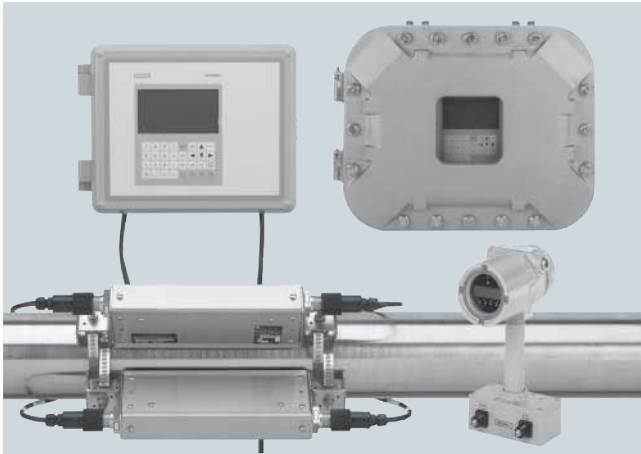


System 1010 Ultrasonic, Clamp-On Gas Flow Meter

Overview



ABLE 1010 clamp-on non-intrusive ultrasonic flow display computer is ideal for natural and process gas applications, including checkmetering, allocation, production, storage and gas fired power station applications.

ABLE 1010 is available in single, dual and optional four beam configurations, with your choice of IP65 (NEMA 4X) or IP65 (NEMA 7) and IP66 (NEMA 7) explosionproof enclosures.

Benefits

- Easy installation; no need to cut pipe or stop flow
- Minimal maintenance; external transducers do not require periodic cleaning
- No moving parts to foul or wear as found in turbine and PD meters
- Eliminates the pressure drop or energy loss in orifice metering
- Wide turn-down ratio
- Choice of single, dual or optional four beam versions
 - Single beam version reduces initial investment
 - Multiple beam versions provide higher accuracy, especially with limited straight run and poor flow profile conditions
 - In diametric reflect mode configuration, the meter is less sensitive to crossflow and swirl
- Wide-Beam technology provides improved accuracy over a wide range of flow velocity and operating pressure
- Zeromatic Path automatically sets zero without stopping flow and reduces zero drift, even at low flow
- Tolerant of most wet gas conditions
- Immune to most pressure reducing valve noise
- Optional rugged stainless steel transducer enclosure permits permanent and direct burial installations
- Easy to use "DataView" diagnostic software

Application

ABLE 1010 is ideal for most natural and process gas industry applications, including:

- Checkmetering
- Allocation
- Flow survey verification
- Lost and unaccounted for (LAUF) gas analysis
- Production
- Storage

Design

ABLE 1010 is available in three enclosures:

- IP65 (NEMA 4X) enclosure constructed of fiberglass reinforced polyester with stainless steel hardware and polyester keypad
 - Single beam
 - Dual beam
 - Four beam (optional)
- IP65 (NEMA 7) Compact explosionproof enclosure constructed of cast aluminum with glass window, stainless steel hardware
 - Single beam
 - Dual beam
- IP66 (NEMA 7) Wall mount explosionproof enclosure constructed of cast aluminum stainless steel hardware, optional glass window
 - Single beam
 - Dual beam
 - Four beam (optional)

Function

- IP65 (NEMA 4X) and IP66 (NEMA 7) flow display computers have integral 33 button keypads and large (128 x 240 pixel) graphic displays visible up to 12 m (40 ft) away
- IP65 (NEMA 7) compact flow display computer has a 2 x 16 alphanumeric LCD display
- Current, voltage, frequency and RS232 outputs (see specification section for details)
- Analog inputs for pressure and temperature
- Zeromatic Path automatically compensates for zero flow drift
- Bidirectional flow operation
- 1 Mbyte data logger with both site and data logger storage
- English, spanish, german, italian and french language options
- Internal AGA-8 table for fixed gas composition is available for standard volume computation
- Complete application and operation diagnostics, to assure calibration and operational integrity
- Upward compatibility and compliance with AGA-10 speed of sound measurement practice

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Technical specifications

1010

Input

Flow range	± 30 m/s (± 100 ft/s), bidirectional
Flow sensitivity	0.0003 m/s (0.001 ft/s), flow rate independent
Minimum pressure	7 ... 10 bar (100 ... 145 psi), typical (gas composition and application dependent; plastic pipes support operation at atmospheric pressure)
Pipe size	25 mm ... 1.52 m (1" ... 60") (for other sizes, consult factory)

Analog inputs	Current: 4 x 4 ... 20 mA, programmable (IP65 (NEMA 7) enclosure has 2 x 4 ... 20 mA, programmable)
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Output

Standard outputs	<ul style="list-style-type: none"> • Current: 2 x 4 ... 20 mA, a programmable, standard Additional 2 x optional, except IP65 (NEMA 7) • Voltage: 2 x 0 ... 10 V DC, menu programmable (None for IP65 (NEMA 7) enclosure) • 2 x Open collector digital pulses (quadrature) (None for IP65 (NEMA 7) enclosure) • 2 x 0 ... 5 kHz, TTL pulse square wave + (None for IP65 (NEMA 7) enclosure) • 1 x Optically isolated digital pulse & source, IP65 (NEMA 7) enclosure only • RS232 Serial Port
Enhanced outputs	<ul style="list-style-type: none"> • MODBUS (RS485/422/232) (not for IP65 (NEMA 7))
Status/Alarm I/O	<ul style="list-style-type: none"> • 4 x programmable form C relays (not for IP65 (NEMA 7) enclosure) • 4 x programmable N.O. Mer. Wet. Relays optional (not for IP65 (NEMA 7) enclosure) • 2 x Optically coupled output logic gates (for IP65 (NEMA 7) enclosure, only) • 1 Totalizer clear switch input (not for IP65 (NEMA 7)) • 1 Totalizer hold switch input (not for IP65 (NEMA 7) enclosure) • 1 x Opto iso. totalizer clear switch input (for IP65 (NEMA 7) enclosure, only) • 1 x Opto iso. totalizer hold switch input (for IP 65 (NEMA 7) enclosure, only)

Accuracy

Typical accuracy	1 % ... 2 % of actual volume reading (higher accuracy is pipe condition and flow profile dependent)
Repeatability	0.05 % ... 0.1 %, of actual volume reading, for 1.5 ... 30 m/s (5 ... 100 ft/s) velocities (pipe condition dependent)
Zero drift	0.0003 m/s (0.001 ft/s), with Zero-Matic Path active
Data refresh rate	5 Hz (80 Hz optional)

Rated operation conditions

Degree of protection	
• Wall mount enclosure	IP65 (NEMA 4X)
• Compact explosionproof	IP65 (NEMA 7)
• Wall mount explosionproof	IP66 (NEMA 7)
Gas temperature	-40 ... +60 °C (-40 ... +140 °F) (for higher temperatures consult factory)
Ambient temperature	-18 ... +60 °C (0 ... 140 °F)

Design

Dimensions	see SITRANS F US Clamp-on „System info and selection guide“
Weight	see diagrams

Power supply

• For IP65 (NEMA 4X) and IP66 (NEMA 7)	• 90 ... 240 V AC, 50 ... 60 Hz (30 VA) or 9 ... 36 V DC (12 W)
• For IP65 (NEMA 7):	• 90 ... 240 V AC, 50 ... 60 Hz (15 VA) or 9 ... 36 V DC (10 W)

Indication and operation

Data logger memory	1 Mbyte, programmable for 17 data functions
Display	
• IP65 (NEMA 4X) and IP66 (NEMA 7) enclosures	128 x 240 pixel LCD with backlight
• IP65 (NEMA 7) enclosure	2 x 16 alphanumeric LCD display
Keypad	
• IP65 (NEMA 4X) and IP66 (NEMA 7) Enclosures	33 keypad buttons with tactile feedback
• IP65 (NEMA 7) Enclosure	5 magnetic hall effect switches
Language options	English, spanish, german, italian, french

K) Subject to export regulations AL: N, ECCN: 5A991X.

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Certificates and approvals

IP65 (NEMA 4X) flow display computer ratings

FM and CSA	I.S. Class I, II, Div 1 N-I Class I, Div 2 S Class II, Div 2
ATEX	<ul style="list-style-type: none"> • Flowmeter: Ex II (1) G [EEEx ia] IIC Ex II 3 (1) G EEx nC [ia] IIC T5 • Transducers: Ex II 1 G EEx ia IIC T5 Ex II 2 G EEx m II T5 (for use with flowmeter in safe area)
INMETRO (Brazil)	<ul style="list-style-type: none"> • Flowmeter: [BR-Ex ia] IIC BR-Ex nC [ia] T5 • Transducers: BR-Ex ia IIC T5 IP65 -50 °C ≤ Ta ≤ +60 °C

IP65 (NEMA 7) compact explosionproof enclosure ratings

FM and CSA	XP Class I, Div 1 D-I Class II, Div 1 I.S. Class I, Div 1 N-I Class I, Div 2 S Class II, Div 2
ATEX	<ul style="list-style-type: none"> • Flowmeter: Ex II 2 (1) G EEx d [ia] IIB + H2 T5 • Transducers: Ex II 1 G EEx ia IIC T5
INMETRO (Brazil)	<ul style="list-style-type: none"> • Flowmeter: BR-Ex d [ia] IIB + H2 T5 • Transducers: BR-Ex ia IIC T6 IP65 -50 °C ≤ Ta ≤ +60 °C

IP66 (NEMA 7) wall mount explosionproof enclosure ratings

FM and CSA	XP Class I, Div 1 D-I Class II, Div 1 I.S. Class I, Div 1 N-I Class I, Div 2 S Class II, Div 2
ATEX	<ul style="list-style-type: none"> • Flowmeter: Ex II (1) G [EEEx ia] IIC Ex II 3 (1) G EEx nC [ia] IIC T5 Ex II 2 (1) G EEx d [ia IIC] IIB+H2 T5 • Transducers: Ex II 1 G EEx ia IIC T5
INMETRO (Brazil)	<ul style="list-style-type: none"> • Flowmeter: [BR-Ex ia] IIC BR-Ex nC [ia] IIC T5 BR-Ex d [ia IIC] IIB + H2 T5 • Transducers: BR-Ex ia IIC T5 -50 °C ≤ Ta ≤ +60 °C