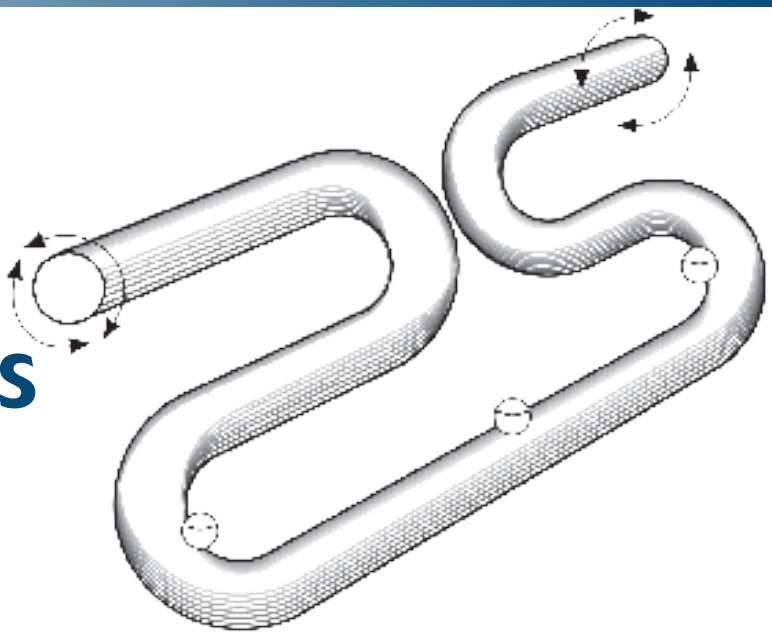
m® m050

Coriolis Mass Flowmeters



Flow rate 1.36 to 136 kg/ min (3 to 300 lb/min)

ISO 9001 Certified Manufacturing Facility

DESCRIPTION

The m® m050 provides accurate, continuous direct measurement of mass, density, temperature and percent solids over the flow range 1.36 to 136 kg/min (2 to 300 lb/ min).

DESIGN FEATURES

ACCURACY

Patented dual omega-shaped tubes provide outstanding sensitivity to Coriolis forces. m® mass flow accuracy is ±0.10% and the mass flow rate repeatability is ±0.10%. Its density accuracy is ±0.002 g/cc over its operating range.

LOW PRESSURE DROP AND 100:1 TURNDOWN

The m® transducer is more sensitive to Coriolis forces than conventional mass flowmeters, providing a greater mechanical gain. Fluid velocity requirements are much lower to produce a given signal. This results in a lower pressure drop and unequaled 100:1 turndown. Therefore, accuracy never has to be compromised to obtain an acceptable pressure drop.

RELIABILITY

The smooth-bore, non-obtrusive flow path is free from moving parts, seals and bellows. The omega shapes produce torsional loading instead of bending loading or improved reliability.

- **Direct mass, density and temperature measurement**
- **Weights & Measures approved for custody transfer applications**
- **Patented omega-shaped flowtubes provide unequaled sensitivity to Coriolis force**
- **Wide 100:1 turndown**
- **Lowest pressure drop**
- **Smooth-bore, non-obtrusive flow path free from moving parts**
- **316: stainless steel**
- **3A-Authorized version available**

MATERIALS OF CONSTRUCTION

Wetted parts: 316L stainless steel
Sensor housing: 304L stainless steel

3A-Authorized version: Connection facing and flowtube surface finish is equivalent to 150 grit (Ra 32 or 0.80 µm) or better

ELECTRONICS

DATAMATE 2200™ Mass Flow Computer:
(Complete information is available in Technical Specification No. TS-612)

NexGen® SFT100 Mass Flow Transmitter:
(Complete information is available in Technical Specification No. TS-620)

NexGen® SFT200 Mass Flow Transmitter:
(Complete information is available in Technical specification No. TS-621)

HAZARDOUS AREA CLASSIFICATION TABLE

Agency	Components	Method	Class	Div/ zone	Group	Temp. Class	Ambient Temp.
CSA	Transducer	Intrinsic Safety	I, II, III	1, 2	C, D, E, F, G	T5	Note 1
	Datamate 2200	Non-incendive	I	2	A, B, C, D	T3C	Note 5
	NexGen	Explosion Proof	I, II, III	1	C, D, E, F, G	T6	Note 2
		Non-incendive	I	2	A, B, C, D	T4	Note 2
LCIE	Transducer	EX ia		0, 1, 2	IIB	T5, T4, T2	Note 3
	Nexgen	EX id		1, 2	IIB	T6	Note 4

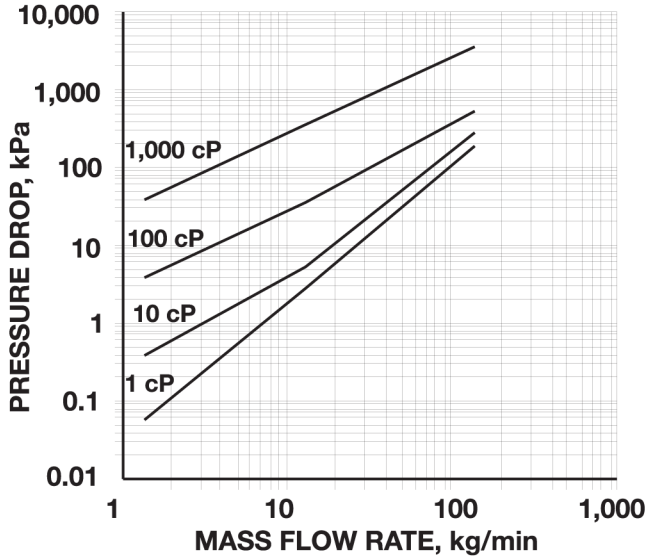
Note 1: -20°C to 40°C (-4°F to 104°F)
Note 2: -20°C to 65°C (-4°F to 149°F)
Note 3: T5 where ambient temperature is: -20°C 40°C (-4°F to 104°F)
T4 where ambient temperature is: +40°C to +60°C (104°F to 140°F)
T2 where ambient temperature is: +60°C to +200°C (140°F to 392°F)
Note 4: -20°C to 65°C (-4°F to 149°F)
Note 5: +65°C ambient

m050 OPERATING SPECIFICATIONS

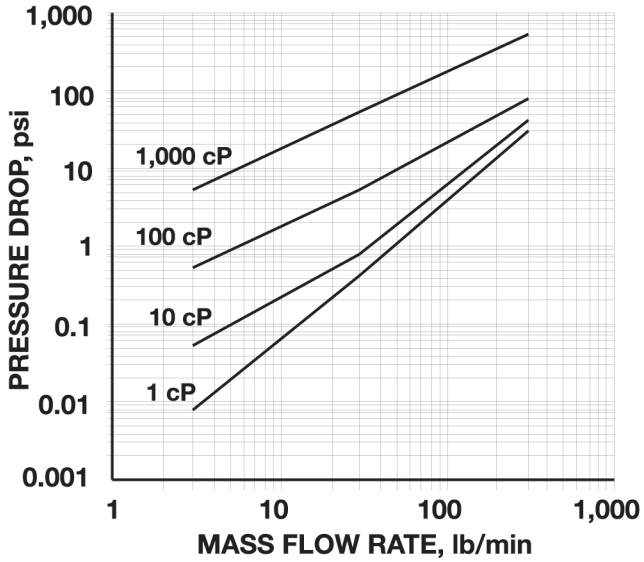
METERING ELEMENT	
Connections:	
Connection type (Flanges)	VCO: 1" female[2] ANSI: 1/2", 3/4", 1"; 150#, 300#, 600# RF DIN: PN40 DN15 3A-Authorized: 2" Tri-Clamp® Industrial Tri-Clamp®; 1-1/2" 2" 150lb Flat Faced[3]
Meter:	
Tube material	316L SST
Tube shape	Omega
Nominal tube bore	12.7 mm (1/2")
Housing	304L SST
Hazardous area classification	Transducer is intrinsically safe when connected to an approved mass flow computer (See table above for approval rating)
Mass accuracy[1]	±0.10% of rate ± zero stability
Mass Repeatability	±0.10% of rate
Mass zero stability	±0.0035 kg/min (0.0299 lb/min)
Turndown ratio	100:1
Density range	0.4 to 3.0 g/cc
Density accuracy	±0.002 g/cc
Density repeatability	±0.0005 g/cc
Temperature measurement	100 ohm platinum resistance sensor
Temperature accuracy	0.56°C (±1°F)
Signal output	8-core shielded twisted pair
Fluid:	
Flow rate	1.36 to 136.0 kg/min (3 to 300 lb/min)
Max. temperature	204°C (400°F)
Min. temperature	-45°C (-50°F)
Max. operating pressure	248 bar (3600 psi); -45°C to 204° limited by flange/connection *
ASSOCIATED INSTRUMENT	
Max. Length of signal cable	300m (1000ft.) 8 core Belden 89892 shielded twisted pair
Electrical connections	Screw terminal
Manufacturer	RSM, Inc.
Meter model number	m050-XXXX0
Instrument model number	Refer to electronics Technical Specification Form Datamate 2200: TS-612 NexGen SFT100: TS-620 NexGen SFT200: TS-621

[1]All calibration equipment traceable to N.I.S.T.
[2]Mating Flanges for MT truck accessories
[2]Only available as 1" female CAJON VCO connections. Requires Male CAJON VCO-8-VCO by SWAGELOCK®.
*ASTM A213-316L(tubing);ASTM A351-CF3M (castings)

PRESSURE DROP VERSUS FLOW RATE



Based on fluid at 1.0 g/cc, 21°C (70°F)



Based on fluid at 1.0 g/cc, 21°C (70°F)

DETERMINING PRESSURE DROP

1. Flow rate vs. pressure drop varies with viscosity. To approximate m050 pressure drop for fluids with viscosity approximating that of water, locate the point on the 1-cP curve corresponding with your desired flow rate.
2. From that point, locate the nearest horizontal line and follow it to the vertical scale on the left, which indicates pressure drop for the flow rate you selected.
3. Divide the pressure drop indicated on the graph by the specific gravity (S) of the process fluid:

$$^{\Delta P}\text{actual} = {}^{\Delta P}\text{plotted} / \text{Sp. gr.}$$

CALCULATING ACTUAL ACCURACY

Use the following formula to calculate accuracy for your selected flow rate:

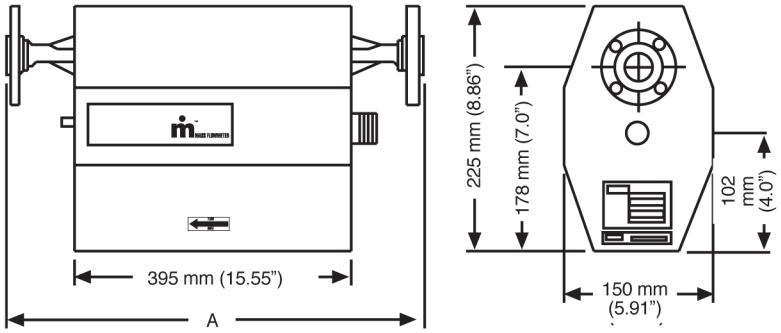
$$\%\ \text{accuracy}, \pm_{actual} = \{[(0.0010\ m) + S_0]/m\} \times 100\%$$

where:

m	=	mass flow rate, kg/min or lb/min
S_0	=	mass zero stability, kg/min or lb/min for the m050 flowmeter

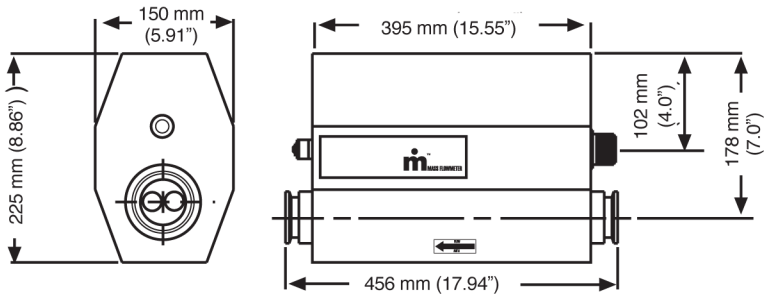
DIMENSIONAL DATA, mm (in.)

m050 Transducer



DIMENSIONS	
CONNECTION	A 316L SS Wetted Parts
1/2" 150# ANSI RF	559 (22.0)
1/2" 300# ANSI RF	574 (22.6)
3/4" 150# ANSI RF	559 (22.0)
3/4" 300# ANSI RF	579 (22.8)
1" 150# ANSI RF	561 (22.1)
1" 300# ANSI RF	582 (22.9)
DN15 PN40	561 (22.10)
DN25 PN40	561 (22.10)

m050 3A-Authorized Transducer



Optional 2" x 1" Tri-Clamp® eccentric reducers (P/N 101630-002) are available.

WEIGHTS OF COMPONENTS

Transducer:	approx. 11.3kg (25 lbs)
Datamate 2200:	approx. 5.2 kg (11.5 lbs)
NexGen SFT100:	
Blind	approx. 6.4 kg (14.1 lbs)
w/Display/keypad	approx. 7.1 kg (15.6 lbs)
NexGen SFT200:	approx. 1.8 kg (4 lbs)

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RED SEAL MEASUREMENT

Certified to ISO 9001:2015