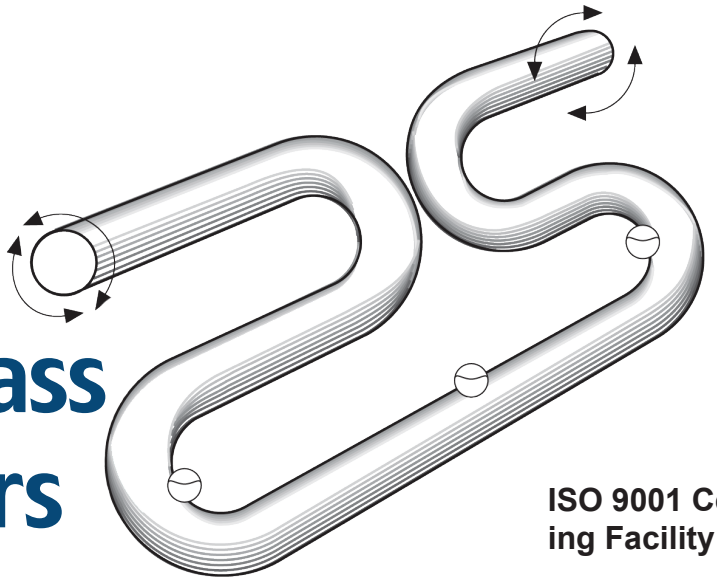
m300

Coriolis Mass Flowmeters



Flow rate 41 to 4082 kg/min (90 to 9,000 lb/min)

ISO 9001 Certified Manufacturing Facility

DESCRIPTION

The m® m300 provides accurate, continuous, direct measurement of mass, density, temperature and percent solids over the flow range 41 to 4,082 kg/min (90 to 9,000 lb/min).

DESIGN FEATURES

ACCURACY

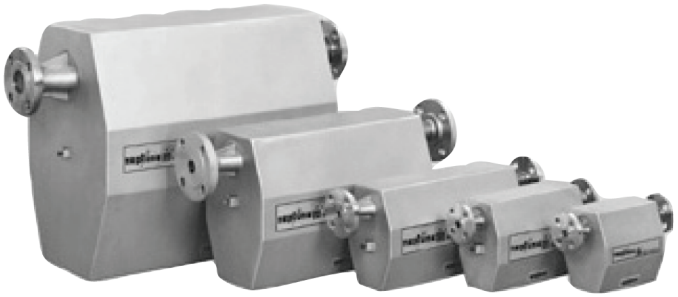
Patented dual omega-shaped tubes provide outstanding sensitivity to Coriolis forces. m® mass flow accuracy is ±0.10% and the mass flow rate repeatability is ±0.10%. Its density accuracy is ±0.001 g/cc over its operating range.

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 unequaled sensitivity to Coriolis force
- Wide 100:1 turndown
- Lowest pressure drop
- Smooth-bore, non-obtrusive flow path free from moving parts
- 4,082 kg/min (9,000 lb/min) capacity
- Ideal for liquid sugar, viscous fluids, caustic liquors, lime slurries, desulfurization slurries, kiln feeds, lube oil blending, bulk loading/unloading

MATERIALS OF CONSTRUCTION

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

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

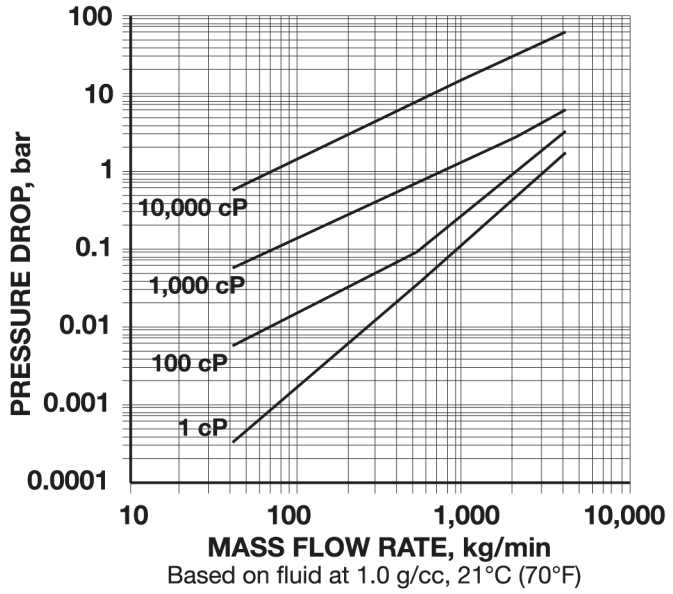
Agency	Components	Method	Class	Div/ zone	Group	Temp. Class	Ambient Temp.
CSA	Transducer	Intrinsic Safety	I, II, III	1, 2	C, D, E, F, G	T5	Note 1
	Datamate	Non-incendive	I	2	A, B, C, D	T3C	Note 5
	NexGen	Explosion Proof	I, II, III	1	C, D, E, F, G	T6	Note 2
		Non-incendive	I	2	A, B, C, D	T4	Note 2
LCIE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

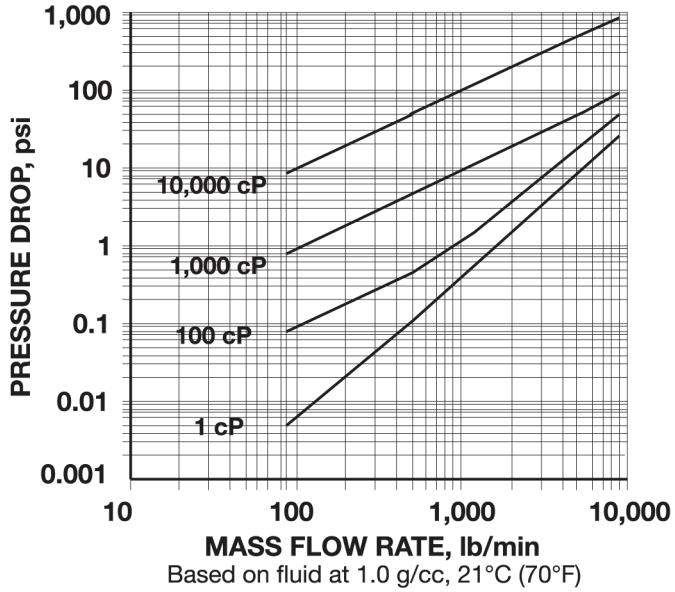
m300 OPERATING SPECIFICATIONS

METERING ELEMENT	
Connections:	
Connection type (flanges)	ANSI: 3”, 4”, 6”; 150#, 300#, 600# Raised Face DIN: PN40, DN80, DN100, DN150
Meter:	
Tube material	316L SST
Tube shape	Omega
Housing	304L SST
Hazardous area classification[1]	Transducer is intrinsically safe when connected to an approved mass flow computer (See table above for approval rating)
Mass accuracy[2]	±0.10% of rate ± zero stability
Mass Repeatability	±0.10% of rate
Mass zero stability	±0.36 kg/min (0.8 lb/min)
Density range	0.4 to 2.0 g/cc
Density accuracy	±0.001 g/cc
Density repeatability	±0.0002 g/cc
Temperature measurement	100 ohm platinum resistance sensor
Temperature accuracy	0.56°C (±1°F)
Signal output	8-core shielded twisted pair
Fluid:	
Max. Flow rate	4,082 kg/min (9,000 lb/min)
Max. temperature	204°C (400°F)
Min. temperature	-45°C (-50°F)
Max. operating pressure	103 bar (1500 psi); limited by flange rating
Max. pressure drop	Less than 2.06 bar (30 psi) for water at 20ºC (68ºF) at 4,082 kg/min (9,000 lb/min)
ASSOCIATED INSTRUMENT	
Max. Length of signal cable	300m (1000ft.) 8 core Belden 89892 shielded twisted pair
Manufacturer	RSM, Inc.
Meter model number	m300-XXXXX
Instrument model number	Refer to electronics Technical Specification Form Datamate 2200: TS-612 NexGen SFT100: TS-620 NexGen SFT200: TS-621
[1]Ambient Temperature Limits for Hazardous Locations: see chart above. [2]All calibration equipment traceable to N.I.S.T.	

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 m300 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:

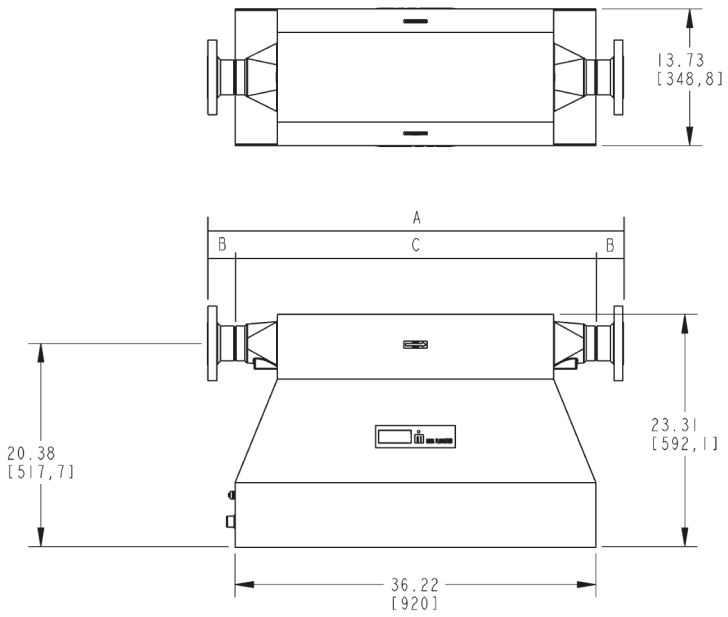
$$\%\ \text{accuracy}, \pm_{actual} = \{[(0.0010\ m) + S_0]/m\} \times 100\%$$

where:

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

S_0 = mass zero stability, kg/min or lb/min for the m300 flowmeter

DIMENSIONAL DATA, mm (in.)



Meters with “ANSI” Flange Connections			
A (in)	B (in)	C (in)	Flange Size
41.75	2.75	36.25	3” - 150#
42.50	3.12	36.25	3” - 300#
42.75	3.25	36.25	3” - 600#
42.25	3.00	36.25	4” - 150#
43.00	3.38	36.25	4” - 300#
44.25	4.00	36.25	4” - 600#
43.25	3.50	36.25	6” - 150#
44.00	3.88	36.25	6” - 300#
45.50	4.62	36.25	6” - 600#

Meters with “DIN” Flange Connections			
A (mm)	B (mm)	C(mm)	FLANGE SIZE
1037	58	921	PN40-DN80
1051	65	921	PN40-DN100
1071	75	921	PN40-DN150

WEIGHTS OF COMPONENTS

Flowmeter:	approx. shipping wt. 95 kg (210 lb), depending on flanges
Datamate 2200:	approx. 5.2 kg (11.5 lbs)
NexGen SFT100:	
Blind	approx. 6.4 kg (14.1 lbs)
w/Display	approx. 7.1 kg (15.6 lbs)
w/Display/keypad	approx 7.1 kg (15.6 lbs)
NexGen SFT 200:	approx. 1.8 kg (4 lbs)

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RED SEAL MEASUREMENT