



**ONICON**  
Flow and Energy Measurement

# FSM-3 SUPERMAG INSERTION ELECTROMAGNETIC FLOW METER

The FSM-3 Series SuperMag represents the state-of-the-art in electromagnetic water flow measurement. By incorporating the latest in DSP technology, the FSM-3 Series achieves the performance of an inline magmeter with the installation ease and flexibility of an insertion style meter.



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



## DESCRIPTION

ONICON's FSM-3 Series SuperMag Insertion Electromagnetic Flow Meters are ideally suited for the demanding flow measurement requirements associated with today's high performance HVAC industry applications. The FSM-3 will interface directly with the BAS/EMS system. Outputs provided include analog signals for rate information, scaled pulse outputs for totalization, and digital outputs for flow direction and alarms.

The FSM-3 is available in four fixed insertion pipe sizes: 6", 8", 10", and 12". Every FSM-3 is hand insertable up to 400 psi and hot tappable – no system shut down required!

The FSM-3 is designed to integrate seamlessly with an ONICON BTU meter, creating a complete, cost effective and incredibly accurate energy measurement system.



## APPLICATIONS

- HVAC hydronic applications including chilled water, heating hot water, and condenser water.
- Bi-directional flow for primary / secondary by-pass and thermal storage applications.
- Domestic cold and hot water applications.
- Clean process flow applications with conductivities greater than 25 uS/cm.

## FEATURES

**Exceptional Performance & Value** - Cost effective insertion style design provides the accuracy and reliability found in inline magmeters.

**Multiple Outputs** - Three programmable pulse outputs and one analog output are provided with each meter.

**Simple Installation and Commissioning** - Factory programmed and ready for use upon delivery. All process data and programming functions are accessible via front panel display and keypad.

**User-friendly Interface** - Commissioning is easy via the backlit display and smart button technology. No special configuration tools needed!

## 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.



*The FSM-3 utilizes a single, monolithic coil, designed to create a uniform magnetic field across the entire pipe, which is paramount for accurate flow measurement in installation locations with less than ideal flow profiles.*

\* National Institute of Standards and Technology

**SPECIFICATIONS\***

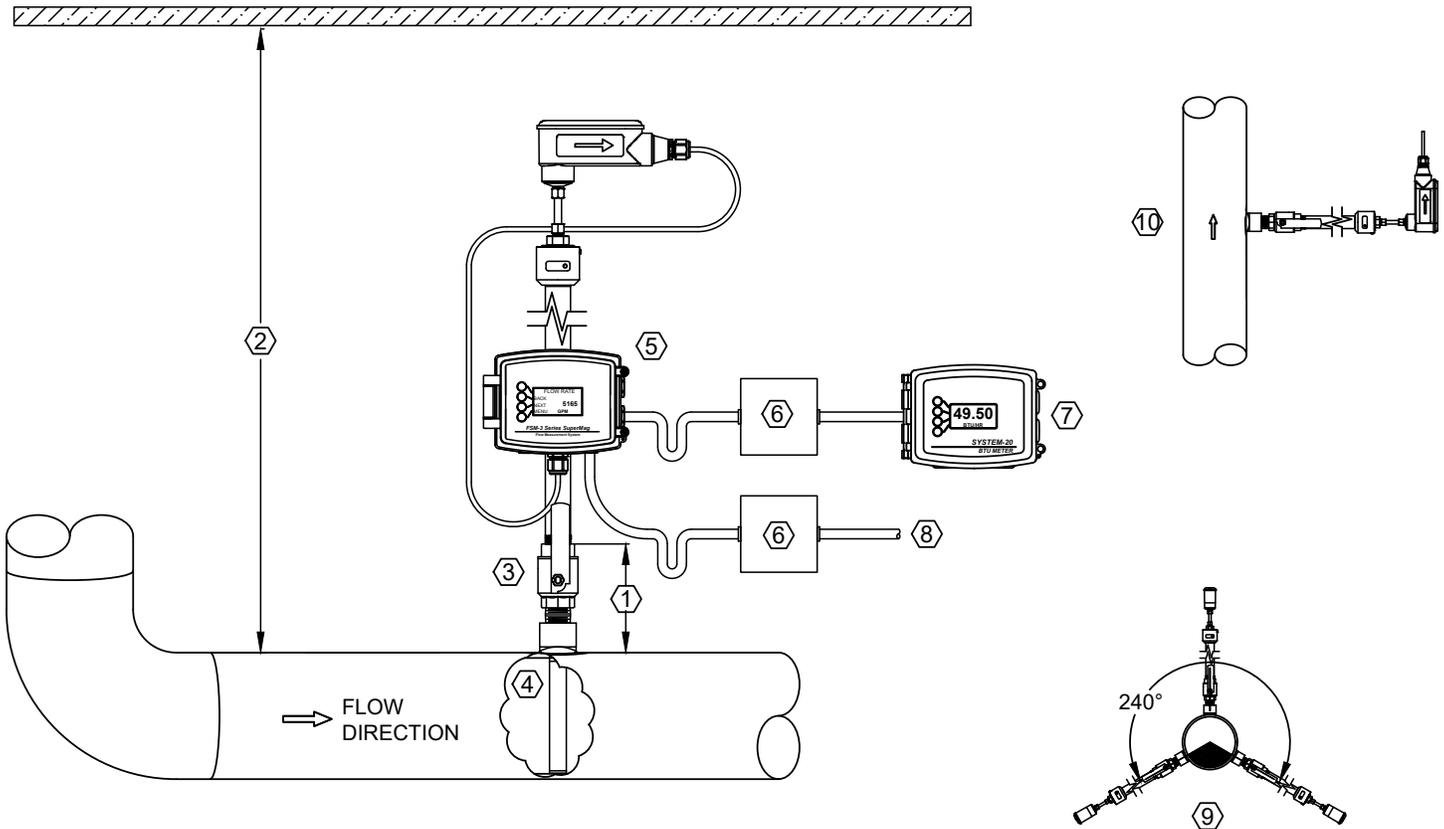
<b>FSM-3 SERIES TRANSMITTER</b>		
PERFORMANCE	ACCURACY	± 1.0% of reading from 1 to 20 ft/s ± 0.5% of reading at the calibrated velocity ± 0.01 ft/s at flow rates less than 1 ft/s
INPUT POWER**	24 VAC	40 VA @ 20 to 28 VAC
	24 VDC	50 W @ 24 VDC ± 10%
I/O SIGNALS**	One (1) isolated AO, 4-20 mA or 0-10 VDC One (1) frequency One (1) pulse	
ELECTRONICS ENCLOSURE**	Cast aluminum NEMA 4 enclosure with display	
	DISPLAY	2.88" STN monochrome screen with back light, 128 x 64 dot matrix
	AMBIENT CONDITIONS	-20°F to 150°F
PROGRAMMING	Menu driven via four (4) programming keys	
ELECTRICAL CONNECTIONS	INPUT POWER	Pluggable terminal block, for use with 18 - 24 ga. wire
	I/O	Pluggable terminal block, for use with 20 - 26 ga. wire
	REMOTE CABLE	Three twisted pair, 22 gauge conductors with individual shields, PVC jacketed, suitable for direct burial
<b>FSM-3 SERIES FIXED INSERTION FLOW SENSOR</b>		
PERFORMANCE	SENSING METHOD	Single monolithic coil extending across entire pipe diameter
	OPERATION	Pulsed DC coil with enhanced DSP
OPERATING CONDITIONS	FLUID TEMPERATURE RANGE	15°F to 250°F
	FLUID PRESSURE RANGE	0 to 400 psi
	MINIMUM CONDUCTIVITY	25 µS/cm
	PRESSURE DROP	<0.5 psi in 6" line at 12 ft/s, decreasing with increasing pipe size
CONSTRUCTION MATERIALS	FLOW TUBE	Delrin / PSU
	STEM ASSEMBLY	316/316L SS
	ELECTRODES	316/316L SS
	SEALS	EPDM
	HOT TAP ADAPTER	316/316L SS
PROCESS CONNECTION	1" NPT	
APPROVALS**	NSF/ANSI 61 NSF/ANSI 372	

\* SPECIFICATIONS subject to change without notice.

\*\*See model codification for additional information regarding option selections.

**TYPICAL INSTALLATION**

OPERATING RANGE			INSTALLATION REQUIREMENTS
Model Number	Nominal Pipe Size (inches)	Flow Rate Range (GPM) (0.1 to 20 ft/s)	Overhead Clearance (inches)
FSM-3BF-06	6	9.0 - 1800	41
FSM-3BF-08	8	15.6 - 3120	45
FSM-3BF-10	10	24.6 - 4920	49
FSM-3BF-12	12	35.3 - 7060	53



**NOTES**

1. Maximum installation valve stack height is 7"
2. Overhead clearance dimension includes 7" installation valve stack height
3. Typical installation kit includes 1" NPT pipe outlet and 1" Full Port Ball Valve, min.
4. Minimum 1" diameter access hole required for flow meter installation
5. Transmitter shown installed on integral bracket mounted to hot tap adapter fitting
6. Provide enough slack in the flexible conduit connection between flow meter transmitter and enclosure and field junction box, allowing for flow meter removal
7. Flow meter output signals provided for connection to BAS and ONICON peripheral equipment (optional SYS-20 BTU meter shown)
8. Refer to IOM for input power requirements
9. Locate the flow meter in the top 240 deg. section of a horizontal pipe
10. Installation in vertical pipes is acceptable. Upward flow is recommended in a pressurized (closed loop) system

## METER ORDERING INFORMATION

### Meter Model Number Coding = FSM-3ABCC-DEFG-HHI-JKL

**A = Flow Meter Configuration**

B = Base flow meter model

**B = Meter Type**

F = Insertion, fixed pipe size

**CC = Meter Style/Size**

06 = 6" fixed insertion

08 = 8" fixed insertion

10 = 10" fixed insertion

12 = 12" fixed insertion

**DE = Output Configuration**

10 = One (1) active analog output,  
one (1) freq. output & one (1)  
pulse output for totalization

**F = Enclosure**

2 = Remote NEMA 4 enclosure with display

**G = Input Power**

1 = 24 V AC/DC (24 VAC typical)

**HH = Pipe Size Range/Meter Length**

FA = 6" pipe, 40" meter length

FB = 8" pipe, 44" meter length

FC = 10" pipe, 48" meter length

FD = 12" pipe, 52" meter length

**I = Wiring Connection**

3 = Remote mount, terminal block

**JKL = Mechanical Configuration**

131 = SS stem, SS process connection, Delrin/ NSF

141 = SS stem, SS process connection, PSU/ HT

