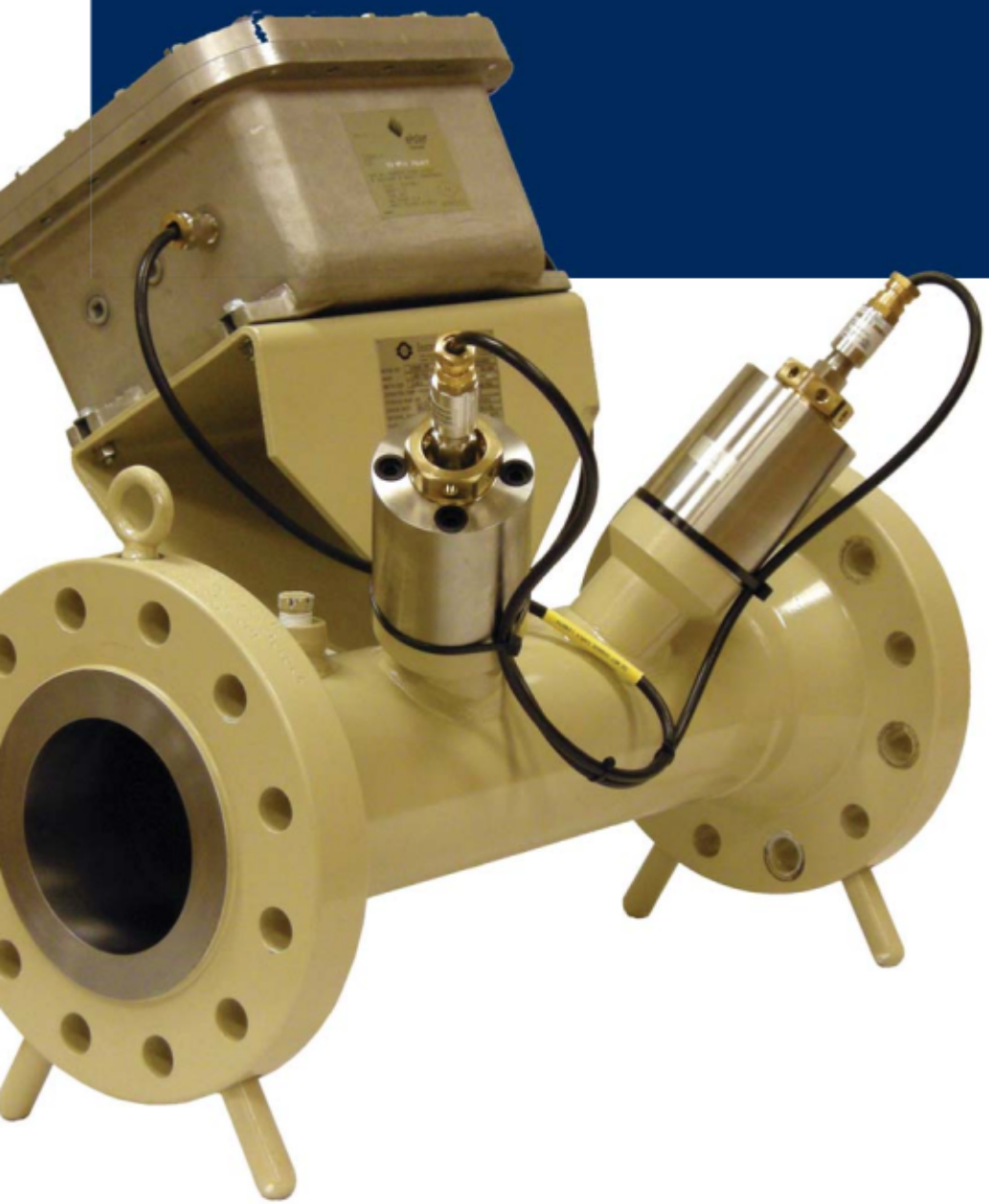
S.Sonic Ultrasonic Gas Flow Meter



Elster Instromet

S.Sonic Single Path Ultrasonic Flow Meter

The Elster Instromet S.Sonic Single Path Ultrasonic Flow Meter is a device ideally suited for a variety of gas measurement applications.

Advantages

- No pressure drop
- Wide rangeability/turn down ratio 50:1
- Bi-directional flow
- No moving parts
- Very low cost ownership (maintenance)
- Insensitive to contamination
- Interfaces with major flow computer mfg
- Measures pulsating flow accurately

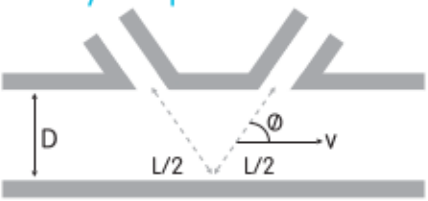
Applications

- Underground (natural) gas storage
- Gas compressor control
- Gas processing plants
- In-plant metering
- Power plants
- Check measurement
- Pipeline leak detection
- System balancing
- Gas well flowline measurement

The Elster Instromet S.Sonic Single Path Ultrasonic Flow Meter is a device ideally suited for a variety of gas measurement applications. Sophisticated transducers utilizing a unique bounce path configuration along with digital electronics gives the S.Sonic low uncertainty (± 1.0%) with excellent repeatability and linearity characteristics. The S.Sonic is recommended for non-custody applications. It is available in line sizes from 4" and all ANSI ratings. It can be configured for retractable and non-retractable transducers. The absence of moving parts makes it a very low maintenance meter. For optimal performance, the installation of a flow conditioning plate or system is recommended.

Using the Absolute Digital Time Travel method (ADTT), the flow meter measures gas flow by comparing the time taken by an ultrasonic pulse to travel upstream and downstream. The larger the difference in time taken, the greater the velocity or flow of the gas.

Theory of Operation



Travel Time Equations

$$t_D = \frac{L}{c+v \cdot \cos \varnothing} \qquad t_U = \frac{L}{c-v \cdot \cos \varnothing}$$

Velocity Equation

$$\hat{v} = \frac{L}{2 \cdot \cos \varnothing} \left[\frac{1}{t_D} - \frac{1}{t_U} \right]$$

Standard Spool Piece Specifications

- Body design code: CFR 49 Part 192**
- Flange design code: ANSI B16.5 or MSS SP 44
- Design temperature: -20°F to 200° F, -28°C to 93° C (meter body only)
- Design factor: 0.5
- Design pressure: 1480 PSIG, 100 Bar for 600 ANSI**
- Testing pressure: Standard; 1.5 x Design Pressure for 8 hours.
- Transducer ratings: Standard: 220 to 2250 PSIG**, -20°F to 176°F; 15 to 172 Bar, -28°C to 80°C
- Sandblasting: To near white metal
- Internal coating: Rust preventative Solvent
- External coating: Standard; Ameron Amercoat 385, Light Gray, DFT 4 - 6 mils.
- Other specific coatings are available upon request.

** Additional design codes, ANSI or pressures and transducers ratings available, please contact your sales representative for specifications.

The Ultrasonic flowmeter is in full compliance with the requirements of AGA Report #9 and approved for customdy transfer by Nmi, PtB, DTI, Gost and etc.

Specifications	
Outputs	- Four pulse outs: 0 to 10,000 Hz - Digital: RS 485/232 - Modbus RS 232/485
Performance	- Rangeability of 2' to 100'/sec, .6m to 30m per sec. - Accuracy within 1.0% - Repeatability equal or < 0.2%, Bi-directional flow. - Velocity Range: -100' to 100 ' per second, -30m to 30m per second. - Extended Range of 1' to 120 '/sec.; 0.3m to 36m/sec.
Response Time	- 1 update per second
Approvals	- FM Class, Div 1, Group C,D.
Power	- 12/24 VDC, 7 Watts consumption
Included	- Frequency Splitter Card - Uniform software program for monitoring and configuring flow meter with a laptop computer

Meter Material and Dimensional Specification

Size ANSI 600	ID - Inches (mm)	Length - Inches (mm)	Weight - Lbs (Kg)	Body Materials	Flange Materials
3"	3.068 (77.93)	40 (1016)	156 (71)	ASTM A 106 Gr. B	ASTM A105
4"	4.026 (102.10)	40 (1016)	203 (92)	ASTM A 106 Gr. B	ASTM A105
6"	6.065 (154.05)	30 (1762)	283 (130)	ASTM A 106 Gr. C	ASTM A105
8"	7.981 (202.72)	40 (1016)	400 (182)	API 5L X42	ASTM A694 F42
10"	10.020 (254.51)	40 (1016)	572 (260)	API 5L X52	ASTM A694 F52
12"	11.938 (303.23)	40 (1016)	681 (310)	API 5L X52	ASTM A694 F52
16"	15.000 (381.0)	48 (1219.2)	1109 (504)	API 5L X52	ASTM A694 F52
20"	19.000 (482.6)	60 (1524.0)	1645 (747)	API 5L X60	ASTM A694 F60
24"	22.876 (581.05)	72 (1828.8)	2396 (1087)	API 5L X65	ASTM A694 F65
30"	28.750 (730.25)	72 (1828.8)	3581 (1625)	API 5L X75	ASTM A694 F75