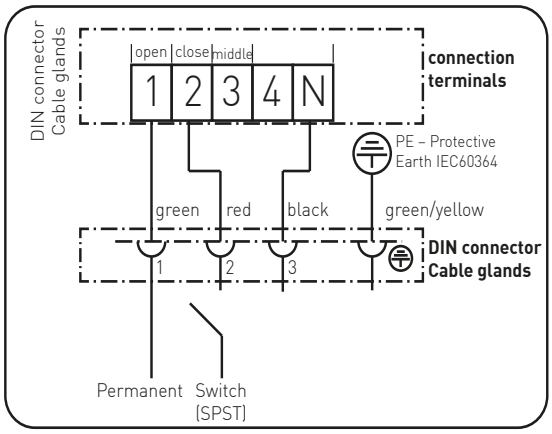
For a proper use of the Actuator with smart functions, you can use the following connection schemes:

Possibility 1

Connection diagram

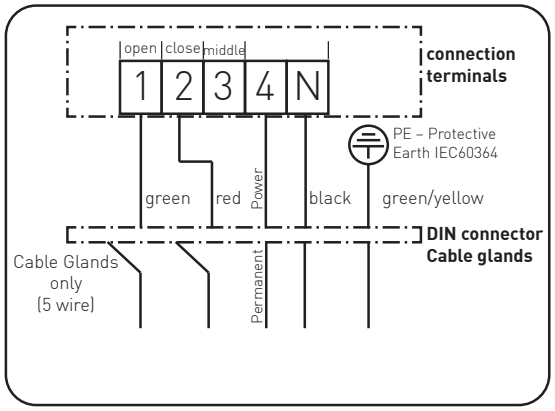


Possibility 2



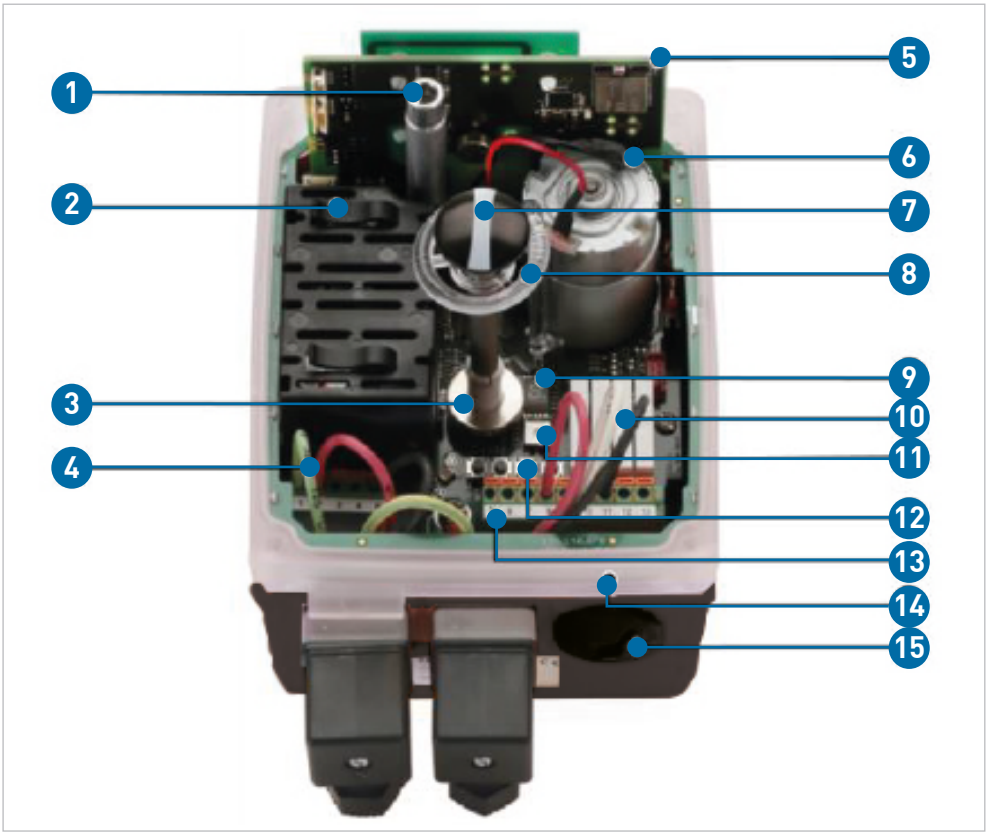
Possibility 3

Connection diagram



Technical data

The standard version of the dEA25/45/120/250 electric smart actuator consists of the following elements:



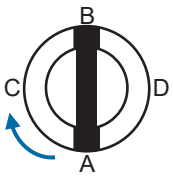
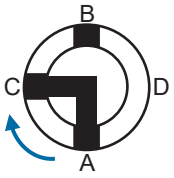
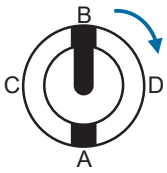
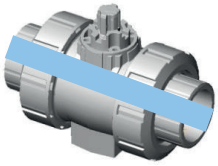
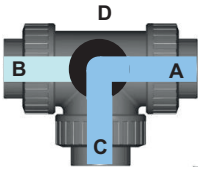
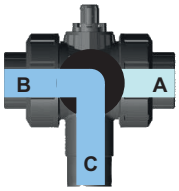
1 Shaft for emergency manual override
2 Power supply unit with contact-protection installed at 230 V version
3 Digital position detection
4 Control for OPEN/CLOSED/MIDDLE position
5 Smartboard with NFC and Wi-Fi direct interface
6 DC motor
7 Optical position indicator
8 Light tube for LED status feedback
9 7-segment error display
10 Position feedback via relay for OPEN/CLOSED/MIDDLE
11 Heating element (temperature threshold regulator)
12 Button for end position adjustment
13 Terminal block to connect position feedback"
14 360° visible LED
15 Connection options for DIN plugs or cable glands

Specification		
	dEA25	2-way ball valve type 546 Pro up to DN50
		3-way ball valve type 543 up to DN50
	dEA45	2-way ball valve type 546 Pro up to DN65
		Butterfly valve types 567 and 578, types 038 and 039 up to DN65
	dEA120	2-way ball valve type 546 Pro up to DN80/DN100
		Butterfly valve types 567 and 578, types 038 and 039 up to DN80-DN200
	dEA250	Butterfly valve types 567 and 578, types 038 and 039 up to DN250-DN300
Rated voltage	AC	100 – 230 V, 50/60 Hz
	AC/DC	24 V, 50/60 Hz
Rated voltage tolerance	± 15%	
Protection class	IP 65 (IP67)[1)] per EN 60529 Designed for wet & dry locations (NEC), designed for indoor use (UV light may cause discoloration)	
Contamination level	2 according to EN 61010-1	
Overload protection	Current/time-dependent (resetting)	
Overvoltage category	II	
Ambient temperature	-10 °C to +50 °C (14°F to +122°F)	
Max. installation altitude	2'000m above sea level (AMSL)	
Allowable humidity	Max. 90 % relative humidity, non-condensing	
Housing material	PP GF for very good chemical resistance	

	dEA25	dEA45	dEA120	dEA250
Rated output	AC: 35 VA at 100 – 230 V	AC: 55 VA at 100 – 230 V	AC: 50 VA at 100 – 230 V	AC: 60 VA at 100 – 230 V
	AC/DC: 40 VA at 24 V	AC/DC: 60 VA at 24 V	AC/DC: 55 VA at 24 V	AC/DC: 65 VA at 24 V
Rated torque Mdn. (peak)	10 (25)	20 (45)	60 (120)	100 (250)
Duty cycle at 25 °C / 15 min	100 %	50 %	50 %	35 %
Cycle time s/90° at Mdn.	5 s	6 s	15 s	20 s
Mechanical connection	F05	F05	F07	F07
Tested cycles (at 20 °C and Mdn.)	250'000	100'000	100'000	75'000
Weight	2,1 kg	2,2 kg	3,6 kg	5 kg
Actuating angle	Max. 355°, set to 90°			

Position indicator

The position indicator shows the valve position. The valve positions can be read on the fitted cover. When the cover is fitted, the following image can be seen (Example ball valve):

	2-way	3-way horizontal (L)	3-way vertical (L)
Image of position indicator in valve position 1			
Valve function			
Actuating angle	0° - 90°	0° - 90°	0° - 180°
Valve position 1	A – B (OPEN) See image	A – C (Flow right side, outlet to the front) See image	B – C (Flow left side, bottom outlet) See image
Valve position 2	C – D (CLOSE)	B – C (Flow left side, outlet to the front)	A – C (Flow right side, bottom outlet)

By teaching in a „Middle position“ different possibilities can be achieved depending on the valve and the application. For example:

- 2-way ball valve: Middle position describes a position, permitting no 100% flow but for instance only half as strong.
- 3-way ball valve: Middle position describes a position of the ball in which both passages are slightly opened.
- 3-way ball valve: Middle position describes a position of the ball which closes both passages.

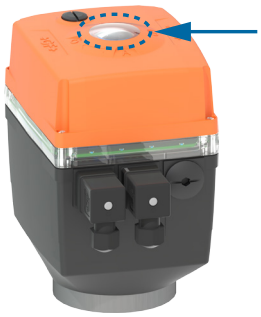
Ball valve and ball-type	3-way horizontal (L-ball)	3-way horizontal (L-ball)	3-way vertikal (L-ball)
Function of the middle position	CLOSE (on both sides no flow)	„Mixing“ (both passages slightly opened)	CLOSE (on both sides no flow)
Actuating angle	0° – 180°	0° - 90°	0° - 180°
Position 1 Position 2 Position 3	A – C (OPEN right) B – C (OPEN left) 90° B – D (CLOSE) 180°	A – C (OPEN right) A/C – B/C (partly opened) 45° B – C (OPEN left) 90°	B (-C) (OPEN left) (C-) D (CLOSE) 90° A (-C) (OPEN right) 180°

(Function of the middle position as „Mixing“ with the 3-way ball valve vertical is only possible with the T-ball)

LED status feedback

The LED status feedback shows the valve positions and the current status of the actuator.

The following table shows the colour assignment of the LED:



Color	Meaning
Red	Open
Green	Closed
White	Middle
Flashes white	Actuator moves
Flashes yellow	Error
Flashes blue	Adjustment mode
Green/yellow	Setpoint value reached (at positioner)
Turquoise	Adjustment run / operation of color inversion

If the plant standard requires an inversion of the colour assignment, the customer can adjust this afterwards.

Ordering information

DN (mm)	Code	Type	Spannung	Torque max.	Acc. to ISO 5211	Product picture
50	198 153 194	dEA45	AC 100-230V	45 Nm	F05* (WS 11/14)	
50	198 153 195	dEA45	AC/DC 24V	45 Nm	F05* (WS 11/14)	
50 - 125	198 153 196	dEA120	AC 100-230V	120 Nm	F07 (WS17)	
50 - 125	198 153 197	dEA120	AC/DC 24V	120 Nm	F07 (WS17)	
150 - 300	198 153 198	dEA250	AC 100-230V	250 Nm	F07 (WS17)	
150 - 300	198 153 199	dEA250	AC/DC 24V	250 Nm	F07 (WS17)	

Accessories

- Failsafe return unit
  Battery incorporated into the housing for moving to a safe position in case of power outage (open or closed).

i For further information on accessories, refer to Planning Fundamentals, chapter on “Accessories for Electrical Actuators”, and the online product catalog at www.gfps.com

Electric multiturn actuators type EAMT



Product description

The EAMT electric multiturn actuator opens and closes the diaphragm valve fully automatic. Therefore with the EAMT actuator, volume flows are automatically controlled, closed and regulated via a diaphragm valve.

Applications

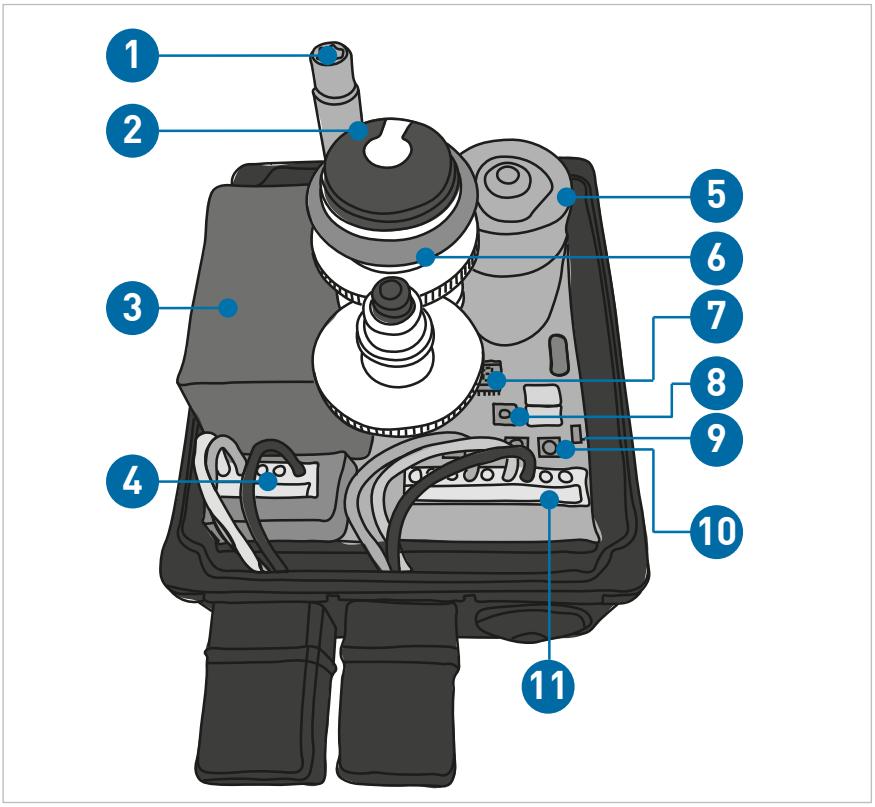
- Chemical process industry
- Microelectronics
- Water treatment
- Cooling
- Control applications

Benefits/features

- Multiturn actuator
- Adjustable integrated heating
- 7-segment error display
- Position feedback (open/close)
- Fully automatic end position teach-in
- Integrated emergency manual override
- Retrofit set includes: Conversion kit with drive, half shells and screws

Technical data

The standard version of the EAMT electric actuator consists of the following elements:



1 Shaft for emergency manual override
2 Power supply with cover
3 Control power for OPEN/CLOSED position
4 Optical position indicator
5 DC motor
6 Light tube for LED status feedback
7 7-segment error display
8 Heating element (temperature threshold regulator)
9 Switch for diaphragm material
10 Buttons for end position adjustment
11 Terminal block to connect position feedback

Specification EAMT	
Power input max.	65 VA
Current (calculated)	0.55A at 100V 0.24A at 230V
	2.5A at 24V
Power Supply	AC: 100 – 230 V, 50/60 Hz
	AC/DC: 24 V, 50/60 Hz
Supply voltage toler-ance	-10%...+15%
Mechanical interface	F05* (WS 11/14)
Duty cycle	50 %
Cycle time open/close	DN25: ≈ 85 sec. DN50: ≈ 130 sec.
Tested cycles (at 20 °C and Mdn)	5'000
Weight	2.2 kg / 4.85 lbs
Actuating angle	Multiturn
Protection class	IP 65 (IP67)[1)] per EN 60529 Designed for wet & dry locations (NEC), designed for indoor use (UV light may cause discoloration)
Pollution degree	Operation: Pollution Level 3 Commissioning (open housing cover): Only in controlled environments of pollution level 2
Overload protection	Current/time dependent, resetting

Specification EAMT	
Overvoltage category	II
Fuse	Internal: SMD fuse 2 A, not replaceable. Req. external breakers on all live wires: Rated Current: max. 16A Trip Curve: C, Standards Compliance: UL489, CSA C22.2 No. 5.1, IEC 60947-2
Ambient temp.	-10 °C to +50 °C (14°F to 122°F)
Max. installation altitude	2'000m above sea level (AMSL)
Feedback relays	Mono-stable change-over contacts Either max 6A @ 230VAC or 24VDC, no mixed voltage potentials allowed!
Recommended connecting cable	AWG 18-16, UL/cUL AWM 4'486 min. 125°C 1000V , outside diameter 8-13mm (cable glands), 4-9mm (DIN-connectors)
Allowable humidity	Max. 90 % relative humidity, non-condensing
Housing material	Housing: PP-GF (POLYFLAM, RPP 4225 CS1) Inspection glass: Udel P-1700 (CL2611) Assembly shells and intermediate elements: PPGF 30

[1)] When used with cable glands and vertical installation.

Technical basics

Operation

The electric actuators are available in 24 V AC/DC versions as well as versions equipped with a 100 to 230 V DC universal power supply. Since everything is transformed to 24 V within the device, accessories are equally suited for all actuators. The end positions are teached-in fully automatic.

Overload protection

The power supply unit for the EAMT is equipped with overload protection to protect the DC motor and the power supply circuit board from overheating. The overload protection is activated as soon as the load exceeds the torque range. As soon as the load returns to the allowable torque range and the temperature has dropped, the actuator returns to operation.

Heating element

The integrated heating element prevents condensation or icing inside the housing. It starts heating from a preset value depends on the ambient temperature, at which the actuator is operated, and can be set manually.

By default the heating element starts heating from a device temperature of 0°C and switches off at 5 °C. The switch-on threshold can be set within steps of 5 °C up to 40 °C. Then the heating switches off again at 45 °C.

Safety position

In the event of power outage, the actuator remains in whatever position it is in at the time. If in this case the actuator is equipped with the „failsafe return unit“ accessory, it automatically returns to a previously defined safe position (OPEN/CLOSE).

Handling

Installation notes

- If the actuator is connected directly to the power supply, an isolating switch must be installed on site (do not disconnect the ground cable). The wire gauge of the supply line must be between 0.75mm² and 1.5 mm². To prevent water from penetrating into the actuator, make sure that the cable entry is not facing upward.
- The EAMT actuators are equipped with healthy monitoring (ready-to-operate signal).
- When the actuator is first swiched on, the power supply capacitor charging may cause current surges for a few microseconds.
- Don't switch power off in end positions. Use e.g. changeover contacts.
- Actuators must be permanently powered to maintain feedback (otherwise feedback relay will be de-engergized).

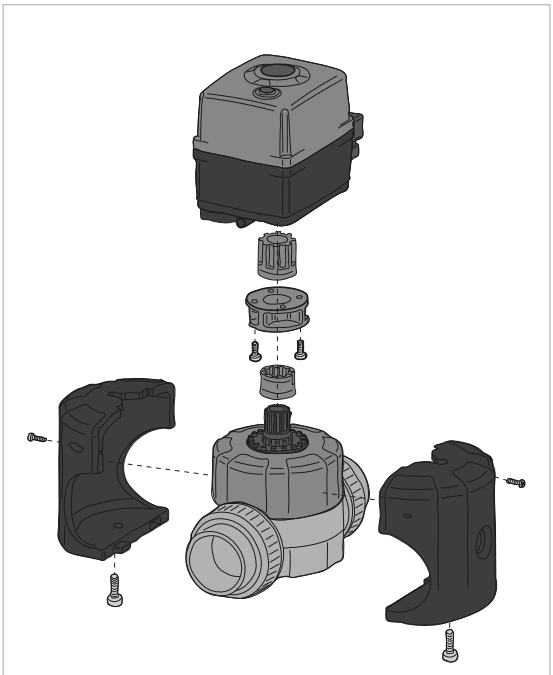
Maintenance notes

- Inspect regularly to ensure all housing screws are properly installed.
- Ensure that the emergency override cover is installed.
- Check whether the control signal and the visual display match, if not, readjust the end positions.

! Installation and maintenance must be performed as specified in the installation manual. The document is provided with the product, see also the online catalog at www.gfps.com

Installation tips

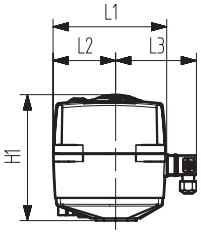
- Max. connection wire gauge: 1.5 mm^2; Min. connection wire gauge 0.75mm^2
- Fuse rating: > 6 A
- Install control and signal lines in separate cable conduits

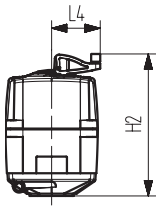


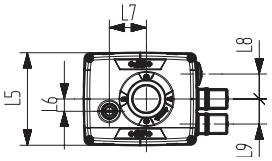
Kit with actuator, half shells and screws

Dimensions

Actuator dimensions

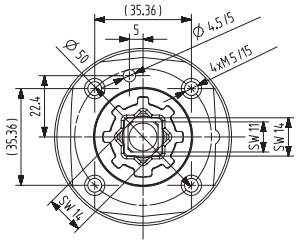






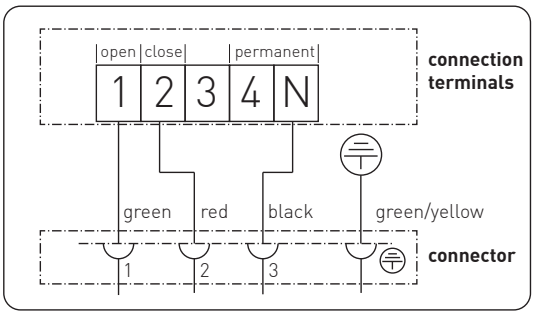
	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	L9 (mm)	H1 (mm)	H2 (mm)
EAMT	150	83	108	64	122	16	49	33	33	167	189

Interface dimensions

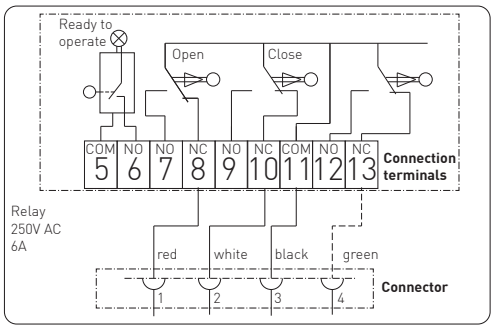


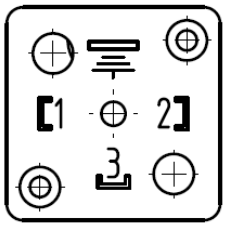
Connection diagram

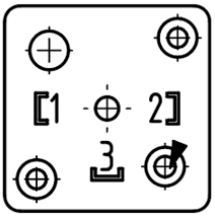
Connector 1: supply and control



Connector 2: position feedback



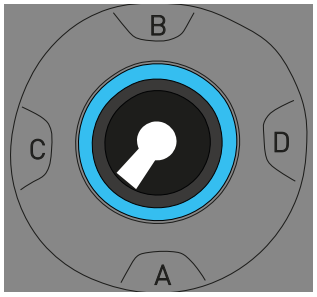




LED status feedback

The LED status feedback shows the valve positions and the current status of the actuator.

The following table shows the colour assignment of the LED:



Color	Meaning
Red	OPEN position*
Green	CLOSE position*
Flashes white	Actuator moves
Flashes yellow	Fault
Green/yellow	Setpoint value reached (at positioner)
Turquoise	Adjustment run / operation of color in-version
Blue/red	Teach OPEN position
Blue/green	Teach CLOSE position

*Factory color settings.

Accessories

- Fail-safe return unit with integrated battery pack
- External fail-safe return unit
- Positioner 4-20 mA
- EA Demo Box

i For further information on accessories, refer to the online product catalog at www.gfps.com

Planning Fundamentals

of Valves and Automation

Accessories for Electric Actuators

Content

Overview accessories for electric actuators 504
Ethernet Interface Card EA25-250 505
Profibus DP module for EA25–250 507
Failsafe return unit with battery for EA15 and EA25–250 509
Failsafe return unit for external voltage supply for EA15 and EA25–250 510
Positioner for EA25–250 511
Monitoring board for EA25–250 512
AS interface 515

Overview accessories for electric actuators

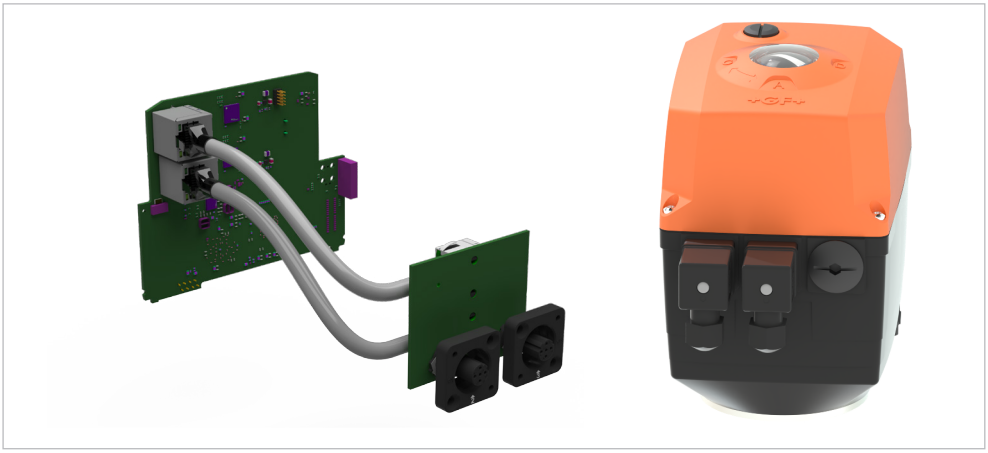
The accessories for the electric actuators can be retrofitted by the end user at any time. The installation of the accessory boards is easily done via plug-in cards in the housing of the standard actuator. All accessories can be used for the actuator version 24 V DC/AC, as well as the actuator version with 100 to 230V AC.

Compatibility of actuator type with accessories

✓ Available
x Not available

	EA15	EA25, EA45, EA120, EA250
Heating element	Integrated (standard)	Integrated (standard)
Failsafe return unit integrated or extenal	✓	✓
End position feedback (open/closed/middle)	Integrated (standard)	Integrated (standard)
Middle position	x	Integrated (standard)
Positioner	x	✓
Monitoring board with full set of modules	x	✓
AS interface module	✓	✓
Profibus DP	x	✓
Modbus TCP	x	✓

Ethernet Interface Card EA25-250



Product description

EA25-250 electric actuators can be equipped with an Ethernet interface. Different boards are available for Modbus, PROFINET and EtherNet/IP.

In addition, an adapter card can be used for connection with M12 connectors.

The following Ethernet Interface Cards for electric actuators are available

Ethernet type	Description	Type	Order code
Modbus TCP	Modbus TCP EA25-250 Ethernet Interface Card	EA25, EA45, EA120, EA250 (24 VAC/DC & 100-230 VAC)	199 190 660
PROFINET	PROFINET EA25-250 Ethernet Interface Card	EA25, EA45, EA120, EA250 (24 VAC/DC & 100-230 VAC)	199 190 662
EtherNet/IP	EtherNet/IP EA25-250 Ethernet Interface Card	EA25, EA45, EA120, EA250 (24 VAC/DC & 100-230 VAC)	199 190 661

Connection variants

Connection variant	Description	Type	Order code
Cable glands	Standard connection via cable glands	EA25, EA45, EA120, EA250 (24 VAC/DC & 100-230 VAC)	-
M12 Ethernet Adapter Set	Optional adapter set for connection via M12 connectors	EA25, EA45, EA120, EA250 (24 VAC/DC & 100-230 VAC)	199 190 663

Command overview (selection)

Signal type	Description
Actuator position	Stop
	OPEN
	CLOSED
	MIDDLE
	Positioner
	Desired actuator position
Digital input	Actuator moving
	Position OPEN
	Position CLOSED
	Position MIDDLE
	Measured actuator position
	Remote control selected
	Monitoring relay
	Motor current
	Internal temperature
Actuator mainboard feedback	Low power voltage
	Overtemperature active
	Cycle time expired
	Motor protection active
	Thermostat triggered
	Heater failed
	Position detection failed
	Actuator position invalid
	Teaching mode active
	Emergency manual active
	Accessory failure
Actuator accessory feedback	Fail-safe active
	Battery active
	Fail-safe time exceeded
	Battery weak
	Battery failure
	Activation of cycle time extension
	Cycle time extension
	Activation of cycle time monitoring
	Limit cycle time monitoring
	Activation cycle counter
	Limit cycle counter
	Activation of motor current monitoring
	Motor current limit
	Cycle time extension active
	Cycle time monitoring active
	Cycle time monitoring exceeded
	Cycle counter active
	Cycle counter exceeded
	Motor current monitoring active
	Motor current exceeded
	Watchdog recovery

Profibus DP module for EA25–250



General

Profibus is realized via an accessory board and M12 plug adapter. The actuator in a Profibus network can be looped through or used as an end position via a termination resistor.

- Profibus DP V0
- Baud rate 9'600 – 1.5M
- Connector: M12 (male & female for daisy chain)
- Power supply via standard device plug

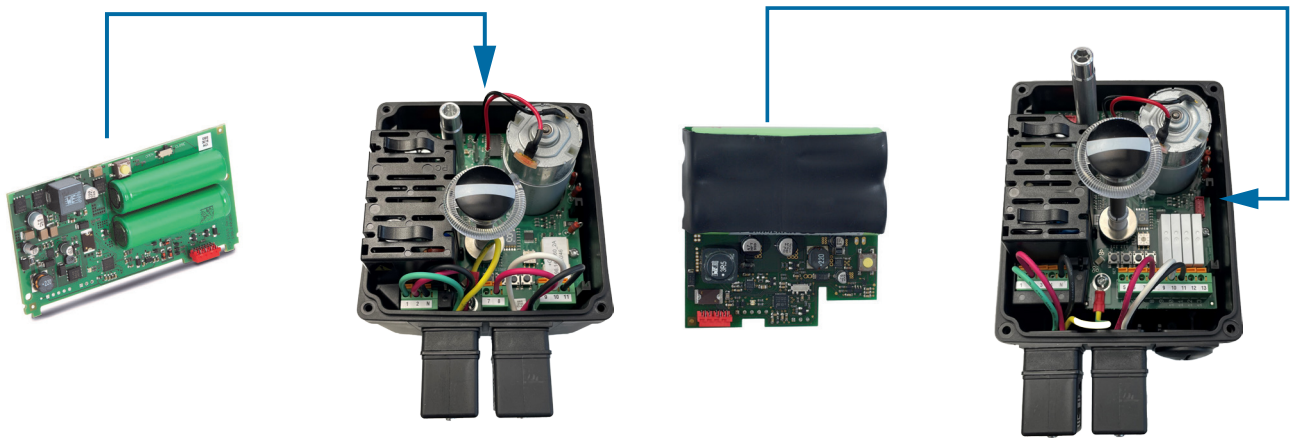
Profibus commands

Signal type	Description	Parameter
Digital output	Stop	
(command)	OPEN	
	CLOSED	
	MIDDLE	
	Positioner	
	Desired actuator position	0 – 100 % of the end position
Digital input	Actuator moving	
(feedback)	Position OPEN	
	Position CLOSED	
	Position MIDDLE	
	Measured actuator position	0 – 100 % of the end position
	Remote control selected	
	Monitoring relay	
	Motor current	0-2'000 mA
	Internal temperature	0-100° C
Feedback from basic board	Low power voltage	
	Overtemperature active	
	Cycle time expired	
	Motor protection active	
	Thermostat triggered	
	Heater failed	
	Position detection failed	
	Actuator position invalid	
	Teaching mode active	
	Emergency manual active	
	Accessory failure	

Signal type	Description	Parameter
Accessories		
Fail-safe return (Failsafe return unit)	Fail-safe active	
	Battery active	
	Fail-safe time exceeded	
	Battery weak	
	Battery failure	
Monitoring (monitoring card)		
Digital output	Activation of cycle time extension	
(command)	Cycle time extension	0 ... 9
	Activation of cycle time monitoring	
	Limit cycle time monitoring	0 ... 9
	Activation cycle counter	
	Limit cycle counter	0 ... 9
	Activation of motor current monitoring	
	Motor current limit	0 ... 9
Digital input		
(feedback)	Cycle time extension active	
	Cycle time monitoring active	
	Cycle time monitoring exceeded	
	Cycle counter active	
	Cycle counter exceeded	
	Motor current monitoring active	
	Motor current exceeded	
Profibus		
Digital input	Watchdog recovery	
(feedback)	.	

Failsafe return unit with battery for EA15 and EA25–250

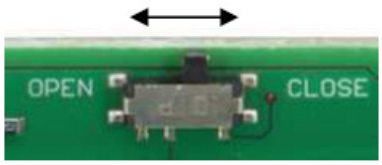
EA15	EA25 - 250

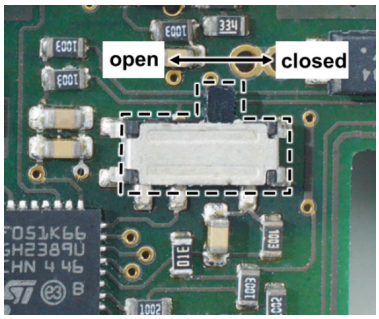


General

The failsafe return unit works with the actuator type EA15 and EA15 – 250 and is plugged into the base board and also fixed in place by the cover when installed. The failsafe return unit already includes the required battery; no external wiring is necessary. The failsafe return unit of the type EA15 and EA15 – 250 is a different construction.

In case of a failure of the supply voltage, the battery is electronically switched on automatically after 5 s. With the selector switch on the board, the functions “Move to CLOSED position” or “Move to OPEN position” can be selected.

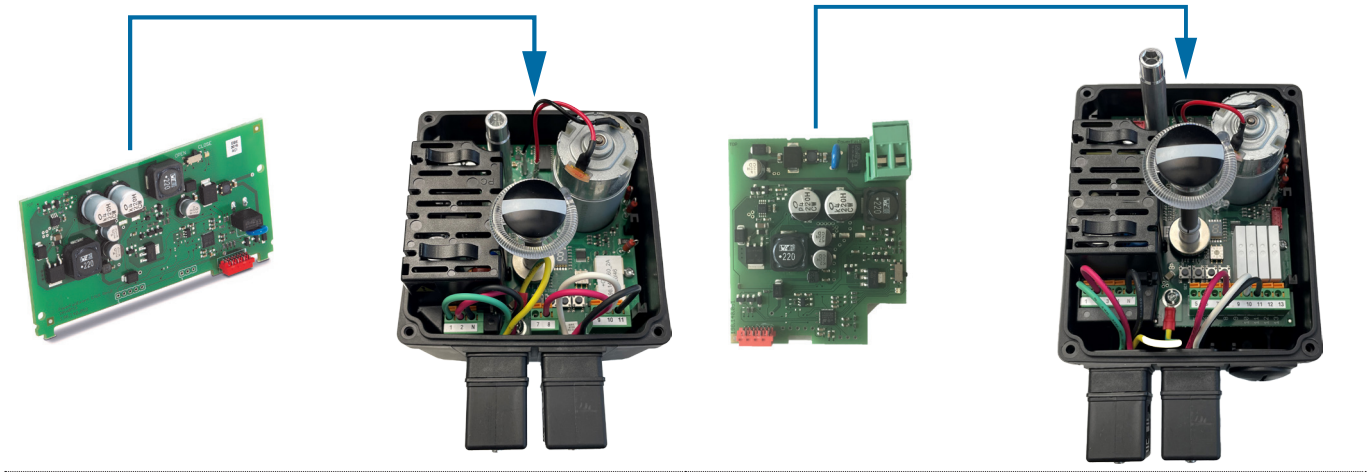
EA15	Switch position	Function
	Switch left	Actuator moves to **open** (counterclockwise)
	Switch right	Actuator moves to **closed** (clockwise)

EA25 - 250	Switch position	Function
	Switch left	Actuator moves to **open** (counterclockwise)
	Switch right	Actuator moves to **closed** (clockwise)

The batteries are always stored charged. If the battery charge level sinks below 50 %, the actuator flashes yellow and the charge cycle starts. Once UBatt rises above 50 %, the flashing stops.

During the charge cycle, the actuator can be operated normally.

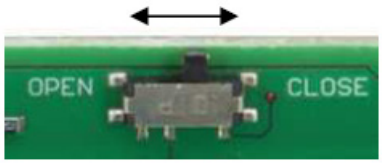
Failsafe return unit for external voltage supply for EA15 and EA25–250

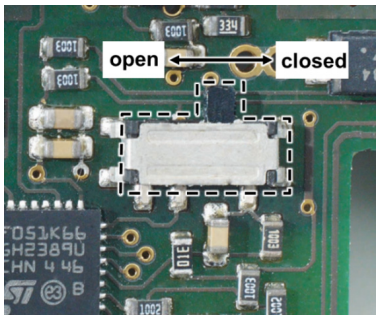


General

The failsafe return unit works with the actuator type EA15 and EA15 – 250. The failsafe return unit is plugged into the base board and also fixed in place by the cover when installed. This reset unit is connected via an external 24 V DC emergency power supply. The failsafe return unit of the type EA15 and EA15 – 250 is a different construction.

In case of a failure of the supply voltage, the battery is electronically switched on automatically after 5 s. With the selector switch on the board, the functions “Move to CLOSED position” or “Move to OPEN position” can be selected.

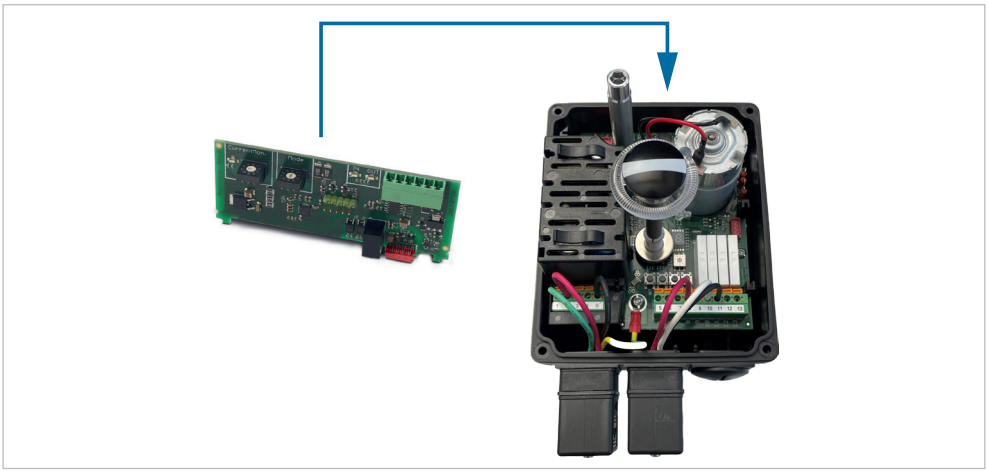
EA15	Switch position	Function
	Switch left	Actuator moves to **open** (counterclockwise)
	Switch right	Actuator moves to **closed** (clockwise)

EA25 - 250	Switch position	Function
	Switch left	Actuator moves to **open** (counterclockwise)
	Switch right	Actuator moves to **closed** (clockwise)

Use the cable glands provided to insert the cable for the control signal.

Avoid excess length of the battery cable! Excess cable must not be longer than required. Internal cables must not be longer than 12 cm.

Positioner for EA25–250



General

The positioner works with the EA25, EA45, EA120 and EA250 actuators. The positioner controls a user-defined valve position proportional to a given setpoint value. This can be 0–10 V or 4–20 mA. Feedback on the valve position (actual value) is done via the integrated 4–20 mA position detection. All signals can be inverted in any desired combination.

! The inputs are galvanically isolated, so the power supply does not have to be galvanically separated.

i The monitoring card module „Motor current monitoring“ is located on the positioner (left BCD switch). See the chapter „Monitoring / current monitoring“ for further settings.

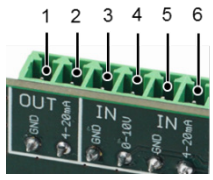
Signal configuration

Signal configuration is performed via the right BCD switch „Mode“; depending on switch position, the following signal configuration can be achieved:

BCD	0 (factory setting)	1	2	3	4	5	6	7 (only as feedback)	8 (only as feedback)	9
Input	4-20 mA	0-10 V	4-20 mA inverted	0-10 V inverted	4-20 mA	0-10 V				
Output	4-20 mA	4-20 mA	4-20 mA	4-20 mA	4-20 mA inverted	4-20 mA inverted		4-20 mA	4-20 mA inverted	

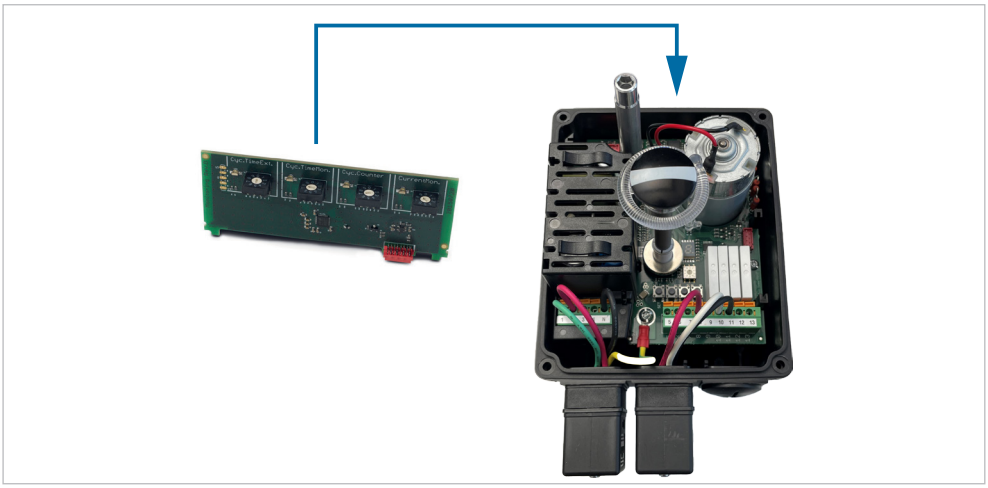
Terminal assignment

The cables are applied as follows via a plug (according to signal configuration):



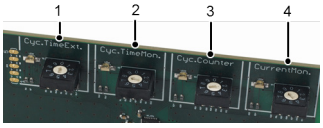
1	2	3	4	5	6
Ground	4-20 mA	Ground	0-10 V	Ground	4-20 mA
OUT		IN			

Monitoring board for EA25–250



General

The monitoring board works with the EA25, EA45, EA120 and EA250 actuator. The monitoring board is plugged onto the base board and is available immediately. The monitoring board enables the following four functions:



No.	Description
1	Cycle time extension
2	Cycle time monitoring
3	Cycle counter Monitoring of a selected number of cycles
4	Motor current monitoring Monitoring a selected maximum motor current

These monitor settings are made via the BCD switches 1 to 4. The functions work independently of one another.

Settings

Cycle time extension

The cycle time extension extends the cycle time of the electric actuator. To do this, the actuator is moved continuously into the end positions (open or closed). For the corresponding value please refer to the table below. These values are valid for 90° actuation. The cycle time is given in seconds.

BCD	EA25	EA45	EA120	EA250
0 (factory setting)	7	7	25	27
1	10	10	28	35
2	13	13	32	40
3	15	15	38	45
4	18	18	42	50
5	20	20	48	55
6	23	23	52	60
7	25	25	58	65
8	28	28	62	70
9	30	30	67	75

Cycle time monitoring

Cycle time monitoring monitors the duration of a preset cycle time of the electric actuator. As soon as the cycle exceeds the preset time, an error is reported. For the corresponding value please refer to the table below. These values are valid for 90° actuation. The cycle time is given in seconds.

BCD	EA25	EA45	EA120	EA250
0	8	7	8	7
1	11	10	11	10
2	14	13	14	13
3	17	16	17	16
4 (factory setting)	20	19	20	19
5	23	22	23	22
6	26	25	26	25
7	29	28	29	28
8	32	31	32	31
9	36	34	36	34

Cycle counter

This function allows setting a desired number of cycles. As soon as the number of cycles exceeds the set value, an error is reported.

BCD	EA25, EA45, EA120, EA250
0	1
1	10'000
2	20'000
3	30'000
4 (factory setting)	40'000
5	50'000
6	75'000
7	100'000
8	150'000
9	200'000

Reset number of cycles

The cycle counter can be reset by the BCD switch and pressing the “SET” button on the main board.

Motor current monitoring

The current monitoring function monitors the motor current. If the motor current is higher than the preset value, an error is reported and the actuator will remain in place.

BCD	EA25	EA45	EA120	EA250
0	25	25	50	50
1	100	300	300	400
2	150	350	400	500
3	200	400	500	600
4	250	450	600	700
5	300	500	700	800
6	400	600	800	1'000
7	500	700	900	1'200
8	600	900	1'000	1'500
9 (factory setting)	700	1'100	1'200	1'800

The motor current monitoring is also located on the positioner card, and thus increasing motor current (and hence torque) can also be monitored here.

When setting the BCD switches, make sure that the set functions do not block one another.

Example for an EA25:

BCD1 cycle time extention pos 3 = 15 s

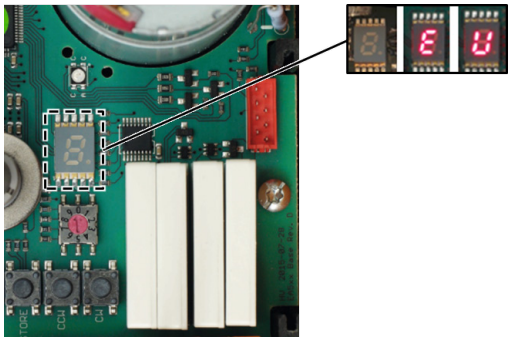
BCD2 cycle time monitoring pos 0 = 8 s

➔ Will generate error

Error message

An error message triggers the following:

- The 7-segment display on the base board illuminates; see illustration below. If the monitoring PCB is installed, the respective LED lights up red on the BCD switch, if its set value is exceeded.
- The ready-to-operate signal will be off (terminals 5, 6 / NC contact).
- LED flashes yellow (except for in case of power outage)



Assignment of error codes for error messages

Error code	Description	Signal „Ready for operation“	Response of the actuator
----	No voltage	NO	None
U	Voltage below specification	NO	None
0	Housing temperature too high	> 80° C	Stops
5	Time from end position to end position too long	> 120 s	Stops
b	Voltage over specification	NO	Stops
h	Heater defective (T = < 0 °C)	NO	Runs
e	Error in position detection	NO	None
P	Invalid position	NO	Runs
E	Emergency manual override enabled	NO	None
9	No communication with accessories	NO	None
L	Battery voltage < 50 % (if failsafe return unit is installed)	NO	Runs
A	Defective battery	NO	Runs
I	Actuator has run into engine current limit	NO	

Acknowledge error message

- Check the cause of fault
- If necessary, carry out relevant maintenance
- Error can be acknowledged via the „SET“ button on the main board.

The message can be eliminated while the supply voltage is still connected or the actuator is briefly disconnected from the mains voltage (does not work with cycle monitoring).

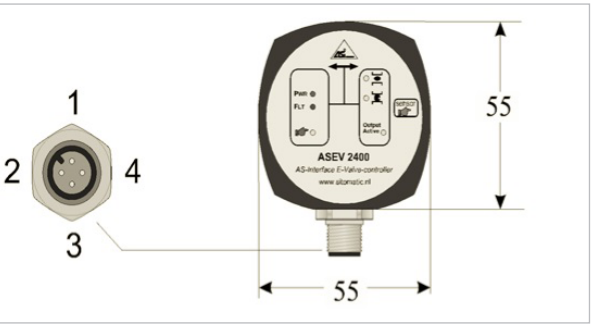
AS interface



To connect our electric actuators to an AS-i network, GF Piping Systems offers a module which fits exactly to our actuator interface. The ASEV 2400 module offers a compact solution with the feedback already integrated.

! To obtain an AS interface-ready actuator, the actuator version with 24 V AC/DC must be ordered. Together with the integrated relais the feedback of the end positions can be obtained in the network.

Technical data	
Housing materials	POM (black)
Cover material	Resopal
Gasket	NBR
Power supply	31.6 V DC (ASi voltage)
Connector	M12x1 (4-pin)
AS interface specification	3.0
AS interface profile	S-D/A.0.E
Power consumption	1.3 Watt
Protection class	IP67



i For more information on ASI, see Planning Fundamentals, chapter „Actuators for valves“.

Planning Fundamentals

of Valves and Automation

Pneumatic Actuators

Content

Pneumatic actuators type PPA04 – PPA80 518
Pneumatic actuator type PA30 – PA90 527

Pneumatic actuators type PPA04 – PPA80



PPA04 – PPA80 Single acting (FC/FO)



PPA04 – PPA80 Double-acting (DA)

Product description

The pneumatic actuators PPA04 – PPA80 are made almost entirely of plastic. Due to the realization of a special spring return unit, these actuators are very compact and light. The actuators can be connected in various ways.

A position indicator is incorporated into the NAMUR interface, greatly simplifying the installation of accessories for the pneumatic actuators PPA04 – PPA80. Furthermore, an additional NAMUR interface allows easy connection to a compressed air system without an adapter plate. The flange pattern also complies with the NAMUR standard. The PPA04 – PPA80 actuators are compatible with products from other manufacturers.

Function

Pneumatic Actuators can be used as open/close or control element for valves. The double-acting (DA) design means that the fitting is opened or closed by the actuator applying compressed air. Depending on the requirement, the springs can open or close. The single-acting actuators (FC/FO) only apply compressed air on one side, while adjustment on the other side is by spring resistance. This means that if there is air failure they return automatically to a safety position. Standard interfaces allow pilot valves, limit switches or positioners to be connected to the actuator.

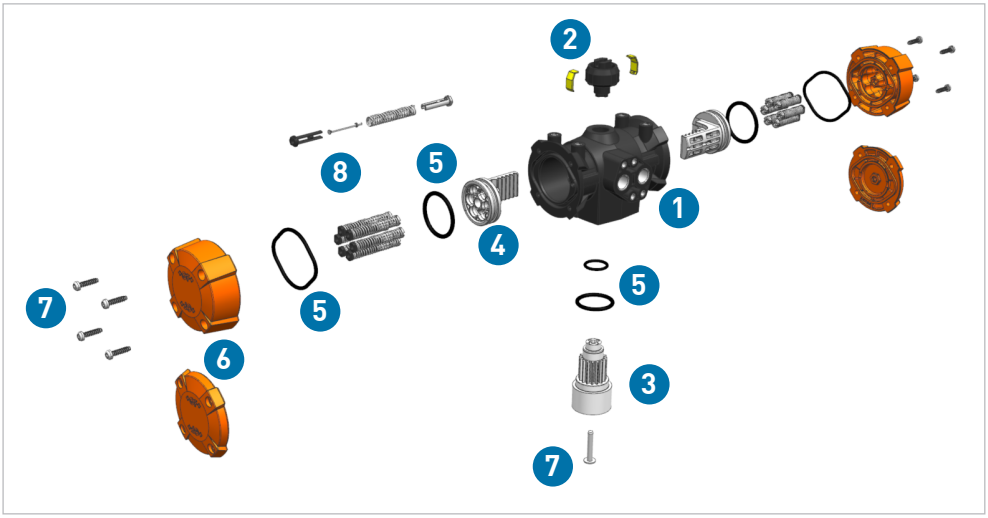
Applications

- Chemical process industry
- Water treatment
- Refrigeration
- Process Automation
- Natural resources & surface treatment
- Conventional power generation
- Photovoltaics, semiconductor & TFT/HB LED

Features/Benefits

- Robust and compact PP-GF Piping Systems housing
- Full plastic actuator
- Linear torque characteristic curves
- Optimized assignment to ball valve 546 Pro with safe and reliable torque characteristics, tested over service life
- NAMUR accessory interface according to VDE 3845 for integrated mounting of a wide range of accessories
- Flexible spring concept for low pressure operation (4.2 bar) as well as OEM solutions

Technical Data



1 Housing with inserts (PP-HGF30)
2 Display body (PBTGF30)
3 Spindle (PPT20)
4 Plunger (POM)
5 O-rings (NBR)
6 Cover (PP-HGF30)
7 Screws (steel A2)
8 If necessary, loaded spring component (POMGF, steel coated)

Technical Data		PPA04	PPA08	PPA15	PPA40	PPA80
FC/FO Standard	Torque ratings		3 Nm	8 Nm	17 Nm	40 Nm
	Minimum control pressure		5.4 bar	5 bar	4.5 bar	5.1 bar
	Max. permitted control pressure[1)]		7 bar	7 bar	7 bar	7 bar
	Number of loaded spring components		12	12	10	12
FC/FO Low pressure	Torque ratings			4.3 Nm	14.7 Nm	32.4 Nm
	Minimum control pressure			3.2 bar	4.2 bar	4.2 bar
	Max. permitted control pressure[1)]			7 bar	7 bar	7 bar
	Number of loaded spring components			8	10	10
DA doub-le-acting	Torque ratings	3 Nm	5 Nm	13 Nm	31 Nm	40 Nm
	Minimum control pressure	3.2 bar	2.3 bar	2.5 bar	3.1 bar	1.8 bar
	Max. permitted control pressure[2)]	7 bar	7 bar	7 bar	7 bar	7 bar
Control medium		Compressed air, lubricated and unlubricated Fluids on request				
Compressed air class		ISO 8573-1				
Control connection		G ¼" (PPA04 DA G ⅛")				
Standard connection NAMUR as per VDE 3845		optional	yes	yes	yes	yes
Mechanical interface as per ISO 5211		F03	F05	F05	F05	F07
Control volume per cycle (dm³)	FC/FO		0.1253	0.1429	0.2899	0.6650
	DA	0.0623	0.1253	0.2774	0.5636	1.2551
Cycle time		1 - 2s, with throttle valve up to 5s				
Actuating angle		90°				
Position indicator		Optical				
Enclosure material		PP-GF (glass fiber reinforced polypropylene)				
Ambient temperature		-10 to +50°C				
Permitted air humidity		0 to 100%				
Safety Integrity Level		SIL2-compliant				

[1)] In use with GF valves. For non-GF valves 6 bar.
[2)] In use with GF valves. For non-GF valves 5 bar.

Versions

Pneumatic ball valves

The pneumatically operated ball valves are composed of the ball valve type 546 Pro and the pneumatic actuator PPA04 – PPA80.

Pneumatic actuator	Manually operated ball valve	Dimension	Materials	Standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C, ABS	ISO/DIN
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PP-H	All standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVDF	All standards
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C	ASTM/ANSI
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, ABS	BS
PPA04 – PPA80	Type 546 Pro	DN10 – DN100	PVC-U, PVC-C, PPH, PVDF	JSI

Control pressure PPA FC/FO*

	Number of springs per side	Spring torques [Nm]		Torque with control pressure [Nm]									
				Control pressure [bar]									
				3		4.2		5		5.6		6	
FC		Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open
FO		Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed	Open	Closed
PPA08	6	3.12	6.57					6.20	2.10	7.65	3.70	8.95	4.73
	5	2.53	5.58			5.57	2.07	7.60	4.10	9.27	5.65	10.10	6.55
	4	1.54	4.16			6.30	3.45	8.40	5.50	9.70	6.90	10.70	7.91
PPA15	6	8.23	13.04			10.44	3.90	14.57	8.69	18.33	12.19	20.10	14.46
	5	6.20	10.33			11.96	7.08	16.20	11.74	19.97	15.26	21.91	17.46
	4	4.38	7.71	7.10	3.31	14.05	10.23	18.64	14.73	22.07	18.20	23.84	20.52
PPA40	6	20.16	29.00			18.27	4.57	29.44	16.25	36.35	23.25	40.51	28.41
	5	17.01	24.47			24.49	14.70	33.15	23.74	39.64	30.70	44.39	35.25
	4	12.18	19.03	16.42	6.65	29.03	21.15	37.71	29.28	43.51	36.20	49.02	40.96
PPA80	6	44.53	71.42			48.65	17.43	67.89	37.99	81.83	54.03	91.85	63.80
	5	35.47	59.82			55.10	32.40	77.01	53.53	91.57	69.25	102.42	79.81
	4	27.64	47.42	34.58	15.20	68.44	47.02	91.02	68.24	107.95	84.15	119.23	94.75

*For GF valves max. 7 bar. For valves from other manufacturers, a throttle is recommended.

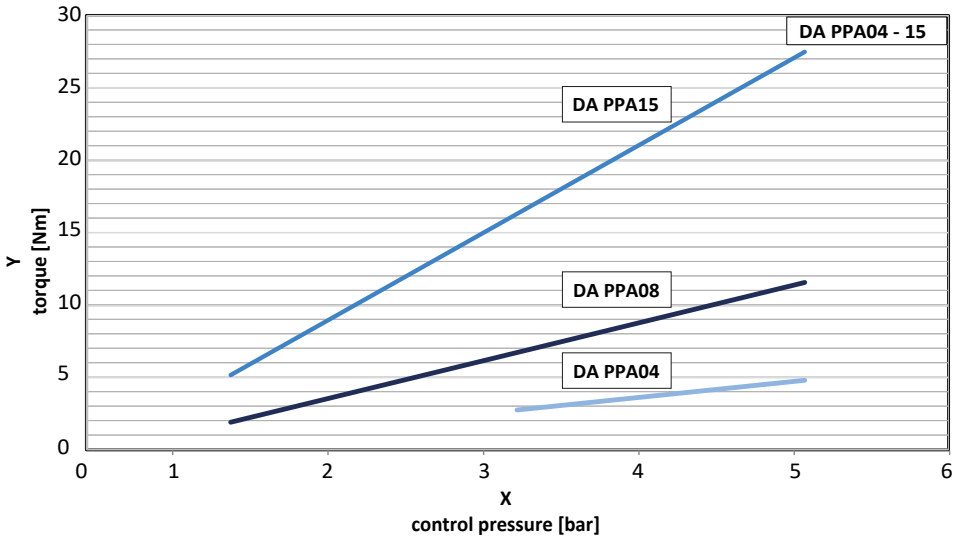
Minimum control pressure

Minimum control pressure for spring combination	Springs	Minimum spring closing torque [Nm]	Minimum control pressure for spring combination [bar]
PPA08	4	1.54	3.5
	5	2.53	4.4
	6	3.12	5.4
PPA15	4	4.38	3.2
	5	6.20	4.1
	6	8.23	5
PPA40	4	12.18	3.5
	5	17.01	4.5
	6	20.16	5.4
PPA80	4	27.64	3.5
	5	35.47	4.4
	6	40.00	5.1

Control pressure DA

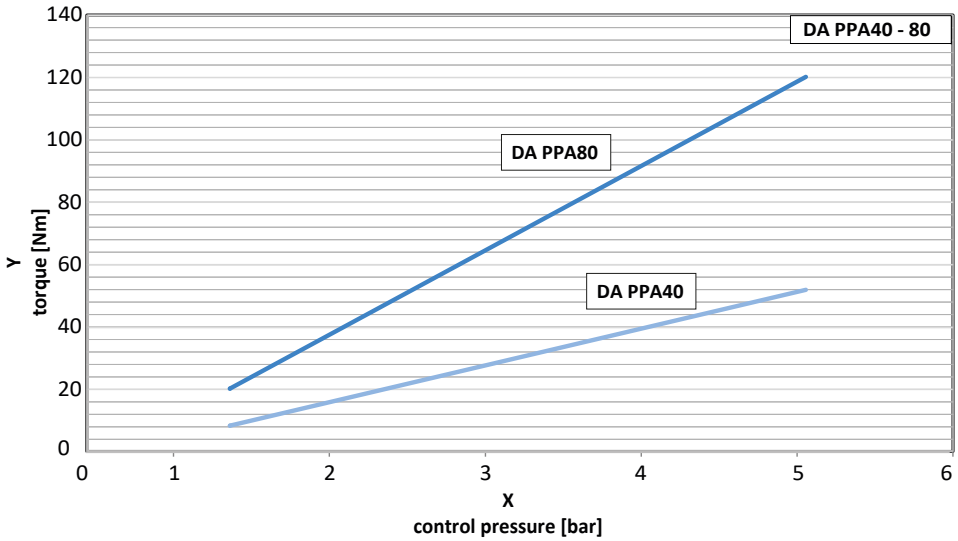
	Torque with control pressure [Nm]				
	Air pressure [bar]				
	1	2	3	4.2	5
PPA04		1.98	3.02	4.42	5.31
PPA08		4.20	6.92	9.87	11.92
PPA15		10.96	16.71	23.74	28.49
PPA40	7.88	18.95	30.35	43.16	53.02
PPA80	20.88	45.82	70.70	104.17	121.36

Torque PPA04-15



X Control pressure [bar]
Y Torque [Nm]

Torque PPA40-80



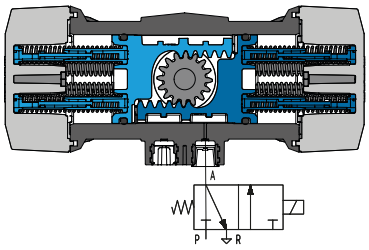
X Control pressure [bar]
Y Torque [Nm]

Technical basis

Operating diagram FC, FO, DA and function FC, FO, DA

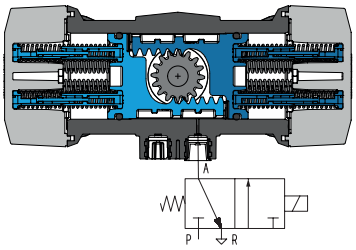
For the proper function of the actuator assembly, it is important that the position of the actuator and valve position matches.

- Actuator open – Valve open
- Actuator closed – Valve closed



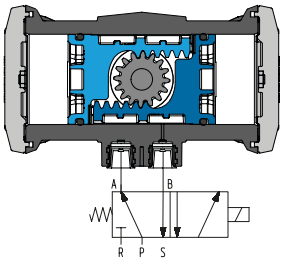
Function FC:
Spring resistance closed

Control air through 3/2 solenoid pilot valve on connection.
A turns the actuator 90° to the left.



Function FO:
Spring resistance opened

Control air through 3/2 solenoid pilot valve on connection.
A turns the actuator 90° to the right.



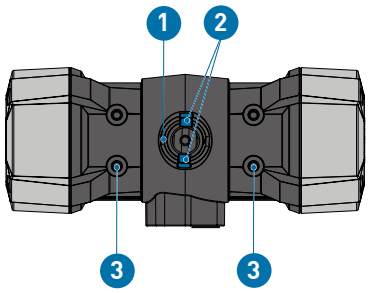
Function DA:
Double-acting

Control air through 5/2 solenoid pilot valve on connection.
A turns the actuator 90° to the right.
Control air through 5/2 solenoid pilot valve on connection.
B turns the actuator 90° to the left.

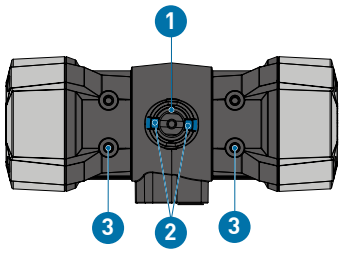
Position indicator

Valve positions can be read off at the mark on the position indicator. The NAMUR standard accessory interface is used for attaching accessories such as a position feedback device or a positioner.

CLOSED position



OPEN position

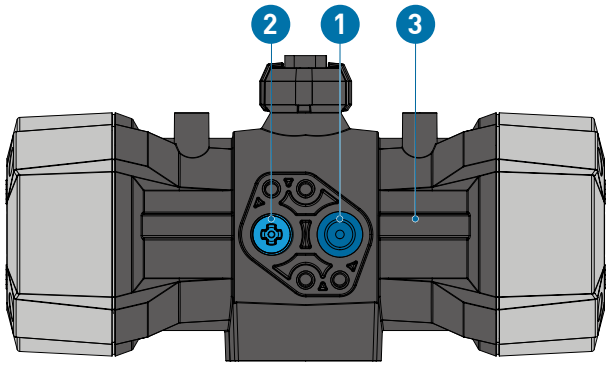


1 Position indicator
2 Marking position
3 Accessory interface NAMUR as per VDE 3845

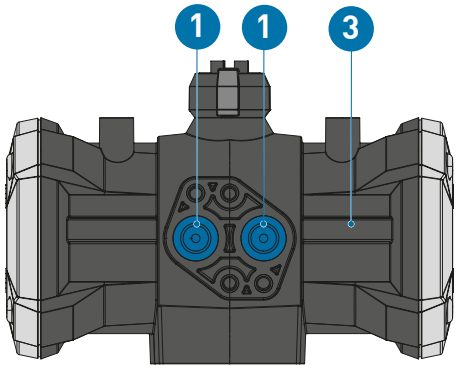
Control air

Vent holes

Function FC/FO



Function DA



1 Control air connection G ¼" (PPA04 DA G ⅛")
2 Vent hole (FC/FO, green reducing plug)
3 Control air connection laser marking (function)

The control air connection are provided with laser markings indicating the effect of the control air at the respective connection. In the above example, the actuator is closed in the series state and is opened by applying compressed air through the control connection. Consequently, it is a pneumatic actuator of function FC (spring resistance closes).

In versions with the FC/FO function, the vent hole protected with the reducing plug must not be damaged or blocked, as this would obstruct the movements of the actuator.

Handling

Installation note

If the control air connections used are too long, the control air holes in the product can be blocked.

- When installing, make sure that the control air connections do not penetrate into the product housing beyond the available thread in the hole.

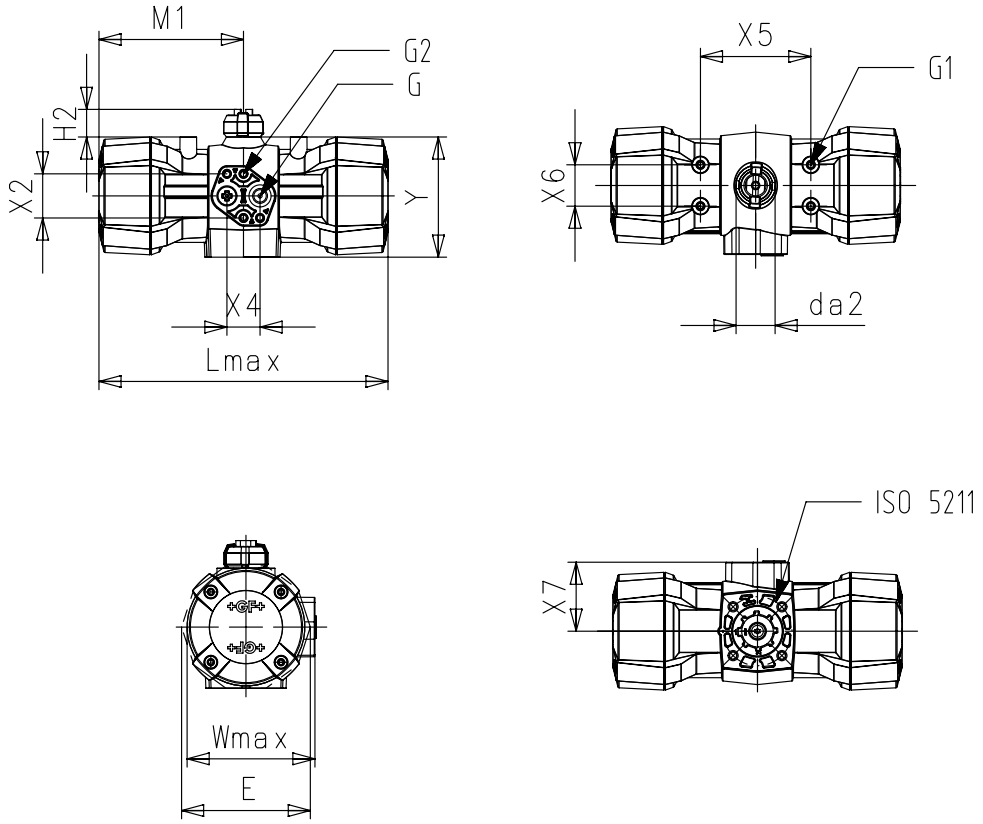
Maintenance notes

Regularly check that the actuator opens and closes correctly.

! Installation and service must be carried out as per the relevant installation instructions. Installation instructions are included with the product, see also online product catalog at www.gfps.com

Dimensions

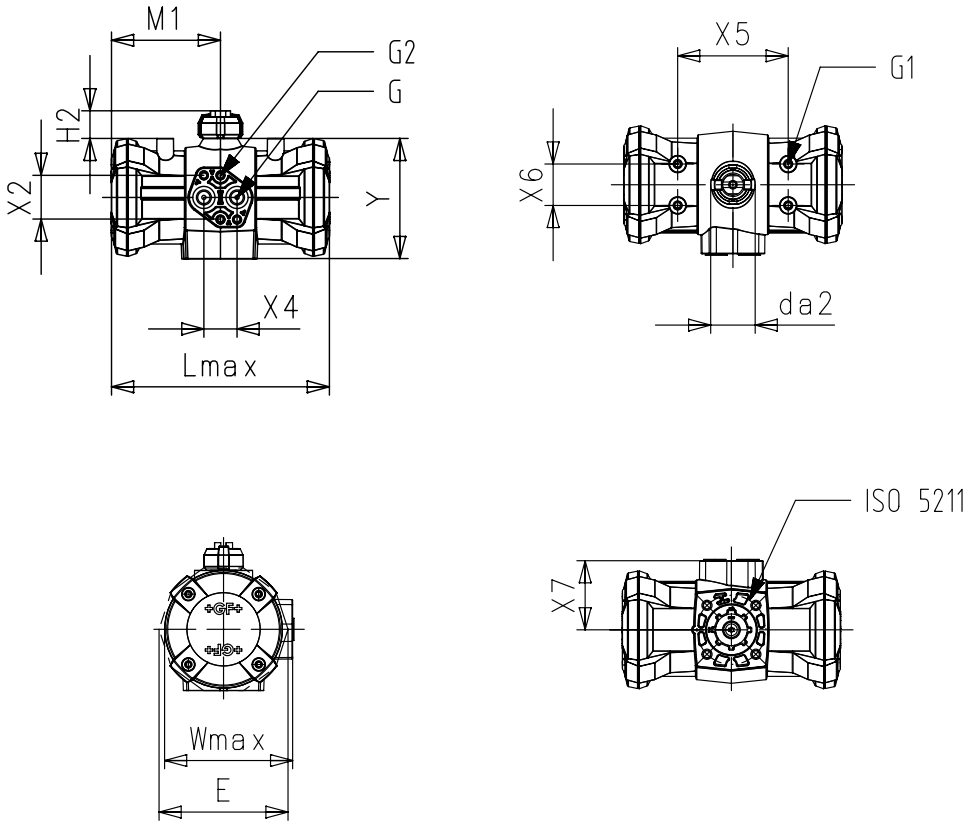
FC/FO
(Single-acting)



	G (inch)	G1 (mm)	H2 (mm)	ISO 5211	M1 (mm)	Wmax (mm)	X4 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	Y (mm)
PPA08	¼	M5	20	F05	79.5	76.5	24	80	30	43.0	75
PPA15	¼	M5	20	F05	105.5	93.0	24	80	30	50.5	88
PPA40	¼	M5	20	F05	122.8	117.0	24	80	30	62.0	111
PPA80	¼	M5	20	F07	171.5	138.5	24	80	30	74.0	131

	da2 (mm)	Lmax (mm)	X2 (mm)	E (mm)	G2 (mm)	Gewicht (kg)
PPA08	32.5	159	32	73.5	M5	0.551
PPA15	32.5	211	32	94.0	M5	1.006
PPA40	32.5	246	32	119.5	M5	1.917
PPA80	32.5	343	32	141.5	M5	3.683

DA
(Double-acting)

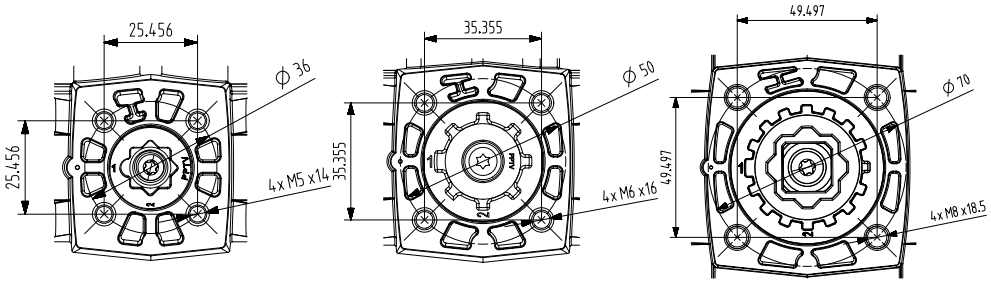


	G (inch)	G1 (mm)	H2 (mm)	ISO 5211	M1 (mm)	Wmax (mm)	X4 (mm)	X5 (mm)	X6 (mm)	X7 (mm)	Y (mm)
PPA04	¼	M5	20	F03	51.0	63.0	24	50	25	34.0	66.0
PPA08	¼	M5	20	F05	63.8	76.5	24	80	30	43.0	75.0
PPA15	¼	M5	20	F05	82.5	93.0	24	80	30	50.5	87.5
PPA40	¼	M5	20	F05	91.8	117.0	24	80	30	62.0	111.0
PPA80	¼	M5	20	F07	130.5	138.5	24	80	30	74.0	131.0

	da2 (mm)	Lmax (mm)	X2 (mm)	E (mm)	G2 (mm)	Gewicht (kg)
PPA04	32.5	102		63.0		0.255
PPA08	32.5	128	32	73.5	M5	0.419
PPA15	32.5	165	32	94.0	M5	0.714
PPA40	32.5	184	32	119.5	M5	1.322
PPA80	32.5	261	32	141.5	M5	2.463

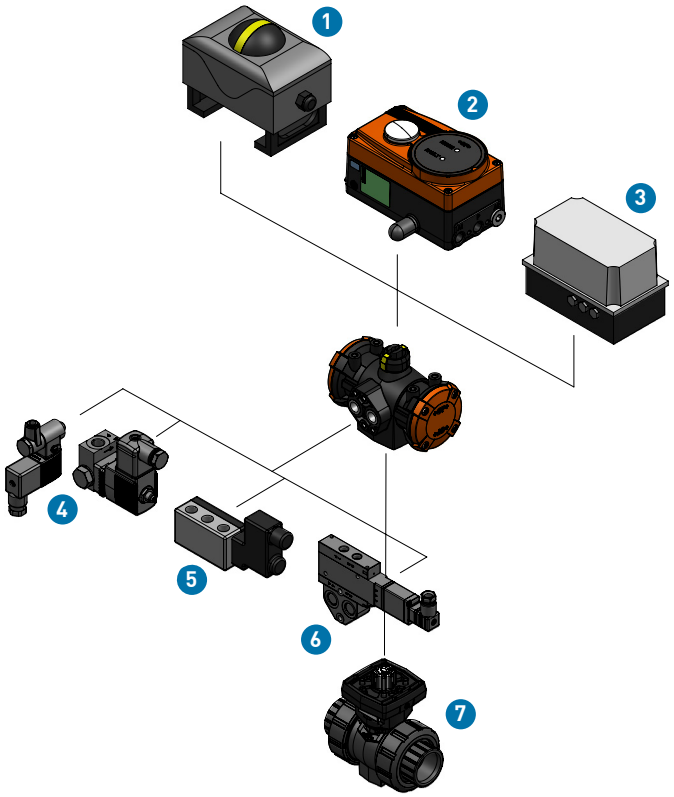
Interfaces F03-F07

F03	F05	F07
PPA04	PPA08/PPA15/PPA40	PPA80



Accessories

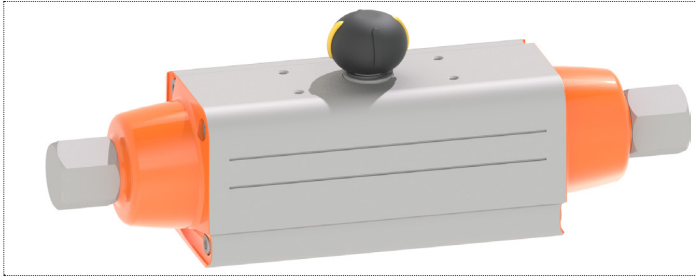
Peripheral overview*



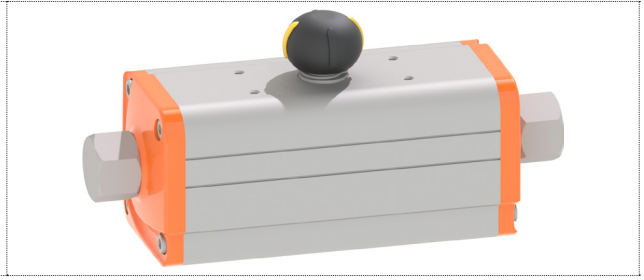
* Not all accessories as shown can be used simultaneaously, e.g. Digital positioner cannot be used together with a pilot valve.

	Peripheral overview	Designation
	Accessory interface NAMUR top VDE 3845	
1	Position feedback device	Feedback box
2	Digital positioner	RPC, RPC D, RPC PID
3	AS interface	ASVC 2300
	Accessory interface NAMUR side VDE 3845	
4	3/2-way pilot valve	PV94/95
5	3/2 - 5/2 way pilot valve	MNL532
6	4/2-way pilot valve	5470
	Mechanical interface F03/F05/F07 (ISO 5211) Connection at the valve	
7	Valve	Ball valve type 546 Pro

Pneumatic actuator type PA30 – PA90



PA30 – PA90 Single-acting (FC/FO)



PA30 – PA90 Double-acting (DA)

Product description

The pneumatic actuator series PA30 – PA90 serves to operate valves with a 90° positioning angle. GF actuators already comply with both the EN standards, as well as several ISO standards: actuator mounting flange according to ISO 5211; actuator square connection according to DIN 3337; connection for pilot valves, positioner and limit switch according to VDI/VDE 3845 (NAMUR); optical position indicator.

Function

All GF Piping Systems rotary actuators can be used as open/close or control actuators. The double-acting design means that the valve is opened or closed by the actuator applying compressed air. Depending on the requirement, the springs can open or close. The single-acting actuators only apply compressed air on one side, while adjustment on the other side is by spring force. This means that if there is air failure they return automatically to a safety position. Standard interfaces enable easy configuration of: pilot valve, limit switch and positioner.

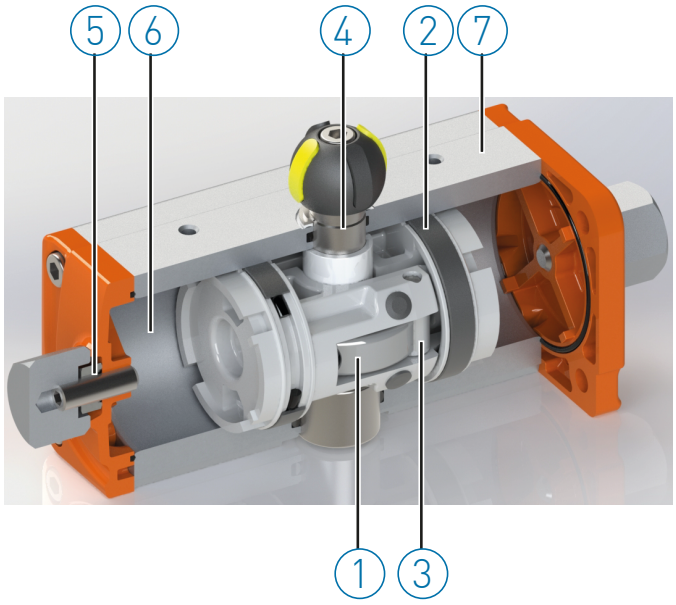
Applications

- Chemical process industry
- Water treatment
- Refrigeration

Benefits/features

- Integrated NAMUR interface for accessories and air connections
- Fast cycle times
- Improved stroke limiter
- Wide torque range, from 15 Nm up to 240 Nm
- Attractive price-performance ratio for all variants
- Construction of various limit switch versions without any problems
- Low installation height

Technical data



1 Lift design for high end torques
2 Seals ad piston guide rings
3 Automatic bolt lubrication
4 ISO/NAMUR connecting shaft of stainless steel
5 End position damping
6 The cylinder bore is lapped and hard anodized
7 Outer surface is hard anodized

Specification			
Combinations	Ball valve	Type 546 Pro	d63/DN50 – d110/DN100
	Butterfly valve	Type 567/578, type 038/039	d63/DN50 – d315/DN300
Rated torque Mdn.	15 – 240 Nm (11.1 – 177.1 lb. ft.)		
Peak torque	30 – 480 Nm (22.2 – 354.1 lb. ft.)		
Actuator connection	R⅛“ (PA30 - PA65); R¼ (PA70+)		
Cycle time	0.5 – 4 s		
Actuating angle	92° (-1°+91°)		
Mode of operation	Fail-safe to close (FC)		
	Fail-safe to open (FO)		
	Double-acting (DA)		
Ambient temperature	-20 – +80 °C		
Control medium	Neutral, non-aggressive gases		
	Preferably slightly oily compressed air		
Permissible humidity	0 – 95 %		
Position indicator	Optically integrated		
Housing material	Aluminum, hard anodized		
Weight	1.95 kg – 22.7 kg		
Control pressures in bar		**Single-acting**	**Double-acting**
	Min.	2.8	2.5
	Max.	8.4	8.4

Options

Pneumatic ball valves

The pneumatic actuated ball valves DN65-DN100 are a combination of the ball valve type 546 Pro, and the pneumatic actuator PA35-PA45.

Ball valve type	Dimensions	Function	Actuator, pneumatic
Type 546 Pro	DN65	FC/FO	PA35
Type 546 Pro	DN65	DA	PA35
Type 546 Pro	DN80	FC/FO	PA40
Type 546 Pro	DN80	DA	PA40
Type 546 Pro	DN100	FC/FO	PA40
Type 546 Pro	DN100	DA	PA45

Butterfly valve, pneumatically operated

The pneumatically actuated butterfly valve type 240 is designed for wafer style installation. The pneumatically actuated butterfly valve types 243/244 are designed for lug style or wafer style installation.

The electro-pneumatic positioner, stroke limiter, and feedback switches give flexibility for integration into a wide variety of applications.

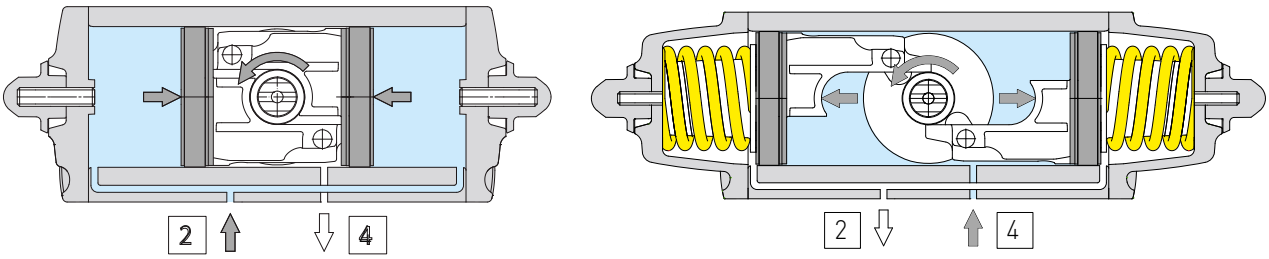
Butterfly valve, pneumatic	Actuator, pneumatic	Butterfly valve, manually operated	Dimensions	Materials	Standards
Type 240	PA30 – P90	Type 567	DN50 – DN300	All	All standards
Type 243	PA30 – P90	Type 578	DN50 – DN300	All	ISO/DIN
Type 244	PA30 – P90	Type 578	DN50 – DN300	All	ANSI

The metal butterfly valves type 038P/039P can be used universally as open/close or control valves. The easy installation of the valve between pipe flanges warrants reliable operation and sealing. The Rilsan-coated valve body and the ductile iron valve disc provide high resistance against corrosion. The butterfly valves are also available in a standard version with stainless steel valve disc.

Butterfly valve, pneumatic	Actuator, pneumatic	Butterfly valve, manually operated	Dimensions	Standards
Type 038P	PA30 – P70	Type 038 lug style	DN50 – DN300	ISO/DIN, ASTM
Type 039P	PA30 – P70	Type 039 wafer style	DN50 – DN300	All standards

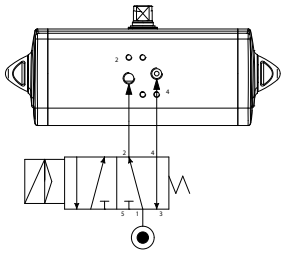
Technical basics

Functional prinziple DA/FC/FO

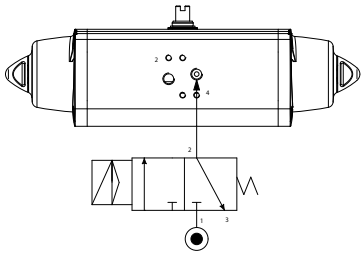


DA Double-acting	FC/FO Single-acting
The port 2 is in connection with the cylinder side chambers. Supplying pressurised air in port 2, the actuator drive shaft rotates counter clockwise to open. While the port 4 is in connection with the pressurised intermediate chamber, the drive shaft rotates clockwise to close.	FC: The compressed air supply causes the cylinders to move outwards against the spring tension, until they reach their end position. Without compressed air, the drive is automatically closed by the spring force. FO: The compressed air supply causes the cylinders to move inwards against the spring tension, until they reach the end position. Without compressed air, the actuator is automatically opened by the spring force.

Operating diagram FC, FO, DA



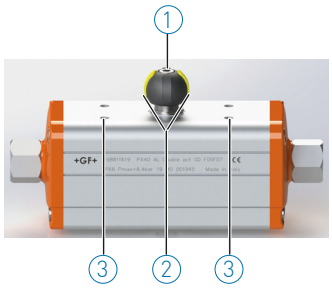
DA Double-acting
with NAMUR 5/2-way valve



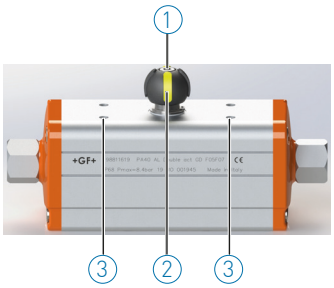
FC/FO Single-acting
with NAMUR 5/2-way valve

Position indicator

The position indicator displays the valve position. The valve positions can be read on the fitted cover.



Position CLOSED



Position OPEN

The valve positions can be read on the position indicator marking. The NAMUR accessory interface serves to connect accessories, such as position feedback or positioner.

Control air

Venting opening

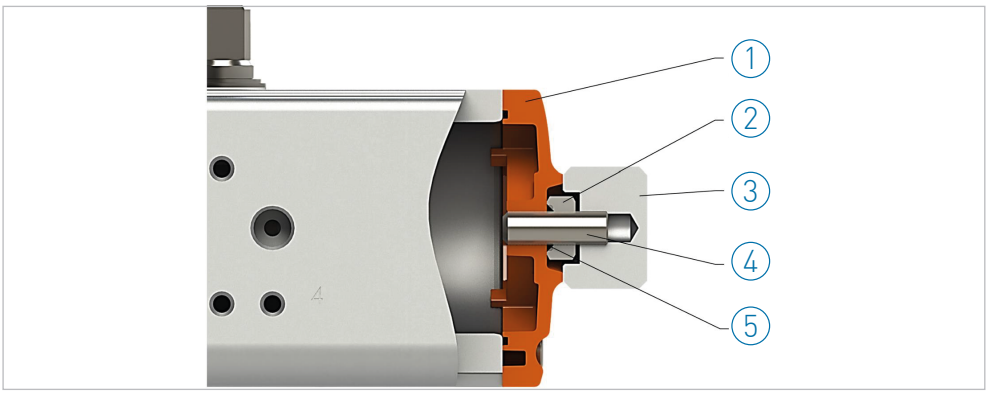
In designs with the FC/FO functions, the bleed hole protected by a green reducing plug may not become damaged or plugged, since the movement of the actuator will otherwise be restricted.

The control air connections are marked with stickers that describe the function of the control air at the respective connection. In the above example, the control air connection A is opening. This is subsequently a pneumatic actuator for the function FC (fail-safe to close).

Control air is introduced via the open control connection A (function FC and FO) or via the two control connections A and B (function DA).

Stroke limiter

In designs with a stroke limiter, the stroke limiter is set at the factory to 90°. This setting can be changed as needed. Limiting the turning movement in the direction of the working position to less than 90°, for example to 45°, is possible in this way.



1 Cap
2 Nut
3 Protection nut
4 Screw
5 O-Ring

Handling

Installation notes

If the control air connections used are too long, the control air openings of the product may become plugged.

- During installation, ensure that the control air connections do not protrude further into the housing than the existing threaded hole.

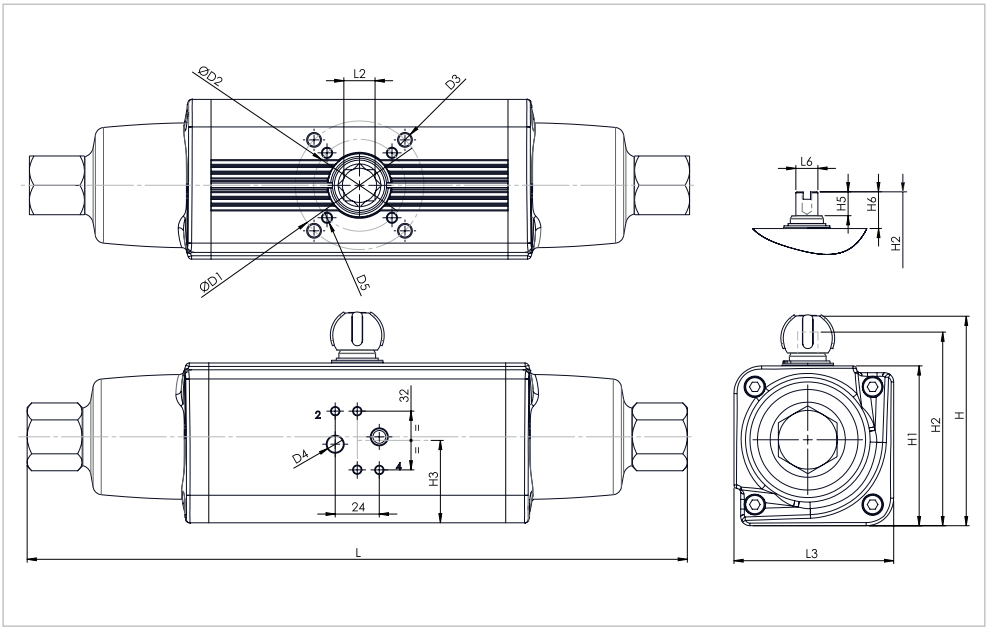
Maintenance notes

Regularly check whether the actuator opens and closes correctly.

! Installation and maintenance must be performed according to the corresponding installation instructions. The installation manual is included with the product, see also the online product catalog at www.gfps.com

Dimensions

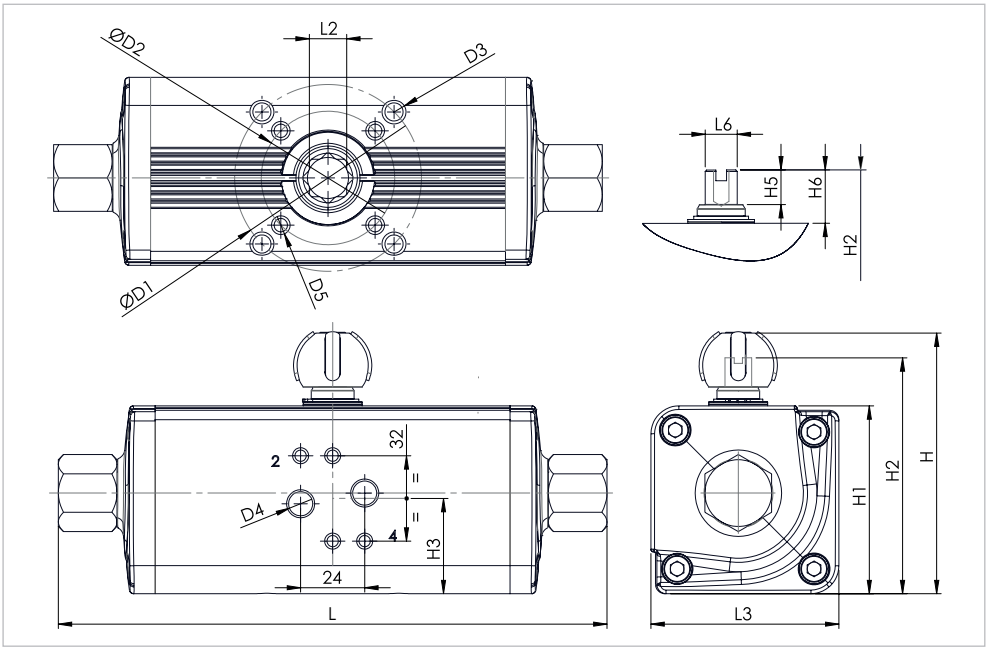
Single-acting (FC/FO)



Type		ØD1 (mm)	ØD2 (mm)	D3 (mm)	D4 (mm)	D5 (mm)	L (mm)	L2 (mm)	L3 (mm)	L6 (mm)
PA30	F05/07	70	50	M8x12	⅛"	M6x9	274.4	14	70.4	10
PA35	F05/07	70	50	M8x12	⅛"	M6x9	325.2	17	83.3	12
PA40	F05/07	70	50	M8x12	⅛"	M6x9	359.5	17	87	12
PA45	F07/10	102	70	M10x15	⅛"	M8x12	418	22	107.5	15
PA50	F07/10	102	70	M10x15	⅛"	M8x12	433.9	22	111.1	15
PA55	F07/10	102	70	M10x15	⅛"	M8x12	498.3	22	118	19
PA60	F10/12	125	102	M12x18	¼"	M10x15	547.3	27	134.9	19
PA65	F10/12	125	102	M12x18	¼"	M10x15	646	27	148	22
PA70	F10/12	125	102	M12x18	¼"	M10x15	681	36	168	24

Type		H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)
PA30	F05/07	98.2	70.4	90.4	35.7	13	20
PA35	F05/07	111.1	83.3	103.3	42.8	13	20
PA40	F05/07	114.8	87	107	44.8	13	20
PA45	F07/10	149.5	107.5	137.5	54.5	16	30
PA50	F07/10	153.1	111.1	141.1	58.1	17	30
PA55	F07/10	160	118	148	60	19	30
PA60	F10/12	176.9	134.9	164.9	57.4	19	30
PA65	F10/12	190	148	178	61.5	19.5	30
PA70	F10/12	210.1	168	198	78	19.5	30

Double acting (DA)



Type		ØD1 (mm)	ØD2 (mm)	D3 (mm)	D4 (mm)	D5 (mm)	L (mm)	L2 (mm)	L3 (mm)	L6 (mm)
PA30	F03/05	50	36	M6x9	⅛"	M5x8	181.1	11	59.2	9
PA35	F03/05	50	36	M6x9	⅛"	M5x8	196.1	11	64.5	10
PA40	F05/07	70	50	M8x12	⅛"	M6x9	205.6	14	70.4	10
PA45	F05/07	70	50	M8x12	⅛"	M6x9	242	17	83.3	12
PA50	F05/07	70	50	M8x12	⅛"	M6x9	249.1	17	87	12
PA55	F07/10	102	70	M10x15	⅛"	M8x12	290.2	22	107.5	15
PA60	F07/10	102	70	M10x15	⅛"	M8x12	313.9	22	111.1	15
PA65	F07/10	102	70	M10x15	⅛"	M8x12	339.6	22	118	19
PA70	F10/12	125	102	M12x18	¼"	M10x15	382.5	27	134.9	19

Type		H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)
PA30	F03/05	87	59.2	79.2	30.3	10	20
PA35	F03/05	92.3	64.5	84.5	32.5	13	20
PA40	F05/07	98.2	70.4	90.4	35.7	13	20
PA45	F05/07	111.1	83.3	103.3	42.8	13	20
PA50	F05/07	114.8	87	107	44.8	13	20
PA55	F07/10	149.5	107.5	137.5	54.5	16	30
PA60	F07/10	153.1	111.1	141.1	58.1	17	30
PA65	F07/10	160	118	148	60	19	30
PA70	F10/12	176.9	134.9	164.9	57.4	19	30

Torque depends on control pressure

Torque (Nm)		Single acting					
Type		2.8 bar		4.2 bar		5.6 bar*	
		air	Spring	air	Spring	air	Spring
PA30 FC/FO	0 °	15.0/14.6	10.0/11.2	22.5/21.9	15.0/16.7	30.0/29.2	20.0/22.3
	45 °	7.5/7.8	7.5/7.8	11.3/11.6	11.3/11.6	15.0/15.5	15.0/15.5
	90 °	10.0/11.2	15.0/14.6	15.0/16.7	22.5/21.9	20.0/22.3	30.0/29.2
PA35 FC/FO	0 °	26.5/26.0	17.5/18.5	40.0/39.0	26.0/27.8	53.0/52.0	35.0/37.0
	45 °	13.0/13.0	13.0/13.0	19.5/19.5	19.5/19.5	26.0/26.0	26.0/26.0
	90 °	17.5/18.5	26.5/26.0	26.0/27.8	40.0/39.0	35.0/37.0	53.0/52.0
PA40 FC/FO	0 °	30.0/28.3	20.0/23.3	45.0/42.4	30.0/34.9	60.0/56.5	40.0/46.5
	45 °	15.0/15.6	15.0/15.6	22.5/23.3	22.5/23.3	30.0/31.1	30.0/31.1
	90 °	20.0/23.3	30.0/28.3	30.0/34.9	45.0/42.4	40.0/46.5	60.0/56.5
PA45 FC/FO	0 °	45.0/41.8	30.0/32.5	67.5/62.7	45.0/48.7	90.0/83.6	60.0/64.9
	45 °	22.5/22.3	22.5/22.3	33.9/33.4	33.9/33.4	45.0/44.5	45.0/44.5
	90 °	30.0/32.5	45.0/41.8	45.0/48.7	67.5/62.7	60.0/64.9	90.0/83.6
PA50 FC/FO	0 °	60.0/56.5	40.0/45.8	90.0/84.7	60.0/68.7	120.0/112.9	80.0/91.6
	45 °	30.0/30.5	30.0/30.5	45.0/45.8	45.0/45.8	60.0/61.0	60.0/61.0
	90 °	40.0/45.8	60.0/56.5	60.0/68.7	90.0/84.7	80.0/91.6	120.0/112.9
PA 55 FC/FO	0 °	90.0/84.8	60.0/66.7	135.0/127.2	90.0/100.1	180.0/169.6	120.0/133.4
	45 °	45.0/45.3	45.0/45.3	67.5/68.0	67.5/68.0	90.0/90.6	90.0/90.6
	90 °	60.0/66.7	90.0/84.8	90.0/100.1	135.0/127.2	120.0/133.4	180.0/169.6
PA60 FC/FO	0 °	120.0/114.5	80.0/91.5	180.0/171.8	120.0/137.2	240.0/229.0	160.0/182.9
	45 °	60.0/61.5	60.0/61.5	90.0/92.3	90.0/92.3	120.0/123.0	120.0/123.0
	90 °	80.0/91.5	120.0/114.5	120.0/137.2	180.0/171.8	160.0/182.9	240.0/229.0
PA65 FC/FO	0 °	180.0/172.0	120.0/137.2	270.0/258.0	180.0/205.7	360.0/344.0	240.0/274.3
	45 °	90.0/92.3	90.0/92.3	135.0/138.4	135.0/138.4	180.0/184.5	180.0/184.5
	90 °	120.0/137.2	180.0/172.0	180.0/205.7	270.0/258.0	240.0/274.3	360.0/344.0
PA70 FC/FO	0 °	240.0/211.8	160.0/196.4	360.0/317.6	240.0/294.6	480.0/423.5	320.0/392.8
	45 °	120.0/120.4	120.0/120.4	180.0/180.5	180.0/180.5	240.0/240.7	240.0/240.7
	90 °	160.0/196.4	240.0/211.8	240.0/294.6	360.0/317.6	320.0/392.8	480.0/423.5

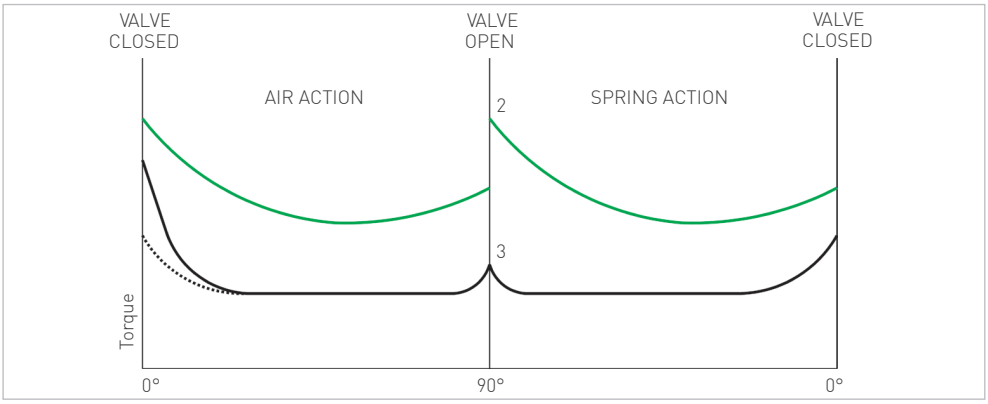
* Standard series; for lower control pressures, special springs are available

Torque (Nm)		Double acting					
Type		3 bar	4 bar	5 bar	5.6 bar*	6 bar	7 bar
PA30 DA	0 °	16.1	21.4	26.8	30.0	32.1	37.5
	45 °	8.0	10.7	13.4	15.0	16.1	18.8
	90 °	12.1	16.1	20.1	22.5	24.1	28.1
PA35 DA	0 °	24.1	32.1	40.2	45.0	48.2	56.3
	45 °	12.1	16.1	20.1	22.5	24.1	28.1
	90 °	18.1	24.1	30.3	33.8	36.2	42.2
PA40 DA	0 °	32.1	42.9	53.6	60.0	64.3	75.0
	45 °	16.1	21.4	26.8	30.0	32.1	37.5
	90 °	24.1	32.1	40.2	45.0	48.2	56.3
PA45 DA	0 °	56.8	75.7	94.6	106.0	113.6	132.5
	45 °	28.4	37.9	47.3	53.0	56.8	66.3
	90 °	42.9	57.1	71.4	80.0	85.7	100.0
PA50 DA	0 °	64.3	85.7	107.1	120.0	128.6	150.0
	45 °	32.1	42.9	53.6	60.0	64.3	75.0
	90 °	48.2	64.3	80.4	90.0	96.4	112.5
PA55 DA	0 °	96.4	128.6	160.7	180.0	192.9	225
	45 °	48.2	64.3	80.4	90.0	96.4	112.5
	90 °	72.3	96.4	120.5	135.0	144.6	168.8
PA60 DA	0 °	128.6	171.4	214.3	240.0	257.1	300.0
	45 °	64.3	85.7	107.1	120.0	128.6	150.0
	90 °	96.4	128.6	160.7	180.0	192.9	225.0
PA65 DA	0 °	192.9	257.1	321.4	360.0	385.7	450.0
	45 °	96.4	128.6	160.7	180.0	192.9	225.0
	90 °	144.6	192.9	241.1	270.0	289.3	337.5
PA70 DA	0 °	257.1	342.9	428.6	480.0	514.3	600.0
	45 °	128.6	171.4	214.3	240.0	257.1	300.0
	90 °	192.9	257.1	321.4	360.0	385.7	450.0

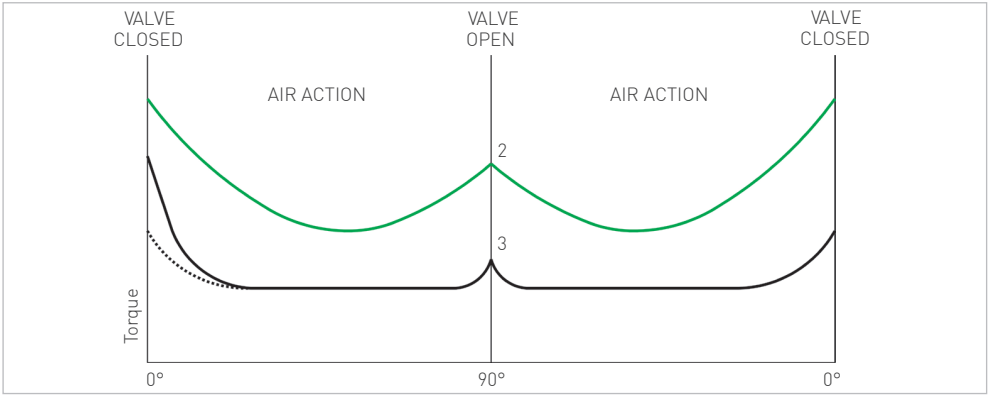
* Standard series; for lower control pressures, special springs are available

Torque characteristics

FC/FO Single-acting



DA Double acting



Accessories

- 3/2-way pilot valve PV94/95
- 3/2 – 5/2-way pilot valve MNL532
- 4/2-way pilot valve 5470
- Pilot pilot valve type PV2000 (for valve clusters)
- Electropneumatic positioner type RPC
- Limit switch box for feedback
- AS interface
- Emergency manual override

i For further information on accessories, refer to the online product catalog at www.gfps.com

Planning Fundamentals

of Valves and Automation

Accessories for Pneumatic Actuators

Content

Overview accessories for pneumatic actuators 539
Electropneumatic positioner type SPC/RPC 541
Type PV95/PV96 3/2-Ways Pilot Valve 551
3/2- and 5/2-way pilot valve MNL532 556
4/2-way pilot valve type 5470 558
Pilot valve cluster PV2000 560

Overview accessories for pneumatic actuators

The accessories for the electric actuators can be retrofitted by the end user himself at any time. The installation of the accessories is performed via the standardized interfaces of the respective actuator. The pneumatic actuators include rotary actuators (PPA04-80 and PA30-90) and stroke actuators (DIASTAR). Depending on the function of the accessory, it can be used for both actuator types or for only one. An overview of the possible applications follows below.

Compatibility of actuator type with accessories

Accessories		Rotary actuators PPA04-80 PA30-90	Stroke actuators DIASTAR
Pilot valves* • **Pilot valves PV94/PV95** • **MNL532** • **Type 5470** • **Pilot valve cluster PV2000**		✓	✓
Digital positioner	SPC		✓
	RPC	✓	
Stroke limiter / emergency manual override			✓
Position feedback sensor	ER52/ER53/ER55		✓
	Limit switch boxes	✓	
AS interface modules	Topmatic		✓
	ASEV2300	✓	

*See chapter „Pilot valves“

Electropneumatic positioner type SPC/ RPC



Type SPC positioner
with diaphragm valve DIASTAR



Type RPC positioner
with pneumatic actuator PPA and ball valve type 546 Pro

Product description

The types SPC (Stroke Process Controller) and RPC (Rotary Process Controller) are digital, electro-pneumatic positioners for integrated mounting on pneumatically operated industrial valves with single-acting stroke actuators e.g. DIASTAR diaphragm valves as well as single- and double-acting rotary actuators e.g. PA and PPA.

Benefits

- Compact and robust design
- Putting into operation by TUNE function of positioner and process controller
- Integrated diagnostic functions for valve monitoring
- Dynamic control system without air consumption in the controlled state
- PID closed loop process controller function (type SPC PID; RPC PID)

Product features

- For pneumatic actuators in double-acting and single-acting function (SPC only single-acting)
- Power supply voltage 24V DC
- Activation 0-10 V, 0-5 V, 4-20 mA, 0-20 mA adjustable
- Multi-pin plug electrical connection
- Operation/configuration via display or internal DIP switch
- Protection rating IP65/IP67
- Binary input (fail-safe position, changeover)
- Operating mode (Automatic/Manual)
- Analog position indicator (0/4 to 20 mA, 0 to 5/10 V) for setpoints and actual values
- Approved and listed according to cULus and cCSAus

Variants

Positioner (SPC, SPC*, SPC D, RPC, RPC D)

The positioner is assembled to a pneumatically driven valve and regulates the position of the valve. The positioner detects the valve position wear-free via a contactless, analog position sensor. The microprocessor electronics in the positioner continuously compares the current position (actual position value) with the position setpoint value specified via the standard signal input (or via fieldbus). If there is a control difference, the electropneumatic control system causes the actuator to correct the actual position value accordingly.

Process controller (SPC PID, RPC PID)

The process controller is integrated in a control loop. The position setpoint value of the valve is calculated from the process setpoint value and the actual process value (sensor signal) via the control parameters (PID controller). The process setpoint value can be specified by an external signal (or via fieldbus). The process controller processes all common current and voltage standard signals and can optionally be equipped with a fieldbus interface. The actual value of the process variable is fed directly to the device as a 4 to 20 mA, Pt 100 or frequency signal. The process controller calculates the internal setpoint value for the subordinate positioner from the setpoint/actual value comparison.

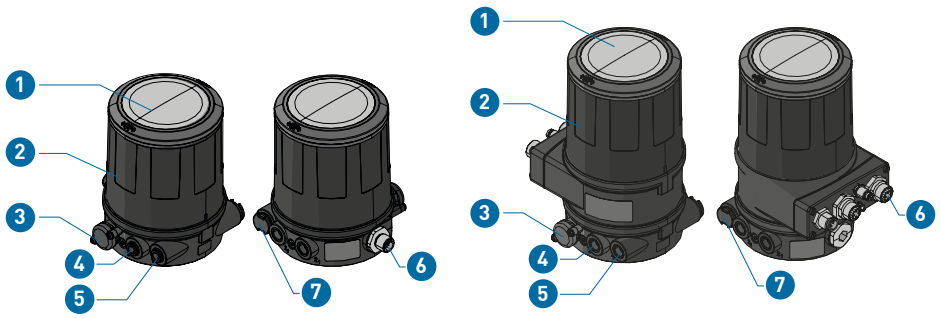
Control head (SPC Lite)

The type SPC Lite positioner is a control head designed for decentralized automation of pneumatic process valves for simple OPEN/CLOSED applications. The valve position is detected via a non-contact, analog sensor element, which automatically detects and stores the valve end positions via a teach function upon putting into operation. The integrated pilot valve controls single-acting actuators.

Technical Data

Type SPC Positioner design

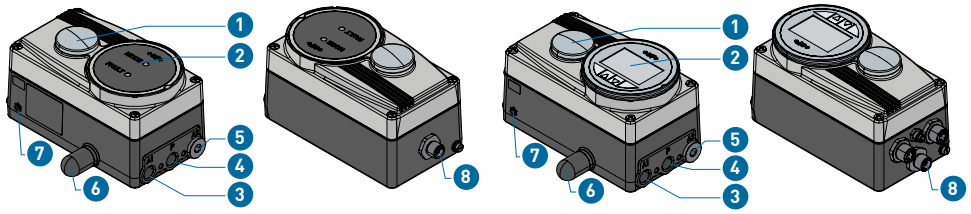
Type SPC/SPC Lite | **Type SPC D/PID**



1 Transparent cover, underneath decoding module
2 Housing cover
3 Pressure limiting valve
4 Exhaust air connection Lettering: 3
5 Control air connection Lettering: 1
6 Electrical connection
7 Supply air filter

Type RPC Positioner design

Type RPC | **Type RPC D/PID**



1 Mechanical position indication
2 Display/control module
3 Working connection 1 (connection: A1)
4 Pressure connection 1.4 - 7 bar (connection: P)
5 Working connection 2 (connection: A2)
6 Venting connection/Venting filter
7 Overpressure valve
8 Electrical connection

Type	SPC Lite	SPC	SPC D	SPC PID	RPC	RPC D	RPC PID
Pneumatic actuator type	Stroke actuator SPC*: large air capacity for DIASTAR DN>50				Rotary/multiturn actuator		
Function	Control head	Positioner		Process controller	Positioner		Process controller
General data							
Operating Temperature	-10 to +55 °C						
Storage Temp	-20 to +65 °C						
Protection rating	IP65/IP67 as per EN 60529 (evaluated by the manufacturer)						
Deployment height	up to 2'000 m above sea level relative humidity max. 95% at 50 °C (non-condensing)						
Housing material	External: PPS, PC, VA, PP-FR Internal: PA 6; ABS				Plastic-coated aluminum stainless steel (V4A), PC, PE, POM, PTFE		
Sealing material	NBR/EPDM				EPDM, NBR, FKM		
Stroke range valve stem (all SPC)	2 - 47 mm	3 - 45 mm					
Integrated displacement transducer	Non-contact (wear-free) analog inductive position sensor				Conductive plastic rotary potentiometer Rotation angle 30° to 180°		
Putting into operation/ Initialization	Automatically through X.TUNE function (automatic adjustment of positioner)						
Pneumatic data							
Control medium	Neutral gases, air Quality class as per ISO 8573-1						
Dust content	Quality class 7, max. particle size 40 µm, max. particle density 10 mg/m^3						
Water content	Quality class 3, max. pressure dew point -20 °C or min. 10 °C below the lowest operating temperature						
Oil content	Quality class X, max. 25 mg/m^3						

Type	SPC Lite	SPC	SPC D	SPC PID	RPC	RPC D	RPC PID
Temperature range of control medium	-10 to 50 °C						
Pressure range of control medium	3 - 7 bar				1.4 - 7 bar		
Positioning system nominal diameter	DN0.6	DN0.6 SPC*: DN2.5	DN0.6		DN3.0		
Air output control valve for ventilation and vent outlet (QNn value according to definition with pressure drop from 7 to 6 bar absolute)	250 l_N/min	SPC: 7 l_N/min SPC*: 130 l_N/min	7 l_N/min		50 l_N/min (at 1.4 bar2.) 150 l_N/min (at 6 bar2.) QNn=100 l_N/min		
Fluidic connection	Threaded joint G ⅛				Threaded joint G ¼		
Electrical data							
Protection class	III as per DIN EN 61140 (VDE 0140-1)						
Connections	Round connector (see accessories, not included in delivery)						
M12 8-pin Power supply, input/output signals	x	x	x	x	x	x	x
M12 4-pin Power supply			x	x			x
M8 4-pin Process current value from sensor				x			x
M8 4-pin Digital outputs						x	
M12 D-coded Fieldbus connection	Only with fieldbus device, not available as accessories						
Supply voltage	24 V DC ± 10% - max. residual ripple 10% SPC: 24 V DC ± 25% - max. residual ripple 10%						
Power consumption	< 5 W						
Input data for actual value signal (PID only)	4 ... 20 mA: • Input resistance 70 Ω Resolution 12 bit						
	Frequency: • Measurement range 0 - 1000 Hz • Input resistance 20 kΩ Resolution 1‰ of measured value Input signal > 300 mVss • Signal form: sine, rectangle, triangle						
	PT 100: • Measuring range -20 to +220 °C • Resolution < 0.1 °C • Measuring current < 1 mA						
Input data for setpoint value signal		0/4 - 20 mA: Input resistance 75 Ω Resolution 12 bit					
			0 - 5/10 V: Input resistance 22 kΩ, Resolution 12 bit (at 0 - 5 V only 11 bit)			0 - 5/10 V: Input resistance 22 kΩ, Resolution 12 bit (at 0 - 5 V only 11 bit)	
						+Inductive proximity switches 100 mA current limitation	
Analog position indicator		Load: 0 - 560 Ω (for current output 0/4 - 20 mA)					
			Max. current: 10 mA (for voltage output 0 - 5/10 V)			Max. current: 10 mA (for voltage output 0 - 5/10 V)	
Digital outputs		Galvanically isolated, PNP Current limiting 100 mA, output is clocked on overload					
Digital input		PNP					
		0 - 5 V = log "0", 12 - 30 V = log "1"	0 - 5 V = log "0", 10 - 30 V = log "1"				
		Inverted input correspondingly inverted (input current < 6 mA)					
Approvals/Standards	cULus and cCSAus						

Assignments

Assignment of SPC and RPC positioners to pneumatic stroke/rotary actuators:

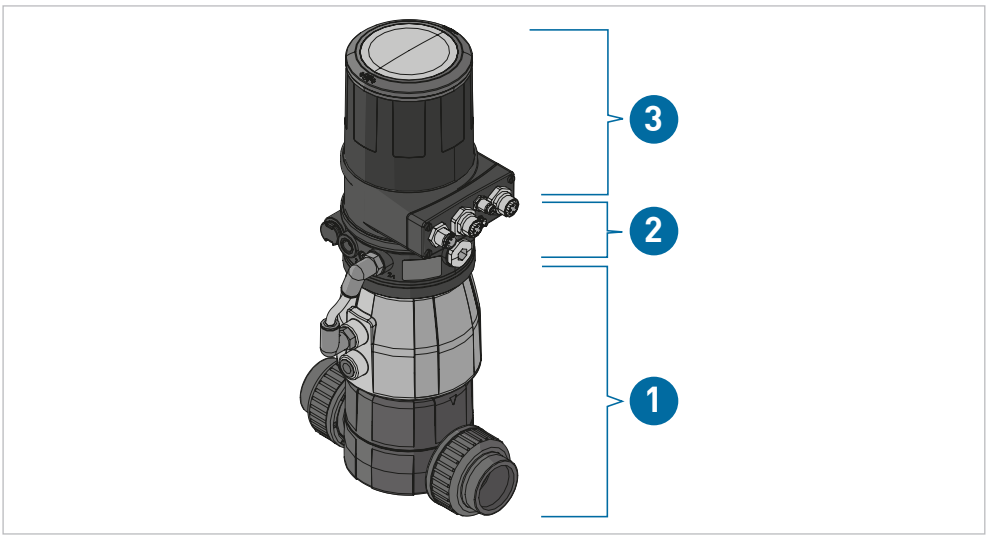
	DIASTAR							PA30-90	PPA08-80
	Six FC	Ten FC/FO	Ten DA	TenPlus FC	Sixteen FC/FO	Sixteen DA	025 FC/FO	FC/FO/DA	FC/FO/DA
Type SPC		x	x	x	x	x	x*		
Type RPC								x	x

only SPC

! Opening times SPC D for DIASTAR FO Sz.5/DN50 up to 30 seconds possible. This should be taken into account when selecting the valve.

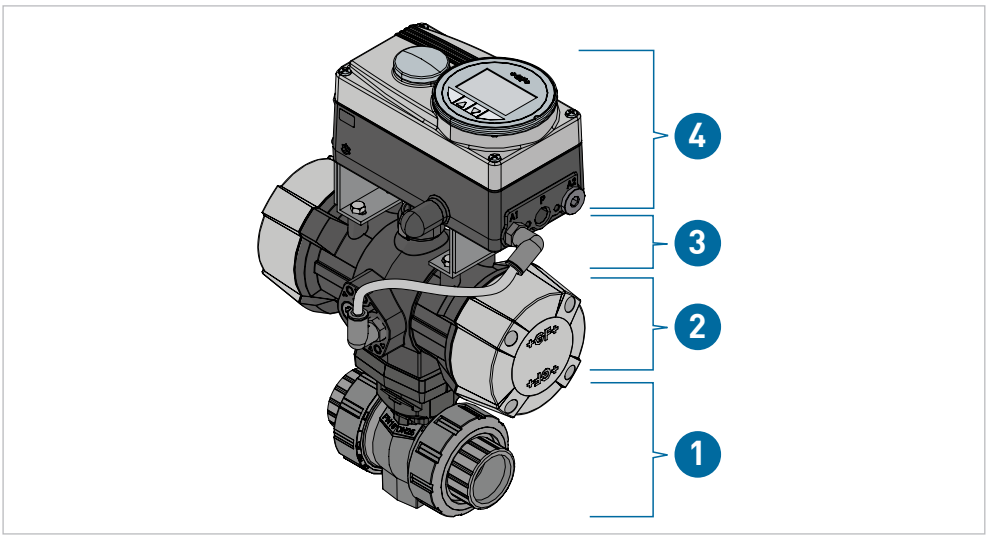
! For diaphragm valves with EPDM diaphragms and 16 bar version, flipping the diaphragm can cause overshooting.

Type SPC positioner



1 DIASTAR diaphragm valve
2 Adaption SPC
3 Type SPC Positioner

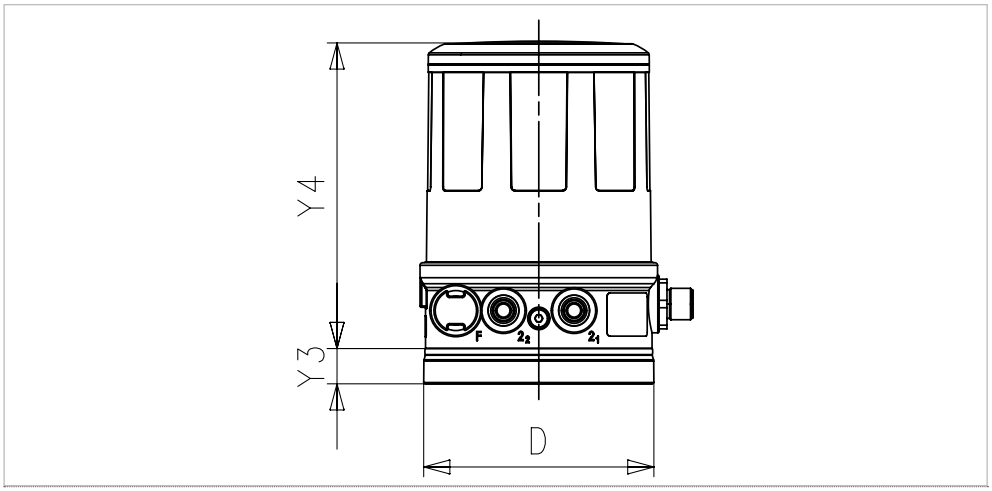
Type RPC positioner



1 Ball valve type 546 Pro
2 Pneumatic actuator type PPA04 – PPA80
3 Adaption RPC
4 Type RPC positioner

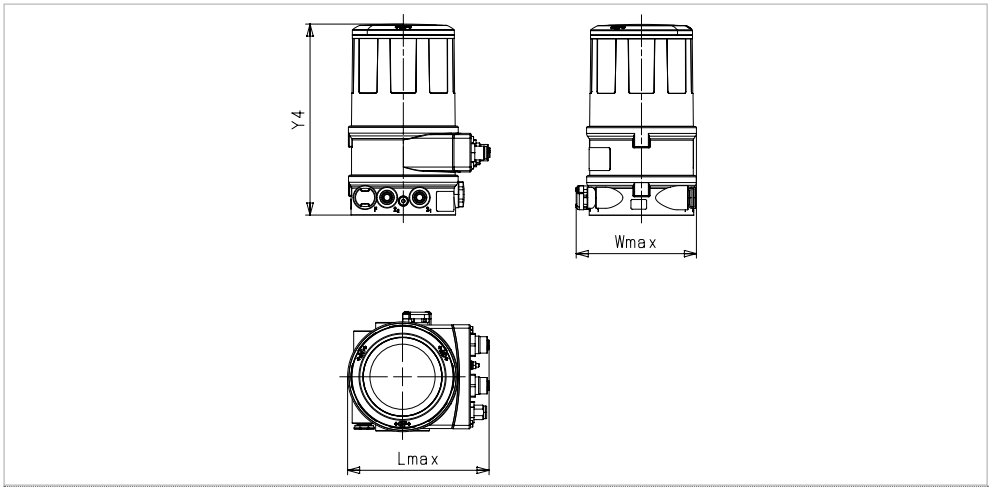
Dimensions

Type SPC / SPC Lite



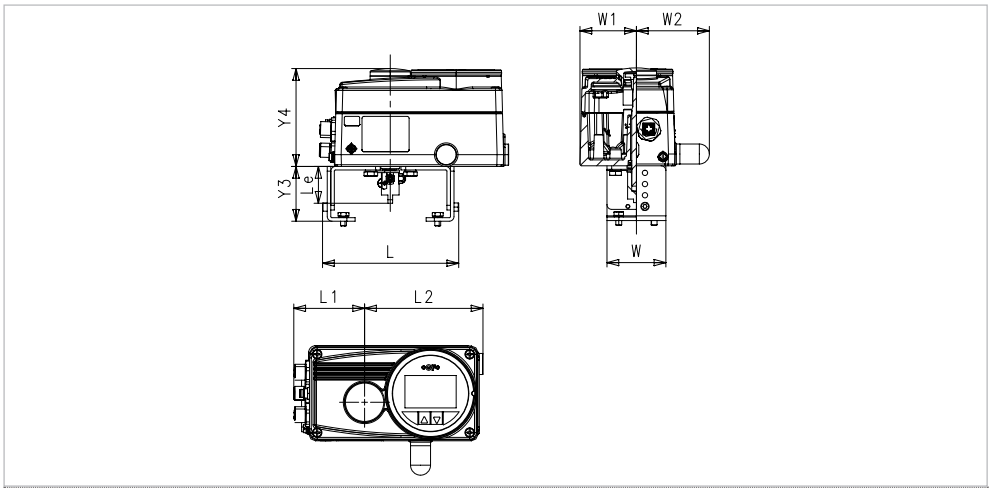
Designation	Order code	Y4	Lmax	Wmax
SPC	199 190 620	117.5	104.5	99.5
SPC*	199 190 621	117.5	104.5	99.5
SPC Lite	199 190 619	117.5	104.5	99.5

Type SPC D/PID



Designation	Order code	Y4	Lmax	Wmax
SPC D	199 190 622	158.5	115.5	99.5
SPC PID	199 190 625	158.5	115.5	99.5

Type RPC / RPC D / RPC PID



Designation	Order code	Y4	W1	W2	L1	L2
RPC	199 190 640	83.5	48	62	60.5	100.5
RPC D	199 190 641	83.5	48	62	60.5	100.5
RPC PID	199 190 644	83.5	48	62	60.5	100.5

Accessories

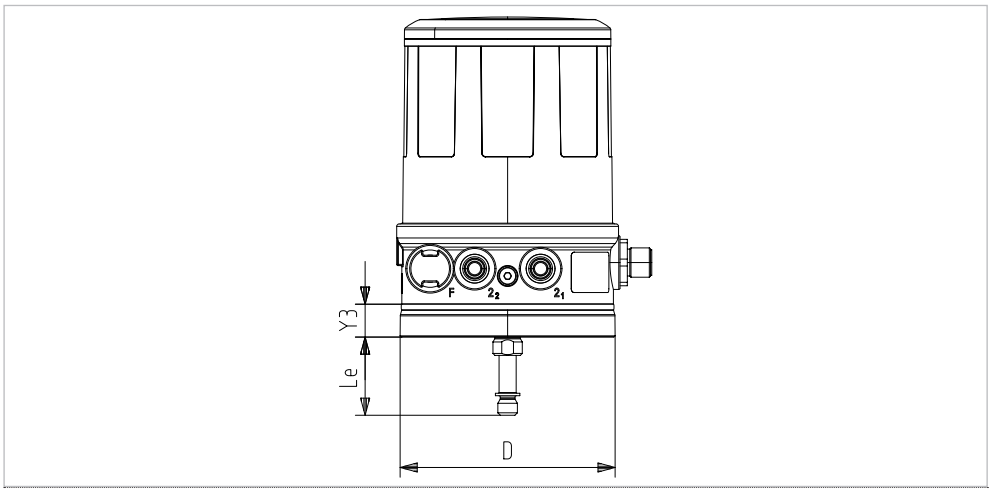
Adaption for positioner type SPC, SPC Lite, SPC D, SPC PID

SPC adapter assignment depending on the DIASTAR stroke actuator used:

	DIASTAR						
Nominal diameter	Six FC	Ten FC/FO	Ten DA	TenPlus FC	Sixteen FC/FO	Sixteen DA	025 FC/FO
DN15		1		2	2		
DN20		2		2	2		
DN25		2		3	3		
DN32		3		4	4		
DN40		4		5	5		
DN50		4		5	5		
DN65							6
DN80							6
DN100							6
DN150							6

For mounting positioner on pneumatic stroke actuator type DIASTAR.



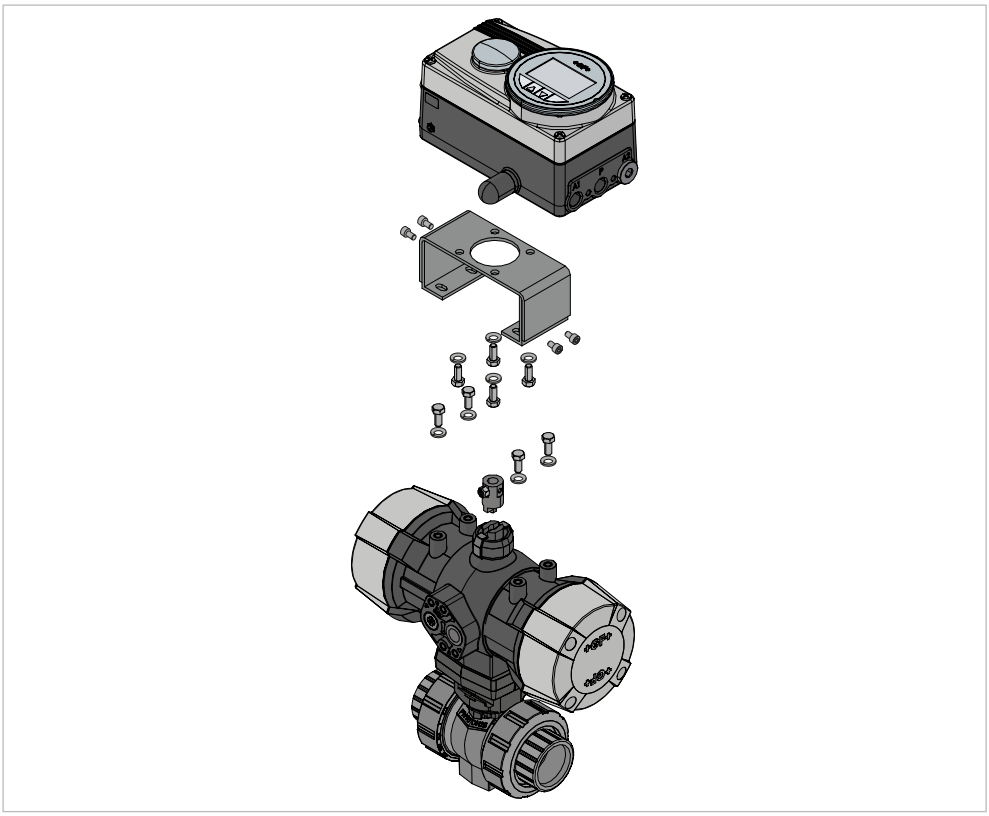


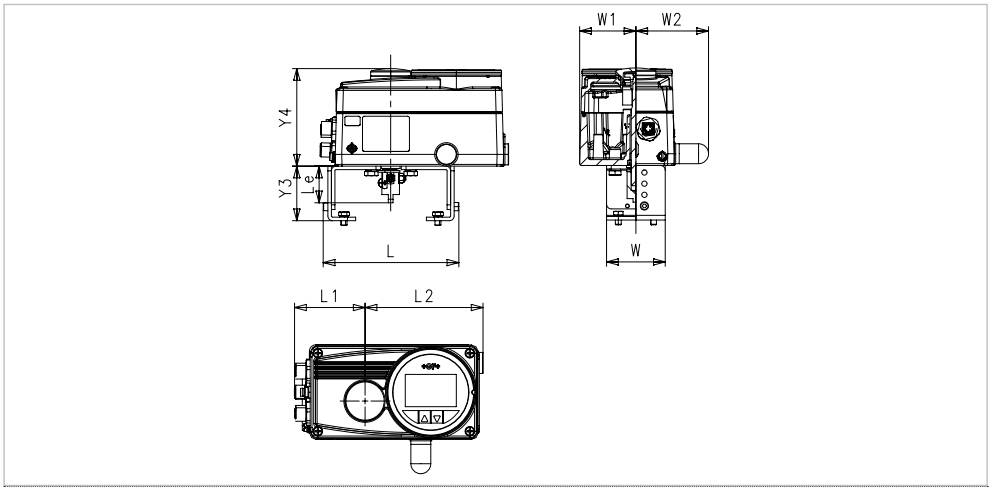
Order code	Designation	Y3	D
199 190 628	Adaption SPC 1 + 2	13.5	88
199 190 629	Adaption SPC 3 + 4	13.5	88
199 190 630	Adaption SPC 5	13.5	88
199 190 631	Adaption SPC 6	13.5	88

! Note: Observe the assignment of adaptation to actuator size.

Adaption for positioner type RPC, RPC D, RPC PID

For mounting positioner on pneumatic rotary actuator type PPA08-80.





Order code	Designation	Y3	L	Le	W
199 190 647	Adaption RPC	46.5	116	31.5	50

Multi-pin connector

For electrical connection of positioner type SPC, type RPC to customer's control system

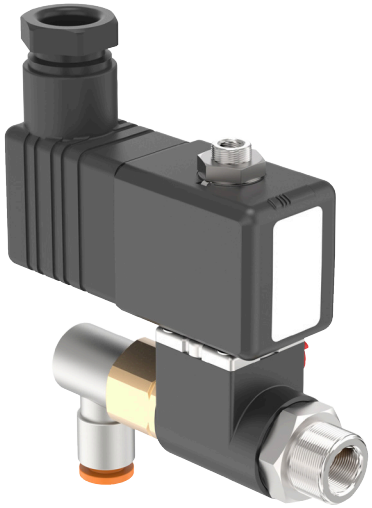
Order code	Designation	
199 190 649	Round socket M12 8-pin w. cable 5m PUR	Protection rating IP67/IP68/IP69, A-coded, angled plug, free cable end, operating voltage max. 250 V AC/DC, operating current max. 4 A, microbe and hydrolysis resistant, halogen free, ambient temperature: • Connector: -40 - 90 °C (-40 - 194 °F) • Cable, permanently installed: -40 - 80 °C (-40 - 176 °F) • Cable, movable: -25 - 80 °C (-13 - 176 °F) Contamination level: 3
199 190 650	Round socket M12 4-pin w. cable 5m PUR	
199 190 651	Round socket M8 4-pin w. cable 5m PUR	

! The connections to be used for the respective positioner can be taken from the electrical data above.

Type PV95/PV96 3/2-Ways Pilot Valve



Type PV95



Type PV96

Product description

The pilot valves Type PV95 and Type PV96 are direct-acting 3/2-way Pilot Valves with NC function (Normally Closed). They are used to activate single-acting pneumatic actuators.

Both valve types have a nominal diameter of DN2 and differ in their air performance. Both the PV95 and the PV96 are available in different operating voltage variants.

PV96 pilot valves are designed for a control pressure up to 8 bar and are attached to the actuator by means of a hollow bolt. They are supplied as standard with an industry-standard Form B plug.
Connection options:

- Compressed air connection: G⅛", NPT ⅛“ or 6 mm tube fitting
- Working connection actuator: G¼" or G⅛"

PV95 pilot valves are designed for a control pressure up to 10 bar and are also attached to the actuator using a hollow bolt. They are provided with an industry-standard Form A valve plug.
Connection options:

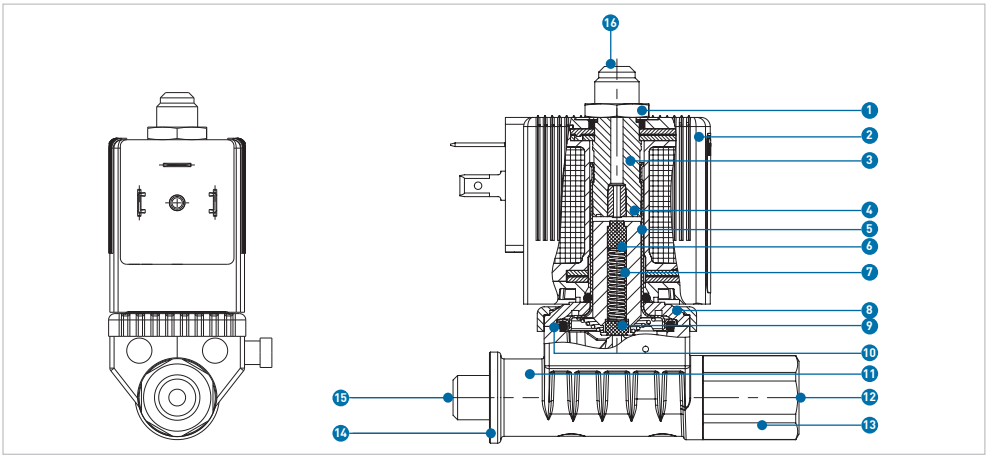
- Compressed air connection: G¼“ or NPT ⅛"
- Working connection actuator: G¼" or G⅛"

Benefits/features

- Direct acting and compact small valve
- Easy direct attachment to a pneumatic Actuator
- Service-friendly manual operation
- Type PV96 pilot valves with coil UL Recognized for USA and Canada (cURus UL File MH19303)

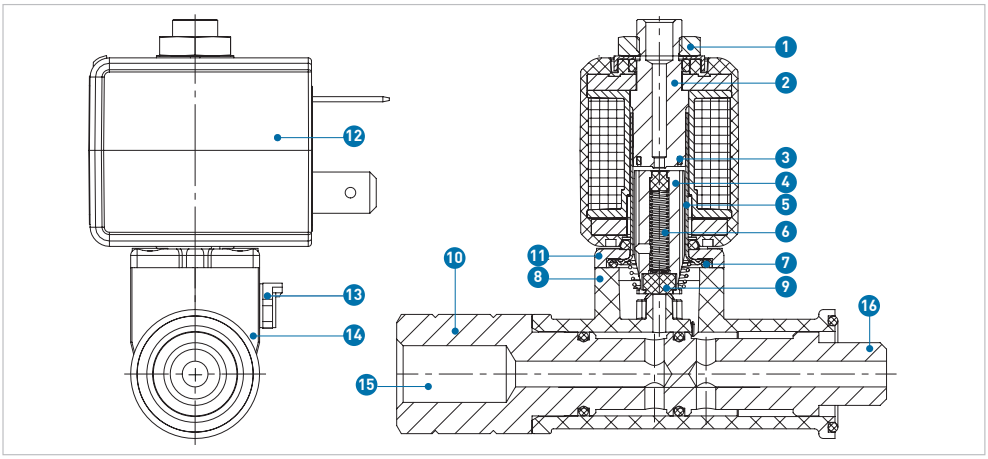
Technical data

Type PV95



1 Locknut (Steel)
2 Coil (PA)
3 Stopper (Stainless steel)
4 Shading ring (Copper)
5 Core guide tube (Stainless steel)
6 Magnetic core (Stainless steel)
7 Spring (Stainless steel)
8 Sub-base (Steel)
9 Armature seal (FKM)
10 O-ring (FKM)
11 Valve body (PPS)
12 Compressed air connection (P)
13 Hollow bolt (brass)
14 O-rings (NBR)
15 Working connection actuator (A)
16 R-connection

Type PV96



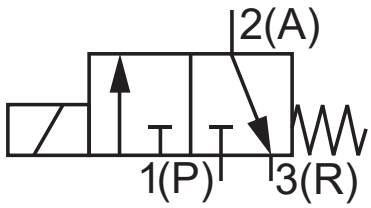
1 Nut (steel)
2 Plug (stainless steel)
3 Shorting ring (copper)
4 Core (stainless steel)
5 Core guide tube (stainless steel)
6 Spring (stainless steel)
7 O-ring (FKM)
8 Spring (stainless steel)
9 Core seal (FKM)
10 Hollow bolt (brass)
11 Flange (brass/stainless steel)
12 Coil (epoxy)
13 Hand lever (Durethan)
14 Housing (PPS)
15 Compressed air connection (P)
16 Working connection actuator (A)

Specification	PV96	PV95
Nominal diameter	DN2	DN2
Control pressure[2)]	0 - 8 bar DC 2 - 7 bar AC	0 - 10 bar
Housing material	PPS	PPS
Coil material	Epoxy resin	Polyamide
Hollow bolt	Nickel-plated brass	Nickel-plated brass
Sealing material	FKM	FKM
Media	Neutral gases and fluids	
Medium temperature	-10 °C to +60°C	-10 °C to +100 °C
Ambient temperature	-10 °C to +55°C	Max. + 55 °C
Viscosity	Max. 21 mm^2/S	
Working connection actuator (A)	G⅛", G¼"	G⅛", G¼"
Compressed air connection (P)	G⅛", NPT ⅛", tube fitting Ø6mm	G¼", NPT ⅛"
Supply voltage	24 VDC 24 VAC, 50 – 60 Hz 110 VAC, 50 – 60 Hz 120 VAC AC, 60 Hz 230 VAC, 50 – 60 Hz	24 VDC 24 VAC, 50 Hz 110 VAC, 50 Hz 230 VAC, 50 Hz
Voltage tolerance	+/-10 %	
Rated duty	Continuous duty 100 % ED	

Specification	PV96	PV95
Electrical connections	Per DIN EN 175301-803 Form B	Per DIN EN 175301-803 Form A
Manual override	Standard	
Mounting position	User-defined, preferably actuator on top	
Weight	120 g - 135 g	420 g
Protection rating	IP 65 with cable plug	
Coil insulation class	H	B
Circuit function	NC (Normally Closed)	
QNn value air[1)]	75 l/min	120 l/min
Coil output	7 W (DC), 6 W (AC)	8 W (AC, DC)
Electrical power startup	12VA (AC); 7 W (DC)	24 VA (AC), 8 W (DC)
Electrical power operation	6,5 VA (AC); 5,5 W (DC)	17 VA (AC), 8 W (DC)
Response time open[3)]	8-12 ms	10-15 ms
Response time close[3)]	8-12 ms	15-20 ms
Product standard	IEC 61508-2	IEC 61508-2
Test standard	IEC 61508-2	IEC 61508-2
Approvals	The coils are UL Recognized for the USA and Canada according to: • UL 429 (electrically operated valves) • CAN/CSA-C22.2 No. 139	SIL

[1)] QNn value air (l/min) at +20°C, 6 bar valve inlet, pressure difference 1 bar.
[2)] Pressure data (bar) overpressure to atmospheric pressure
[3)] Switching times (ms) Measurement at valve outlet at 6 bar and +20°C Opening: Pressure build-up 0-90 %, closing: Pressure reduction 100-0 %

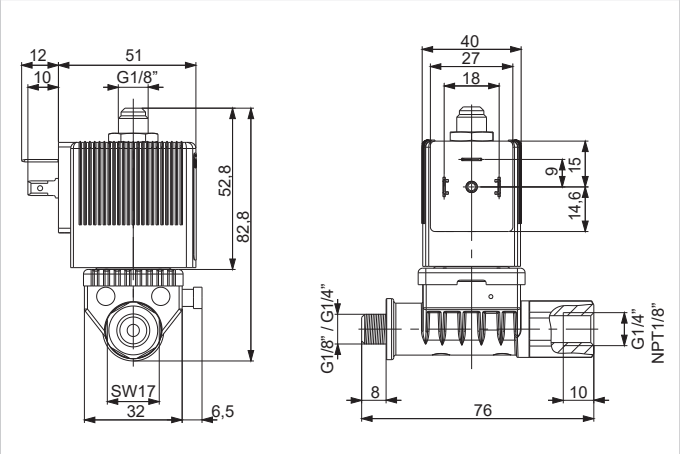
Switching functions

Circuit function C

3/2 way direct-acting solenoid valve, NC normally closed

Dimensions

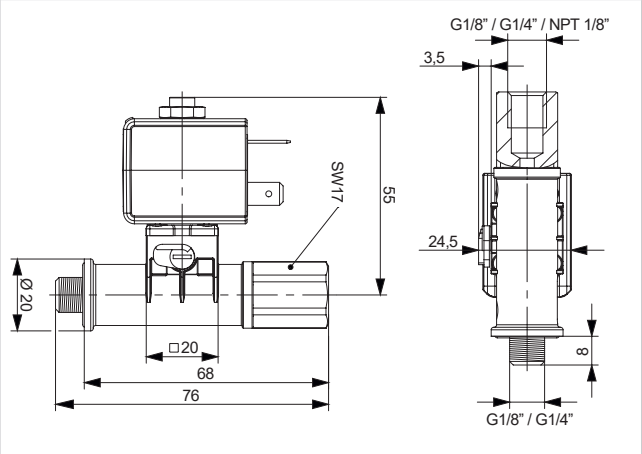
Type PV95

Version with 76 mm hollow bolt



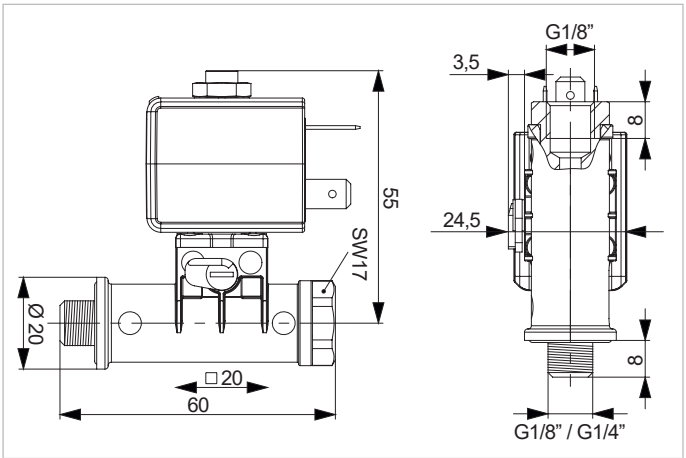
Type PV96

Version with 76 mm hollow bolt



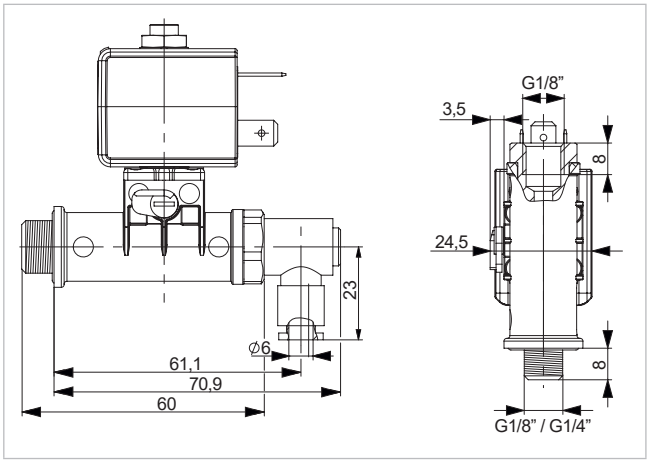
Type PV96

Version with 60 mm hollow bolt



Type PV96

Version with 60 mm hollow bolt and hose coupling



Order Overview

PV95

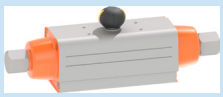
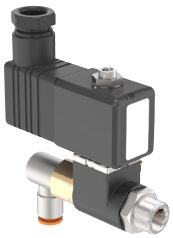
Order code	Description	Voltage	Cable plug shape	Hollow bolt, length	Compressed air connection (P)	Working connection actuator (A)
199190532	PV95 Pilot Valve, 0-10 bar	24 VDC	A	76 mm	G¼"	G⅛"
199190533	PV95 Pilot Valve, 0-10 bar	24 VAC, 50 Hz	A	76 mm	G¼"	G⅛"
199190534	PV95 Pilot Valve, 0-10 bar	110 VAC	A	76 mm	G¼"	G⅛"
199190535	PV95 Pilot Valve, 0-10 bar	230 VAC	A	76 mm	G¼"	G⅛"

PV96

Order code	Description	Voltage	Cable plug shape	Hollow bolt, length	Compressed air connection (P)	Working connection actuator (A)
199196100	PV96 Pilot Valve, 0-8 bar	24 VDC	B	76 mm	NPT ⅛"	G¼" *
199196101	PV96 Pilot Valve, 0-8 bar	24 VDC	B	60 mm	G⅛"	G¼" *
199196102	PV96 Pilot Valve, 2-7 bar	24 VAC, 50 Hz	B	76 mm	NPT ⅛"	G¼" *
199196103	PV96 Pilot Valve, 0-8 bar	24 VDC	B	60 mm	G⅛"; tube fitting Ø6mm	G¼" *
199196104	PV96 Pilot Valve, 2-7 bar	24 VAC, 50 Hz	B	60 mm	G⅛"; tube fitting Ø6mm	G¼" *
199196105	PV96 Pilot Valve, 2-7 bar	110 VAC, 50 Hz	B	60 mm	G⅛"; tube fitting Ø6mm	G¼" *
199196106	PV96 Pilot Valve, 2-7 bar	120 VAC, 60 Hz	B	76 mm	NPT ⅛"	G¼" *
199196107	PV96 Pilot Valve, 2-7 bar	230 VAC, 50 Hz	B	60 mm	G⅛"; tube fitting Ø6mm	G¼" *
199196108	PV96 Pilot Valve, 2-7 bar	230 VAC, 50 Hz	B	60 mm	G⅛"	G¼" *

* Reducing nipple for G⅛" connection included

Pressure ratings of pilot valves and actuators

		Control pressure min. - max.	Pneumatic Actuator Typ PPA	Pneumatic Actuator Typ PA30-90	Pneumatic Diaphragm Valve DIASTAR
					
			4.5 - 7 bar	2.8 - 8.4 bar	2.6 - 5.5 bar
PV96		0 - 8 bar DC 2 - 7 bar AC	X		X
PV95		0 - 10 bar	X	X	X

3/2- and 5/2-way pilot valve MNL532



Product description

3/2 and 5/2-way solenoid valve for activating a double-acting pneumatic actuator. The mounting takes place via a NAMUR connection. For the dimensions of the DIASTAR series DN15 – DN50 and our pneumatic actuators PPA04-80 a NAMUR connection plate must be used between the actuator and the solenoid pilot valve.

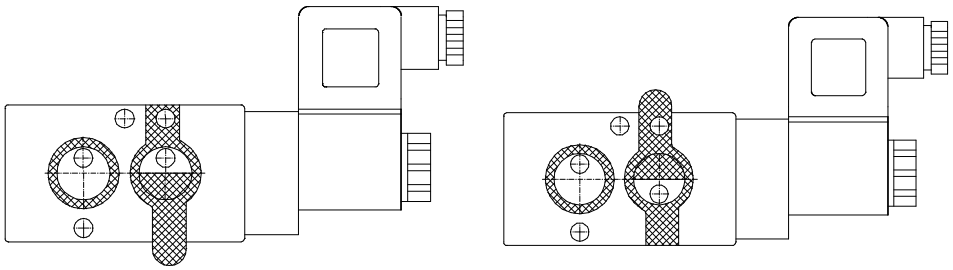
Benefits/features

- Easy change over from 5/2- to 3/2-ways operation by innovative sealing plate
- Single stable version
- Manual override

Technical data

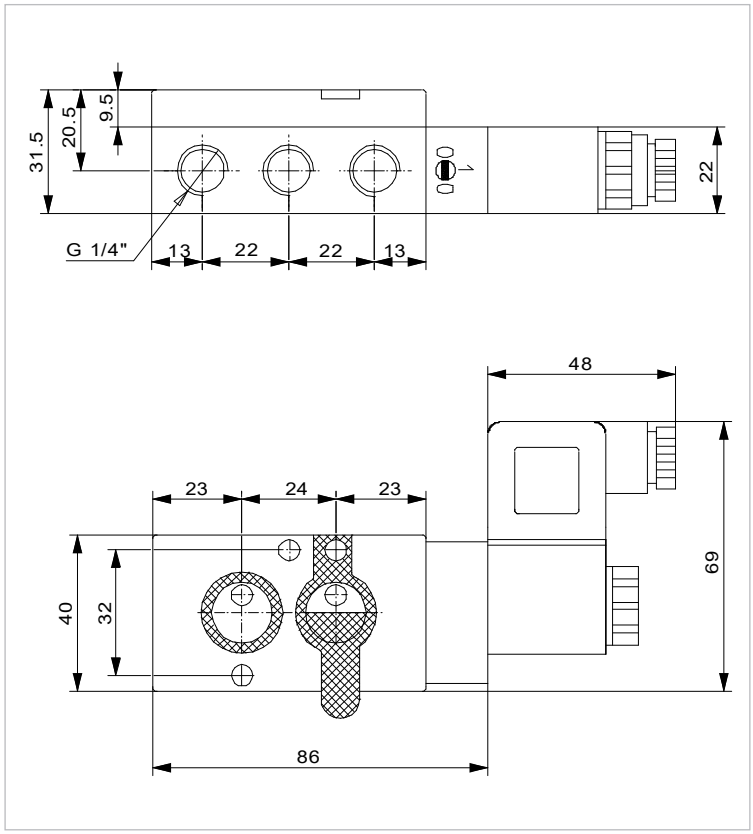
Specification	
Air connection	G¼"
Dimension	5.5 mm
Air pressure	2 – 10 bar
Temperature	-10 °C – +50 °C
Protection rating	IP67 per DIN40050
Voltage (V AC) / Power consumption	230 V / 5 VA, 115 V / 5 VA, 48 V / 5 VA, 24 V / 5 VA
Voltage (V DC) / Power consumption	24 V/ 3 W
Air flow	950 l/min
Product standard	IEC 61508-2
Test standard	IEC 61508-2
Approvals	SIL

Sealing plate



5/2- ways function	3/2- ways function

Dimensions



4/2-way pilot valve type 5470



Product description

Type 5470 is a 4/2-way solenoid valve for double acting pneumatic actuators. This valve consists of a pilot rocker solenoid valve and a pneumatic valve. A tilting bearing tilts within the housing of the pilot valve, similar to a rocker, and switches the valve. The minimal tilting movement of the rocker is wear-free; basic lubrication is not required. The valves can be mounted together individually using a module flange. They can be snapped together with the connection modules to form valve blocks (on request).

Benefits/features

- Compact design in 4/2-way version
- Extendable valve block
- Reduced power consumption
- Robust construction

Technical data

Technical data		
Product properties		
Materials	Body Inner valve parts Seal material	Polyamide (PA) Ultramid NBR
Weight	approx. 120g	
Nominal diameter	DN4	
Nominal operating mode	Continuous operation	
Electrical data		
Operating voltage	24V AC/DC, 110-120V AC/DC, 220-240V AC/DC	
Voltage tolerance	± 10 %	
Electrical power consumption	24V AC/DC: 2W, 110-120V AC/DC, 220-240V AC/DC: 3 W	
Performance data		
Pressure range	2...10 bar overpressure with respect to atmospheric pressure	
Q_{Nn} value air	300 l/min*	
Electrical nominal power	2...3 W; Solenoids with integrated rectifier, LED and varistor (UC variant) solenoids	
Medium data		
Operating media	Compressed air, neutral gases (5 µm filtration)	
Medium temperature	- 10...+ 50 °C	

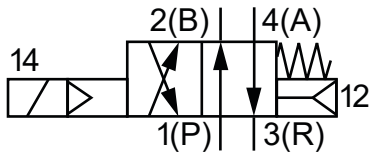
Technical data

Prrovals and certificates	
Protection class	IP65
Type of protection	EEx la IIC T6 on request
Product connections	
Electrical connection	Connector lugs according to DIN EN 175301 – 803, Form C
Port connection	NAMUR
Air connection	Sleeve G ⅛
Environment and installation	
Ambient temperature	- 10...+ 55 °C
Installation position	Any, preferably actuator face up

* Flow rate value for air, measurement at + 20 °C, 6 bar pressure at the valve inlet and 1 bar pressure difference

Switching functions

Circuit function G



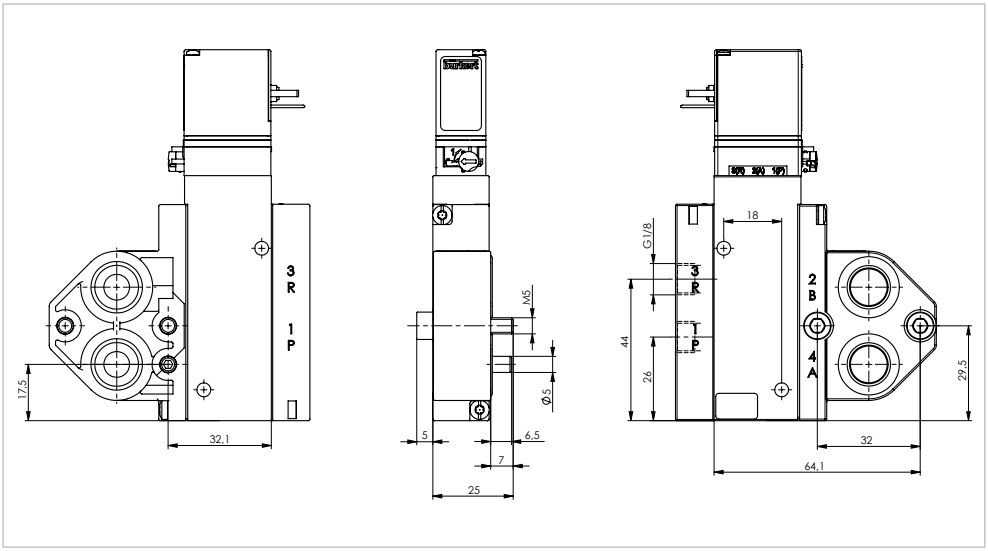
Type: G, solenoid valve
4/2 way
Servo-assisted
Normally open

Switching time

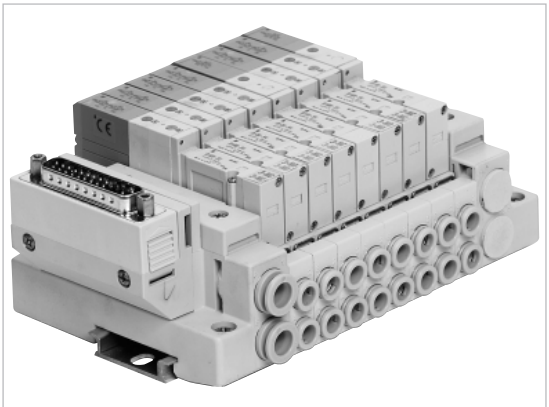
Open	Close
15	12

Switching time (ms): Measurement at valve outlet according to ISO 12238 at 6 bar and +20 °C. Open: Pressure build-up 0% to 90%. Close: Pressure build-up 100% to 10%.

Dimensions



Pilot valve cluster PV2000



Product description

The pilot valve cluster PV 2000 is used for activating several actuators at the same time. It consists of a connecting module, several solenoid pilot valves and an end module. Depending on the application you can choose a connecting module for D-sub connection, AS interface or Profibus. The modular system allows combining 3/2 and 5/2-way valves as required by the application.

Benefits/features

- Compact design
- Fully modular
- Easy subsequent extension
- Connectors for electric as well as pneumatic connections
- 5/2- and 3/2-ways valves
- Bus interfaces available
- Low power consumption
- Optical position indicator
- Manual override

Environmental conditions

! Do not use valves in environments with corrosive gases, chemicals, salt water, water, steam, or where there is direct contact with any of these.

Products with protection class IP65 and IP67 (according to IEC529) are protected against dust and water. However, these products cannot be used in the water.

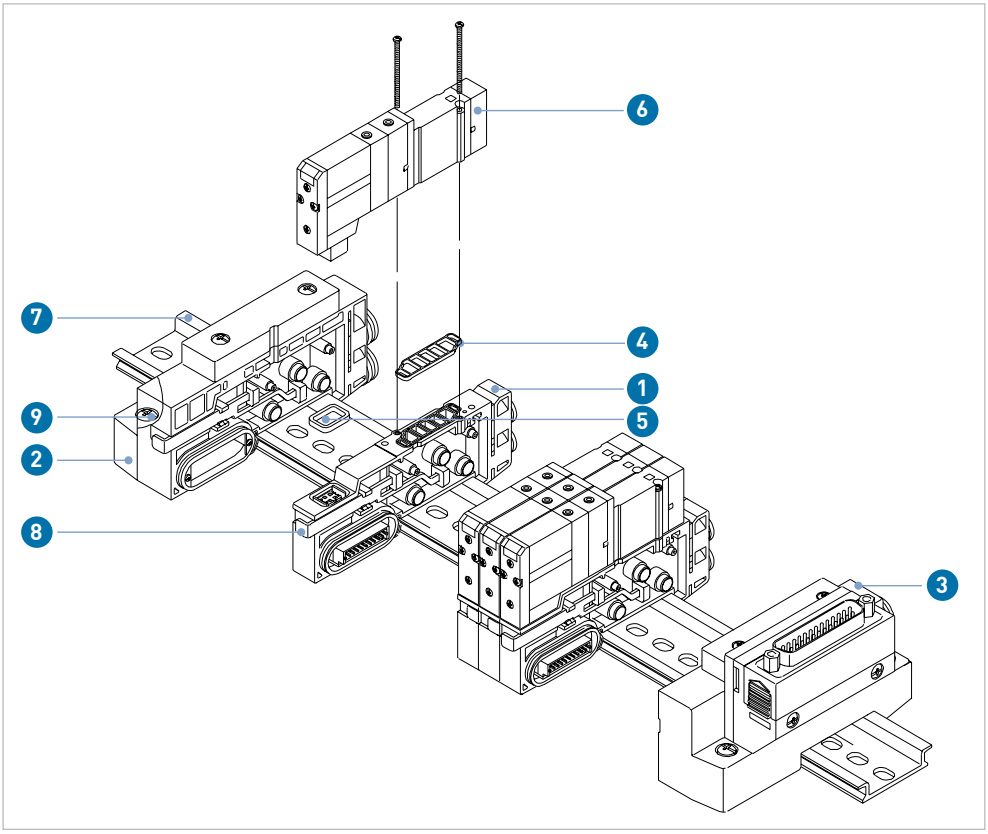
When using the manifold block assembly with integrated sound absorber and protection class IP67, it has to be ensured that the vent connection does not get in direct contact with water or other liquids.

Any liquid entering through the vent connection of the sound absorber can damage the valve. Do not use the valve in an explosive environment.

Do not use in locations subject to vibration or impact. Confirm the specifications in the technical datasheet. Use a protective cover to shield valves from direct sunlight. Shield valves from radiated heat generated by nearby heat sources. Employ suitable protective measures in locations where there is contact with oil or welding, spatter, etc.

If solenoid valves are mounted into a switch panel or if they are energized over a longer period, measures for diverting the excess heat must be taken, in order to comply with the admissible operating temperature.

Technical data



1 Mounting base
2 End module
3 Connection module with D-sub connector
4 Valve seal
5 Connector seal
6 Solenoid valve
7 DIN rail (customer-supplied)
8 Separation lever
9 Screw

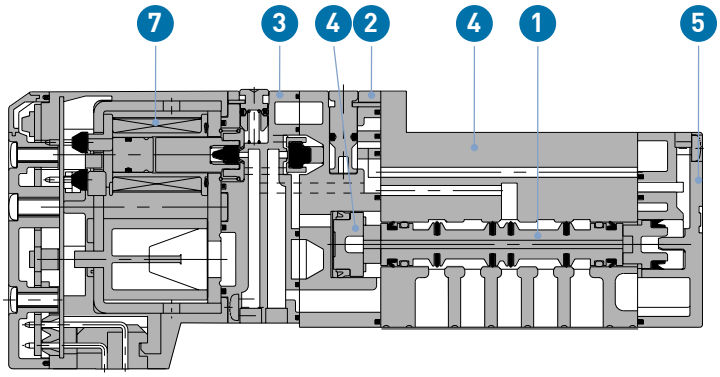
Specification		
Manifold type		Stacking type cassette base manifold
1/3 (P: supply), 5 (R: exhaust)		Common supply, exhaust
Valve station		Max. 18 stations
Max. number of solenoids		18
Port size	1(P)/3, 5(E) connection	C8 *
	4(A)/2(B) connection	C6 *
Internal pilot operating pressure range		1.5 to 7 bar
Medium		Compressed air, 5 µm filter or smaller recommended
Maximum operating frequency (Hz)		5
Manual override		Non-locking type
Pilot exhaust method		Main valve / pilot valve common exhaust
Lubrication		Not required
Mounting orientation		Unrestricted
Impact/vibration resistance		150/30 ms (8.3 to 2'000 Hz)
Protection rating valves / D-sub connector		IP67/IP40 (acc. IEC529)
Supply voltage / duty cycle		24 V DC / 100 %
Allowable voltage fluctuation		± 10 % of rated voltage
Power consumption		0.65 W
Spark suppression		Zener diode
Indicator light		LED

* C6: One-touch fitting for Ø 6 mm
* C8: One-touch fitting for Ø 8 mm

Impact resistance
No malfunction when tested with a drop tester in the axial direction and at a right angle to the main valve and armature, one time each in energized and de-energized states (at initial value).

Vibration resistance
No malfunction when tested with one sweep of 8.3 to 2,000 Hz in the axial direction and at a right angle to the main valve and armature, in both energized and de-energized states (at initial value).

Materials



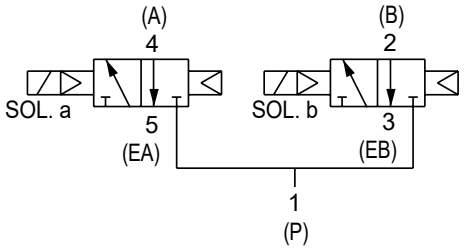
1 Body (die-cast aluminum zinc)
2 Adapter plate (Resin)
3 Pilot body (Resin)
4 Piston (Resin)
5 End plate (Resin)
6 Spool valve assembly (Aluminum/H-NBR)
7 Molded coil (Resin)

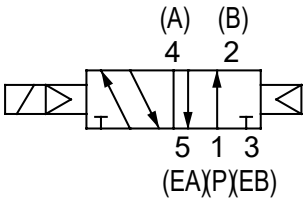
5/2-way valve

Flow characteristics

Model	Port size		Flow values	
	1, 5, 3	4, 2	1 → 4, 2 (P → A, B)	4, 2 → 5, 3 (A, B → EA, EB)
	(P/EA/EB)	(A/B)	Flow rate (l/min)	Flow rate (l/min)
SS5 V1-16	C8*	C6*	216	226

Mode of operation of valves





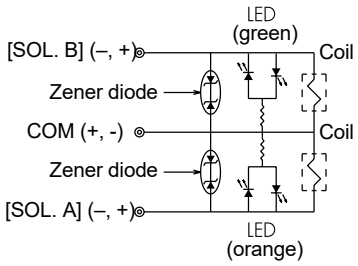
2 x 3/2-way valve

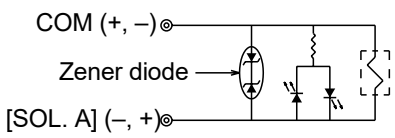
5/2-way valve

Electrical connections

! When electric power is connected to the solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

After completing the wiring, confirm that the connections are correct.





5/2-way valve

2 x 3/2-way valve

Assignment of wire colors as per DIN 4710

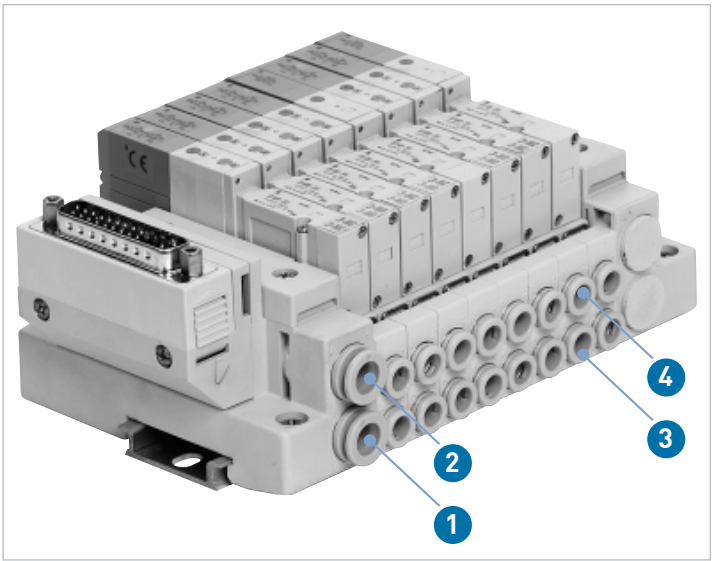
Process connection	Wire color	Marking
1	White	
2	Brown	
3	Green	
4	Yellow	
5	Grey	
6	Pink	
7	Blue	
8	Red	
9	Black	
10	Violet	
11	Grey	Pink
12	Red	Blue
13	White	Green
14	Brown	Green
15	White	Yellow
16	Yellow	Brown
17	White	Grey
18	Grey	Brown
19	White	Pink
20	Pink	Brown
21	White	Blue

Pneumatic connections

Use clean compressed air
Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

Install air filters
Install air filters close to valves at their upstream side. A filtration degree of 5 µm or less should be selected.

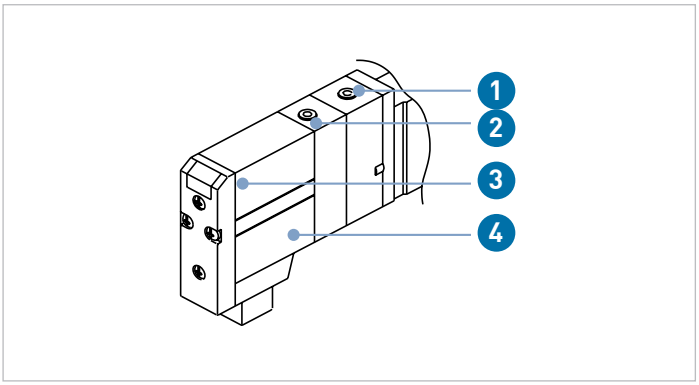
Install an air dryer, after-cooler or water separator
Air that contains excessive condensate may cause malfunction of valves and other pneumatic equipment. Take measures by installing an air dryer, after-cooler or water separator, etc.
Prevent any excessive carbon powder concentration, by installing water separators on the valve inlet side.
If excessive carbon powder is generated by the compressor, it may adhere to the inside of valves and cause malfunction.



1 Common exhaust
2 Compressed air inlet
3 Valve outlet A
4 Valve outlet B

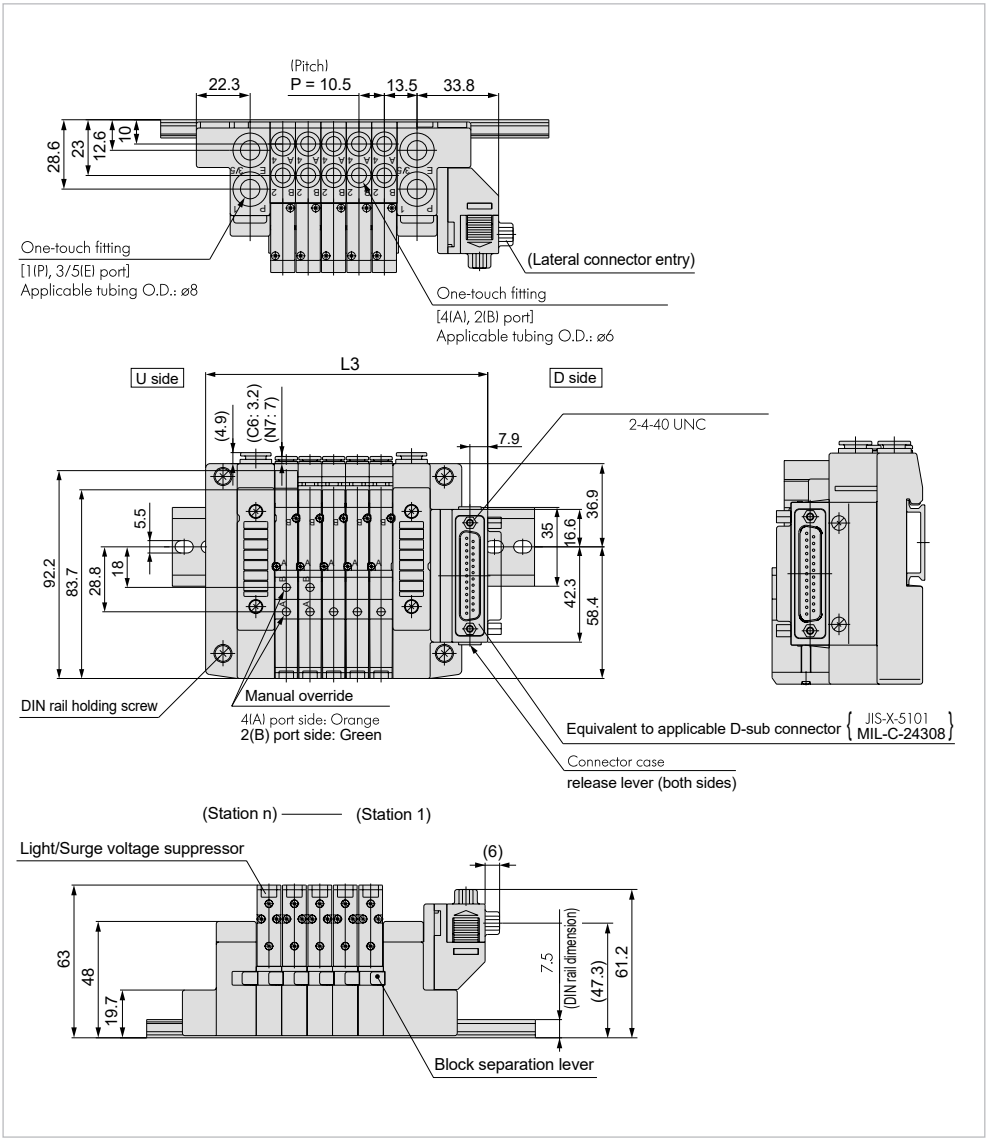
Manual override

> ! Handle carefully, as connected equipment can be actuated through manual override operation.



1 Manual override for solenoid B
2 Manual override for solenoid B
3 Solenoid A
4 Solenoid B

Dimensions



n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L3 (mm)	99.5	110	120.5	131	141.5	162.5	152	173	183.5	194	204.5	215	225.5	236	246.5	257	267.5

n = Number of stations

Digital Communication

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Introduction Digital Communication

Digital communication in process plants becomes increasingly important due to automation trends around digitalization and Industry 4.0 which can`t be supported by traditional 4-20mA analogue technology.

In the past decades, different standard organizations specified several digital communication technologies. End customers in the process industries can freely choice the technology that fits best to their needs, as there are plenty of device types available per technology.

Benefits/features

- Maximized engineering efficiency due to less hardware infrastructure components
- Minimized commissioning time due to remote parameterization of devices
- Increased operational performance and uptime of the plant due to additional and accurate process variables
- Improved maintenance processes due to real-time and remote diagnostic insights
- Continuous process and staff optimization due to monitoring and optimization applications based on the device data in the field level

Technology overview

GF Piping Systems supports the most important digital communication technologies in the process automation portfolio for both sensors and actuators.

In general, digital communication technologies can be divided into Industrial Ethernet, Fieldbus and some other technologies. The table below gives a high-level comparison of the technologies.

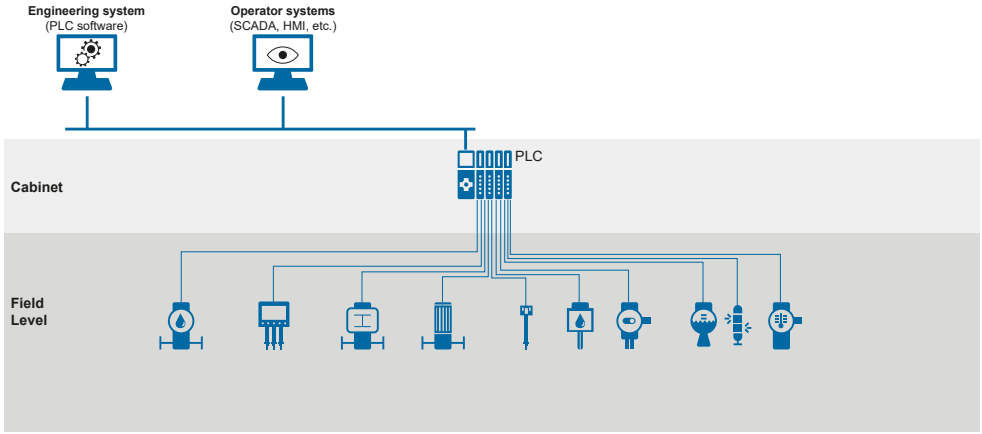
	Electrical	Fieldbus	Industrial Ethernet
	4-20 mA 0-10V	PROFIBUS Modbus RTU AS-I HART	PROFINET EtherNet/IP Modbus TCP
Number of Process Variables from device to PLC	1	all	all
Diagnostic information from device to PLC		yes	yes
Working principle	Analog signals	Master/Slave (half-duplex)	Switched network (full-duplex)
Data rate		Depending on technology; max. 12 Mbit/s	100 Mbit/s
Remote device access			yes (e.g. web server)

The following chapters consist of a short technology description and list all GF Piping Systems products, which support this certain technology.

Analogue Network Topologies

A typical analogue network topology uses a direct wiring from analog or digital I/O cards to the field instrumentation. Such a concept requires a lot of space within the cabinet, expensive I/O cards and high wiring effort between field level and cabinet. The communication between field devices and PLC consists of one single value only. Additional device data, such as further process variables or diagnostic data, are locked within the device.

Example for analogue network topology



Digital Network Tolopogies

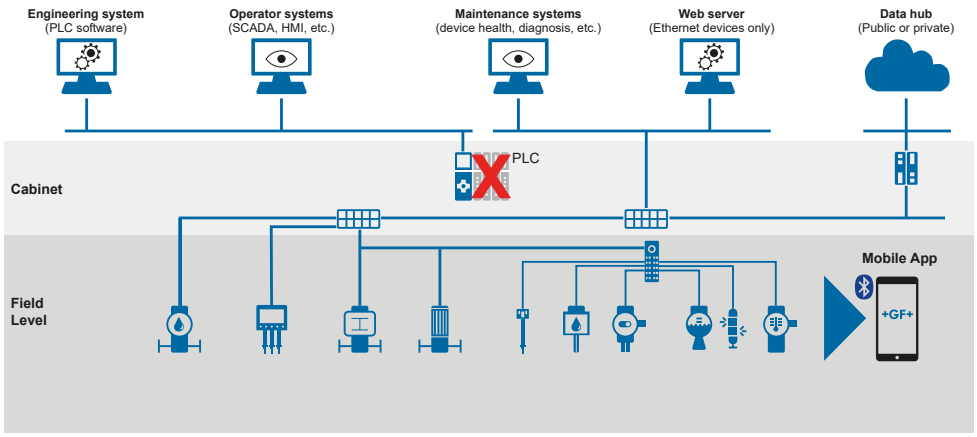
Digital communication technologies open up the potential for highest plant efficiency.

There is no need for expensive I/O cards and extensive device wiring as only one cable goes from the PLC to the field level. Flexible topology concepts support the individual needs of a process plant.

Smart field instruments share their valuable data to enable a continuous process improvement. The field of potential improvements ranges from diagnostic insights to simplify troubleshooting to extensive trend monitoring to optimize processes or avoid unplanned plant shutdowns.

Wireless communications between field devices and mobile applications complete the picture of a highly efficient process plant by providing a simple possibility to connect to a device for live device data or parameterization.

Example for digitized network topology



Industrial Ethernet

Industrial Ethernet technology with protocols like PROFINET, EtherNet/IP or Modbus TCP is best suited to fully support the trends around digitalization, as Ethernet technology is already the standard communication technology on the upper layers of the automation pyramid. By bringing Ethernet down to the field level, systems have a seamless data access to a single sensor or actuator with less hardware components and without protocol conversion. Global market studies show that the share of Industrial Ethernet compared to traditional field level technologies increased a lot and further will increase in future.

PROFINET

Description

PROFINET (Process Field Network) is an international standard led by the user association PROFIBUS PROFINET International with more than 1700 member companies. PROFINET extends the Ethernet physics and TCP/IP transport by a real-time deterministic protocol, which meets the requirements in factory and process automation industries for many years already.

Benefits/features

- Flexible topologies including redundancy mechanisms
- Simple device integration to PLC and basic device parameterization via GSD device driver
- All process variables of the device with precise accuracy due to digital transmission
- Remote access to embedded web server for parameterization and troubleshooting
- Plug & Play device exchange by automatic re-configuration
- Plenty of programmable logic controllers (PLC) and infrastructure components available

Technology

PROFINET uses a real-time channel for time-critical data such as cyclic process data or alarms and TCP/IP for not time-critical data such as configuration and diagnostics. The data rate of PROFINET is 100Mbit/s full-duplex with a maximum cable length of 100m with copper cables or 2 km with fiber optic.

A huge amount of official PROFINET guidelines supports users from system design to troubleshooting.

More information about PROFINET: www.profibus.com

GF components

Product	Type	Picture
Positioner for electro pneumatic actuator	• SPC D • SPC PID • RPC D • RPC PID	
Electric actuator	• EA 25-250	

EtherNet/IP

Description

EtherNet/IP is an international standard led by the user association ODVA with more than 350 member companies. EtherNet/IP extends the Ethernet physics and TCP/IP transport by a real-time deterministic protocol, which meets the requirements in factory and process automation industries.

Benefits/features

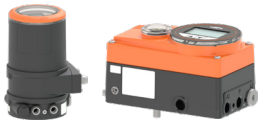
- Flexible topologies including redundancy mechanisms
- Simple device integration to PLC and device parameterization via EDS device driver or AOP (Rockwell systems only)
- All process variables of the device with precise accuracy due to digital transmission
- Remote access to embedded web server for parameterization and troubleshooting
- Plug&Play device exchange by automatic re-configuration

Technology

EtherNet/IP uses implicit messages via UDP for time-critical data such as cyclic process data or alarms and TCP for not time-critical data such as configuration and diagnostics. The data rate of EtherNet/IP is 100Mbit/s full-duplex with a maximum cable length of 100m with copper cables or 2 km with fiber optic.

More information about EtherNet/IP: www.odva.org/technology-standards/key-technologies/ethernet-ip

GF components

Product	Type	Picture
Positioner for electro pneumatic actuator	• SPC D • SPC PID • RPC D • RPC PID	
Electric actuator	• EA25-250	

Modbus TCP

Description

Modbus TCP uses the Modbus protocol over Ethernet and TCP/IP. The Modbus protocol is maintained by the Modbus organization.

Benefits/features

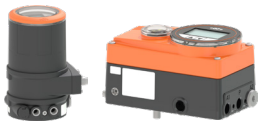
- Simple integration to PLC via standard Modbus function codes and registers
- No device driver needed for PLC integration
- All process variables of the device with precise accuracy due to digital transmission
- Remote access to embedded web server for parameterization and troubleshooting

Technology

Modbus is based on a request and response model, where the master initiates a request and the field device responses accordingly. Standardized function codes define the type of the read or write request and response. A data model defines the type of registers that can be accessed.

More information about Modbus: www.modbus.org

GF components

Product	Type	Picture
Positioner for electro pneumatic actuator	• SPC D • SPC PID • RPC D • RPC PID	
Electric actuator	• EA25-250	

Fieldbus

With fieldbus technologies such as PROFIBUS or Modbus RTU, it is possible to establish a real digital communication network. These technologies are suitable for field device integration that enables the field network to communicate digital. Main differentiation to Industrial Ethernet is the proprietary technology and thus an increased complexity for upper layer integration as well as special expertise during engineering and troubleshooting.

PROFIBUS

Description

PROFIBUS (Process Field Bus) according to IEC 61158/61784 is a worldwide leading standard for fieldbus communication in manufacturing, process and building automation. PROFIBUS also enables communication between devices from different manufacturers without special interface adaptations.

Benefits/features

- Established transmission technology
- Quick and easy device configuration
- Communication of devices from different manufacturers
- Real-time capable protection mechanisms against incorrect parameterization (DP)
- Safe condition in case of failure

Technology

PROFIBUS DP (Decentralized Peripherals) is used for communication of central automation devices with decentralized field devices via a fast serial connection. In addition to user data transmission, DP also provides powerful functions for diagnostics and commissioning. Data transmission rates of up to 12 MBit/s on twisted two-wire lines and/or fiber optic cables are possible.

More information about PROFIBUS: www.profibus.com

GF components

Product	Type	Picture
PROFIBUS Concentrator	• 0486 PROFIBUS Concentrator	
PROFIBUS DP module for Electric actuator	• PROFIBUS DP Module for EA25-250	

Modbus RTU

Description

Modbus is an open communication protocol for the transmission of information between electronic devices via a serial line. The protocol ensures that a master device and one or more slave devices are connected to each other. In this way, different devices can be controlled or data can be transmitted. Modbus has developed into a widely used protocol used by many manufacturers in different sectors, but especially in industry.

Benefits/features

- Widely used and proven
- Open system without license fees
- Simplistic protocol
- Low demands on the hardware performance of the system

More information about Modbus: www.modbus.org

GF components

Product	Type	Picture
Transmitter	• Modbus module for 9900 Transmitter	
	• Modbus module for 9950 Transmitter	
Electric Actuator	• Modbus Module for EA25-250	
Ultrasonic Flowmeter	• U1000 V2 WM • U1000 V2 WHM	
	• U3000 V2 • U3000 V2 HM	

Other technologies

Some other technologies became popular over the last decades for certain use cases and in certain applications.

HART

Description

HART (Highway Addressable Remote Transducer) is a standardized, widely used communication technology. HART enables the digital communication via a 2-wire cable. This technology is based on the widely used 4...20 mA analogue signal. Existing lines of the existing analog system are overlaid with additional information using Frequency Shift Keying (FSK) technology. The HART protocol communicates at 1,200 bit/s without interruption of the 4...20 mA signal and enables the host application (master) to receive two or more digital updates per second from a field device. Since the digital signal of the frequency shift keying takes place in continuous phases, the 4...20 mA signal is not disturbed.

Benefits/features

- Cost-effective and simple: use of existing analog wiring
- Transport of additional process information with the existing analog signal
- Particularly robust fieldbus solution
- Open protocol
- Worldwide spread and proven
- The protocol is constantly evolving
- Bidirectional and acyclic communication

More information about HART: www.fieldcommgroup.org/technologies/hart

GF components

Product	Type	Picture
Transmitter	• HART module for 9900 Transmitter	
Level	• Ultrasonic Level Transmitter 2260 • Ultrasonic Level Transmitter 2270	

AS-Interface

Description

The AS interface (ASi) is an automation technology which enables the connection of simple sensors and actuators to a digital network topology. It cannot replace complex networks but has advantages in cost reduction by low cable efforts and simple installation and configuration.

Benefits/features

- Economical cabling concept for the lower field level for the harsh industrial setting
- Connection to all common field bus systems via gateways, links or network couplers
- Low connection costs per participant
- Low cost of installation
- Simple handling during commissioning and service

More information about ASi: www.as-interface.net/en/technology

GF Components

AS interface for electrical actuators

Actuator types	EA25-250



AS interface for pneumatic actuators

Actuator types	PPA04–80 FC, FO, DA
	PA30-90 FC, FO, DA



AS interface for pneumatic lift actuators DN15 – DN50

Actuator types	DIASTAR Ten
	DIASTAR Ten Plus
	DIASTAR Sixteen



AS interface for pneumatic lift actuators DN65 – DN150

Actuator types	DIASTAR 025 FC/FO DN65 - 150



AS interface for manual valves

With integrated feedback	Ball valve
	Butterfly valve
	Diaphragm valve



AS interface for sensors

With switch output	Level sensor
	Flow sensor
	Pressure sensor
	Temperature sensor



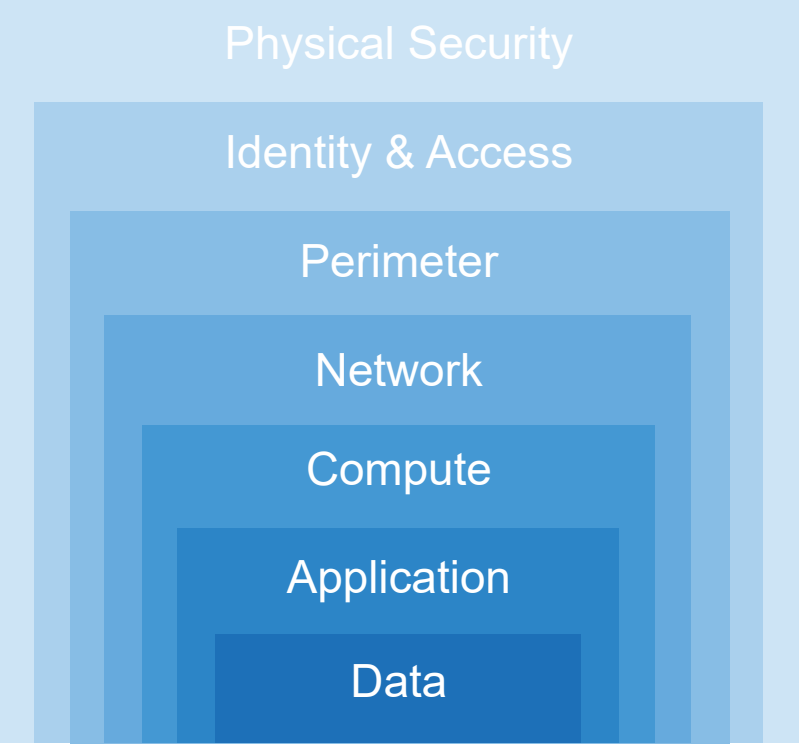
System Security

Product defense in depth

In the context of IEC62443, product defense in depth is a security strategy that involves implementing multiple layers of security measures to protect a product from cyber attacks. This approach is based on the principle that no single security measure can provide complete protection against all possible attacks.

The customer responsibility is to guarantee an on-site defense in depth strategy. Different layers of security shall be considered.

Example different layers of security



GF recommends following the “Security risk assessment” described inside the international standard IEC 62443 Part 3-2.

The official URL to report a variability for all Georg Fischer devices is

https://www.gfps.com/cyber-security

Further information for a practical approach to adopt the IEC standards could be found at the Global Cybersecurity Alliance: https://gca.isa.org

Defense in depth – expected measures

In practice a single security measure can not provide complete protection against all possible attacks. Often a combination of measures is used to complicate the attack of a system.

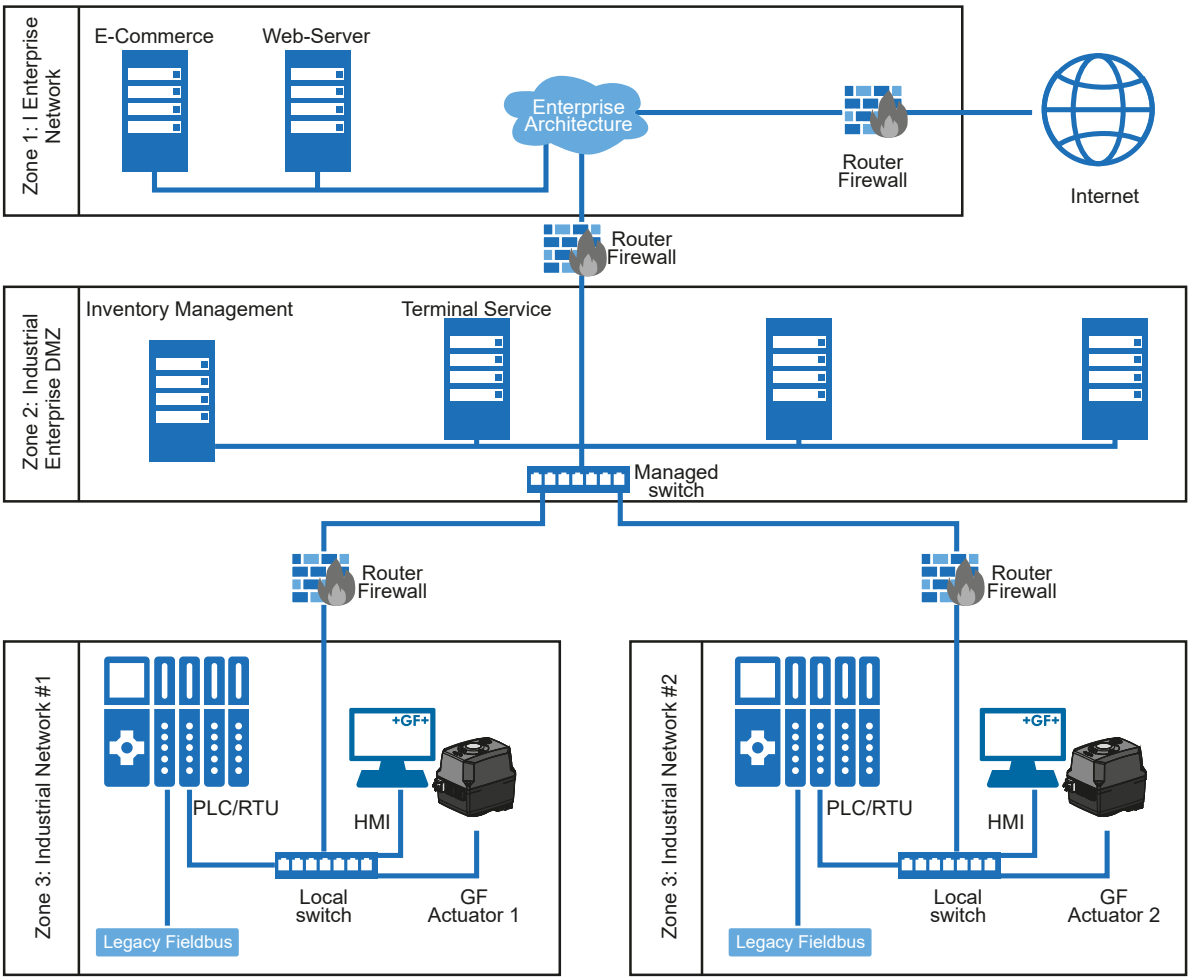
The least expected measures are described inside this chapter.

Physical Security

The physical security contains the direct access control to the device. This access shall be limited to the least possible roles, e.g. plant operator, network administrator.

Network Segmentation

Example of a network segmentation



To encapsulate the embedded devices, it is important to set up different zones. Each zone shall be protected by a own firewall containing at least port filtering and auditing.

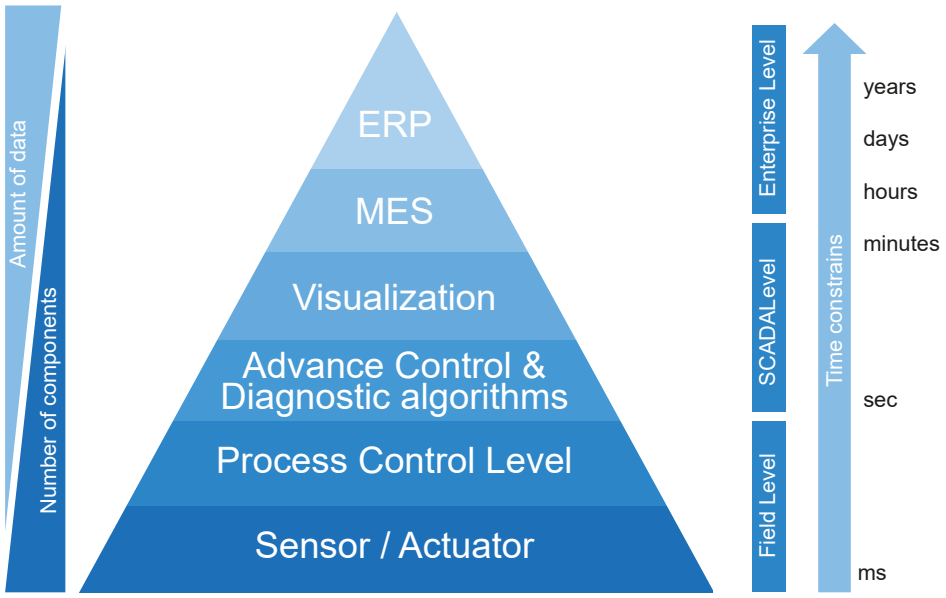
Data

The data is stored on the device itself. A sufficient password shall be used to protect access to the log data. Personal data is not used on field devices.

Product Security context

Process automation communication pyramid

The Process automation communication pyramid illustrates a typical setup with different device classes.



Source: https://www.researchgate.net/figure/An-Automation-Pyramid_fig1_320187633

Our portfolio currently comprises three types of device: Sensors, actuators and transmitters, which are assigned to the “Field Area”.
In industry environments the sensor and actuators talk directly to the “Process Control Level” – which for example could be a remote transmitter or a classical PLC.

Although the transmitters belong to the Process Control Level, they usually do not have a communication interface to the “Advance Control & Diagnostic algorithms”. Nevertheless, in cases of enabled parallel communication, special care needs to be taken in the overall context, see generic (high-speed) and generic (wireless) content.

Examples of communication protocols with the process control level:

Protocol	Example
Analog	Mostly 4-20 mA to represent a measuring value or set a desired position. Since analogue interfaces are not really in scope of the security context, all following protocols are digital.
Proprietary (low speed)	Usually low speed (RS-485 Uart based communication) to transfer cyclic data - process data measurement values and acyclic data e.g. calibration, diagnosis, etc. The upper laying device to which the sensor/actuator is connected to is always well known. Due to that fact, encryption is not in focus here. It is about authentication to protect Intellectual property.
Generic (low-speed) (e.g. IO-Link, Modbus RTU, etc.)	Aim of these protocols is to define a best cost interface for simple field devices and connect them to different devices on the Process Control Level. In case there are security requirements given (by the standard), the device needs to implement them to ensure compliance to the standard.
Generic (high-speed) (PROFINET, Ethernet/IP, Modbus TCP)	The communication of cyclic and acyclic data is the same as for generic low speed protocols. Since the transport layer is based on standard Ethernet (IEEE 802.x) there is the possibility to enable parallel communication, e.g. by implementing a embedded webserver directly on the device. This is common in industry environments to ease up commissioning and diagnosis. Nevertheless, whenever a parallel communication is enabled, special care needs to be taken to ensure no security leak in the overall product security environment.
Generic (wireless) (Bluetooth, WiFi)	Some devices provide an additional parallel wireless interface. Today this is exclusively used for commissioning and diagnosis. Same fact as for parallel communication on the generic high-speed interface is true: special care needs to be taken to ensure no security leak in the overall product security environment.

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