Isco Product Data

accQmin® Velocity Profiler
Shallow Water / Small Pipe

The accQmin Flow Meter brings unparalleled precision and accuracy to flow rate (Q) measurement in small pipes and channels, measuring rates in flow depths of 3 to 48 inches (75 to 1200 mm).

Pulse-Doppler technology measures velocity distribution within the flow, providing extremely accurate flow measurement. Its unique ability makes the most suitable choice for sites with non-uniform, rapidly changing, backwatered, near zero, zero, or reverse flow conditions.

Principles of Operation

Three (3) piezoelectric ceramics in the sensor emit short pulses along narrow acoustic beams pointing in different directions, to measure velocity. A fourth ceramic mounted in the center of the sensor assembly, and aimed vertically, is used to measure the depth.

Each acoustic beam measures velocity at multiple points, or "bins", within the water column. The measured velocity data within each bin are very precise – to within 0.01 ft/s. The measurements are then used to determine the flow pattern over the entire flow cross-section. Since the flow pattern and measured velocity distribution are dependent on each other, the accQmin's advanced flow algorithms automatically adapt to changing hydraulic conditions within the pipe. This removes the need for in-situ calibration and ensures accurate flow rate measurement over a host of different measurement environments and hydraulic conditions.

The accQmin Velocity Profiler is also available in a Class I, Div 1 configuration.

Applications

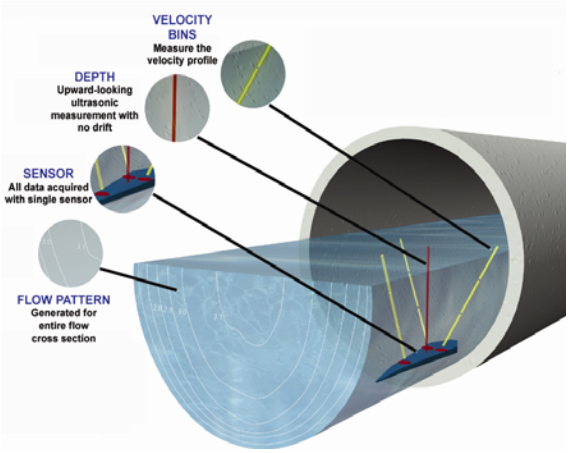
- Wastewater collection systems
- Combined sewer systems and outfalls
- Wastewater treatment facilities
- Irrigation canals and channels
- Industrial process and discharges
- Stormwater conveyance and outfalls

Standard Features

- Pulse Doppler velocity profiling technology
- Tri-redundant velocity sensors and depth sensor combined in a single, compact housing
- Upward-looking sensor mounts on a stainless steel band and is positioned in the channel invert.
- Data quality verification information (signal strength and correlation)
- In-situ calibration never required
- NEMA 6P electronics unit housing
- Real-time data output

Options

- Industry standard communications protocol interfaces
- Secondary depth sensor – pressure or ultrasonic
- Unique Flow Conditioning Platform
- Intrinsic Safety System for area classified as CSA Class 1, Div. 1, Group C & D

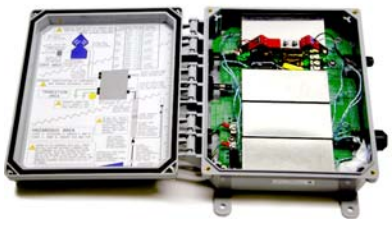


Specifications

accQmin® Velocity Profiler	
Measurement Performance	
Bin Velocity	
Maximum Range:	±15.0 ft/s (±4.5 m/s)
Velocity Bin Size:	0.4 in (10 mm)
Vertical Profiling Range:	Standard — 3 to 48 in (75 mm to 1200 mm), Ex — 3 to 40 in (75mm to 1000 mm) nominal, for particle concentrations of 50 to 1000 ppm
Accuracy:	0.5% of reading ± 0.01 ft/s (3.0 mm/s)
Water Level	
Measurement Range:	Standard — 1.5 in to 48 in (40 mm to 1200 mm), Ex — 1.5 in to 40 in (40 mm to 1000 mm)
Accuracy:	0.5% of reading ± 0.1 in (2.5 mm)
Acoustic Frequency	
Frequency:	2.46 MHz
Physical	
Electronics Unit	
Operating Temperature:	-15 to 125º F (-26 to 52º C)
Storage Temperature:	-65 to 160º F (-54 to 71° C)
Packaging:	NEMA 6
Size (HxWxD)	15.6 x 9.4 x 5.9 in. (397 x 240 x 150 mm)
Weight (with batteries):	16.4 lb (7.4 kg)
accQmin Sensor	
Operating Temperature:	23 to 95º F (-5 to 35º C)
Housing Material:	Plastic
Static Pressure:	250 psi Nominal
Dimensions:	10.5 x 2.25 x 0.63 in (267 x 57 x 16 mm)
Weight:	1 lb (0.5 kg)
Optional intrinsic safety area classification:	CSA Class 1, Div. 1, Group C & D; (sensor =T3)
Sensor Signal Cable	
Operating Temperature:	-40 to 125º F (-40 to 52º C)
Material:	Polyethylene Jacket
Length:	33 ft (10 m) std. 150 ft length (45 m) available
Minimum Bend Radius:	6 in (150 mm)
Outer Diameter:	0.5 in (13 mm) nominal

Data Management	
accQmin Velocity Profiler Data Types	
Q, V, D:	Discharge, average velocity, depth
Velocity:	Velocity profile data (relative to acoustic beam directions) per beam and bin
Echo Intensity:	Echo intensity data (relative backscatter intensity) per beam and bin
Data Quality:	Profile data quality indicators (Correlation magnitude, % - Good) per beam and bin
Temperature:	Transducer temperature output, range 20 to 125º F (-7 to 52º C)
Sound Speed:	One output for speed of sound data
Leader:	Output of general leader information (time, data, record number, etc.), and for vertical beam data
Data Storage and I/O	
Data Storage Capacity:	2 MB std. (2,000 measurements), slate or wrap
Data I/O Interface:	RS-232 standard. Multiple industry-standard protocols optional.
Data Transfer Rate:	Configurable to 115,200 bps
Power	
Internal Battery Voltage:	18 VDC nominal
Internal Battery Capacity:	26 Ah at 75º F (24º C) - Alkaline. Battery life 30 weeks at 15 minute sampling interval
External DC:	12 - 24 VDC; 10 VDC absolute minimum; 28 VDC absolute maximum
Software	
WinADFM Software for set-up, operation, data review, and data management.	

For measurement in challenging low-depth-of-flow conditions, the accQmin sensor can be mounted in our optional Flow Conditioning Platform. Specify desired pipe diameter when ordering.



Optional Barrier Module for Intrinsic Safety (IS) System. The barrier module is used to connect CSA-certified accQmin sensors with accQmin electronics.

ISCO®
Water is life. Protect it.

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