

TS-604  
Rev. G  
Coriolis Mass Flowmeters  
m100-XXXXX

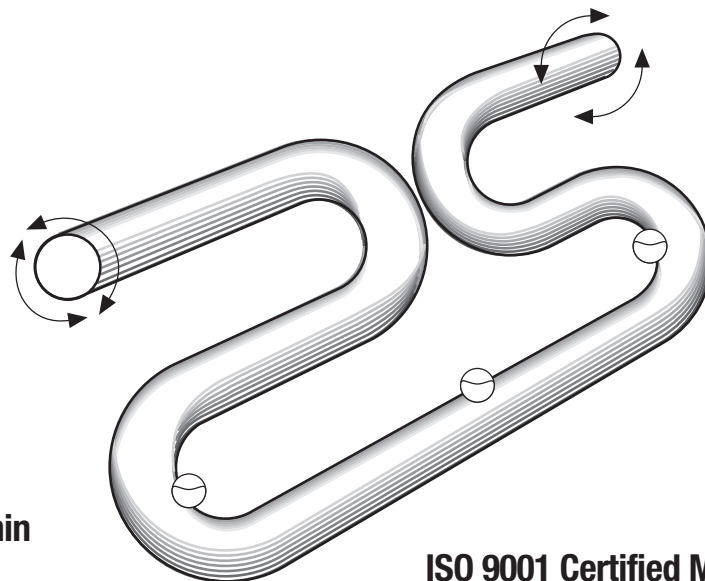
# Itron!

# m

## m100

## Coriolis Mass Flowmeters

Flow rate 5.0 to 500 kg/min  
(11 to 1100 lb/min)



ISO 9001 Certified Manufacturing Facility

### SPECIFICATIONS

#### DESCRIPTION

The **m**<sup>®</sup> m100 provides accurate, continuous, direct measurement of mass, density, temperature and percent solids over the flow range 5.0 to 500 kg/min (11 to 1100 lb/min).

#### DESIGN FEATURES

##### ACCURACY

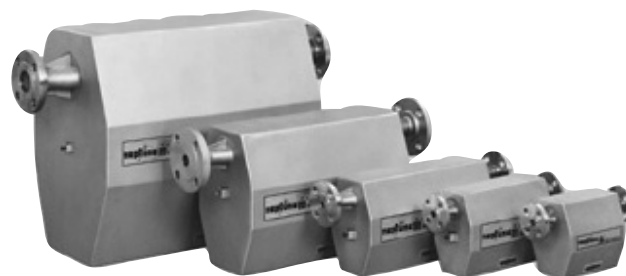
Patented dual omega-shaped tubes provide outstanding sensitivity to Coriolis forces. **m**<sup>®</sup> mass flow accuracy is  $\pm 0.10\%$  and the mass flow rate repeatability is  $\pm 0.10\%$ . Its density accuracy is  $\pm 0.001$  g/cc over its operating range.

##### 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 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 for 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
- 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 (Ra32 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

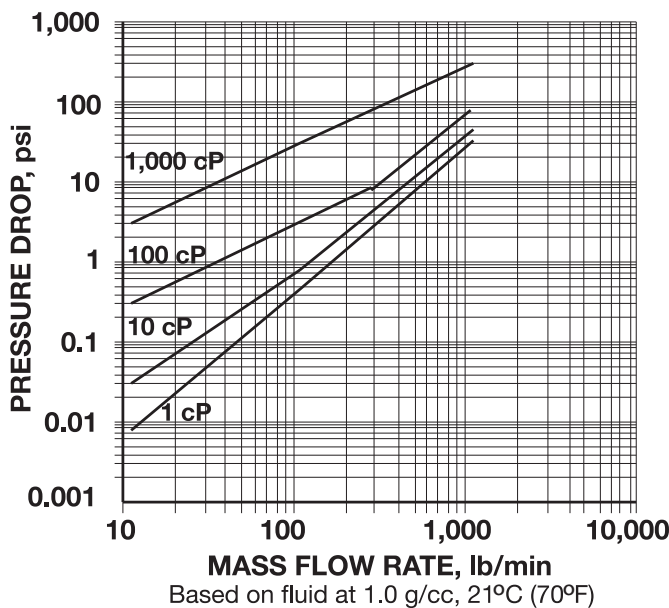
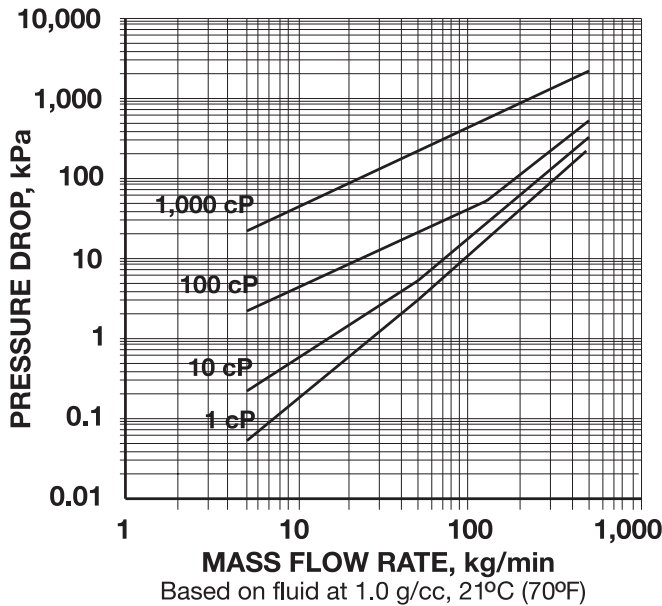
Note 1: -20°C to 40°C (-4°F to 104°F)  
 Note 2: -20°C to 65°C (-4°F to 149°F)  
 Note 3: T5 where ambient temperature is: -20°C to 40°C (-4°F to 104°F)  
 T4 where ambient temperature is: +40°C to +60°C (104°F to 140°F)  
 T2 where ambient temperature is: +60°C to +200°C (140°F to 392°F)  
 Note 4: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

**m100 OPERATING SPECIFICATIONS**

METERING ELEMENT	
<b>Connections:</b> Connection type	ANSI: 1", 1-1/2", 2"; 150#, 300#, 600# RF DIN: DN25, DN50, PN40, PN100 3A-Authorized: 2-1/2" Tri-Clamp® Industrial Tri-Clamp®: 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 25.4 mm (1.0") 304L SST Transducer is intrinsically safe when connected to an approved mass flow computer (See table above for approval ratings)  ±0.10% of rate ± zero stability ±0.10% of rate ±0.0246 kg/min (0.0543 lb/min) 100:1 0.4 to 3.0 g/cc ±0.001 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	5.0 to 500 kg/min (11 to 1100 lb/min) 204°C (400°F) -45°C (-50°F) 83 bar (1200 psi); limited by flange 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. M100 XXXXXX (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  $\dot{m}$  accuracy for your selected flow rate:

$$\% \text{ accuracy, } B1_{\text{actual}} = \{ [(0.0010 m) + S_0] / m \} \times 100\%$$

where:

m = mass flow rate, kg/min or lb/min  
 S<sub>0</sub> = mass zero stability, kg/min or lb/min for the m100 flowmeter

### DETERMINING PRESSURE DROP

1. Flow rate vs. pressure drop varies with viscosity. To approximate m100 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:

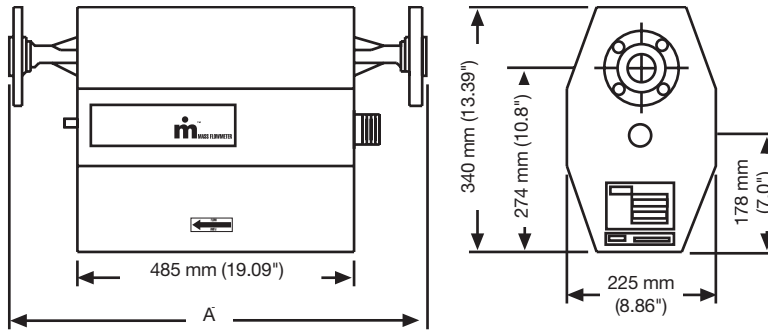
$$\Delta P_{\text{actual}} = \Delta P_{\text{plotted}} / \text{Sp. gr.}$$

## m100 MASS FLOWMETER ORDERING INFORMATION

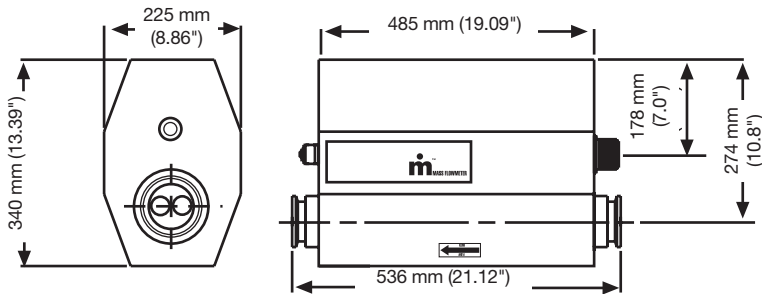
MODEL NUMBER		DESCRIPTION
<b>M100</b>	<b>X X X X X X</b>	
	8 S	<b>Type</b> Transducer 1" SST <sup>1</sup> Transducer 1" SST Sanitary Tri Clamp <sup>1</sup>
	000 832 833 842 852 853 856 8DE 8FE XXX	<b>Flange</b> 2-1/2" 3A SST Sanitary Tri Clamp <sup>4</sup> 1" 150lb. ANSI RF SST 1" 300lb. ANSI RF SST 1-1/2" 150lb. ANSI RF SST 2" 150lb. ANSI RF SST 2" 300lb. ANSI RF SST 2" SST Industrial Tri Clamp <sup>4</sup> DN25 PN40 SST DN50 PN40 SST Special - Contact Factory <sup>2</sup>
	0 2	<b>Approvals</b> General Purpose CSA
	0 W	<b>W &amp; M</b> None Custody Transfer (Weights & Measures)
	000 101 102 103 105 110	<b>Cable</b> No Cable ASM CBL KIT 10Ft. <sup>3</sup> ASM CBL KIT 20Ft. <sup>3</sup> ASM CBL KIT 30Ft. <sup>3</sup> ASM CBL KIT 50Ft. <sup>3</sup> ASM CBL KIT 100Ft. <sup>3</sup>
	0 02 03	<b>Electronics</b> No Electronics For Use With Nexgen For use With Datamate 2200
<sup>1</sup> Note: Wetted materials and connection materials must be the same. <sup>2</sup> Note: The special 2" mating flanges to the MT truck accessories are no charge (N/C). <sup>3</sup> Note: For a complete list of available cables, contact factory. <sup>4</sup> Note: The 2" industrial and 2-1/2" 3A tri-clamp connections are available in 316L SS wetted materials only.		

## DIMENSIONAL DATA, mm (in.)

### m100 Transducer



### m100 3A-Authorized Transducer



Optional 2-1/2" x 1-1/2" Tri-Clamp® eccentric reducers are available.

## WEIGHTS OF COMPONENTS

Transducer:	approx. 26.4 kg (58 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" 150# ANSI RF	688 (27.1)
1" 300# ANSI RF	706 (27.8)
1" 600# ANSI RF	719 (28.31)
1-1/2" 150# ANSI RF	696 (27.4)
1-1/2" 300# ANSI RF	714 (28.1)
1-1/2" 600# ANSI RF	729 (28.69)
2" 150# ANSI RF	704 (27.7)
2" 300# ANSI RF	719 (28.3)
2" 600# ANSI RF	738 (29.07)
DN25 PN40	689 (27.14)
DN50 PN40	689 (27.14)