F-4300
CLAMP-ON ULTRASONIC FLOW METER

ONICON's F-4300 Clamp-on Ultrasonic Flow Meter is the non-invasive approach to highly accurate hydronic measurement. Using an innovative design incorporating matched transducers and easy to use mounting hardware, it is ideal for installations in existing systems when shutdowns are impractical.

• Chilled Water • Hot Water • Domestic Water • Condenser Water •

ONICON F-4000 Series Ultrasonic Flow Meters utilize the differential transit time method to measure the velocity of relatively clean liquids in full pipes. By measuring the difference between transit times of ultrasonic sound waves traveling between two transducers, the flow velocity and direction are accurately determined.

DESCRIPTION

ONICON F-4300 Clamp-on Ultrasonic Flow Meters offer an ideal solution for liquid flow measurement in existing systems when it is impractical to install traditional inline or insertion style flow meters. The innovative design incorporates matched precision clamp-on transducers and signal processing circuitry to accurately measure the flow of most liquids over a wide velocity range. Each F-4300 is provided with transducers and easy-to-use mounting hardware, factory supplied transducer cabling, and a wall mount enclosure with an LCD and user interface keypad.

Output signals include a single analog output and two pulse outputs. The F-4300 will also provide an isolated RS485 output capable of communicating over BACnet® MS/TP or MODBUS® RTU networks. Optional BTU measurement systems are also available.

APPLICATIONS

- Chilled water, hot water, condenser water & water/glycol solutions for HVAC
- Steam condensate (pumped)
- Domestic/municipal water
- Process water & other clean liquids

FEATURES

Ideal Solution for Retrofits & Baseline Monitoring -
Clamp-on transducers allow for quick and easy installation with no system shutdown and no pressure drop, designed for use on a number of pipe materials and sizes, from ½" through 48". Each meter is provided with a built-in 128 megabyte data logger, making it an ideal solution for baseline monitoring.

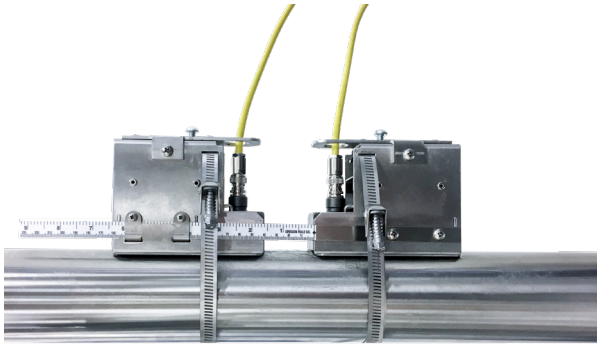
Simple to Install and Commission -
Every ONICON F-4300 is individually configured and programmed using customer specific application data. Complex field programming is not required.

High Confidence and Reliability -
ONICON provides transducers that are optimized for specific pipe conditions, providing a strong, stable signal with an outstanding signal-to-noise ratio.

Native BACnet & MODBUS Communications –
The F-4300 is provided with a single RS485 output that can be configured to operate on BACnet® MS/TP or MODBUS® RTU networks. MODBUS® TCP/IP network version can be provided in lieu of RS485 connection.

CALIBRATION

All F-4300 Series flow meters are calibrated in a flow laboratory against standards that are directly traceable to National Institute of Standards and Technology (N.I.S.T.). A certificate of calibration accompanies every meter.



Typical Installation on Steel Pipe

SPECIFICATIONS*

F-4300 TRANSMITTER		
PERFORMANCE	ACCURACY	± 1.0% of reading from 1 to 20 ft/s ± 0.01 ft/s for velocities below 1 ft/s
	REPEATABILITY	± 0.25%
	OVERALL FLOW RANGE	0.1 to 20 ft/s
OPERATING CONDITIONS	OPERATING TEMPERATURE	-40°F to 250°F
	STORAGE TEMPERATURE	-5°F to 140°F
INPUT POWER	AVAILABLE OPTIONS	• 24 V AC/DC, 50/60 Hz, 10 VA max • 110-240 VAC, 50/60 Hz, 10 VA max
I/O SIGNAL	One (1) isolated analog output, 4-20 mA or 0-5 VDC Two (2) pulse outputs	
ELECTRONICS ENCLOSURE	NEMA 4X (IP67) polycarbonate with clear shatter proof cover	
	DISPLAY	White, backlit, 128 x 64 dot matrix
	AMBIENT CONDITION	-5°F to 140°F
PROGRAMMING	Menu driven via five (5) programming keys	
ELECTRICAL CONNECTIONS	Enclosed terminal blocks, cable access through four (4) conduit openings	
NETWORK CONNECTIONS	AVAILABLE OPTIONS	• RS485 serial interface, BACnet MS/TP or MODBUS RTU • MODBUS TCP/IP (24 VDC Only)
NETWORK CONFIGURATION & ADDRESSING	BAUD RATES	4800, 9600, 19200, 38400, or 76800
	DEVICE ADDRESS RANGE	1 - 247
	DEVICE INSTANCE RANGE	1 – 4,194,302 (BACnet® only)
	PARITY	None, Even, Odd (MODBUS® RTU only)
APPROVALS	CE	2014/30/EU EMC Directive
	CSA	EN61010
F-4300 FLOW SENSOR		
PERFORMANCE	SENSING METHOD	Ultrasonic differential transit time velocity measurement via non-wetted transducers
OPERATING CONDITIONS	FLUID PROPERTIES	Clean liquids in full (pressurized) pipes
	FLUID VELOCITY RANGE	0.07 ft/s to 40 ft/s
	FLUID TEMPERATURE RANGE	-40°F to 250°F
	PIPE MATERIALS	Suitable for use in a wide range of metallic and non-metallic piping systems. Refer to Pipe Material table below
	PIPE SIZE RANGE	½" to 48", based on transducer series selected

PIPE MATERIAL**	PIPE SCHEDULE
Carbon Steel	Schedule 40, Schedule 80, Schedule Standard
PVC	Schedule 40, Schedule 80, Schedule Standard
Copper	Type L, Type K
Stainless Steel	Schedule 5S, Schedule 10S, Schedule 40S
Ductile Iron (cement lined or unlined)	Thickness Class 50, Thickness Class 51, Thickness Class 52, Thickness Class 53, Thickness Class 54, Thickness Class 55, Thickness Class 56
HDPE	SDR 7.4, SDR 11, SDR 17, SDR 17.6, SDR 21

* SPECIFICATIONS subject to change without notice.
**Contact factory for pipe materials not listed.

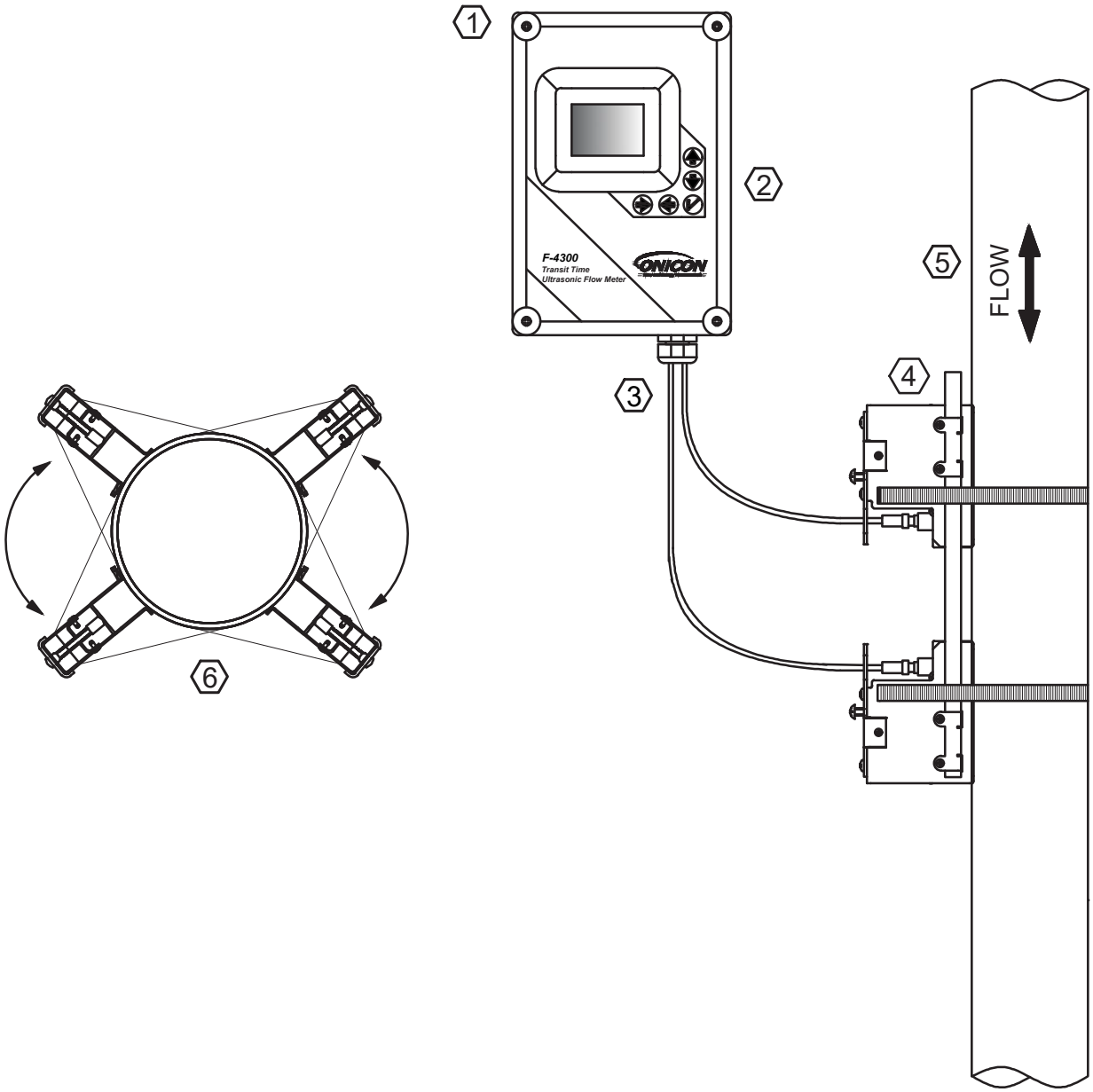
SPECIFICATIONS CONTINUED*

F-4300 FLOW SENSOR (continued)		
TRANSDUCER DESIGN - 10 SERIES	OPERATING FREQUENCY	2.56 MHz
	PIPE SIZE RANGE	½" to 4"
	CABLE CONNECTIONS	• Triaxial cable with BNC style connectors and sealing jacket • Triaxial cable with NEMA 6 (IP67) direct connection for wet locations
	MOUNTING KIT	Stainless steel mounting track with pipe clamps and an alignment and spacer tool
TRANSDUCER DESIGN - 20 SERIES	OPERATING FREQUENCY	1.28 MHz
	PIPE SIZE RANGE	2" to 10"
	CABLE CONNECTIONS	Triaxial cable with BNC style connectors and sealing jacket
	MOUNTING KIT	Stainless steel mounting brackets with conduit connection, pipe clamps and an alignment and spacer tool
TRANSDUCER DESIGN - 30 SERIES	OPERATING FREQUENCY	640 kHz
	PIPE SIZE RANGE	12" to 48"
	CABLE CONNECTIONS	Triaxial cable with BNC style connectors and ½" MNPT conduit connection and NEMA 4 (IP66) threaded strain relief
	MOUNTING KIT	Stainless steel mounting brackets with pipe clamps and an alignment and spacer tool

OPERATING RANGE					
PIPE SIZE (inches)	**FLOW RATE (GPM) (0.1 ft/sec - 20 ft/sec)**	**PIPE SIZE (inches)**	**FLOW RATE (GPM) (0.1 ft/sec - 20 ft/sec)**	**PIPE SIZE (inches)**	**FLOW RATE (GPM) (0.1 ft/sec - 20 ft/sec)**
½	0.06 - 12	5	6.2 - 1,200	24	132 - 26,500
¾	0.2 - 28	6	9.0 - 1,800	26	166 - 33,100
1	0.3 - 48	8	16 - 3,100	30	221 - 44,100
1¼	0.4 - 76	10	25 - 4,900	34	283 - 56,600
1½	0.6 - 110	12	35 - 7,050	36	318 - 63,500
2	1.0 - 200	14	43 - 8,600	42	432 - 86,400
2½	1.5 - 230	16	57 - 11,400	48	564 - 112,500
3	2.3 - 460	18	73 - 14,600		
4	4.0 - 800	20	91 - 18,100		

* SPECIFICATIONS subject to change without notice.

TYPICAL METER INSTALLATION



1. NEMA 4X (IP67) polycarbonate with clear shatter proof cover
2. Backlit LCD display with menu, driven via five (5) programming keys
3. Triaxial transducer cables. The maximum allowable cable length is 100 ft
4. Mounting hardware, includes: mounting brackets, mounting strap kit and alignment tool
5. Vertical pipe: mounting on a vertical pipe is recommended, when flow is in the upward direction. When mounting on a vertical pipe flowing in a downward direction, make sure there is sufficient back pressure in the system to maintain a full pipe
6. Horizontal pipe: avoid mounting transducers on the top of a horizontal pipe. The best placement on a horizontal pipe is either the 2:00 to 4:00 or 8:00 to 10:00 positions

METER ORDERING INFORMATION

Meter Model Number Coding = F-4300-ABCD-EEFF

A = Electronics Enclosure
1 = NEMA 4X Polycarbonate

B = Input Power
1 = 24 V AC/DC
2 = 110 - 240 VAC

C = Feature Set & I/O
1 = Flow only, one (1) AO and RS485, BACnet or MODBUS
2 = Flow only, one (1) AO and MODBUS TCP/IP[1]

D = Transducer Cable Length
1 = 25′ transducer cable, BNC connector[2, 5]
2 = 50′ transducer cable, BNC connector[2, 5]
3 = 100′ transducer cable, BNC connector[2, 5]
4 = 25′ transducer cable, submersible connection (NEMA 6 - IP67)[2]
5 = 50′ transducer cable, submersible connection (NEMA 6 - IP67)[2]
6 = 100′ transducer cable, submersible connection (NEMA 6 - IP67)[2]
7 = 25′ transducer cable, BNC connector, threaded strain relief (NEMA 4 - IP66)[3]
8 = 50′ transducer cable, BNC connector, threaded strain relief (NEMA 4 - IP66)[3]
9 = 100′ transducer cable, BNC connector, threaded strain relief (NEMA 4 - IP66)[3]

EE = Transducer Series
12 = Includes pair of 10 Series transducer, 37 deg., line size ½″ to 4″
2X = Includes pair of 20 Series transducer, 35 to 41 deg., selected based on line size 2″ to 10″[4]
32 = Includes pair of 30 Series transducer, 37 deg., line size 12″ to 48″

FF = Installation Hardware
12 = ½″ to 4″ nom. pipe diameter, stainless steel mounting bracket[2]
21 = 2″ to 6″ nom. pipe diameter, stainless steel mounting bracket[5]
22 = 8″ to 10″ nom. pipe diameter, stainless steel mounting bracket[5]
31 = 12″ to 16″ nom. pipe diameter, stainless steel mounting bracket[6]
32 = 18″ to 48″ nom. pipe diameter, stainless steel mounting bracket[6]

Notes
[1] MODBUS TCP/IP requires 24 VDC input power
[2] Only available for transducer series EE = 12
[3] Threaded strain relief connectors only avaialble for EE = 32
[4] Actual transducer selected, 21 through 24, is factory selected at time of order
[5] Only available for transducer series EE = 2X
[6] Only available for transducer series EE = 32