

# • F-5400 SERIES • THERMAL MASS FLOW METER



## 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 without a LCD display. This version of the meter is provided with a 4-20 mA analog 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

## 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

### **OVERALL FLOW RANGE**

15 to 35,000 SFPM

## 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 F-5400 programming and diagnostic functions may be accessed with ONICON F-5000 view software. This easy to use PC based utility software allows you to perform diagnostic tests and to change program settings 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 interruption to the gas service. The meter can also be removed for service without disrupting flow.

## 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.

### **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

## **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:

Standard process adapter fitting - 60 PSIG (4.1 barg) max

High pressure adapter fitting - 150 PSIG (10.3 barg) max

Inline flow meter:

Flanged-ANSI 150 (230 PSIG at 100° F (16 barg))

NPT 300 PSIG (20.7 barg)

All stainless steel ferrules

### **PRESSURE DROP (@ 2500 SFPM, 70° F and 2 PSIG)**

Insertion meter - Less than 0.5" W.C. (H2O) in 1½" diameter pipes, decreasing in larger pipes

Inline meter - (with built-in flow conditioner)

Less than 0.5" 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 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

### **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

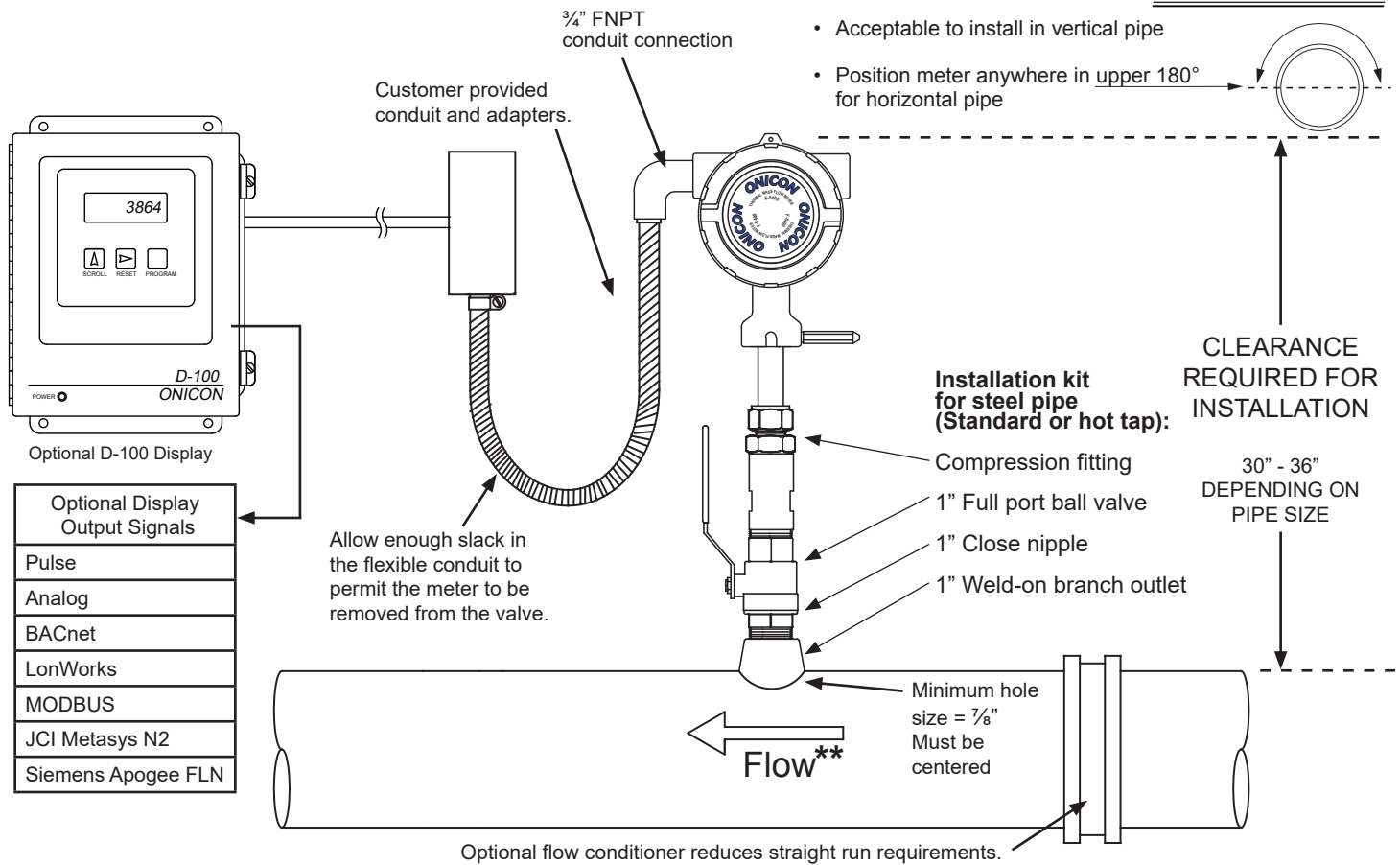
JCI Metasys N2

Siemens Apogee FLN

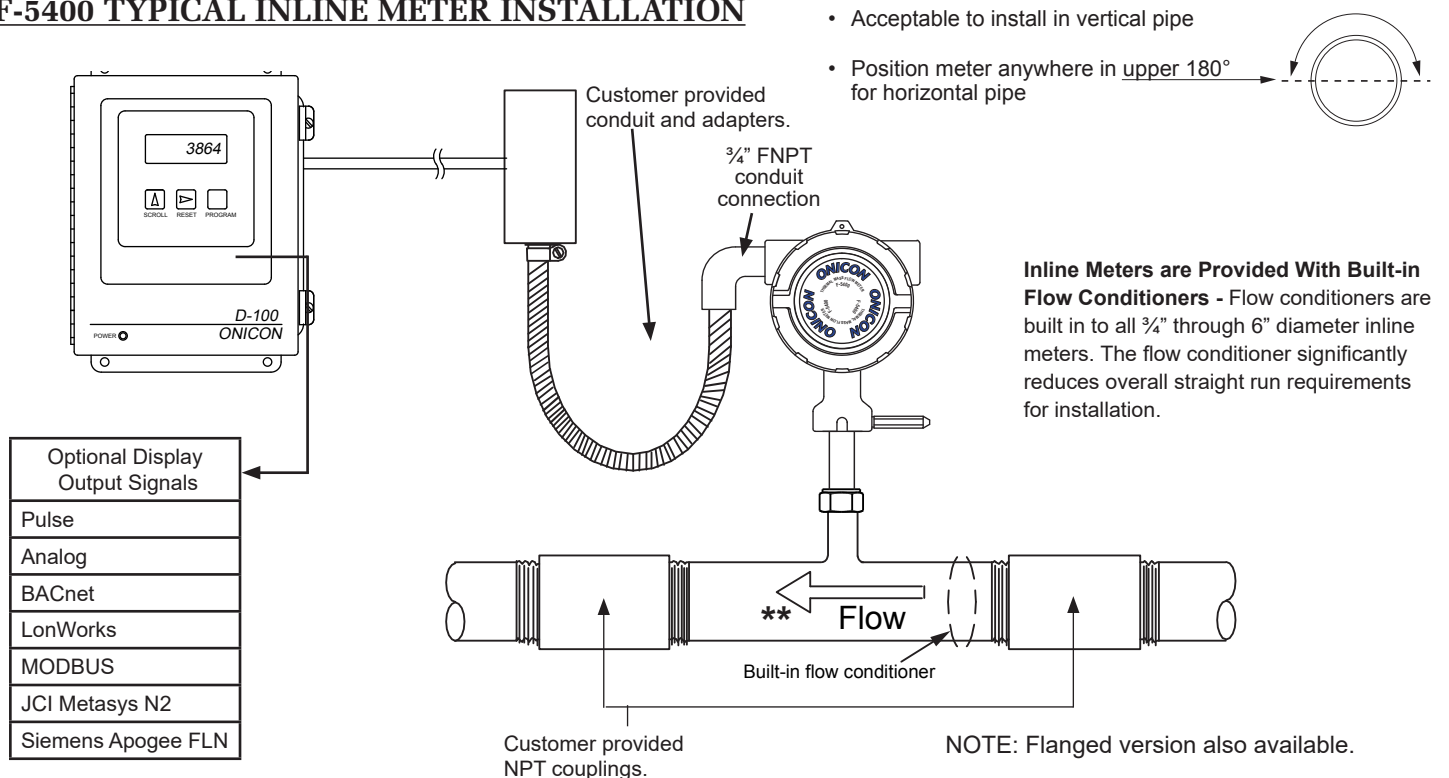
Scaled pulse & Analog



## F-5400 TYPICAL INSERTION METER INSTALLATION



## F-5400 TYPICAL INLINE METER INSTALLATION



\*\* Standard orientation. Contact ONICON for other options.

## ORDERING INFORMATION



### F-5400 THERMAL MASS MODEL # CODIFICATION F-54AA-BCDE-FGGH

#### **F-54 = Thermal Mass Flow Meter Without Integral 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

##### **C = Line Voltage**

1 = 12-28 VDC

##### **D = Enclosure 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 = Process Adapter Fitting**

0 – Standard (60 psi max)  
1 – High Pressure (150 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-5400 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