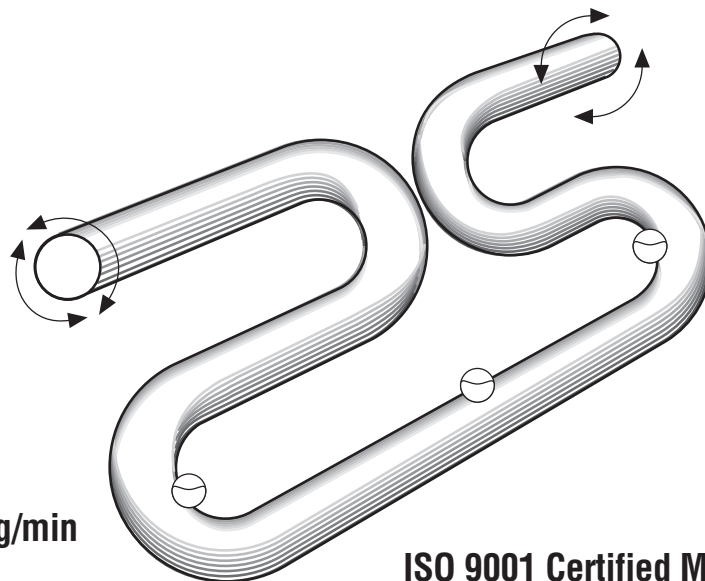


TS-605
Rev. D
Coriolis Mass Flowmeters
m200-XXXXX



Coriolis Mass Flowmeters

Flow rate 14.5 to 1450 kg/min
(32 to 3200 lb/min)



ISO 9001 Certified Manufacturing Facility

SPECIFICATIONS

DESCRIPTION

The \dot{m} m200 provides accurate, continuous, direct measurement of mass, density, temperature and percent solids over the flow range 14.5 to 1450 kg/min (32 to 3200 lb/min).

DESIGN FEATURES

ACCURACY

Patented dual omega-shaped tubes provide outstanding sensitivity to Coriolis forces. \dot{m} mass flow accuracy is $\pm 0.10\%$ with the NexGen transmitter and $\pm 0.10\%$ with the Datamate 2200. The m200 \dot{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 \dot{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 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 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 (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.)

HAZARDOUS AREA CLASSIFICATION TABLE

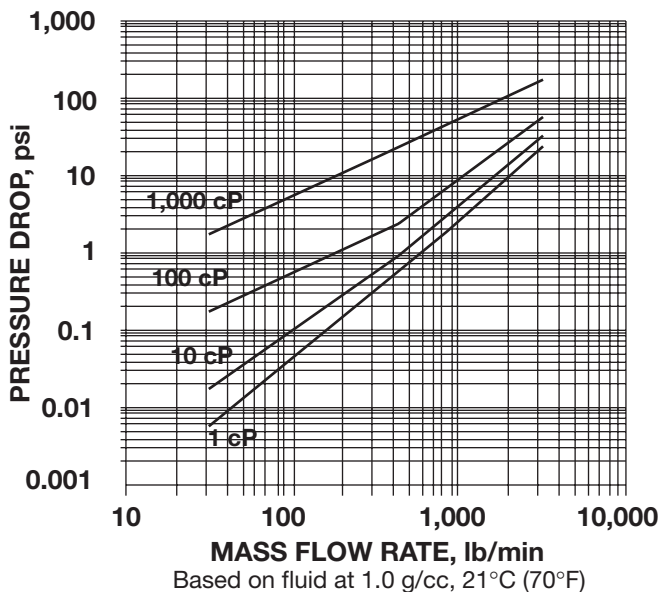
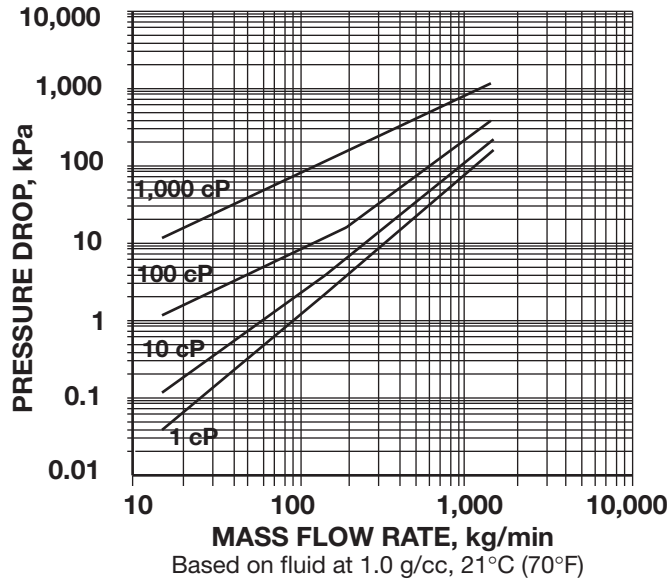
Agency	Components	Method	Class	Div. Zone	Group	Temp. Class	Ambient Temp.
CSA	Transducer	Intrinsic Safety	I, II, III	1,2	C,D,E,F,G	T5	Note 1
	Datamate	APPROVAL PENDING					
	Nexgen	Explosion Proof	I,II,III	1	C,D,E,F,G	T6	Note 2
Non-incendive		I	2	A,B,C,D	T4	Note 2	
LCIE	Transducer	Ex ia		0,1,2	IIB	T5,T4,T2	Note 3
	Datamate	APPROVAL PENDING					
	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)

m200 OPERATING SPECIFICATIONS

METERING ELEMENT	
Connections: Connection type	ANSI: 2", 3", 4"; 150#, 300#, 600# RF DIN: DN50, DN80, DN100; PN40, PN100 3A-Authorized: 4" Tri-Clamp® Industrial Tri-Clamp®: 3", 4"
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 51 mm (2.0") 304L SST Transducer is intrinsically safe when connected to an approved mass flow computer (See table above for approval ratings) Datamate 2200: ±0.10% of rate ± zero stability NexGen SFT100: ±0.10% of rate ± zero stability ±0.10% of rate Datamate 2200: ±0.0557 kg/min (0.1228 lb/min) NexGen SFT100: ±0.0557 kg/min (0.1228 lb/min) 100:1 0.4 to 2.0 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	14.5 to 1450 kg/min (32 to 3200 lb/min) 204°C (400°F) -45°C (-50°F) 68 bar (1000 psi); limited by flange rating
ASSOCIATED INSTRUMENT	
Max. length of signal cable Electrical connections Manufacturer Meter model number Instrument model number	Datamate 2200: 300 m (1000 ft.) 8 core Belden 89892 shielded twisted pair NexGen SFT100: 300 m (1000 ft.) 8 core Belden 89892 shielded twisted pair Screw terminal Actaris Liquid Measurement, LLC. M200 XXXXXX (refer to Ordering Information, page 3) Refer to electronics Technical Specification Form Datamate 2200: TS-612 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, $B1_{actual} = \{ [(0.0010 m) + S_0] / m \} \times 100\%$

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

where:

m = mass flow rate, kg/min or lb/min
 S₀ = mass zero stability, kg/min or lb/min for the m²⁰⁰ flowmeter

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

DETERMINING PRESSURE DROP

- Flow rate vs. pressure drop varies with viscosity. To approximate m²⁰⁰ pressure drop for fluids with viscosity approximating that of water, locate the point on the 1-cP curve corresponding with your desired flow rate.
- 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.
- Divide the pressure drop indicated on the graph by the specific gravity (S) of the process fluid:

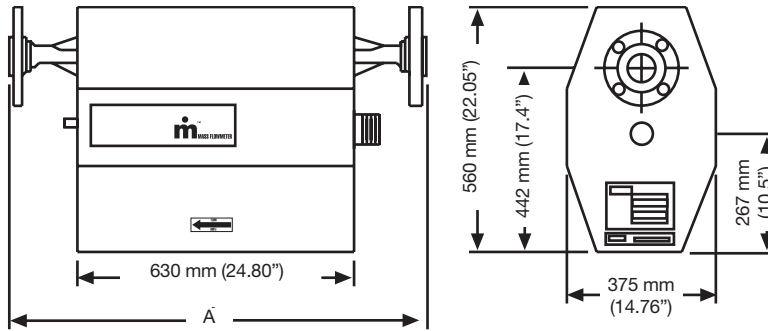
$$\Delta P_{actual} = \Delta P_{plotted} / Sp. gr.$$

m²⁰⁰ MASS FLOWMETER ORDERING INFORMATION

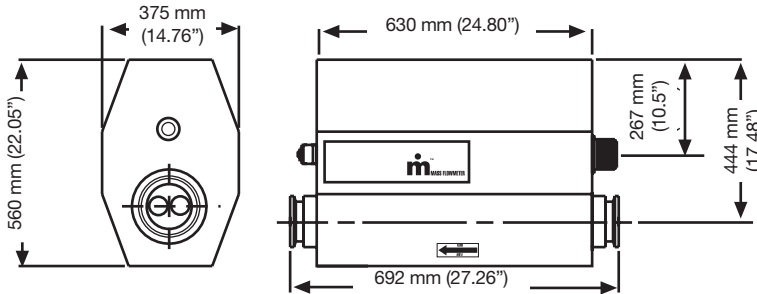
MODEL NUMBER		DESCRIPTION
M200	X X X X X X	
	2 8 S	Type Transducer 2" HastelloyA8 C-22 ¹ Transducer 2" SST ¹ Transducer 2" SST Sanitary Tri Clamp ¹
	000 252 272 273 852 853 862 863 866 872 873 8FE 8GE XXX	Flange 4" 3A SST Sanitary Tri Clamp ⁴ 2" 150lb. ANSI RF HastelloyA8 C-22 4" 150lb. ANSI RF HastelloyA8 C-22 4" 300lb. ANSI RF HastelloyA8 C-22 2" 150lb. ANSI RF SST 2" 300lb. ANSI RF SST 3" 150lb. ANSI RF SST 3" 300lb. ANSI RF SST 3" SST Industrial Tri Clamp ⁴ 4" 150lb. ANSI RF SST 4" 300lb. ANSI RF SST DN50 PN40 SST DN80 PN40 SST Special - Contact Factory ²
	0 2 3	Approvals General Purpose CSA LCIE
	0 W	W & M None Custody Transfer (Weights & Measures)
	000 101 102 103 105 110	Cable No Cable ASM CBL KIT 10Ft. ³ ASM CBL KIT 20Ft. ³ ASM CBL KIT 30Ft. ³ ASM CBL KIT 50Ft. ³ ASM CBL KIT 100Ft. ³
	O D N	Electronics No Electronics For Use With Datamate For use With Nexgen
¹ Note: Wetted materials and connection materials must be the same. ² Note: The special 2" mating flanges to the MT truck accessories are no charge (N/C). ³ Note: For a complete list of available cables, contact factory. ⁴ Note: The 3" or 4" industrial and 4" 3A tri-clamp connections are available in 316L SS wetted materials only.		
General Note: A complete meter consists of a mass flow sensor (Transducer), a mass flow computer (Electronics) and sensor cable.		

DIMENSIONAL DATA, mm (in.)

m200 Transducer



m200 3A-Authorized Transducer



Optional 4" x 3" Tri-Clamp® eccentric reducers (P/N 101630-004) are available.

WEIGHTS OF COMPONENTS

Transducer:	approx. 58.9 kg (130 lbs)
Datamate:	approx. 5.2 kg (11.5 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
2" 150# ANSI RF	866 (34.1)	979 (38.6)
2" 300# ANSI RF	881 (34.7)	979 (38.6)
2" 600# ANSI RF	900 (35.45)	979 (38.6)
3" 150# ANSI RF	876 (34.5)	979 (38.6)
3" 300# ANSI RF	901 (35.48)	979 (38.6)
3" 600# ANSI RF	919 (36.19)	979 (38.6)
4" 150# ANSI RF	881 (34.7)	979 (38.6)
4" 300# ANSI RF	912 (35.9)	979 (38.6)
4" 600# ANSI RF	935 (36.81)	979 (38.6)
DN50 PN40	861 (33.90)	N/A
DN80 PN40	861 (33.90)	N/A
DN100 PN40	860 (33.90)	N/A

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

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