PENDOTECH®

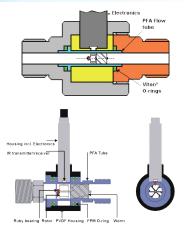*Adding Value To Your Process*

Single Use Rotary Flow Meters

The Single Use Rotary Flow Meters offered by PendoTECH® can conveniently measure flow in your process both accurately and cost effectively. They are the perfect alternative low-cost solution for use with tubing to the existing re-usable rotory flow meters on the market. They are perfect for filtration processes, chromatography and more. Even though they are called single use, they are also suitable for repeat or long-term use. They are available in two sizes for scalability. The tubing slides over the hose barb on the rotor and may be affixed with a cable tie or a more secure method. The reusable flow sensor electronics connect to a flow monitor by a 3 foot (1 meter) electrical cable with extensions available. Suitable monitors include the PendoTECH Flow Monitor, a PendoTECH PressureMAT-PLUS™, or a PendoTECH TFF Process Control System (DAQ), PendoTECH Data Acquisition System, or other qualified 3rd party monitors.

Sensor Features

- Available with hose barb fittings 1/4 and 1/2 inch and a flow range of 100 mL/min to 20 L/min
- Can be used to measure total flow in addition to flow rate
- Compatible with gamma irradiation
- +/- 5% accuracy
- Wide operating temperature range (-20 to 80°C)
- Fluid path materials meet USP Class VI & ADCF
- Maybe be autoclaved to 140°C

How it Works and Connection to Monitors

The flow sensor works by measuring the rotations of the rotor that is in the flow path. The rotor rotates on a ruby bearing and is the only moving part. The rotor blades reflect an infared light beam and each rotation measured is converted to an electrical pulse that is received by the flow monitor which has a "pulse accumulator" that counts the pulses. The rotations per second are converted to volume/minute by a factor called the pulse constant. The nominal pulse constant is different for each rotor size and pre-calibrated pulse constants for each rotor is available. For best accuracy with fluids of viscosity much different than water, the pulse constant can be easily calculated by measuring a known volume and setting the monitor to count the pulses. The pulse constant is then calculated by the pulses counted divided by the volume.
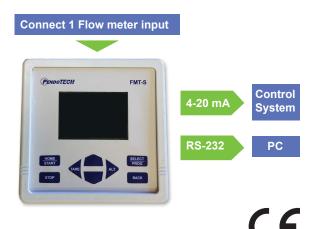
Flow Monitor

The PendoTECH Flow Monitor™ is a high quality, reliable microcomputer-based process monitoring instrument. It has been designed to provide precision liquid measurement, value monitoring, & data communication for a variety of applications. It also has the ability to measure totalized volume in addition to present flow rate. This can use useful in applications such as filtration and chromatography and can be used an alternative to a scale to measure total flow.

Monitor - The pulse constant is permanently saved in non-volatile memory. User can access all the functions of the unit through the menu-driven integrated keypad and LCD. There is on-board audio annunciation for alarms and keypad key activation. There is a panel-mount kit and DIN rail mounting kit available.
Transmitter - Data can be collected to a PC via the RS-232 serial port and the 4-20mA output can be used to integrate the unit to a process control system such as a PLC or DeltaV.

Connect 1 Flow meter input

4-20 mA → Control System

RS-232 → PC

Flow Specification Table

Flow Meter Specifications	FM-22WV	FM-23WV
(based on water at 20°C)		
Connection	1/4inch / 7mm hose barb	1/2inch / 12mm hose barb
Fluids	Liquids	Liquids
Flow Range	0.1 to 2 L/min	1.0 to 20 L/min
Fluid Path Materials	PVDF, ruby glass bearing	PVDF, ruby glass bearing
Accuracy (linearity deviation) of reading	+/-5%	+/-5%
Repeatability	<1%	<1%
Normal Pulse Constant	100,000 pulses/L	4,500 pulses/L
Operating Temperature	-20 to 80°C	-20 to 80°C
Viscosity Range	0.8 to 10 cP	0.8 to 10 cP
Max. Operating Pressure @ 20°C	25 Bar	15 Bar
Length	2inches (53mm)	2.5inches (63mm)
Electronic Assembly	3 ft(1 meter) with integral 1/4inch earphone plug (3) wires: +5VDC Power (Red), Common Ground (Black or Silver), Output (White), 34 mA Power	

Flow Monitor FMT-S Specification Table

System Component	Specifications
Enclosure	Size - 4.70inch x 4.70inch x 2.25inch (11.94 x 11.94 x 5.72cm) Approx weight: 0.86 lbs (0.39 kg) ABS Enclosure NEMA 4X front panel/surface mount
Power Inlet	2.1 mm center pos 12-24 VDC
Sensor Input	Flow meter input to measure 5V square wave via M8 connector (includes 6ft (2 meters) extension cable with 1/4" earphone receptacle)
Analog Output (4-20mA)	4-20 mA accuracy = +/- 0.016 mA
RS232 Serial Output	Data output to a PC at frequency up to approx every 2 seconds
Environment	0–55°C, 0–95% RH non-condense, ship-store –20° to +85°C
Regulatory Compliances	CE Mark EN61326-1:2013; EN61010-1:2010; EN/ISO13489-1:2009; EN60204-1:2009 FCC Part 15 Class B verified FCC Part 68 5TUUSA-23969-DT-E RoHS and REACH Compliant UL Listed

Ordering Information

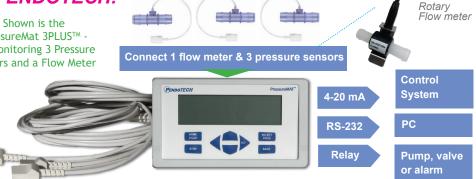| FMT-S	PendoTECH Premium Flow Meter Monitor with LCD and white backlit display, 4-20mA output, serial port, 12-24VDC power input range
FM-22WV	Single Use Rotary Flow Meter, non-sterile, PVDF, 1/4inch hose barb,0.1-2 lpm, clip mount. With individual calibration.
FM-22WV-E	Electronic assembly for one PVDF rotor with 1/4inch hose barb (includes one rotor)
FM-23WV	Single Use Rotary Flow Meter, non-sterile, PVDF, 1/2inch hose barb,1.0 - 20.0 lpm, clip mount. With individual calibration.
FM-23WV-E	Electronic assembly for one PVDF rotor with 1/2inch hose barb (includes one rotor)
PDKT-FM-FMT	Rotary flow meter adapter cable for FMT-S (3ft)
PMATP-GUI	Data Acquisition and Trending Software for PressureMAT and CMONT with 2 USB/serial cables to connect to a PC
PMAT-STND	PressureMAT Benchtop Stand
PMAT-S-DIN	DIN rail mounting kit
PMAT-PANEL-S-U	PMAT-S Panel mount kit UPGRADE- 2 gaskets, 4 mounting brackets, sensor cable (in replacement of standard cable), input connectors for sensor and power
PMAT-PANEL-S-C	PMAT Panel mount kit - 2 gaskets, 4 mounting brackets, 1 sensor cable, and input connectors for sensor and power

Flow monitor includes: Instrument, User Guide, power adapter, interface cable for rotary flow meters

Full electronic assembly

Replacement rotor

ALSO AVAILABLE FROM PENDOTECH:

For processes requiring measurement of multiple parameters such as pressure and flow, the PressureMAT PLUS models can measure multiple parameters of pressure, flow and even temperature, UV and more.

Shown is the PressureMat 3PLUS™ - for Monitoring 3 Pressure Sensors and a Flow Meter

Rotary Flow meter

Connect 1 flow meter & 3 pressure sensors

4-20 mA → Control System

RS-232 → PC

Relay → Pump, valve or alarm