



Proven Performance
for Over 50 Years

82 Series Industrial Flowmeter

ADVANTAGES

- High accuracy
- Wide flow range
- Fast response to rate changes
- Simplicity of construction with few parts
- Cost effective
- Calibration traceable to NIST

DESCRIPTION

COX Sleeve Bearing Industrial Turbine Flowmeters produce a high resolution pulse rate output signal proportional to fluid velocity, and hence, to volumetric flow rate. The turbine meter incorporates a free moving axially-mounted rotor that spins on a bearing system in a housing with a magnetic signal pick-off. Liquid flowing through the meter makes the rotor turn in an angular velocity directly proportional to the rate of flow. As the rotor turns, the blades induce an alternating current in the signal pick-off. The frequency of the signal generated is proportional to the rate of flow and provides high linearity over a wide flow range. The calibration factor for the turbine flowmeter is derived by taking the number of pulses received from the pick-off over a known standard volume or weight of liquid passed through the meter. The COX Industrial 82 series meter has been developed specifically for use in corrosive and nonlubricating fluids. A unique bearing design permits accurate, dependable flow measurement of many fluids that are not suitable for use with a ball bearing style turbine flow meter.

- High corrosion resistance
- Superior water resistance exhibited in nonlubricating fluids containing abrasive particles
- Self-cleaning due to the centrifugal action of rotating balls
- Dependable meter performance is insensitive to bearing clearance or condition of bearing surfaces

INSTALLATION RECOMMENDATIONS

To obtain the rated accuracy of the turbine flowmeter, it is required that the fluid stream be free of rotational components. The forward support provides a straightening effect, but for best results the following is recommended:

- 10 diameters of straight upstream pipe and 5 diameters of straight pipe downstream of meter.
- Installation of flow straighteners is recommended for maximum accuracy.

Performance Specifications

Accuracy	±0.50% of actual flow rate over linear flow range
Linearity	±0.50%
Repeatability	±0.05% of actual flow rate over linear flow range
Response Time	2-5 to 16 ms (depending on line size) for a 63% recovery to step change in flow rate



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Turbine Flowmeter Capacities									
Size Code	Range Limits for a 0.5% Linearity				Typical K-factor		Typical Pulse Rate at Maximum Flow Rate	Maximum Press Drop Based on Water at Maximum Flow Rate	
	L/M Sz ½" to 1"		U.S. GPM		P/L Sz ½" to 1"	P/U.S. Gal			
	m³/hr Sz 1-½" to 8"				P/M³ Sz 1-½" to 8"		PPS	kPa	PSI
Min	Max	Min	Max	Min	Max	PPS	kPa	PSI	
COX Industrial Turbine Flowmeter Capacities with water at 15.6°C (60°F)									
½ & ⅝-1	4.54	45.5	1.2	12	1405	5320	1064	61	8.5
¾ & 1-1	11.3	113	3	30	351	1328	665	50	7.0
1	23.5	235	6.2	62	218	826	855	64	8.9
1-½	3.18	31.8	14	140	65000	246	575	50	7.0
2	5.68	56.8	25	250	27500	104	435	60	8.5
3	12.7	127	56	560	7920	30	280	54	7.5
4	22.7	227	100	1000	3380	12.8	214	28	4.0
6	51.1	511	225	2250	978	3.7	140	40	5.5
8	90.8	908	400	4000	417	1.58	105	44	6.1

TURBINE METER SELECTION

For Example:	Size	Style	End Connections	Materials	Bearings	Optional Items
	2	82	F6	E	4	SS
Your order would therefore be 2-82F6E4-SS.						

Style

82 Ball Sleeve Bearing Design

End Connections

- T3 Male Flared Tube (MS33656)
- T4 Threaded External NPT
- F5 ANSI Class 150 RF Flange
- F6 ANSI Class 300 RF Flange
- F8 ANSI Class 600 RF Flange
- D5 DIN Class PN20 RF
- D6 DIN Class PN50 RF
- D8 DIN Class PN100 RF

Materials

E 82 Series Stainless Steel Body & Flanges

Bearings

4 Tungsten Carbide Ball with Aluminum Oxide Sleeve and Thrust Plate

Options

- HV High Vapor Pressure (HVP) use where vapor pressure is near operating pressure and liquid has a tendency to flash
- SS 17-4PH SS for deionized water (Standard on ¾ & 1-1)
- WC Coil ½ NPT with 3 feet of wire
- BD 90° Electrical Spaced Dual Coils for Bi-Directional Flow (Contact sales engineer for details)

DC Dual Coils (Contact sales engineer for details)

SJ Steam Jacket (Sizes ½ through 4)

Calibration

(Will not appear in model number—clearly define)

- 10 Point Calibration
- Calibration in other liquids to a maximum of 300 GPM (Water Standard)

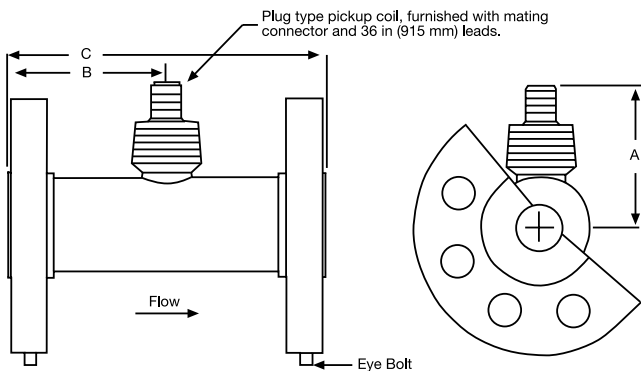
Physical Specifications

Materials	
Flowmeter Body	ASTM Type 300 Series stainless steel
Rotor	Sizes ½" through 3" is 17-4 PH ss sizes 4" and up 17-7 PH ss blades and 17-4 PH ss HUB
Min. Output Voltage	28 mV peak-to-peak at minimum linear flow range
Overrange	To 150% of maximum rated flow for short periods (consult factory)
Process Temperature Limits	(Not to exceed ANSI B16.5-1988 flange ratings) -100° to +450° F (-75° to +230° C)
End Connectors	
Flanged:	ANSI-RF, sizes ½" through 8"
Threaded:	External, NPT, sizes ½" through 1" - 1 External, tubing, sizes ⅝" - 1 and 1" - 1
Pressure Rating	
Flanged:	150-600# ANSI Class Rating
Threaded:	External, NPT, 7 Mpa (1000 psi)
Threaded:	External, Tubing, 20 Mpa (3000 psi)
Max. Pressure Drop:	See Turbine Flow Capacities Table
Outlet Pressure (absolute):	Must be greater than twice the pressure drop, plus 1.3 times the vapor pressure of the measured liquid at operating temperature.

Flange Meter Dimensions

Size Code	A		B		C		ANSI Flange Rating Class	Flange Diameter		Bolt Hole Diameter		Bolt Circle Diameter		Bolt Hole Quantity	82 Series Approx. Weights	
	in	mm	in	mm	in	mm		in	mm	in	mm	in	mm		Lbs.	Kg.
	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm		mm	mm
1/2	2.7	69.0	2.5	63.0	5.0	127.0	150	3.50	89	0.62	16			4	5	2.3
							300	3.75	95	0.62	16	2.62	67.0	4	7	3.2
							600	3.75	95	0.62	16	2.62	67.0	4	8	3.6
3/4	2.9	72.0	2.5	63.0	5.0	127.0	150	3.88	99	0.62	16	2.75	70.0	4	6	2.7
							300	4.62	117	0.75	19	3.25	83.0	4	8	3.6
							600	4.62	117	0.75	19	3.25	83.0	4	10	4.5
1	3.0	76.0	2.5	63.0	5.0	127.0	150	4.25	108	0.62	16	3.12	79.0	4	7	3.2
							300	4.88	124	0.75	19	3.50	89.0	4	9	4.1
							600	4.88	124	0.75	19	3.50	89.0	4	11	5.0
1-1/2	3.2	81.0	3.0	76.0	6.0	152.0	150	5.00	127	0.62	16	3.88	99.0	4	10	4.5
							300	6.12	155	0.88	22	4.50	114.0	4	14	6.4
							600	6.12	155	0.88	22	4.50	114.0	4	16	7.3
2	3.4	86.0	3.3	83.0	6.5	165.0	150	6.00	152	0.75	19	4.75	121.0	4	15	6.8
							300	6.50	165	0.75	19	5.00	127.0	8	20	9.1
							600	6.50	165	0.75	19	5.00	127.0	8	24	10.9
3	8.9	99.0	5.0	127.0	10.0	254.0	150	7.50	191	0.75	19	6.00	152.0	4	30	13.6
							300	8.25	210	0.88	22	6.62	168.0	8	40	18.1
							600	8.25	210	0.88	22	6.62	168.0	8	46	20.9
4	4.3	109.0	7.3	185.0	12.0	305.0	150	9.00	229	0.75	19	7.50	191.0	8	42	19.1
							300	10.00	254	0.88	22	7.88	200.0	8	65	29.5
							600	10.75	273	1.00	25	8.50	216.0	8	95	43.1
6	5.2	132.0	9.4	238.0	14.0	355.0	150	11.00	279	0.88	22	9.50	241.0	8	80	36.3
							300	12.50	318	0.88	22	10.62	270.0	12	120	54.4
							600	14.00	356	1.12	28	11.50	292.0	12	200	90.7
8	6.1	154.0	10.5	266.0	16.0	406.0	150	13.50	343	0.88	22	11.75	298.0	8	143	64.9
							300	15.00	381	1.00	25	13.00	330.0	12	200	90.7
							600	16.50	419	1.25	32	13.75	349.0	12	315	142.9

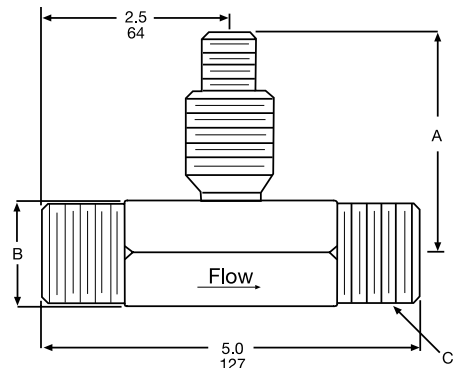
FLANGED TURBINE FLOWMETERS



Bolt on both ends, 1.2 in. (30 mm) diameter hole on sizes 6 through 8 flowmeters.

NPT TURBINE FLOWMETERS

82T4 NPT Threaded			
Line	A	B	C
1/2	2.8 70	1.3 32	1/2 NPT
1-1	2.9 73	1.5 38	1 NPT



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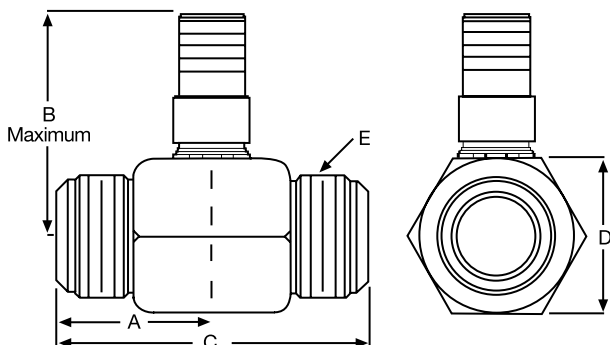
82 SERIES APPLICATION CHART

Process Liquid	Rate	Process Liquid	Rate	Process Liquid	Rate
Acetic Acid, to 100%, 49°C (120°F)	B	Ethyl Acetate	A	Nitrogen Tetroxide	B
Acetic Anhydride	B	Ethyl Alcohol	A	Nitric Acid 40%, 50°C (120°F)	
Acetone	A	Ethyl Chloride	B	80%, 25°C (75°F)	B
Acrylonitrile	A	Ethylene	B	Oil, Crude	A
Adiponitrile	A	Ethylene Glycol-100%	A	Oil, Hydraulic	A
Aerzine	A	Ethylene Oxide	B	Oil, Mineral	A
Alcohols	A	Formaldehyde	B	Oil, Motor	A
Alkylate	A	Freon (R11)	A	Oil, Vegetable	A
Amino Silanes	A	Freon (R113)	A	Olefins	A
Ammonia, Anhydrous	B	Freon (R12)	A	Oxygen, Liquid (LOX)	X
Ammonia, Aqueous	B	Freon (R114)	A	Pentane	A
Ammonium Hydroxide	A	Fuel Oil (SAE 2 to 6)	A	Platformate	A
Ammonium Nitrate	A	Gasoline	A	Propane, Liquid	A
Aviation Gasoline	A	Heptane	A	Propyl Alcohol	A
Beer	A	Hexane	A	Propylene	A
Benzene	A	Hydraulic Oil	A	Reformate	A
Boric Acid	B	Hydrazine	A	Salt Water	B
Brine	B	Isobutane	A	Styrene	A
Butadiene	B	Isopropanol	A	Sugar Syrup	B
Butane	A	Jet Fuel	A	Sulfur Dioxide	A
Butyl Alcohol	A	Kerosene	A	Tetaethyl Lead (TEL)	A
Butylenes	A	Liquefied Petroleum Gas (LPG)	A	Tetramethyl Lead	A
Calcium Stearate/CO ₂ Liquid	A	Lubricating Oil	A	Titanium Tetrachloride	B
Carbon Tetrachloride	B	Methane, Liquid	A	Toluene	A
Caustic - 50%	B	Methyl Alcohol	A	Turpentine	A
Chloroform (Dry)	B	Methyl Chloride	B	Vegetable Oil	A
Citric Acid	B	Methylene Chloride	B	Vinyl Chloride Monomer (1)	A
Crude Oil	A	Milk	A	Water, Demineralized	A
Diesel Fuels	A	Mineral Oil	A	Water, Fresh	A
D M T	A	Naptha	A	Water, Salt	A
Ethane	B	Nitrogen, Liquid	X	Xylenes	A

(1) The vinyl chloride monomer must be clean and strained.

AN (37° FLARED) TURBINE FLOWMETERS

82T3 Flared Tube					
Size	A	B	C	D	E
3/4-1	1.8 45	2.8 70	3.6 90	1.3 32	.975-14UNF
1-1	1.8 45	2.9 73	3.6 90	1.5 38	1.312-12UN



RATING CODE

- A = BEST CHOICE with the listed liquid.
- B = FREQUENTLY USED with the liquid, but some corrosion to be expected.
- X = NOT RECOMMENDED.

For more information, contact COX Instruments or your local COX Instruments representative.



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