

SeniorSonic™ Gas Flow Meters

The Premier Ultrasonic Meter for Custody Transfer Applications



DANIEL®


EMERSON
Process Management

EMERSON. CONSIDER IT SOLVED.

Daniel SeniorSonic™ Gas Flow Meter

Assures you of the highest measurement accuracy and repeatability.

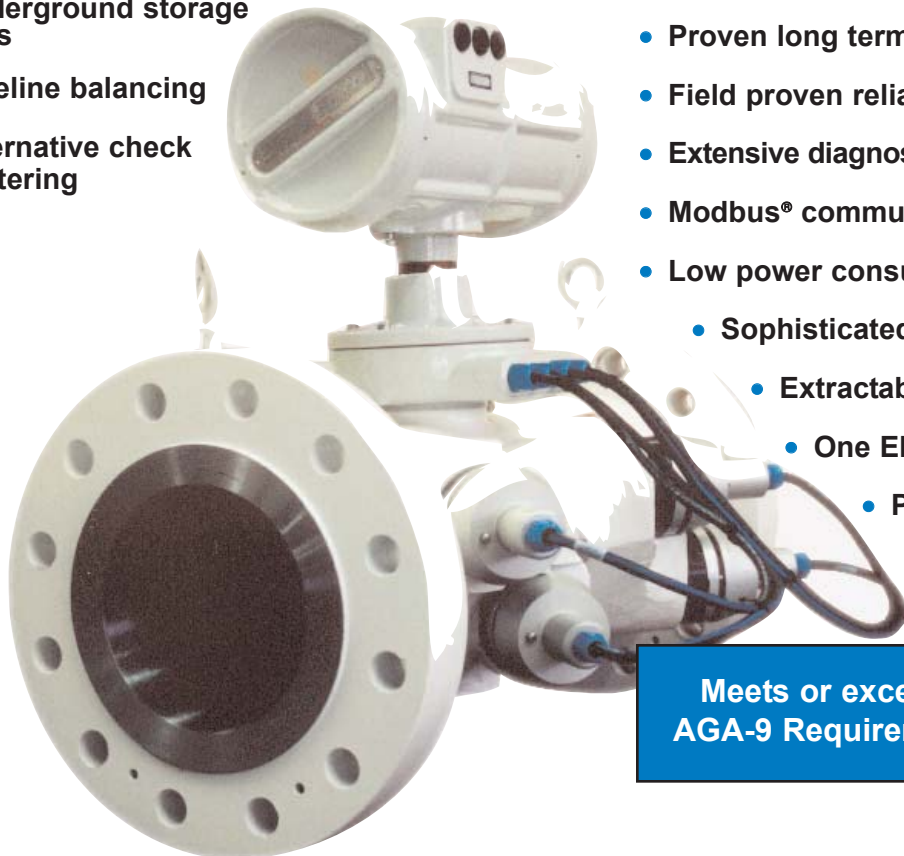
Daniel's SeniorSonic Meter is a natural gas flow meter that offers a high degree of accuracy, repeatability and superior low-flow capabilities without the compromises associated with conventional technologies. Accurate measurement over a wide range of flow rates with no pressure loss and bi-directional capability make the SeniorSonic meter the best choice for custody transfer applications. Safety, reliability, and ease of use are some of the many benefits of the Daniel SeniorSonic meter. Daniel has over 15 years of experience continually improving performance and reliability, resulting in a meter with superior immunity to installation effects. The meter's measurement capability has expanded while reducing the need for operator interaction. A newly released Windows® based CUI software makes the SeniorSonic even easier to use.

Applications include:

- Custody transfer
- Natural gas power plants
- Large industrial suppliers
- City Gates
- Transmission systems
- Underground storage sites
- Pipeline balancing
- Alternative check metering

Features include:

- Unsurpassed measurement accuracy
- Superior low-flow capabilities
- Rangeability Exceeds 50-1 within $\pm 0.1\%$
- Complete audit trail
- Superior "dirty vs. clean" operation
- Proven long term stability
- Field proven reliability
- Extensive diagnostic and alarm system
- Modbus® communications protocol
- Low power consumption
 - Sophisticated noise reduction
 - Extractable transducers
 - One Electronics fits all models
 - Powerful Windows®-based interface software



Meets or exceeds
AGA-9 Requirements

The "Easy to Use" Ultrasonic Metering Solution

Quick and easy access to information is key in taking advantage of today's technology

- Daniel Customer User Interface (CUI) software sets a new industry standard for realtime ultrasonic flowmeter monitoring. SeniorSonic features such as audit trail, extensive alarm reporting, flexible I/O, automatic meter configuration comparison and validation, digital waveform viewing, and the new piece-wise linearization are very easy to access. A single monitor screen presents virtually all live data simultaneously in an easy-to-understand format.
- The Daniel CUI automatically develops file folders and names for all stored data to insure consistency and ease of access for all technicians. An unlimited meter directory table can be shared between technicians to speed implementation of CUI, especially important where multiple technician support for site is required. CUI has comprehensive built-in help and supports direct and remote access via a phone line or radio.
- An Excel-based spreadsheet dramatically simplifies the periodic inspection reporting process, and makes trending of data for long-term meter performance verification simple and accurate. This spreadsheet includes automatic meter configuration collection, graphing of all key data, continuous alarm monitoring, and a built-in SOS calculator for comparison of meter vs. computed SOS. Gas composition can either be manually entered, or imported from the Daniel 2350A GC controller file. Several "wizards" simplify field startup, analog calibration, frequency output testing and other commonly performed functions.

Daniel Ultrasonic Meter Test and Inspection Report Summary

Station Name: Your Favorite Station
 Meter Name: Your Favorite Name
 Technician: Your Technician #1
 Address: Your Favorite Street

Test Date: 1.6.2002
 Time: 11:48:00
 Location: 50 Data Points
 Country: Any State

Meter Serial No: 01-230468
 Inside Diameter: 18.8120 Inches
 Pressure: 846 PSIG
 Temperature: 63.1 Deg. F
 Batch Size: 20
 Stack Size: 0

Velocities	Average	Maximum	Minimum
Path A:	58.5	52.8	45.9
Path B:	66.3	66.3	58.0
Path C:	67.6	71.8	63.1
Path D:	59.6	63.3	55.4
Meter Avg.:	64.0	65.8	57.8

SOS

Path A:	1,397.4	1,399.2	1,396.2
Path B:	1,395.8	1,397.6	1,394.7
Path C:	1,395.2	1,396.9	1,393.3
Path D:	1,396.2	1,398.0	1,397.5
Meter Avg.:	1,396.1	1,397.9	1,395.9

Other Path Diagnostic Averages

	% Perf.	Gain	SNR
Path A Up:	100.0	85.0	70,277
Path A Dn:	100.0	87.0	61,413
Path B Up:	100.0	92.0	59,345
Path B Dn:	100.0	93.0	70,678
Path C Up:	100.0	90.0	69,314
Path C Dn:	100.0	95.0	81,890
Path D Up:	100.0	84.0	62,512
Path D Dn:	100.0	87.0	68,047

Additional Averages

Gain Up:	87.8
Gain Dn:	89.3
SNR Up:	65,362
SNR Dn:	70,725

Reverse Flow Rate

Flow Rate	Meter Factor	
14	180,000	1.0014
3	160,000	1.0028
	140,000	1.0002
	110,000	0.9989
	85,000	0.9983
	65,000	1.0002
	30,000	1.0004
	15,000	1.0001
	10,000	0.9989
	5,000	0.9975

Path Gas Velocity (fps)

Path	Average
Path A	58.5
Path B	66.3
Path C	67.6
Path D	59.6
Average	64.0

New Interface Software

Daniel provides the most advanced diagnostic software with each SeniorSonic meter. This Windows based Customer User Interface software has been specifically designed to simplify monitoring and diagnosing the SeniorSonic meter. It is compatible with all previously shipped SeniorSonic meters. Some of the many features include:

- Comprehensive monitor screen
- Field start-up wizard
- Audit/Alarm/History retrieval
- Digital wave form viewing
- Maintenance log summary in Excel
- Trending of maintenance logs
- Configuration comparison with exception summary
- Remote dial-up support
- Calibration wizards (analog and frequency)
- Flow calibration wizard
- Unlimited meter directory support
- Two levels of technician support
- Automatic naming and organized saving



The Daniel "T-Slot" Extractable Transducer



The T-Slot transducer is one component of an advanced isolation system which provides a convenient and safe method for on-line transducer extraction. The

electrical components of the transducer have retained their intrinsic safety properties and are even more efficient than previous versions because of added acoustical isolation.

Safety interlocks prevent the transducer port from being opened prior to proper seating of the threaded transducer holder and insertion. Extraction is performed in a pressure balanced condition. The combination of all these features make the T-Slot the most advanced and efficient ultrasonic transducer in the gas industry.

Daniel Division Headquarters

Houston, Texas, USA, T: (713) 467-6000, F: (713) 827-3880
Calgary, Alberta, Canada, T: (403) 279-1879, F: (403) 236-1337
Stirling, Scotland - UK, Mid-East & Africa, T: +44 01786 433400, F: +44 01786 433401
Singapore - Asia Pacific, T: +65-6777-8211, F: +65-6770-8001

USA Toll Free 1-888-FLOW-001 www.daniel.com

Daniel is a wholly owned subsidiary of Emerson Electric Co., and a division of Emerson Process Management

The Daniel logo is a registered trademark of Daniel Industries, Inc. The Emerson logo is a registered trademark and service mark of Emerson Electric Co.

Precision manufacturing is essential.

The geometry of each meter body is critical to accurate measurement. Daniel's reputation for manufacturing excellence and painstaking quality assurance procedures is well known. Each meter body is subjected to rigorous testing and measurement throughout the manufacturing process.



The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time.

Daniel does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Daniel product remains solely with the purchaser and end-user.

