Expro PassiveSONAR™ Flow Meter

For Geothermal applications

A piezoelectric sensor array is installed around the pipe and measures pipe wall strain caused by the coherent vortical structures. The coherent vortical structures or eddies occur in the pipe in the form of varying length scales. These eddies remain coherent over a certain length typically 15-20D (pipe diameters) and convect at or near the volumetrically averaged flow rate in the pipe. The sensor signals are decomposed in the spatial-temporal domain (wavenumber-frequency domain) using our SONAR processing algorithms and the slope of the plot generated yields the flow velocity or actual flow rate.

PassiveSONAR Meter also measures the SOS (speed of sound) of the fluid medium which is especially useful to determine the GVF (gas void fraction) in a well-mixed bubbly liquid flow or to qualitatively indicate the flow regime (gas/liquid/multiphase). It is multiphase tolerant as there is no direct interaction with the fluid medium.

The PassiveSONAR Meter can be used across the entire GVF range – single phase to bubbly liquid/multiphase/type 1 type 2 wet gas.

Features and benefits

- Applicable to a wide range of flow rates and pressures
- Completely non-intrusive, clamp-on design
- No pressure drop or leak risk
- Unaffected by corrosive or erosive fluids such as CO_2/H_2S
- Robust installation with no in-situ calibration required

Applications

- Geothermal well surveillance

Copyright 2025 Expro. All Rights Reserved. Notice: this product is protected by one or more patents assigned to Expro or one of its affiliated entities. For more information regarding Expro's patents, please go to: www.expro.com/patents. The sale, rental and use of Expro's products and the offering of services are subject to Expro's standard terms and conditions, available on request. Unless noted otherwise, trademarks and service marks herein are the property of Expro. Product and service information and/or specifications are subject to change without notice. For more information, please contact an authorized Expro representative.

Expro PassiveSONAR™ Flow Meter

For Geothermal applications

Specifications		
Parameter	**Specifications**	**Comments**
Pipe diameter range	4" to 12" NPS	Enquire about other sizes
Flow velocity range	Liquid: 1 to 10 m/s, Gas: 6 to 50 m/s	
Flow rate accuracy	+/-2% of full range reading	Whereas accuracy can be improved over a reduced measurement range
Repeatability	+/-0.3%	
Sensor head	Clamp-mounted onto the existing pipe section	Sensor head requires 1m (3ft) of straight pipe free of fittings
Transmitter	Programmable by keypad or PC interface, self-diagnostic, and data logging capability	LCD display with backlight. Provides flow rate, status, and diagnostics 1.
Transmitter to sensor cable	Unarmored cable, connected at one end	Cable lengths up to 90m (300ft). Optional armored cable
Cable Entries	4 x 1/2" NPT	
Operating temperature range		
Ambient temp - sensor head	-40°C to +60°C (-40°F to 140°F)	
Ambient temp - transmitter	-20°C to +60°C (-4°F to 140°F)	Can be remote from sensor 2.
Process temperature	-40°C to +120°C (-40°F to 248°F)	
Digital outputs	Serial communications ports Pulse/frequency and alarm	RS-485, half-duplex Isolated solid-state switches
Serial communication protocol	Modbus (slave) RTU/ASCII	Enquire about other protocols
Analog output	Two (2) isolated 4-20mA outputs	Enquire about other protocols
Analog input	Two (2) 4-20mA inputs	For use with 2-wire transmitters
Ingress protection (IP) rating		
Transmitter	IP-55	Models are Type 4X After installation on pipe
Sensor head	IP-55	
Diagnostic interfaces	USB port	For data history, configuration and diagnostic data via USB memory stick only
	10Base- T Ethernet	For setup/diags using a laptop
Power requirements	AC version: 100-240Vac, 25W DC version: 18 to 36Vdc, 25W	
Mounting	Pole or pipe mount	
Methods of protection	Non-sparking (nA) Intrinsic safety (ic)	Intrinsic safety applies to the sensor Head cable and 4-20mA inputs

Copyright 2025 Expro. All Rights Reserved. Notice: this product is protected by one or more patents assigned to Expro or one of its affiliated entities. For more information regarding Expro's patents, please go to: www.expro.com/patents. The sale, rental and use of Expro's products and the offering of services are subject to Expro's standard terms and conditions, available on request. Unless noted otherwise, trademarks and service marks herein are the property of Expro. Product and service information and/or specifications are subject to change without notice. For more information, please contact an authorized Expro representative.