• F-5500 SERIES •
THERMAL MASS
FLOW METER

ONICON
FLOW AND ENERGY MEASUREMENT

Made in America

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-5500 is available as an inline or an insertion style meter and includes an easy to operate user interface/display. The standard version of the meter is provided with a 4-20 mA analog output and an RS485 interface that is field configurable for BACnet® MS/TP or Modbus® RTU. A second output signal configuration is available that includes a 4-20 mA analog output and a programmable pulse output. The pulse output model is also available with HART.

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

GENERAL SPECIFICATIONS

FLOW ACCURACY
  Natural Gas / Propane Gas
    ± 1.0% of reading from 500 – 7000 SFPM
    ± 2.0% of reading from 100 – 500 SFPM
  Compressed Air & other high velocity calibrations
    ± 1.0% of reading + 0.5% of scale over a 100:1 turn-down
TEMPERATURE ACCURACY
  ± 1.0°F over the range of -40 to 250° F
OVERALL FLOW RANGE
  15 to 35,000 SFPM

FEATURES

BACnet MS/TP or MODBUS RTU -
The standard F-5500 includes an RS485 output that provides BACnet MS/TP or Modbus RTU. Data reported to the network includes flow rate and total, temperature and elapsed time since reset.

User Friendly Interface / Display - The bright, easy-to-read, backlit display and intuitive menu structure simplify page navigation and allow for field programming. Free utility software is also available for programming and data logging.

Provides for Field Validation of Calibration -
F-5500 internal diagnostic functions include a zero flow calibration check. This fast, easy to perform, test allows for field validation of the factory zero flow calibration. The utility software provided with the meter allows you to print a certificate validating the test results.

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

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.

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.

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.

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

GENERAL SPECIFICATIONS (cont.)

SENSING METHOD
Thermal mass flow utilizing direct digital control sensing circuitry

PIPE SIZE RANGE
Insertion style - 1½" through 24" nominal diameter
Inline style - ¾" through 6" nominal diameter

INPUT POWER
12 - 28 VDC, 6W minimum power

FLUID TEMPERATURE RANGE
-40° F to 250° F

AMBIENT TEMPERATURE RANGE
-40° F to 158° F

MAXIMUM OPERATING PRESSURE
Insertion flow meter: 300 PSIG (20.7 barg)
Inline flow meter (3/4" through 6")
Flanged-ANSI 150 (230 PSIG at 100° F (16 barg))
NPT 300 PSIG (20.7 barg)
Retractor / Hot Tap assemblies - 60 PSIG (4.1 barg) max
All stainless steel ferrules

PRESSURE DROP (@ 2500 SFPM, 70° F and 2 PSIG)
Insertion meter - Less than 0.5" W.C. (H20) in 1½" diameter pipes, decreasing in larger pipes
Inline meter - (with built-in flow conditioner)
Less than 0.5" W.C (H20) in 2" and larger diameter meters
Less than 0.9" W.C (H20) in 1" and 1½" diameter meters

PROGRAMMING / MEMORY
Factory programmed for specific application. Field programming available through user interface or 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 (standard on all models)
Select from one of the following options as the second output:
• RS485 interface: BACnet MS/TP or Modbus RTU (field selectable)
• Programmable pulse output: Field selectable as frequency, scaled pulse or alarm (Isolated open collector output)
• 4-20 mA with HART FSK (Only available with programmable pulse output)

MATERIAL
Wetted metal components: 316 stainless steel

ELECTRICAL CONNECTIONS
Enclosed terminal blocks, cable access through two ¾" NPT conduit fittings

APPROVALS
FM (USA) FMc (CAN)
Class 1, Div 1, Groups B, C, D;
Class 2, Div 2, 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
CE Mark
EMC Directive; 2014/30/EU
Emissions and Immunity Testing:
EN61326-1:2013

OPERATING RANGE FOR COMMON PIPE SIZES
15 to 7000 SFPM in schedule 40 pipe

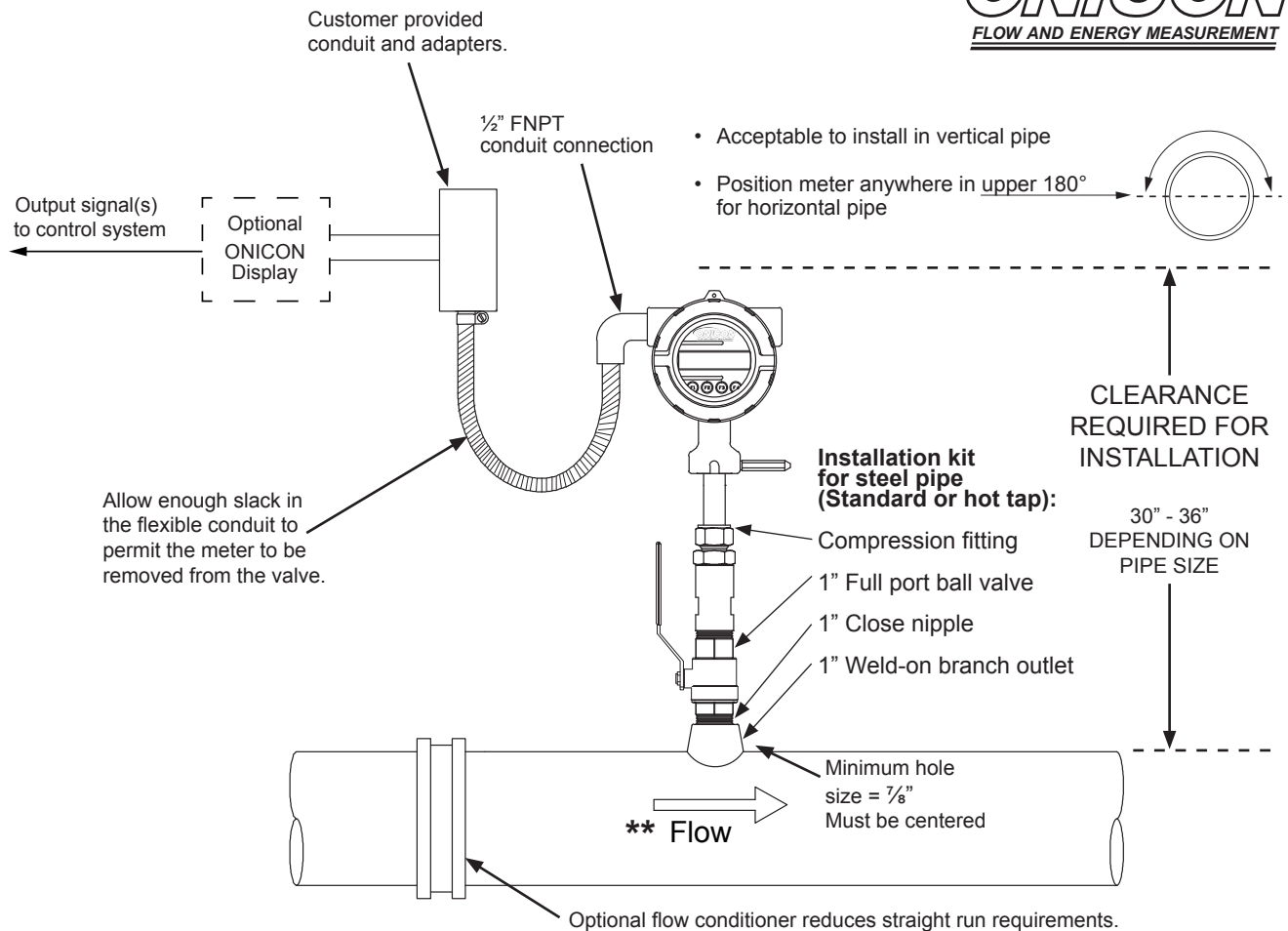| Pipe Size (Inches)	Flow Rate (SCFH)	
	Min	Max
¾	3.3	1,560
1	5.4	2,521
1¼	9.3	4,362
1½	13	5,938
2	21	9,740
2½	30	13,964
3	46	21,562
4	80	37,130
5	125	58,350
6	181	84,263
8	313	145,912

Optional D-100 Display
The D-100 is ideal for providing a remote display option with an IP interface for BACnet or Modbus. The versatile D-100 can also provide 2 additional analog rate and 1 pulse inputs to the network.
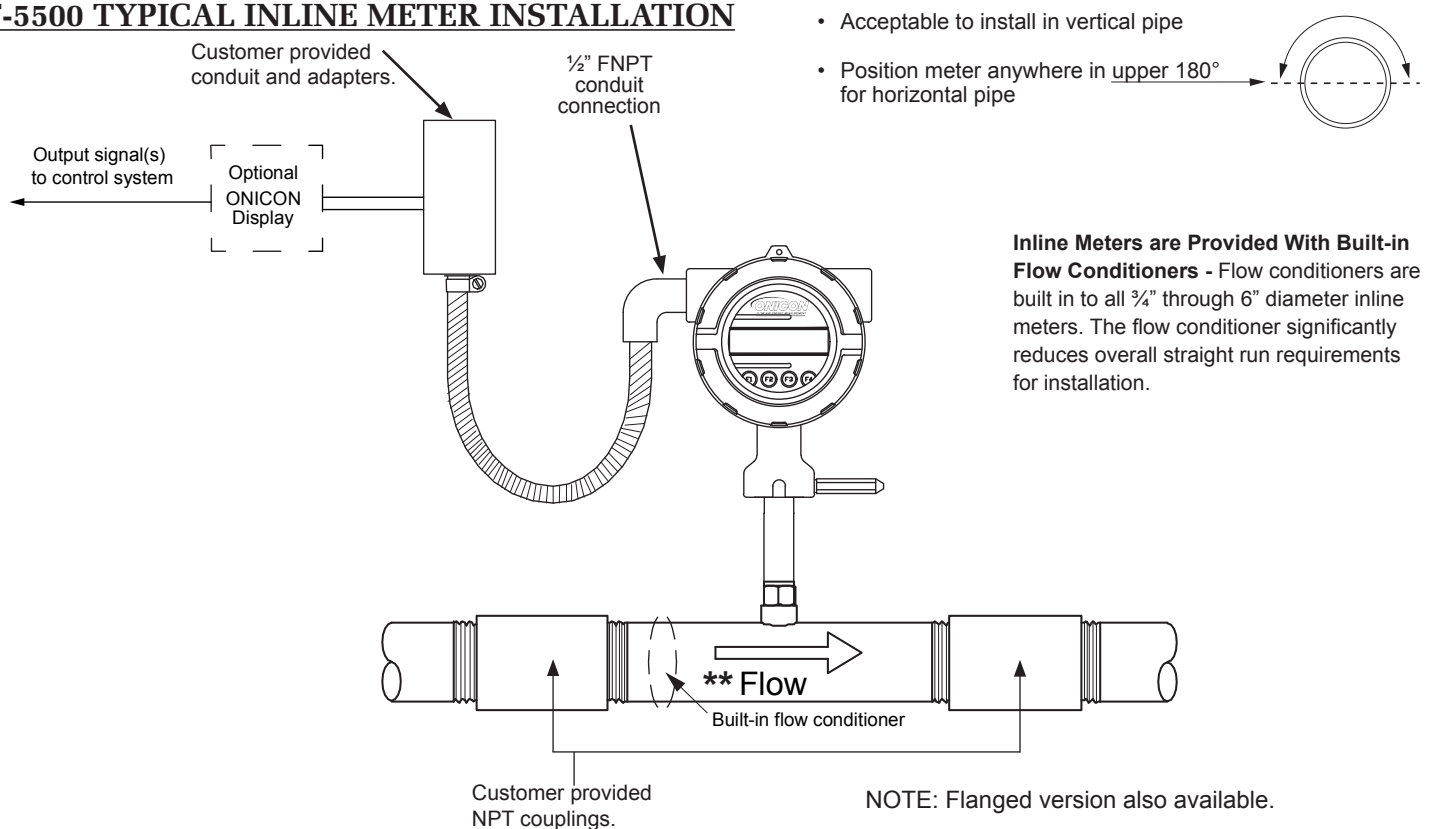
Available Output Signals:
BACnet/IP or MS/TP
Modbus TCP or RTU
LonWorks TP/FT-10F
JCI Metasys N2
Siemens Apogee FLN
Scaled pulse & Analog

F-5500 TYPICAL INSERTION METER INSTALLATION

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Customer provided conduit and adapters.

½" FNPT conduit connection

• Acceptable to install in vertical pipe

• Position meter anywhere in upper 180° for horizontal pipe

Output signal(s) to control system

Optional ONICON Display

Allow enough slack in the flexible conduit to permit the meter to be removed from the valve.

CLEARANCE REQUIRED FOR INSTALLATION

30" - 36" DEPENDING ON PIPE SIZE

Installation kit for steel pipe (Standard or hot tap):

Compression fitting

1" Full port ball valve

1" Close nipple

1" Weld-on branch outlet

Minimum hole size = ⅞" Must be centered

** Flow

Optional flow conditioner reduces straight run requirements.

F-5500 TYPICAL INLINE METER INSTALLATION

Customer provided conduit and adapters.

½" FNPT conduit connection

• Acceptable to install in vertical pipe

• Position meter anywhere in upper 180° for horizontal pipe

Output signal(s) to control system

Optional ONICON Display

Inline Meters are Provided With Built-in Flow Conditioners - Flow conditioners are built in to all ¾" through 6" diameter inline meters. The flow conditioner significantly reduces overall straight run requirements for installation.

** Flow

Built-in flow conditioner

Customer provided NPT couplings.

NOTE: Flanged version also available.

** Standard orientation. Contact ONICON for other options.

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11451 Belcher Road South, Largo, FL 33773 • USA • Tel +1 (727) 447-6140 • Fax +1 (727) 442-5699
www.onicon.com • sales@onicon.com

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ONICON
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F-5500 THERMAL MASS MODEL # CODIFICATION F-55AA-BCDE-FGGH

F-55 = Thermal Mass Flow Meter With Display

AA = Meter Type

00 = Insertion	02 = 2"
34 = ¾"	25 = 2½"
01 = 1"	03 = 3"
13 = 1¼"	04 = 4"
15 = 1½"	06 = 6"

B = Output Signal Type

2 = 4-20 mA & Pulse Output
3 = 4-20 mA & RS-485 (BACnet or MODBUS)
4 = 4-20 mA / HART & Pulse Output

C = Line Voltage

1 = 12-28 VDC

D = Display Type

1 = Integral

E = Process Connection Type

4 – Insertion
5 – Threaded MNPT (¾" - 3" only)
6 – ANSI Class 150 Flanges

F = Flow Conditioner

1 – Insertion w/o Conditioner
2 – Insertion w/ Conditioner
3 – Inline Meter

GG = Pipe Size Range

00 – Inline Meter
15 - 1½ to 6" nominal diameter
18 - >6" nominal diameter

H = Retractor Type

0 – Standard (60 psi max)
9 – Inline Meter

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

F-5500 Thermal Mass Meter Accessory Ordering Information

Item #	Accessory Item Description
Install Kits for Carbon Steel Pipe	
INSTL94	Installation kit for welded carbon steel pipe, 60 PSIG, 125˚ F max
Flow Conditioners	
17383	Flow conditioner for 1½" schedule 40 pipe
17384	Flow conditioner for 2" schedule 40 pipe
17385	Flow conditioner for 2½" schedule 40 pipe
17386	Flow conditioner for 3" schedule 40 pipe
17387	Flow conditioner for 4" schedule 40 pipe
17388	Flow conditioner for 6" schedule 40 pipe
Flow Meter Accessory Items	
14063	25 ft of signal cable
14064	50 ft of signal cable
14065	100 ft of signal cable