

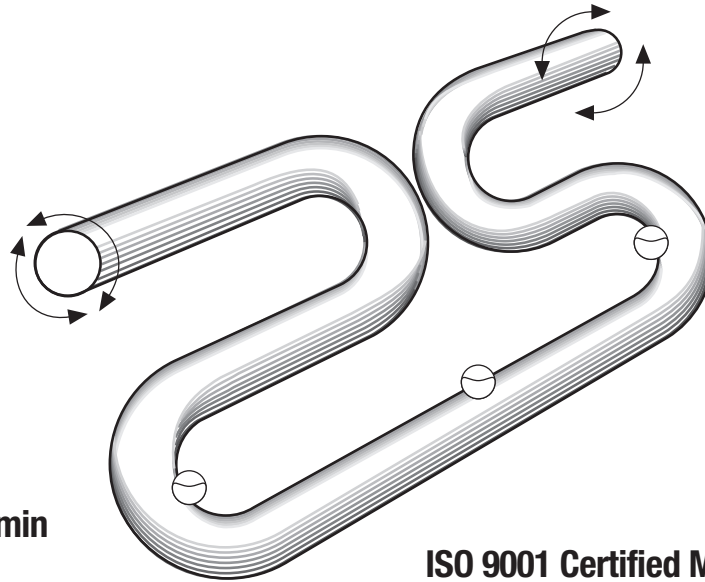
TS-603  
Rev. C  
Coriolis Mass Flowmeters  
m050-XXXXX

# Itron



## Coriolis Mass Flowmeters

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



ISO 9001 Certified Manufacturing Facility

### SPECIFICATIONS

#### DESCRIPTION

The **m**<sup>®</sup> m050 provides accurate, continuous, direct measurement of mass, density, temperature and percent solids over the flow range 1.36 to 136 kg/min (3 to 300 lb/min).

#### DESIGN FEATURES

##### ACCURACY

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

##### LOW PRESSURE DROP AND 100:1 TURNDOWN

The **m**<sup>®</sup> 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 unequalled 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 for improved reliability.



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

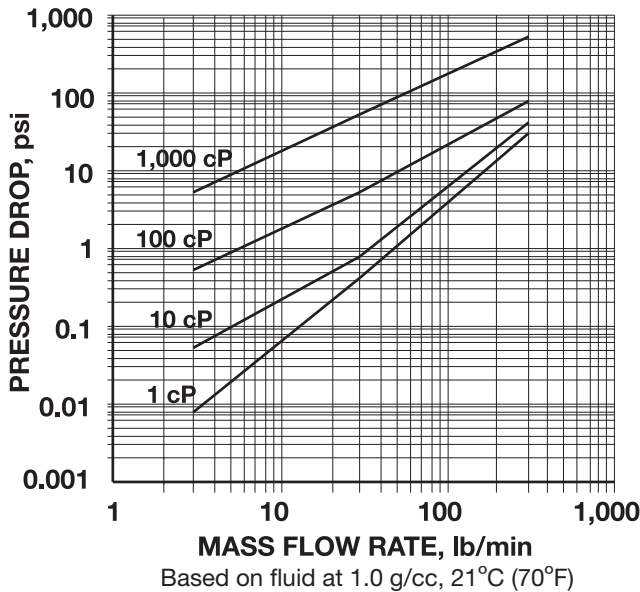
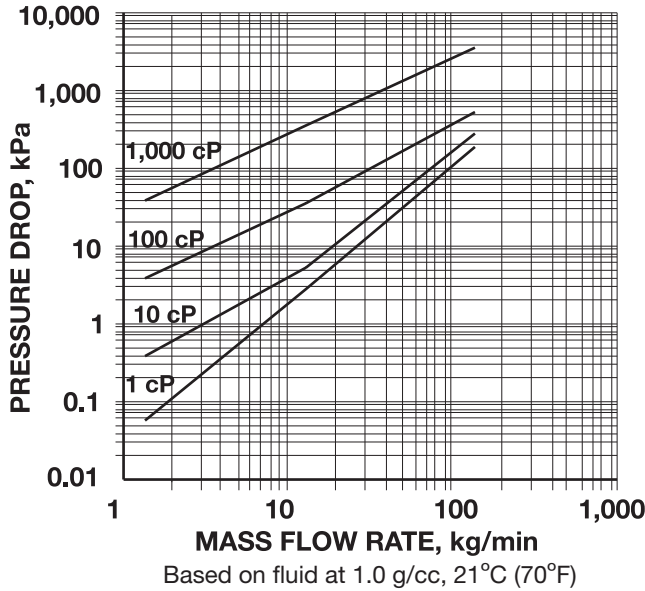
Note 1: -20°C to 40°C (-4°F to 104°F)  
 Note 2: -20°C to 65°C (-4°F to 149°F)  
 Note 3: T5 where ambient temperature is: -20°C to 40°C (-4°F to 104°F)  
 T4 where ambient temperature is: +40°C to +60°C (104°F to 140°F)  
 T2 where ambient temperature is: +60°C to +200°C (140°F to 392°F)  
 Note 4: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

## m050 OPERATING SPECIFICATIONS

METERING ELEMENT	
<b>Connections:</b> Connection type	VCO: 1" female ANSI: 1/2", 3/4", 1"; 150#, 300#, 600# RF DIN: DN15, DN25; PN40, PN100 3A-Authorized: 2" Tri-Clamp® Industrial Tri-Clamp®: 1-1/2"
<b>Meter:</b> Tube material  Tube shape Nominal tube bore Housing Hazardous area classification  Mass accuracy <sup>1</sup> Mass Repeatability Mass zero stability Turndown ratio Density range Density accuracy Density repeatability Temperature measurement Temperature accuracy Signal output	316L SST  Omega 12.7 mm (1/2") 304L SST Transducer is intrinsically safe when connected to an approved mass flow computer (See table above for approval rating) ±0.10% of rate ± zero stability ±0.10% of rate ±0.0135 kg/min (0.0299 lb/min) 100:1 0.4 to 3.0 g/cc ±0.002 g/cc ±0.0005 g/cc 100 ohm platinum resistance sensor 0.56°C (±1°F) 8-core shielded twisted pair
<b>Fluid:</b> Flow rate Max. temperature Min. temperature Max. operating pressure	1.36 to 136 kg/min (3 to 300 lb/min) 204°C (400°F) -45°C (-50°F) 204 bar (3000 psi); limited by flange/connection rating
ASSOCIATED INSTRUMENT	
Max. length of signal cable Electrical connections Manufacturer Meter model number Instrument model number	300 m (1000 ft.) 8 core Belden 89892 shielded twisted pair Screw terminal Itron, Inc. m050-XXXX0 (refer to Ordering Information, page 3) Refer to electronics Technical Specification Form Datamate 2200: TS-612 NexGen SFT100: TS-620 NexGen SFT200: TS-621
<sup>1</sup> All calibration equipment traceable to N.I.S.T.	

Itron, Inc. pursues a policy of continuous development and product improvement. The specifications in this document may therefore be changed without notice.

## PRESSURE DROP VERSUS FLOW RATE



### CALCULATING ACTUAL ACCURACY

Use the following formula to calculate m<sup>®</sup> accuracy for your selected flow rate:

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

where:

- m = mass flow rate, kg/min or lb/min
- S<sub>0</sub> = mass zero stability, kg/min or lb/min for the m050 flowmeter

### 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:

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

## m050 MASS FLOWMETER ORDERING INFORMATION

MODEL NUMBER		DESCRIPTION
m050	X X X X X	
	8	<b>Type</b> Transducer 1/2" SST <sup>1</sup>
	S	Transducer 1/2" Sanitary Tri Clamp <sup>1</sup>
	000	<b>Flange</b> 2" 3A SST Sanitary Tri Clamp <sup>4</sup>
	811	NUT VCO CAJON SST <sup>2</sup>
	812	1/2" 150lb. ANSI RF SST
	813	1/2" 300lb. ANSI RF SST
	822	3/4" 150lb. ANSI
	823	3/4" 300lb. ANSI RI SST
	832	1" 150lb. ANSI RF SST
	833	1" 300lb. ANSI RF SST
	846	1-1/2" SST Industrial Tri Clamp <sup>4</sup>
	8BE	DN15 PN40 SST
	XXX	Special - Contact Factory <sup>5</sup>
	0	<b>Approvals</b> General Purpose
	2	CSA
	0	<b>W &amp; M</b> None
	W	Custody Transfer (Weights & Measures)
	000	<b>Cable</b> No Cable
	101	ASM CBL KIT 10ft. <sup>3</sup>
	102	ASM CBL KIT 20ft. <sup>3</sup>
	103	ASM CBL KIT 30ft. <sup>3</sup>
	105	ASM CBL KIT 50ft. <sup>3</sup>
	110	ASM CBL KIT 100ft. <sup>3</sup>
	0	<b>Electronics</b> No Electronics
	02	For Use With Nexgen
	03	For Use With Datamate 2200

<sup>1</sup> Note: Wetted materials and connection materials must be the same.

<sup>2</sup> Note: Only available as 1" female CAJON VCO connections. Requires male CAJON VCO-16-VCO by SWAGELOCK<sup>®</sup>.

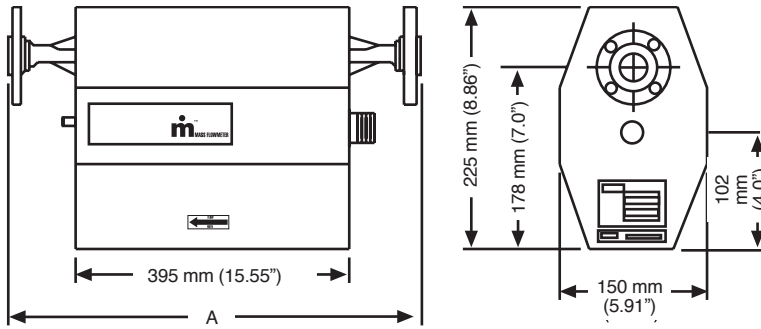
<sup>3</sup> Note: For a complete list of available cables, contact factory.

<sup>4</sup> Note: The 1-1/2" industrial and 2" 3A tri-clamp connections are available in 316L SS wetted materials only.

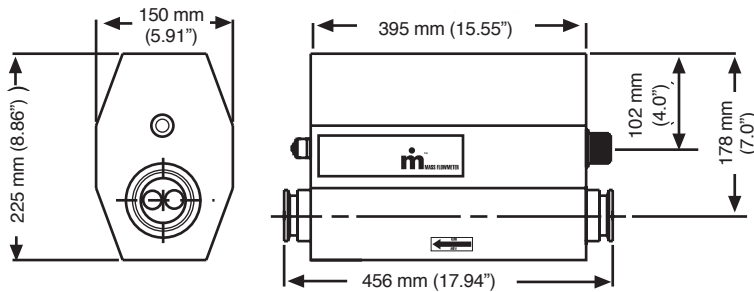
<sup>5</sup> Note: The special 2" mating flanges to the MT truck accessories are no charge (NC).

## DIMENSIONAL DATA, mm (in.)

### m050 Transducer



### m050 3A-Authorized Transducer



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

## WEIGHTS OF COMPONENTS

Transducer:	approx. 11.3 kg (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)

	DIMENSIONS
CONNECTION	A 316L SS Wetted Parts
1/2" 150# ANSI RF	559 (22.0)
1/2" 300# ANSI RF	574 (22.6)
1/2" 600# ANSI RF	584 (23.0)
3/4" 150# ANSI RF	559 (22.0)
3/4" 300# ANSI RF	579 (22.8)
3/4" 600# ANSI RF	591 (23.27)
1" 150# ANSI RF	561 (22.1)
1" 300# ANSI RF	582 (22.9)
1" 600# ANSI RF	594 (23.39)
DN15 PN 40	561 (22.10)
DN25 PN 40	561 (22.10)