

GF U3000 V2 Ultrasonic Flowsensor GF U3000 V2 Heatmeter (HM)



The GF U3000 V2 is the GF reference solution for permanent ultrasonic Clamp-On flowmetering. Providing various options for high accuracy measurement, power, communication, pipe dimension, data storage & export it can be customized to almost any application need.

The GF U3000 V2 Heatmeter (HM) is an ultrasonic permanent clamp-on heatmeter / energy meter / BTU meter. Additionally to an ultrasonic flowmeter it is equipped with Pt100 temperature sensors to calculate the energy of a heat exchanging system.

The 'Clamp-On' concept makes the installation of the sensors in running systems possible. The pipe does not have to be opened. Compact, robust and reliable – the GF U3000 V2 (HM) was designed for long-term use in industrial applications.

The GF U3000 V2 can be used on PVDF-ABS, PVC, PP, PE, PB-Instaflex, iron and steel pipes. Processes can be monitored directly by a higher-level system via 4 to 20 mA, Modbus, pulse or frequency output depending on the model.

Features

- Large, easy to read graphic display with backlighting
- Easy to install with 'Clamp-On' design
- Datalogger option (up to 100 million datapoints)
- USB port for easy data export
- Analog, digital Modbus, pulse & alarm outputs
- Reynolds number correction
- Compatible with almost all pipe types
- Automatic energy calculation with two Pt100 temperature sensors (HM version)



Applications

- HVAC & Energy System Audits
- Pump Verification
- Process Control
- Chemical Addition
- Hydraulic Systems
- Fire Systems
- Leak Detection
- Boiler Testing

Specifications

General		
Measuring method	Ultrasonic transit-time measurement	
Flow Range	0.1 m/s to 20 m/s	
Accuracy	Pipe ID >75 mm, 3 in.	±0.5% to ±3 % of flow reading for flow rate >0.2 m/s, 0.7 ft/s
	Pipe ID 13 mm - 75 mm, 0.5 in. to 3 in.	±3% of flow reading for flow rate >0.2 m/s, 0.7 ft/s
	All pipe ID's	±6% of flow reading for flow rate <0.2 m/s, 0.7 ft/s
Repeatability	±0.5% of measured value or ±0.02 m/s, 0.7 ft/s, whichever is the greater	
Response Time	< 500 ms depending on pipe diameter.	
Selectable Flow Units	Velocity	m/sec, ft/sec.
	Volume	l/s, l/min, l/h, gal/min, gal/h, USgals/min, USgals/h, Barrel/h, Barrel/day, m ³ /s, m ³ /min, m ³ /h.
Selectable Total Volume Units	liter, gallon, US gallons, Barrel, m ³	
Total Volume	12 Digits	
Menu Languages	EN, DE, FR, RU, SWE, IT, SP, P, NO, DEN (user selectable)	
Temperature sensors (Heatmeter models only)		
Operating Temperature	0 °C to 50 °C	32 °F to 122 °F
Storage Temperature	-10 °C to +60 °C	14 °F to 140 °F
Temperature of Pipe Wall	-20 °C to +85 °C	-4 °F to +185 °F
Accuracy	Pt100 Class B 4-wire	
Resolution	0.1 °C (0.2 °F)	
Humidity During Operation	Max. 90% relative humidity at +50 °C (122 °F)	
Environmental		
Operating Temperature	-20 °C to +50 °C	-4 °F to +122 °F
Storage Temperature	-25 °C to +75 °C	-13 °F to +167 °F
Pipe Wall Temperature	-20 °C to +135 °C	-4 °F to +275 °F
Operating Humidity	Max. 90% relative humidity @ +50 °C (+122 °F)	
Suitable Pipe Types		
Pipe Materials	PVDF, PP-H, PE, PB, ABS, UPVC, CPVC, construction steel, iron, stainless steel, copper	
Pipe Diameter (OD)	13 mm to 2000 mm	0.5 inch to 78 inch
Pipe Wall Thickness	1 mm to 75 mm	0.04 inch to 3 inch
Pipe Lining	Applicable pipe linings include Rubber, Glass, Concrete, Epoxy, Steel	
Pipe Lining Thickness	0 mm to 25 mm	0 inch to 1 inch
Electronics		
Power Supply	12 V to 24 V AC/DC, 1A max. or 86 V to 264 V AC (47 Hz to 63 Hz)	
Power Consumption	Max. 10.5 W	
Output (options depending on model)		
Analog Output	Range	4 to 20 mA, 0 to 20 mA, 0 to 16 mA
	Resolution	0.1% of full scale
	Load Max.	620 Ω
	Isolation	1500 V Opto-isolated
	Alarm Current	Adjustable between 0 to 26 mA
Pulse Output	Type	3x Opto-isolated MOSFET volt free contact (NO/NC)
	Options	Flow totals, energy (HM version only), loss of signal, low flow alarms
	Pulse sequence	Volumetric mode: 1 to 50 pulses/sec user-programmable Frequency mode: 200Hz max. pulse frequency
	Pulse Width	50 ms standard value, 3 to 99 ms user-programmable
	Max. Voltage	48 V
	Max. Current	150 mA
	Isolation	>110 V AC/DC
Modbus Output	Format	RTU
	Baud Rate	1200, 2400, 4800, 9600, 19200, 38400
	Data-Parity-StopBits	8-None-2, 8-None-1, 8-Odd-2, 8-Even-1
	Standards	PI-MBUS-300 Rev. J
	Physical Connection	RS485
USB Interface (Optional)	Protocol	Supports full speed (12Mbits/sec) data connection
	Software	USB driver software is provided with the package
	Connector	Mini USB

Specifications (continued)

Data Logger (Optional)

Data Logged	application details, time, date, flowrate, forward total, reverse total, flow velocity, flow side temperature, return side temperature, temperature difference, power, total energy, signal quality, signal SNR, signal status	
Number of Data Points	100 million	
Number of Data Sites	12	
Number of Data Points per Site	No limit	
Programmable Logging Interval	5 s - 1 h	
Start / Stop	Manually or timer controlled	
Data Download	USB interface	

Transducer Sets

Type A	13 to 114 mm (1/2 inch to 4.5 inch) pipe OD (2MHz)	
Type B	50 to 2000 mm (2 inch to 40 inch) pipe OD (1MHz)	

Enclosure and Display

Material	ABS and aluminium	
Dimensions	230 x 180 x 120 mm	9.0 x 7.1 x 4.7 inch
Weight	1.2 kg	2.65 lb
Keypad	15 key tactile feedback membrane keypad	
Display	Type	240 x 64 pixel graphic display, high contrast black-on-white, with backlight.
	Viewing Angle	Min. 30°, typically 40°
	Active Area	127 x 34 mm 5 x 1.3 inch
Protection class	IP 65	

Shipping Information

Packaging Dimensions	480 x 320 x 230 mm	19 x 12.5 x 9 inch
Weight	4.8 kg	10.6 lb
Volume weight	5.8 kg	12.8 lb

Standards and Approvals

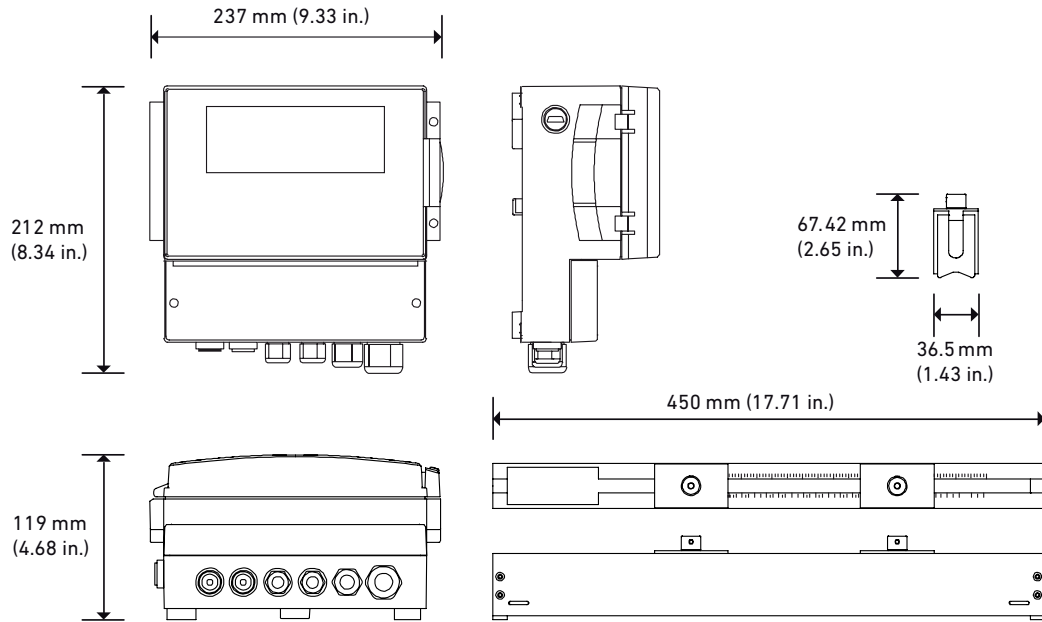
UKCA, CE, RoHS compliant		
Safety	BS EN 61010-1:2010	
EMC	BS EN 61326-1:2013	BS EN 61326-2-3:2013
	BS EN 61326-2-4:2013	
Environmental	BS EN 60068-1:2014	
	BS EN 60068-2-1:2007	BS EN 60068-2-2:2007

Packaging Content



1. GF U3000 V2 (HM)
2. Flow sensors / transducers
3. Sensor cable (2pcs, each 10 m length)
4. Gel pads
5. Guide rail
6. S/steel hose-clips for guide rail
7. Ultrasonic coupling grease
8. Heatsink compound (HM models only)
9. Pt100 temperature probes incl. cable (3 m length) (HM models only)
10. S/steel hose-clips for temperature probes (HM models only)
11. Product documentation (User manual & Factory calibration certificate)

Dimensions

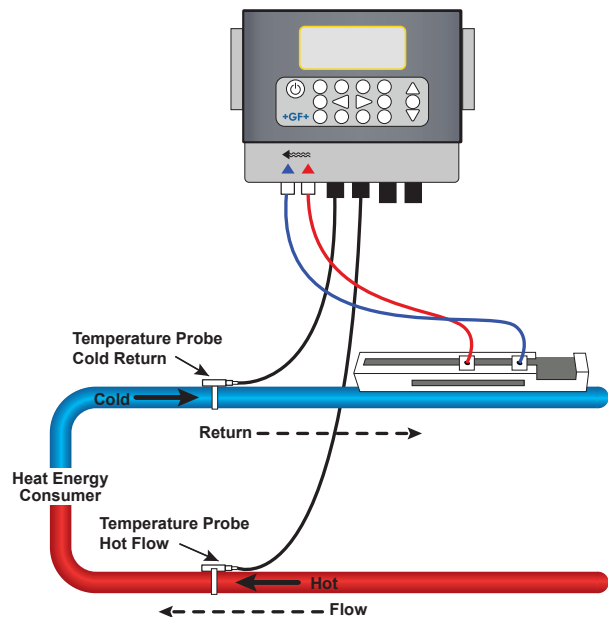
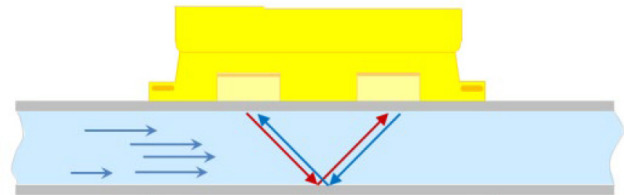


Function

The GF U3000 V2 (HM) functions, as do all current ultrasonic flowmeters, according to the path-time principle of ultrasonic waves.

The device is installed directly on a pipe surface and transmits ultrasonic waves back and forth between the two sound transducers. Depending on the flow, a small time difference arises between the two ultrasonic signals – this is proportional to the flow speed.

By measuring the temperature change between the flow and return pipe of the heat exchanging system with the integrated Pt100 sensors the GF U3000 V2 HM (without brackets) is additionally calculating its thermal energy (in BTU, J or kWh).



Ordering Information

Mfr. Part No.	Code	Description
U3000 V2	159 300 370	GF U3000 V2 Flowmeter 110/240 VAC d13-d115 0.5 in. to 4 in. 4-20 mA, Pulse
U3000 V2	159 300 371	GF U3000 V2 Flowmeter 110/240 VAC d13-d115 0.5 in. to 4 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 372	GF U3000 V2 Flowmeter 110/240 VAC d13-d115 0.5 in. to 4 in. Modbus
U3000 V2	159 300 373	GF U3000 V2 Flowmeter 110/240 VAC d13-d115 0.5 in. to 4 in. Modbus Datalogger
U3000 V2	159 300 374	GF U3000 V2 Flowmeter 110/240 VAC d115-d300 4 in. to 12 in. 4-20 mA, Pulse
U3000 V2	159 300 375	GF U3000 V2 Flowmeter 110/240 VAC d115-d300 4 in. to 12 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 376	GF U3000 V2 Flowmeter 110/240 VAC d115-d300 4 in. to 12 in. Modbus
U3000 V2	159 300 377	GF U3000 V2 Flowmeter 110/240 VAC d115-d300 4 in. to 12 in. Modbus Datalogger
U3000 V2	159 300 378	GF U3000 V2 Flowmeter 110/240 VAC d300-d2000 12 in. to 78 in. 4-20 mA, Pulse
U3000 V2	159 300 379	GF U3000 V2 Flowmeter 110/240 VAC d300-d2000 12 in. to 78 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 380	GF U3000 V2 Flowmeter 110/240 VAC d300-d2000 12 in. to 78 in. Modbus
U3000 V2	159 300 381	GF U3000 V2 Flowmeter 110/240 VAC d300-d2000 12 in. to 78 in. Modbus Datalogger
U3000 V2	159 300 382	GF U3000 V2 Flowmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. 4-20 mA, Pulse
U3000 V2	159 300 383	GF U3000 V2 Flowmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 384	GF U3000 V2 Flowmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. Modbus
U3000 V2	159 300 385	GF U3000 V2 Flowmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. Modbus Datalogger
U3000 V2	159 300 386	GF U3000 V2 Flowmeter 12-24V AC/DC d115-d300 4 in. to 12 in. 4-20 mA, Pulse
U3000 V2	159 300 387	GF U3000 V2 Flowmeter 12-24V AC/DC d115-d300 4 in. to 12 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 388	GF U3000 V2 Flowmeter 12-24V AC/DC d115-d300 4 in. to 12 in. Modbus
U3000 V2	159 300 389	GF U3000 V2 Flowmeter 12-24V AC/DC d115-d300 4 in. to 12 in. Modbus Datalogger
U3000 V2	159 300 390	GF U3000 V2 Flowmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. 4-20 mA, Pulse
U3000 V2	159 300 391	GF U3000 V2 Flowmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. 4-20 mA, Pulse Datalogger
U3000 V2	159 300 392	GF U3000 V2 Flowmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. Modbus
U3000 V2	159 300 393	GF U3000 V2 Flowmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. Modbus Datalogger
U3000 V2 HM	159 300 394	GF U3000 V2 HM Heatmeter 110/240 VAC d13-d115 0.5 in. to 4 in. Modbus
U3000 V2 HM	159 300 395	GF U3000 V2 HM Heatmeter 110/240 VAC d13-d115 0.5 in. to 4 in. Datalogger
U3000 V2 HM	159 300 396	GF U3000 V2 HM Heatmeter 110/240 VAC d115-d300 4 in. to 12 in. Modbus
U3000 V2 HM	159 300 397	GF U3000 V2 HM Heatmeter 110/240 VAC d115-d300 4 in. to 12 in. Datalogger
U3000 V2 HM	159 300 398	GF U3000 V2 HM Heatmeter 110/240 VAC d300-d2000 12 in. to 78 in. Modbus
U3000 V2 HM	159 300 399	GF U3000 V2 HM Heatmeter 110/240 VAC d300-d2000 12 in. to 78 in. Datalogger
U3000 V2 HM	159 300 400	GF U3000 V2 HM Heatmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. Modbus
U3000 V2 HM	159 300 401	GF U3000 V2 HM Heatmeter 12-24V AC/DC d13-d115 0.5 in. to 4 in. Datalogger
U3000 V2 HM	159 300 402	GF U3000 V2 HM Heatmeter 12-24V AC/DC d115-d300 4 in. to 12 in. Modbus
U3000 V2 HM	159 300 403	GF U3000 V2 HM Heatmeter 12-24V AC/DC d115-d300 4 in. to 12 in. Datalogger
U3000 V2 HM	159 300 404	GF U3000 V2 HM Heatmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. Modbus
U3000 V2 HM	159 300 405	GF U3000 V2 HM Heatmeter 12-24V AC/DC d300-d2000 12 in. to 78 in. Datalogger

Spare Parts and Accessories

Code	Description
159 300 088	Ultrasonic Flowmeter Spare parts Transducer gel pads (2 pcs)
159 300 038	Ultrasonic Flowmeter Spare parts Superlube coupling grease (85 g)
159 300 017	Ultrasonic Flowmeter GF U3000 V2 Spare parts Transducer assembly A (2x Transducer A)
159 300 018	Ultrasonic Flowmeter GF U3000 V2 Spare parts Transducer assembly B (2x Transducer B)
159 300 065	Ultrasonic Flowmeter GF U3000 V2 Spare parts USB cable assembly (3 meter, 9.8 ft.)
159 300 068	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (5 meter, 16.4 ft. 2x cables)
159 300 069	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (10 meter, 32.8 ft. 2x cables)
159 300 290	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (15 meter, 49.2 ft. 2x cables)
159 300 070	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (20 meter, 65.6 ft. 2x cables)
159 300 291	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (25 meter, 82 ft. 2x cables)
159 300 292	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (30 meter, 98.4 ft. 2x cables)
159 300 293	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (35 meter, 114.8 ft. 2x cables)
159 300 294	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (40 meter, 131.2 ft. 2x cables)
159 300 295	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (45 meter, 147.6 ft. 2x cables)
159 300 296	Ultrasonic Flowmeter GF U3000 V2 Spare parts Sensor cable kit (50 meter, 164 ft. 2x cables)
159 300 019	Ultrasonic Flowmeter GF U3000 V2 Spare parts Diagonal guide rail
159 300 040	Ultrasonic Flowmeter GF U3000 V2 Spare parts Stainless steel banding (1 piece = 1 meter, 39.4 in.)
159 300 041	Ultrasonic Flowmeter GF U3000 V2 Spare parts Screw clip
159 300 042	Ultrasonic Flowmeter GF U3000 V2 Spare parts Hose clip 620-020 S/steel 19mm - 44mm, 0.75 in. to 1.73 in.
159 300 043	Ultrasonic Flowmeter GF U3000 V2 Spare parts Hose clip 620-036 S/steel 46mm - 70mm, 1.81 in. to 2.76 in.
159 300 044	Ultrasonic Flowmeter GF U3000 V2 Spare parts Hose clip 620-072 S/steel 76mm - 127mm, 3 in. to 5 in.