

Type PF220/330 V2 (HM) – Ultrasonic Flowmeter or Heatmeter



Product description

The Portaflow range brings simplicity to the noninvasive measurement of liquid flow. Portaflow offers the user quick and accurate flow measurement with its easy to follow menu and simple set up. Results can be achieved within minutes of opening the case. Compact, rugged and reliable, the Portaflow range has been designed to provide sustained performance in industrial environments.

The type PF220 V2 and type PF330 V2 Portable Ultrasonic Flowmeter range is designed for temporary or semistationary use.

The type PF330 V2 Heatmeter (HM) is an ultrasonic flowmeter equipped with Pt100 temperature sensors to calculate the energy of a heat exchanging system. Thus the device is able to work as a heatmeter / energy meter / BTU meter for temporary or semi-stationary use.

The flowmeter range enables easy, simple and accurate flow measurement on virtually any pipe. Including PVDF, ABS, PVC, CPVC, PP, PE, PB-Instaflex, iron and steel pipes. Measurements can be viewed directly on-site with the large graphic display or optionally logged and exported to a PC for further analysis (type PF330 V2 (HM) versions). One 4-20 mA output and three individually configurable pulse outputs enable easy integration into 9900/9950 and higher-level systems.

The 'Clamp-On' concept allows for easy installation without process disruption. Compact, rugged and reliable – the type PF220 V2 and type PF330 V2 (HM) portable ultrasonic flowmeters have been designed to provide sustained performance in industrial environments.

Benefits/features

- Large, easy to read graphic display with backlighting
- Easy to install with 'Clamp-On' design
- Datalogger option (up to 100 million datapoints) (PF330 version)
- USB port for easy data export (PF330 version)
- Analog, pulse & alarm outputs
- Battery lifetime up to 14 hours
- Compatible with almost all pipe types
- Automatic energy calculation with two Pt100 temperature sensors (HM version)



Applications

- Potable water
- Intake water
- Cooling water
- Demineralized Pure Water
- Water/Glycol Solutions
- Chemicals
- Leak detection
- Boiler testing

Technical data

Specification

General	
Measuring method	Ultrasonic transit-time measurement
Flow range	0.1 m/s – 20 m/s bidirectional
Accuracy	Pipes > DN75 ± 0.5 % – ± 2 % measured value for flow throughput rates
	Pipes DN13 – DN75 ± 3 % of the measured value for flow throughput rates > 0.2 m/s
	All pipes ID's ± 6 % of the measured value for flow throughput rates < 0.2 m/s
Repetition accuracy	± 0.5 % of the measured value for flow or ± 0.02 m/s depending on which value is larger
Response time	< 500 ms, depending on pipe diameter
	Velocity m/s, ft/s
	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 totalizer units	Liters, m ³ , gallons, US gallons, barrels
Totalizer	12 digits
Menu languages	EN, DE, FR, RU, SE, IT, SP, P, NO, DEN

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
Pipe wall temperature	-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)	

Environment

Operating temperature	-20 °C to +50 °C	-4 °F to +122 °F
Storage temperature	-25 °C to +65 °C	-13 °F to +149 °F
Pipe wall temperature	-20 °C to +135 °C	-4 °F to +275 °F
Humidity during operation	Max. 90 % relative humidity at +50 °C (122 °F)	

Suitable pipe types

Pipe material	PVDF, PP-H, PE, PB, ABS, PVC, CPVC, steel, iron, stainless steel, copper	
Pipe dimensions (OD)	13 mm to 2000 mm	0.5 inch to 78 inch
Pipe wall strength	1 mm to 75 mm	0.04 inch to 3 inch
Pipe Lining	Possible materials: rubber, glass, concrete, epoxy, steel	
Pipe Lining thickness	0 mm to 10 mm	0 inch to 0.4 inch

Electronics

Power supply	9 - 24 V DC
Power consumption	Max. 10.5 W
Rechargeable battery	
Technology	5-cell NiMH
Capacity	3.8 Ah
Operating time (typical)	Up to 14 hours continuous with backlight and 4 to 20 mA output OFF
Battery charge time	6.5 hours
Service life	> 500 charge/discharge cycles
Power supply	
Input voltage	90 - 264 V AC (47 - 63 Hz)
Output voltage	12 V DC
Output voltage max.	1.5 A

Outputs

Analog output	Range	4 to 20 mA, 0 to 20 mA, 0 to 16 mA
	Resolution	0.1 % to scale
	Load max.	620 Ω
	Insulation	1,500 V optoisolated
	Alarm current	Adjustable between 0 – 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
	Insulation	>110 V AC/DC
USB interface (only PF330 V2)	Protocol	Supports full speed (12 Mbits/s) data transmission rate
	Software	USB driver software included in delivery
	Push-fit	USB Type-A female

Datalogger (PF330 V2 (HM) only)

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 sets	12	
Number of data points per set	No limit	
Programmable capture rate	5 s – 1 hour	
Start/stop	Manual or time-controlled	
Data download	USB interface	

Measured value sensor pairs

Type A	13 to 114 mm (½ inch to 4.5 inch) pipe OD (2MHz)	
Type B	50 to 2000 mm (2 inch to 40 inch) pipe OD (1MHz)	

Housing and display

Material	ABS	
Dimensions	264 x 168 x 50 mm	10.4 x 6.6 x 2.0 inch
Weight	1.1 kg (incl. battery)	2.45 lb
Keyboard	16 key tactile feedback membrane keypad	

Housing and display

Display	Type	240 x 64 pixel graphic display, high contrast, backlight	
	Viewing angle	Min. 30°, typically 40°	
	Active area	127 x 34 mm	5 x 1.3 inch
Protection class		IP 54	

Shipping information

	PF330		PF220	
Package dimensions	420 x 390 x 220 mm	16.5 x 15.4 x 8.7 inch	510 x 140 x 440 mm	20 x 5.5 x 17.3 inch
Weight	7.5 kg	16.5 lb	6 kg	13.2 lb
Volume weight	5.7 kg	12.5 lb	5.2 kg	11.5 lb

Standards/approvals

CE, UKCA, RoHS compliant		
Security	BS EN 61010-1:2010	
EMC	BS EN 61326 - 1:2013	BS EN 61326-2-3:2013
Power supply	EN61204 - 3	UL, CUL, TUV, CB, CE, UKCA
Environmental	BS EN 60068-1:2014	
	BS EN 60068-2-1:2007	BS EN 60068-2-2:2007

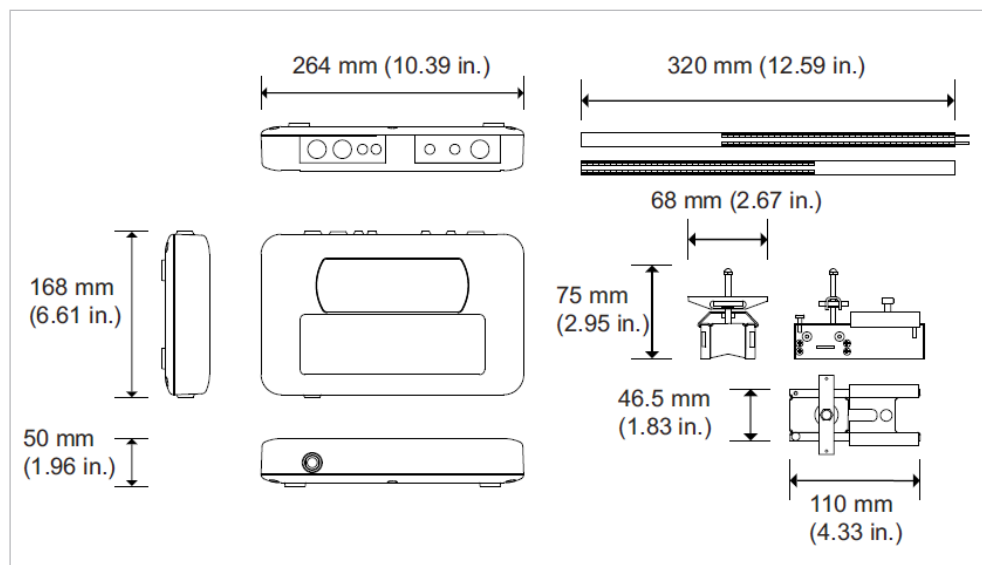
Packaging Content



The type PF330 V2 (HM) models are supplied in a robust IP67 carrying case, which is padded with foam inside to provide additional transport protection.

- 1 Type PF330 V2 (HM)
- 2 Transducer cables (2 pcs, each 2 m length)
- 3 Transducer set 'A' (not all models)
- 4 Transducer set 'B' (not all models)
- 5 Ruled guide rail
- 6 Guide rails
- 7 Mounting chains (2 pcs, each 3.3 m length)
- 8 Output signal cable (current loop & 3 digital outputs)
- 9 Power supply
- 10 Pt100 temperature sensor. cable included (2 pcs with 2 m length) (HM types only)
- 11 S/steel hose-clip for temperature probes (HM models only)
- 12 Tape measure
- 13 PVDF test block
- 14 Heatsink compound (HM models only)
- 15 Syringe for coupling grease
- 16 Super Lube® coupling grease (85 g)
- 17 USB-Stick for data export (PF330 models only)
- 18 Product documentation (User manual & factory calibration certificate)

Dimensions



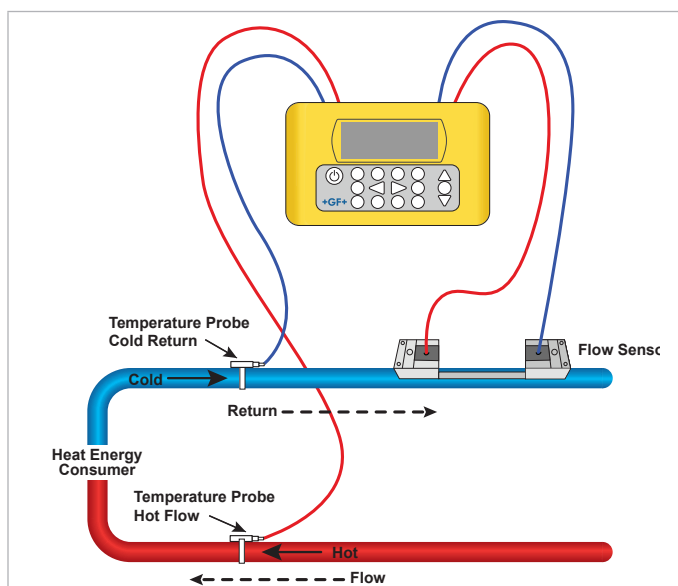
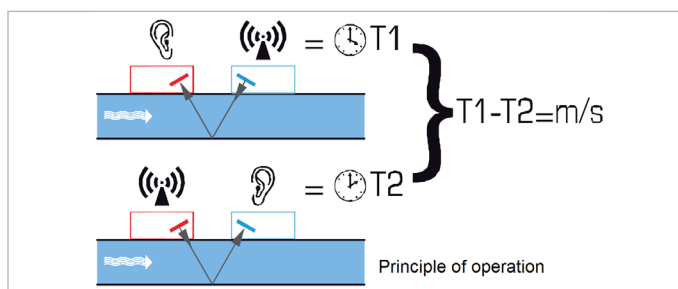
Technical basics

Function

The type PF330 V2 (HM) functions, as do all current ultrasonic flowmeters, according to the transit 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 type PF330 V2 HM (without brackets) is additionally calculating its thermal energy (in BTU, J or kWh).



Ordering Information

Mfr. Part No.	Code	Description
PF220 V2	159300360	Type PF220 V2 type A Portable Ultrasonic Flowmeter d13-d115 Battery & external 110/240 VAC
PF220 V2	159300361	Type PF220 V2 type B Portable Ultrasonic Flowmeter d115-d2000 Battery & external 110/240 VAC
PF220 V2	159300362	Type PF220 V2 type A+B Portable Ultrasonic Flowmeter d13-d2000 Battery & external 110/240 VAC
PF330 V2	159300363	Type PF330 V2 type A Portable Ultrasonic Flowmeter d13-d115 Battery & external 110/240 VAC
PF330 V2	159300364	Type PF330 V2 type B Portable Ultrasonic Flowmeter d115-d2000 Battery & external 110/240 VAC
PF330 V2	159300365	Type PF330 V2 type A+B Portable Ultrasonic Flowmeter d13-d2000 Battery & external 110/240 VAC
PF330 V2 HM	159300366	Type PF330 V2 HM type A Portable Ultrasonic Heatmeter d13-d115 Battery & external 110/240 VAC
PF330 V2 HM	159300367	Type PF330 V2 HM type B Portable Ultrasonic Heatmeter d115-d2000 Battery & external 110/240 VAC
PF330 V2 HM	159300368	Type PF330 V2 HM type A+B Portable Ultrasonic Heatmeter d13-d2000 Battery & external 110/240 VAC

Spare Parts and Accessories

Code	Description
159300088	Ultrasonic Flowmeter Spare parts Transducer gel pads (2 pcs)
159300038	Ultrasonic Flowmeter Spare parts Super Lube® coupling grease (85 g)
159300013	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Transducer assembly A (2x Transducer A)
159300014	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Transducer assembly B (2x Transducer B)
	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Output cable assembly
159300071	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Sensor cable kit (2 meter)
159300072	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Sensor cable kit (5 meter)
159300073	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Sensor cable kit (10 meter)
159300015	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Stainless steel guide rail
159300016	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Magnetic guide rail
159300033	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Link chain zink (3.3 meter)
159300034	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Ruled guide rail
159300035	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Battery assembly
159300036	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Transducer test block
159300037	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Guide rail assembly (guide rail only; no chain; no ruler)
159300039	Ultrasonic Flowmeter type PF220/330 V2 Spare parts Power supply unit (incl. lemo plug & US, Euro, UK adaptors)
159300031	Ultrasonic Flowmeter type PF220/330 V2 Spare parts PF330 V2 carry case with foam
159300032	Ultrasonic Flowmeter type PF220/330 V2 Spare parts PF220 V2 carry case with foam

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