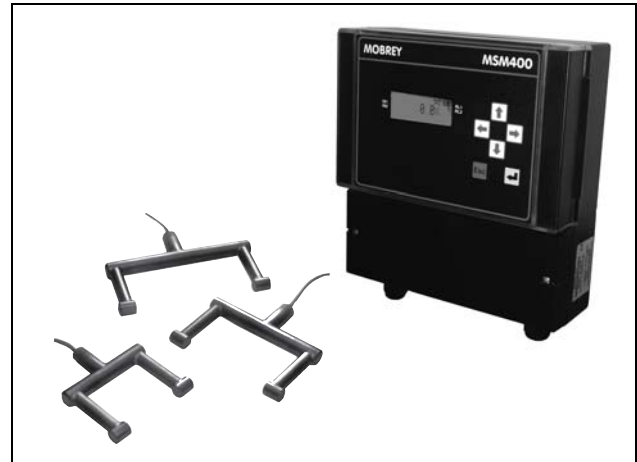


# MSM400 Ultrasonic Suspended Solids Monitoring and Control System

- *Continuous sludge discharge monitor for up to 50% suspended solid*
- *The MSM400 system contains a control unit and either a tank mounted sensor or pipe section with integral sensors*
- *Rugged 316 stainless steel sensors for in-tank or pipe section mounting*
- *Simple keypad operation, and intuitive menu based programming*
- *Dual operating frequency sensors 1MHz to 3.3MHz*



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## MSM400

## MSM400 Control Unit and Sensors



MSM400 Control Unit

- Measuring range up to 50% solids
- Configurable display and output functions
- 4–20 mA HART output, and 2 x SPDT control relays
- Automatic de-sludge control routines

**Additional Information**

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TABLE 1. MSM400 Control Unit Ordering Information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
<b>Standard</b>		<b>Standard</b>
MSM400	Control unit, ATEX intrinsically safe certified, IP65	★
<b>Typical Model Number: MSM400</b>		

TABLE 2. MSM400 Sensors Ordering Information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
<b>Standard</b>		<b>Standard</b>
MSM433	Tank mount	★
MSM448	Pipe mount	★
<b>Approval</b>		
<b>Standard</b>		<b>Standard</b>
A	Intrinsically safe (ATEX)	
<b>Size<sup>(1)</sup></b>		
<b>Standard</b>		<b>Standard</b>
100T	1 / 3.3 MHz 4 in. (100 mm) gap tank sensor	★
150T	1 / 3.3 MHz 6 in. (150 mm) gap tank sensor	★
200T	1 / 3.3 MHz 8 in. (200 mm) gap tank sensor	★
300T	1 / 3.3 MHz 12 in. (300 mm) gap tank sensor	★
450T	1 / 3.3 MHz 18 in. (450 mm) gap tank sensor	★
100	1 / 3.3 MHz flanged PN10/PN16 DN100 pipe sensor	★
150	1 / 3.3 MHz flanged PN10/PN16 DN150 pipe sensor	★
200	1 / 3.3 MHz flanged PN10 DN200 pipe sensor	★
A10	1 / 3.3 MHz flanged ASME B16.5 Class 150 4 in. (100 mm) pipe sensor	★
A15	1 / 3.3 MHz flanged ASME B16.5 Class 150 6 in. (150 mm) pipe sensor	★
A20	1 / 3.3 MHz flanged ASME B16.5 Class 150 8 in. (200 mm) pipe sensor	★
<b>Spray Valve</b>		
<b>Standard</b>		<b>Standard</b>
V	Spray valve (pipe section only)	★
P	No spray valve (pipe section only)	★
<b>Cable</b>		
<b>Standard</b>		<b>Standard</b>
7	23 ft. (7 m) cable	★
D	Customer specified cable length up to 330 ft. (100 m) – <i>length must be clearly stated on order</i>	★
<b>Typical Model Number: MSM448 A 150 V 7</b>		

(1) Sensor size is specified depending on the application. Please contact the sales office to ensure that the size is suitable for the application.

## Specifications

### CONTROL UNIT

General	
Product	Wall Mounted MSM400 Control Unit
Connections	
Conduit Entry	3 x M20 glands and 2 x M16 glands
Cable Termination	Captive screw terminal block. Maximum cable size 2.5mm <sup>2</sup> / 12 AWG
Sensor Frequency	1 MHz or 3.3 MHz auto selection
Current Input	4–20mA
Trigger Input	Volt free contact 5V logic
mA Output	4–20mA into 1000 ohms max.
Relay output	2 x SPDT rated up to 5 A, 250 Vac resistive
Electrical	
External Power Supply	115 or 230 Vac (50/60Hz), or 24 Vdc
Environment	
Operating Temperature	–22 to 130 °F (–30 to 55 °C)
Enclosure Rating	IP65
Approval	
Hazardous Area	ATEX II (1) G, EEx ia IIC

### MSM433 SENSOR

General	
Product	MSM433 Tank Mounted Gap Sensor, 316 Stainless steel
Connections	
Mounting connection	¾-in. BSPT. Gap size 4, 6, 8, 12, or 18 in (100, 150, 200, 300, or 450 mm)
Sensor Cable	23 ft. (7m) dual screened twisted pair ( <i>others upon request</i> )
	Cable junction box: Sensor IP68
Environment	
Operating Temperature	–40 to 130 °F (–40 to 55 °C) -- 212 °F (100 °C) <i>upon request</i>
Operating Pressure	1522 psi (105 bar)
Approval	
Hazardous Area	ATEX II 1 G EEx ia IIC T6

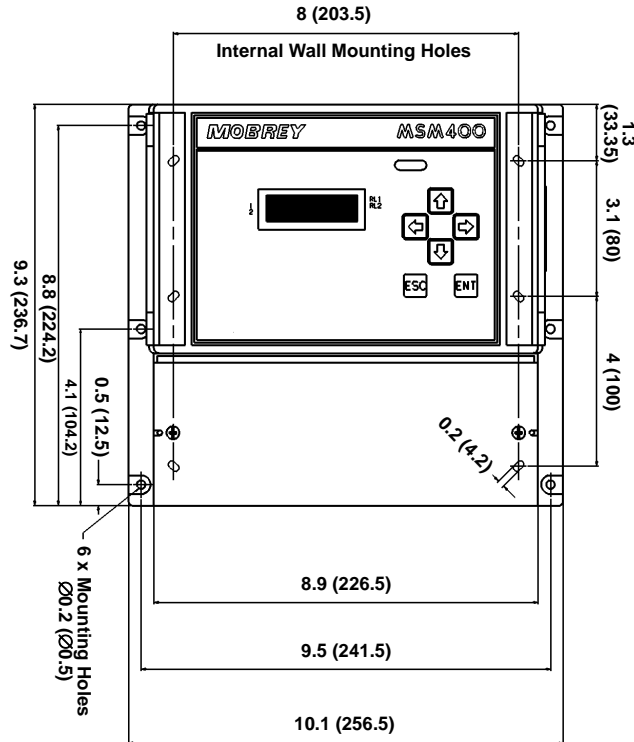
### MSM448 SENSOR

General	
Product	MSM448 Pipe Section Gap Sensor
Pipe Section Material	Epoxy coated carbon steel
Drain Fitting	1-in. NPT
Connections	
Mounting connection	Flanged in-line installation
	DN100, DN150, DN200 to BS4772, PN10 rated or 4 in., 6 in., 8 in. ASME B16.15 Class 150
Sensor Cable	23 ft. (7m) from junction box, oil hose protected, dual screened twisted pair ( <i>others upon request</i> )
Cable Junction Box	IP65 Aluminium alloy
Environment	
Operating Temperature	–40 to 158 °F (–40 to 78 °C)
Operating Pressure	145 psi (10 bar)
Approval	
Hazardous Area	ATEX II 1 G EEx ia IIC T6

## Dimensional Drawings

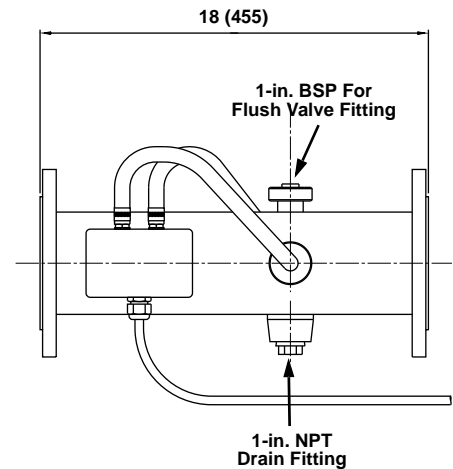
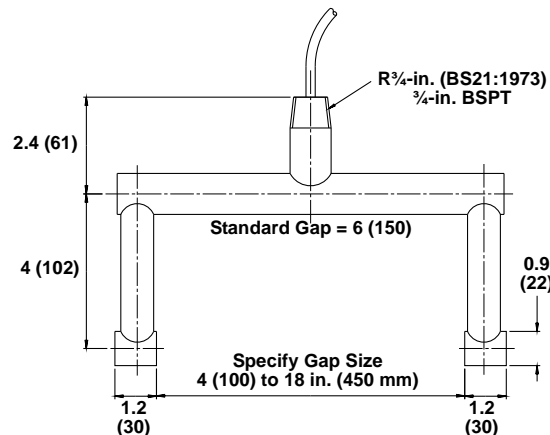
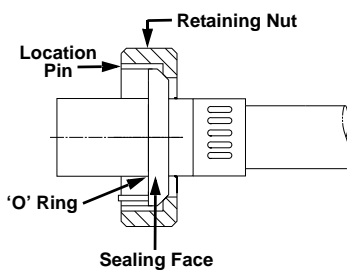
### CONTROL UNIT

Note: Dimensions are in inches (mm)



### SENSORS

Note: Dimensions are in inches (mm)



**Product Data Sheet**

IP257, Rev CA  
May 2010

MSM400

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## MSM400

**Rosemount Level Solutions**

Emerson provides a complete range of Rosemount products for level measurement applications.

**Vibrating Fork Switches – Point Level Detection**

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

The product line consists of:

- Rosemount 2160 WirelessHART™
- Rosemount 2130 Extreme Temperature
- Rosemount 2120 Full-featured
- Rosemount 2110 Compact

**Differential Pressure – Level or Interface Measurement**

Flexible mounting for liquid tank levels, including those with wide temperature and pressure requirements. Can be isolated by valves. Unaffected by: vapor space changes, surface conditions, foam, corrosive fluids, internal tank equipment. Optimize performance with direct mount, Tuned-System Assemblies:

- Rosemount DP Level Transmitters and Remote Seals
- Rosemount 3051S\_L, 3051L, and 2051L Liquid Level Transmitters

**Ultrasonic – Level Measurement**

Top mounted, non-contacting for simple tank and open air level measurements. Unaffected by fluid properties such as: density, viscosity, dirty coating and corrosiveness. Appropriate for routine applications outside of explosion proof areas.

The product line consists of:

- Rosemount 3100 Series Ultrasonic Process Level Transmitters

**Guided Wave Radar – Level and Interface Measurement**

Top mounted, direct level and interface measurement of liquids or solids, including those with wide temperature and pressure requirements. Unaffected by changing process conditions. Good fit for small spaces and easy swap for older technologies.

The product line consists of:

- Rosemount 5300 Series – Accurate, superior performance transmitter in most applications including process vessels and control
- Rosemount 3300 Series – Versatile and easy-to-use transmitter in most liquid storage and monitoring applications

**Non-contacting Radar – Level Measurement**

Top mounted, direct level measurement for liquids or solids, including those with wide temperature and pressure requirements. Can be isolated by valves. Unaffected by changing process conditions. Good for dirty, coating and corrosive applications.

The product line consists of:

- Rosemount 5400 Series – Accurate, superior performance 2-wire transmitters for most liquid level applications and process conditions
- Rosemount 5600 Series – 4-wire transmitters with maximum sensitivity and performance for solids, challenging reactors, rapid level changes and excessive process conditions

**Chambers for Process Level Instrumentation**

- Rosemount 9901 – High quality chambers for external mounting of level measurement and control instrumentation on process vessels

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