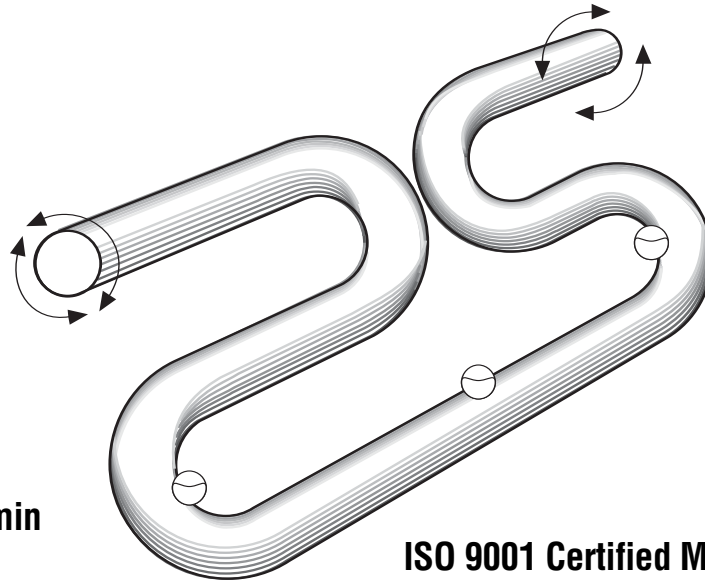


TS-604
Rev. C
Coriolis Mass Flowmeters
m100-XXXXX



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**[®]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

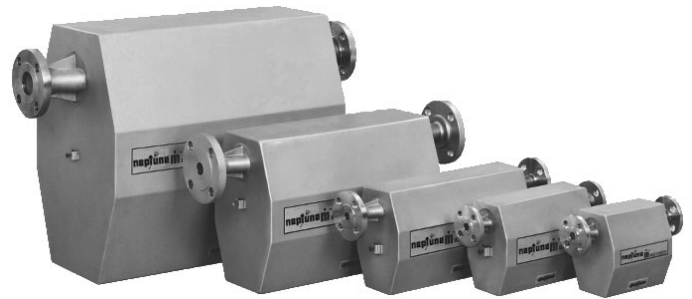
Patented dual omega-shaped tubes provide outstanding sensitivity to Coriolis forces. **m**[®]mass flow accuracy is $\pm 0.10\%$ with the NexGen transmitter and $\pm 0.15\%$ with the Datamate 2100. The m100 **m**[®]mass flow rate repeatability is $\pm 0.10\%$. Its density accuracy is ± 0.001 g/cc over 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 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 or optional HASTELLOY[®] C-22 wetted parts
- 3A-Authorized version available

MATERIALS OF CONSTRUCTION

Wetted parts: 316L stainless steel
(HASTELLOY® C-22 optional)

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 2100™ Mass Flow Computer:

(Complete information is available in Technical Specification No. TS-610.)

NexGen® SFT100 Mass Flow Transmitter:

(Complete information is available in Technical Specification No. TS-620.)

HAZARDOUS AREA CLASSIFICATION TABLE

Agency	Components	Method	Class	Div./Zone	Group	Temp. Class	Ambient Temp.
FM	Transducer	Intrinsic Safety	I, II, III	1	C,D,E,F,G	T5*	2
				2	A,B,C,D	T5*	2
	NexGen	Explosion-Proof	I,II,III	1	C,D,E,F,G	T6	4
				2	A,B,C,D	T4	4
CSA	Transducer	Intrinsic Safety	I,II,III	1	C,D,E,F,G		2
				2	C,D,E,F,G		2
	NexGen	Explosion Proof	I,II,III	1	C,D	T4A	4
				2	A,B,C,D,E,F,G	T4	4

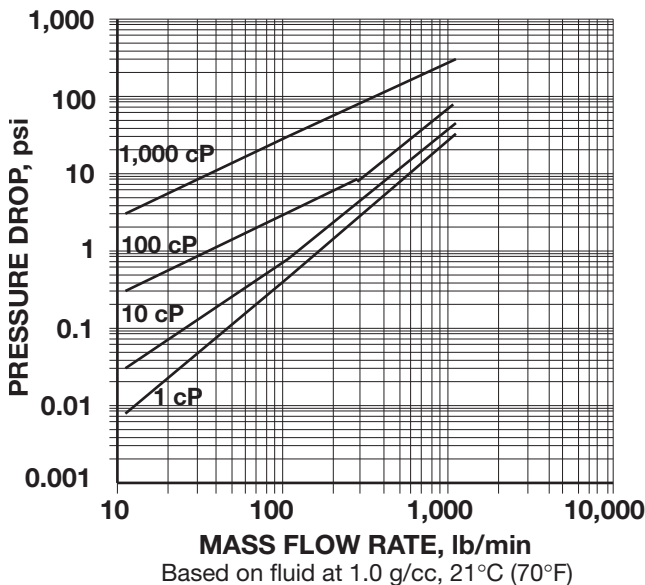
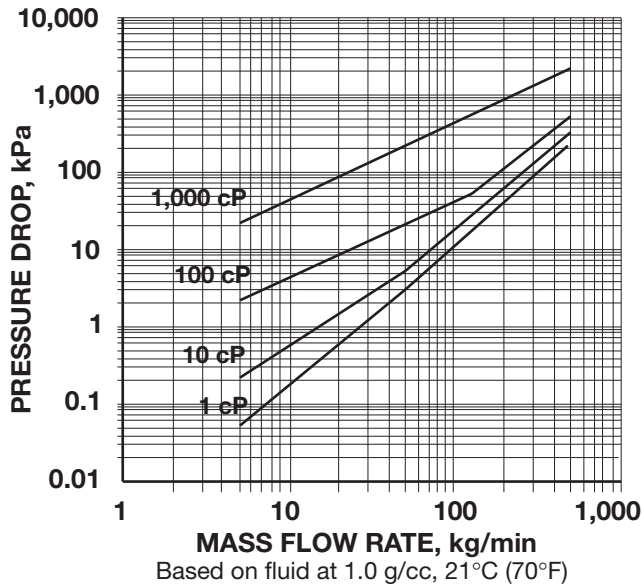
Ambient temperature limits:
2 -20°C to 40°C (-4 to 104°F)
4 -20°C to 65°C (-4 to 149°F)

*M300 rated at T6

m100 OPERATING SPECIFICATIONS

METERING ELEMENT	
Connections: 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"
Meter: Tube material Tube shape Nominal tube bore Housing Hazardous area classification Mass accuracy ¹ Mass Repeatability Mass zero stability Turndown ratio Density range Density accuracy Density repeatability Temperature measurement Temperature accuracy Signal output	316L SST or HASTELLOY® C-22 optional 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) Datamate 2100: ±0.15% of rate ± zero stability NexGen SFT 100: ±0.10% of rate ± zero stability ±0.10% of rate Datamate 2100: ±0.0612 kg/min (0.135 lb/min) NexGen SFT100: ±0.0246 kg/min (0.0543 lb/min) 100:1 Datamate 2100: 0.4 to 2.0 g/cc NexGen SFT100: 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
Fluid: 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	Datamate 2100: 150 m (500 ft.) 8 core Belden 89892 shielded twisted pair NexGen SFT100: 300 m (1000 ft.) 8 core Belden 89892 shielded twisted pair Screw terminal Actaris U.S. Liquid Measurement, Inc. m100 XXXXXX (refer to Ordering Information, page 3) Refer to electronics Technical Specification Form Datamate 2100: TS-610 NexGen SFT100: TS-620
¹ All calibration equipment traceable to N.I.S.T.	

PRESSURE DROP VERSUS FLOW RATE



CALCULATING ACTUAL ACCURACY

Use the following formula to calculate \dot{m} accuracy for your selected flow rate:

Datamate: % accuracy, $\pm_{\text{actual}} = \{[(0.0015 m) + S_0] / m\} \times 100\%$

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

where:

m = mass flow rate, kg/min or lb/min

S₀ = mass zero stability, kg/min or lb/min for the m100 flowmeter

Note that Actaris Neptune offers a free sizing program on three 3-1/2" diskettes to assist you in your selection.

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
M100	X X X X X X
	Type 2 Transducer 1" Hastelloy® C-22 ¹ 8 Transducer 1" SST ¹ S Transducer 1" SST Sanitary Tri Clamp ¹
	Flange 000 2 1/2" 3A SST Sanitary Tri Clamp ⁴ 252 2" 150lb. ANSI RF Hastelloy® C-22 253 2" 300lb. ANSI RF Hastelloy® C-22 832 1" 150lb. ANSI RF SST 833 1" 300lb. ANSI RF SST 842 1-1/2" 150lb. ANSI RF SST 852 2" 150lb. ANSI RF SST 853 2" 300 lb. ANSI RF SST 856 2" SST Industrial Tri Clamp ⁴ 8DE DN25 PN40 SST 8FE DN50 PN40 SST XXX Special - Contact Factory ²
	Approvals 0 General Purpose 1 FM 2 CSA
	W & M 0 None W Custody Transfer (Weights & Measures)
	Cable 000 No Cable 101 ASM CBL KIT 10Ft. ³ 102 ASM CBL KIT 20Ft. ³ 103 ASM CBL KIT 30Ft. ³ 105 ASM CBL KIT 50Ft. ³ 110 ASM CBL KIT 100Ft. ³
	Electronics O No Electronics D For Use With Datamate N For use With Nexgen

¹Note: Wetted materials and connection materials must be the same.

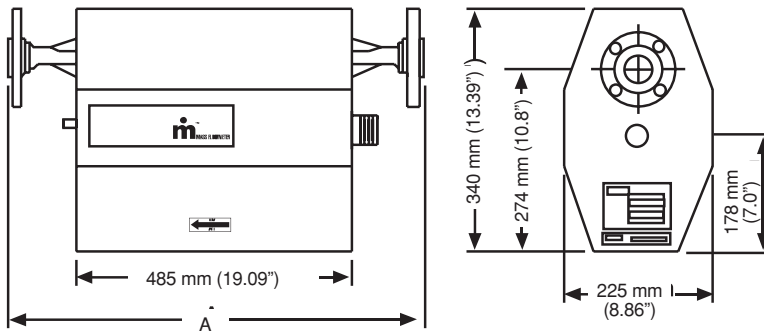
²Note: The special 2" mating flanges to the MT truck accessories are no charge (N/C).

³Note: For a complete list of available cables, contact factory.

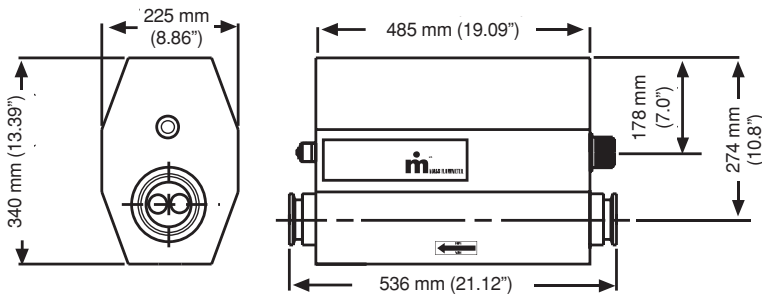
⁴Note: The 2" industrial and 2-1/2" 3A tri-clamp connections are available in 316L SS wetted materials only.

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:	approx. 6.6 kg (14 lbs)
NexGen:	
Blind	approx. 6.4 kg (14.1 lb.)
w/Display/keypad	approx. 7.1 kg (15.6 lb.)

CONNECTION	DIMENSIONS	
	A 316L SS Wetted Parts	A ¹ HASTELLOY® C-22 Wetted Parts
1" 150# ANSI RF	688 (27.1)	780 (30.7)
1" 300# ANSI RF	706 (27.8)	780 (30.7)
1" 600# ANSI RF	719 (28.31)	780 (30.7)
1-1/2" 150# ANSI RF	696 (27.4)	780 (30.7)
1-1/2" 300# ANSI RF	714 (28.1)	780 (30.7)
1-1/2" 600# ANSI RF	729 (28.69)	780 (30.7)
2" 150# ANSI RF	704 (27.7)	780 (30.7)
2" 300# ANSI RF	719 (28.3)	780 (30.7)
2" 600# ANSI RF	738 (29.07)	780 (30.7)
DN25 PN40	689 (27.14)	N/A
DN50 PN40	689 (27.14)	N/A

¹All HASTELLOY® C-22 wetted parts dimensions are for lap-joint flanges.



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