



**ONICON**  
Flow and Energy Measurement

# F-5400

## THERMAL MASS FLOW METER

ONICON's F-5400 Series Thermal Mass Flow Meters provide accurate and reliable flow measurement for natural gas, compressed air, and other industrial gas applications.



• Natural Gas • Compressed Air • Industrial Gases •



## DESCRIPTION

ONICON's F-5000 Series Thermal Mass Flow Meters provide accurate mass flow measurement of natural gas, compressed air and other industrial gases. The proprietary sensor design measures mass flow directly and does not require additional pressure or temperature compensation to deliver accurate flow rate and total data.

The F-5400 is available as an inline or an insertion style meter and provides both an analog (4-20mA) output and pulse output.

## APPLICATIONS

Accurate sub-metering of natural gas & propane for:

- Tenant space usage
- Boiler efficiency
- Campus monitoring

Also ideal for monitoring:

- Compressed Air
- Medical gases
- Other industrial gases

## CALIBRATION

Every ONICON flow meter is wet calibrated in a flow laboratory against standards that are directly traceable to NIST\*. A certificate of calibration accompanies every meter.

\* National Institute of Standards and Technology

\*\* Installations must comply with federal, state and municipal building codes. Review all proposed combustible gas installations with your local code enforcement officials before attempting to install.

## FEATURES

**Highly Accurate Over a Wide Operating Range** - Our proprietary direct digital control sensing circuitry is very stable yet highly responsive to changes in flow. This design allows for accurate flow measurement over a very wide operating range (over 1000:1 for the inline version). It also makes the meter ideal for measuring low flow rates.

**Field Programmable Through Mini-USB Interface** - The PC based utility software provides an easy method to change program settings and perform diagnostic tests in the field.

**Excellent Value** - ONICON insertion style meters are accurate, easy to use and reliable. They are also priced independently of pipe size. This makes them an excellent value, particularly in larger diameter pipes.

**Insertion Meters Can Be Installed Without Interrupting Gas Service\*\*** - ONICON's hot tap design allows for installation without interrupting gas service. The meter can also be removed for service without disrupting flow.

## Optional D-100 Display

The versatile D-100 is ideal for providing a remote display option with an IP interface for BACnet® or MODBUS®. It can also provide two additional analog rate inputs and one pulse input to the network.

## Available Output Signals:

BACnet/IP or MS/TP  
MODBUS TCP or RTU  
LonWorks TP/FT-10F  
JCI Metasys N2  
Siemens Apogee FLN  
Scaled Pulse & Analog



**SPECIFICATIONS\***

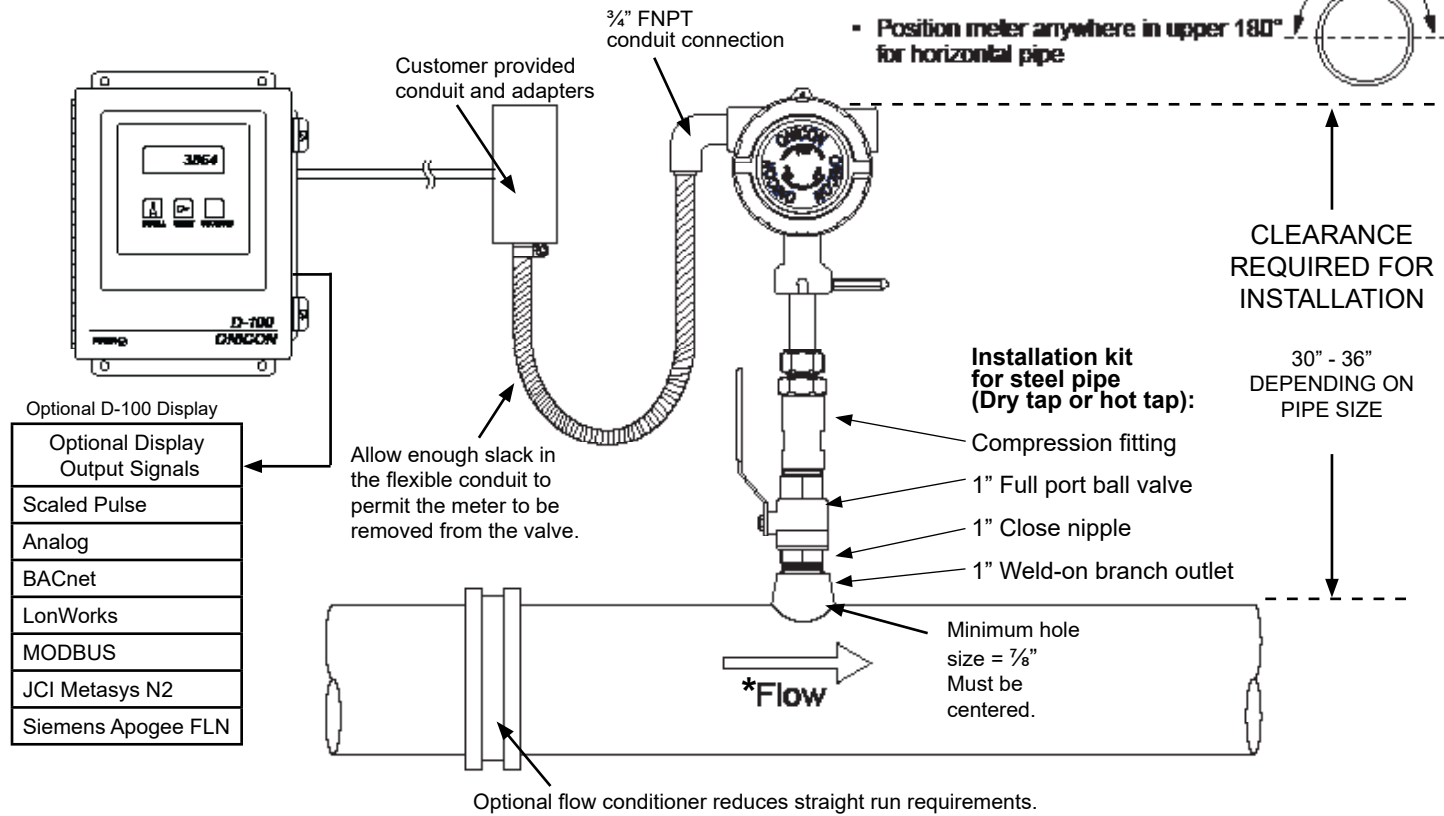
<b>F-5400 THERMAL MASS FLOW METER</b>	
FLOW ACCURACY	NATURAL GAS/PROPANE GAS ±1.0% of reading from 500 – 7,000 SFPM ±2.0% of reading from 100 – 500 SFPM COMPRESSED AIR & OTHER HIGH VELOCITY CALIBRATIONS ±1.0% of reading ± 0.5% of full scale over a 100:1 turndown
OVERALL FLOW RANGE	15 - 35,000 SFPM
SENSING METHOD	Thermal mass flow utilizing direct digital control sensing circuitry
PIPE SIZE RANGE	INSERTION STYLE 1½ - 24" nominal diameter INLINE STYLE ¾ - 6" nominal diameter
INPUT POWER	12 - 28 VDC, 6W minimum power
TEMPERATURE RANGE	FLUID -40°F to 250°F AMBIENT -40°F to 158°F
MAXIMUM OPERATING PRESSURE	INSERTION STYLE Process adapter fitting - 60 psig (4.1 barg) max High pressure adapter fitting - 150 psig (10.3 barg) max INLINE STYLE ANSI Class 150 flange - 230 psig at 100°F (16 barg) NPT-300 psig (20.7 barg) All stainless steel ferrules
PRESSURE DROP (at 2500 SFPM, 70°F and 2 psig)	INSERTION STYLE Less than ½" W.C. (H2O) in 1½" diameter pipes, decreasing in larger pipes INLINE STYLE (with built-in flow conditioner) Less than ½" W.C (H2O) in 2" and larger diameter meters Less than 0.9" W.C (H2O) in 1" and 1½" diameter meters
PROGRAMMING/MEMORY	Factory programmed for specific application. Field programming available through mini-USB interface and utility program. Non-volatile memory retains all program parameters and totalized values in the event of power loss.
OUTPUT SIGNALS PROVIDED	Analog output: 4-20 mA Pulse output: Scaled pulse or alarm (Isolated open collector output)
MATERIAL	Wetted metal components: 316 stainless steel
ELECTRONICS ENCLOSURE	Weather-tight NEMA 4 aluminum enclosure
ELECTRICAL CONNECTIONS	Enclosed terminal blocks, cable access through two ¾" NPT conduit fittings
APPROVALS	FM (USA) FMc (CAN): Approved Class 1, Div 1, Groups B, C, D; Class 2, Div 1, Groups E, F, G; Class 3, Div 1; T4, Ta = -40°C to 70°C; Class 1, Zone 1, AEx/Ex db IIB + H2 T4; Gb Ta = -40°C to 70°C; Type 4X, IP66/67 EMC Directive; 2014/30/EU Emissions and Immunity Testing: EN61326-1:2013



\* SPECIFICATIONS subject to change without notice.

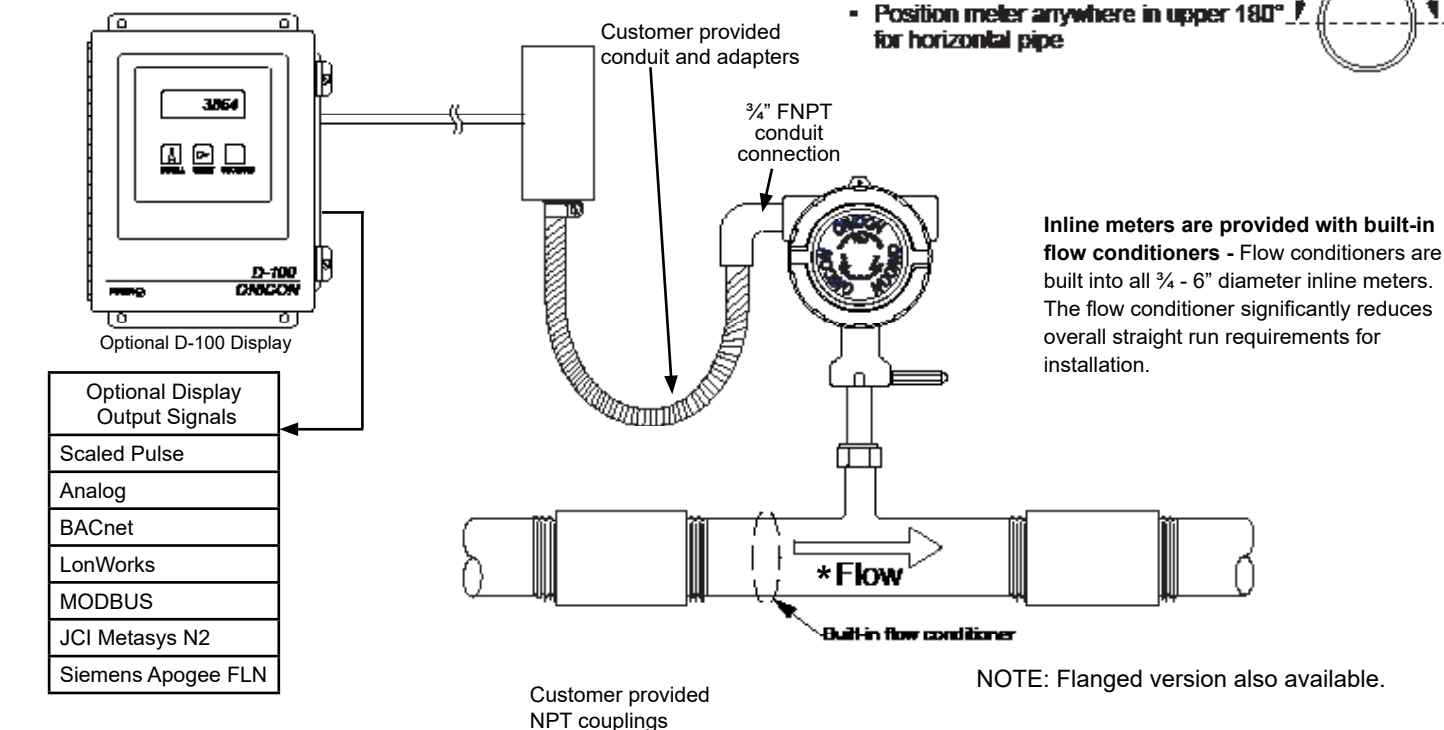
**TYPICAL INSERTION METER INSTALLATION**

- Acceptable to install in vertical pipe
- Position meter anywhere in upper 180° for horizontal pipe



**TYPICAL INLINE METER INSTALLATION**

- Acceptable to install in vertical pipe
- Position meter anywhere in upper 180° for horizontal pipe



\*Standard orientations. Contact ONICON for other options.

**METER ORDERING INFORMATION**  
**Meter Model Number Coding = F-54AA-BCDE-FGGH**

**F-54 = Thermal Mass Flow Meter**

<p><b>AA = Pipe Diameter</b>                  00 = Insertion                  34 = ¾"                  01 = 1"                  13 = 1¼"                  15 = 1½"</p> <p><b>B = Output Signals</b>                  2 = Loop powered 4-20 mA and scaled pulse</p> <p><b>C = Input Power</b>                  1 = 24 VDC</p> <p><b>D = Electronics Enclosure Mounting Configuration</b>                  1 = Integral enclosure, no display</p> <p><b>E = Process Connection</b>                  4 = Insertion, ¾" X 1" NPT                  5 = Male NPT threaded connection (¾ - 3" pipe sizes only)                  6 = ANSI Class 150 flange connection</p> <p><b>F = Flow Conditioner</b>                  1 = Insertion style without flow conditioner                  2 = Insertion style with flow conditioner                  3 = Inline style with conditioner</p>	<p><b>GG = Pipe Size Range</b>                  00 = Inline Meter                  15 = 1½ - 6" nominal diameter                  18 = &gt;6" nominal diameter</p> <p><b>H = Process Adapter Fitting</b>                  0 = Male threads, 0-60 psig                  1 = Male threads with safety chain, 0-150 psig                  9 = Inline connection</p>
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**GAS TYPE**

NG = Natural Gas	HE = Helium Gas
ME = Methane Gas	NI = Nitrogen Gas
PG = Propane Gas	AR = Argon Gas
AI = Air	CD = Carbon Dioxide
O2 = Oxygen Gas	BU = Butane
HY = Hydrogen	

**ACCESSORY ORDERING INFORMATION**

Install Kit for Carbon Steel Piping Systems	
Model Number	Description
INSTL0094-FMH	Insertion flow meter hot tap installation kit, wetted materials are bronze, brass and steel

OPERATING RANGE FOR COMMON PIPE SIZES 15 to 7,000 SFPM in schedule 40 pipe		
Pipe Size (Inches)	Flow Rate (SCFH)	
	Min	Max
¾	3.3	1,560
1	5.4	2,521
1¼	9.3	4,362
1½	13	5,938
2	21	9,740
2½	30	13,964
3	46	21,562
4	80	37,130
5	125	58,350
6	181	84,263
8	313	145,912