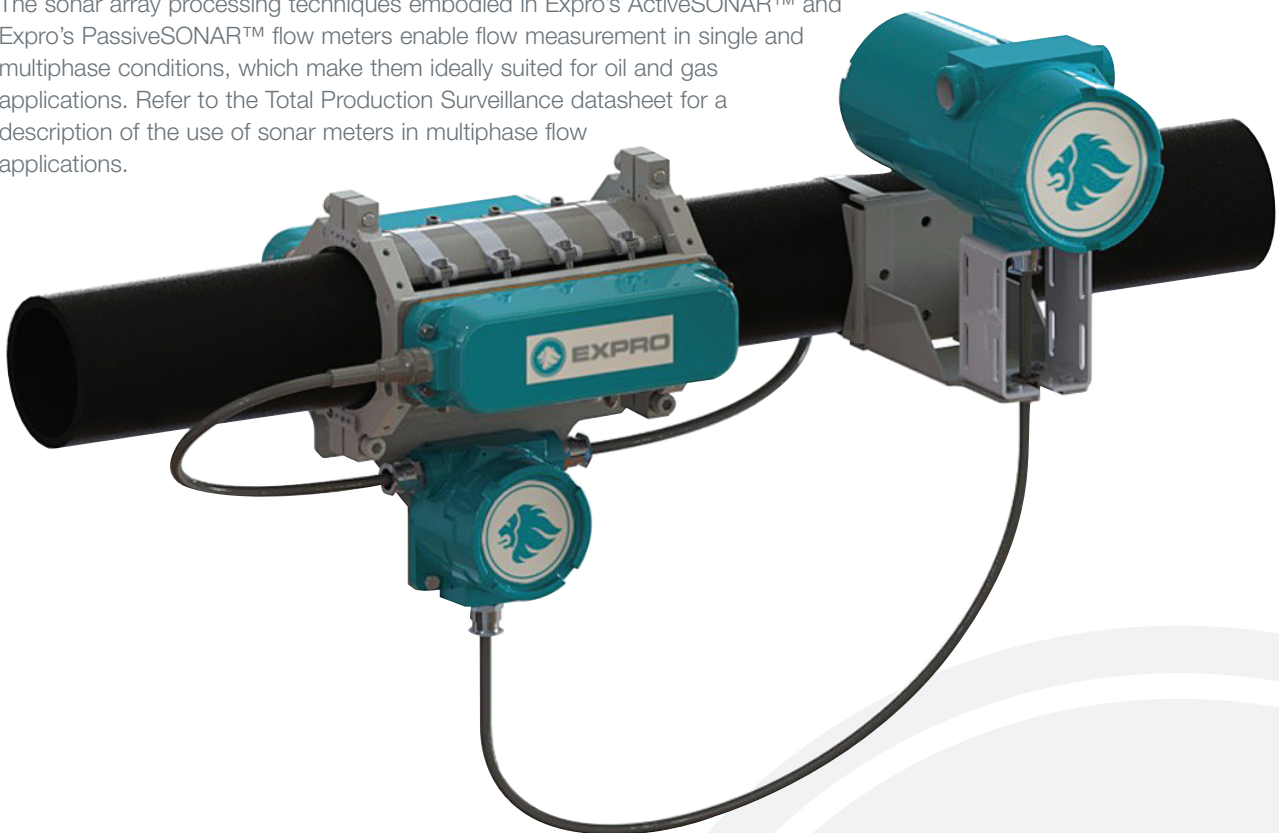


Expro's ActiveSONAR™ clamp-on flow meter for single and multiphase volumetric flow measurement

Expro's ActiveSONAR™ flow meter is a member of the sonar class of clamp-on flow meters.

Developed in the 1990s, sonar flow meters combine sophisticated submarine sonar array processing techniques with state-of-the-art digital signal processors and transducers. Expro's ActiveSONAR™ flow meter employs active pulsed-array sensors clamped to the outside of the pipe to track the velocity of the turbulent eddies in the fluid flow. The velocity is then used to determine volumetric flow rate for single phase flows.

The sonar array processing techniques embodied in Expro's ActiveSONAR™ and Expro's PassiveSONAR™ flow meters enable flow measurement in single and multiphase conditions, which make them ideally suited for oil and gas applications. Refer to the Total Production Surveillance datasheet for a description of the use of sonar meters in multiphase flow applications.



Applications targeted by Expro's ActiveSONAR™ flow meters include:

- Wellhead gas/condensate production surveillance: dry or Type I/II wet gas flow measurement
- Gas injection/gas lift
- Water injection
- Downstream gas and liquid flow rate measurement
- Drilling fluids measurement
- Contact Expro Meters to discuss other applications

Features and advantages of Expro's ActiveSONAR™ flow meters:

- Well suited to gas and liquid flows
- Applicable to a wide range of flow rates and pressures
- Excellent performance on thick-wall pipes, large diameter pipes and a range of pipe material (carbon/stainless steel, concrete lined, PVC/HDPE)
- Completely non-intrusive, clamp-on design
- No pressure drop or leak risk
- Unaffected by corrosive or erosive fluids
- Designed for permanent installation in harsh environments

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Technical specifications:		
Parameter	Specifications	Comments
Pipe diameter range	2" to 32" NPS Inquire about other sizes	Meter is pipe size specific
Flow velocity range	0.5 to 50 m/s (1.5 to 150 ft/s)	
Flow rate accuracy	+/-2.0% of reading	Repeatability of +/-0.3%. See note (a)
Sensor head	Clamp-mounted onto the existing pipe section; designed for permanent installation	Sensor head requires 0.3m (1ft) of straight pipe free of fittings
Operating temperature range		
Ambient temperature	-45° to +60°C (-49° to 140°F)	
Process temperature	-45° to +125°C (-49° to 257°F)	See note (b)
Digital outputs	Serial communications port	RS485, half-duplex, quantity 2
Serial communication protocol	Modbus (slave) RTU/ASCII	
Analog output	4-20mA	Requires external accessory
Ingress Protection (IP) rating		
Transmitter	IP-66	US/Canadian models are Type 4X
Sensor head	IP-67	Not for underwater use
Power requirements	18 to 35 Vdc, 12 Watts	
Methods of protection	Flameproof (d) and encapsulation (mb)	
Gas groups	IIB and IIA; US/Can Groups C,D	
Hazardous area classification (by model number)		
Model QEX1000F-A-AB	ATEX: Zone 1 IECEX: EPL Gb	Also suitable for ATEX Zone 2 Also suitable for IECEX EPL Gc
Model QEX1000F-A-D Model QEX1000F-B-D	US: Class I, Division 2 US: Class I, Division 2	Also US Class I, Zone 2 Also US Class I, Zone 2
Model QEX1000F-A-C	Canada: Class I, Division 2	Also Canadian Class I, Zone 2

Notes: (a) Gas calibrated range is 3 to 27 m/s (10 to 90 ft/s). Accuracy can be a function of piping geometry.

(b) QEX1000F-B-D temperature rating: -45°C to +100°C (-49°F to +212°F)