



Proven Performance
for Over 50 Years

Precision Turbine Flow Meter—HP Series

FOR HIGH PRESSURE LABORATORY AND TESTING MEASUREMENTS

FEATURES

- High pressure applications
- High accuracy
- Wide flow range
- Fast response to rate changes
- Calibration traceable to NIST

DESCRIPTION

A flowmeter design with exceptionally wide application in the areas of testing and control. MS33514 fittings and a wide range of sizes meet the requirements of most high pressure applications.

With standard K factor (10:1 flow ratio) calibration, frequency output is linear to within $\pm 0.5\%$ over the entire flow range with liquids up to 1.26 centistokes viscosity. With special calibration $\pm 0.5\%$ linearity can be achieved at any one viscosity up to the linear viscosity limit shown in Table 3. At higher viscosities, output is non-linear, but repeatable.

Standard K ranges are available from 0.25-2.5 to 25-250 gpm, depending upon meter size.

K-Factor calibrations are available on MIL-C-7024C, Type 2 at 80°F only.

With 20-point loop calibrations (10 points upscale and 10 points down-scale) $\pm 0.5\%$ linearity, over the extended ranges shown in Table 3, is available on fluids where viscosity does not exceed 1.26 centistokes. Standard extended ranges are available from 0.25-3.0 to 6.2-300 gpm depending on meter size.

Performance Specifications	
Pressure Rating: Continuous Proof Burst	5000 psig 7500 psig 25,000+ psig
Turbine Meter Accuracy (% of reading)	$\pm 0.25\%$
Frequency Output (maximum)	1200 to 1500 Hz Standard
Output Signal (minimum)	10 millivolts
Response Time	2-3 ms or better



Precision Turbine Flow Meter—HP Series

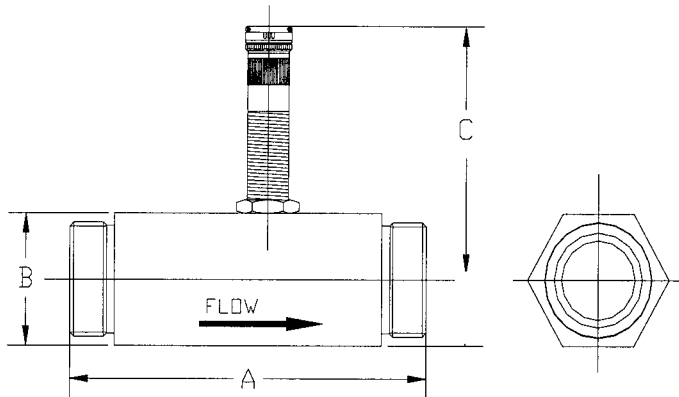


TABLE 2- Dimensions also apply to HPC Series meters.

Cox Model	A N	B C IN	Tube Size N (max)	(inches)
HP 8-4	3.25	1.625	4.35	1/2
HP 8-6	3.25	1.625	4.37	1/2
HP 8	3.50	1.625	4.45	1/2
HP 10	4.00	1.625	4.50	5/8
HP 12	4.50	1.625	4.56	3/4
HP 16	4.75	1.625	4.68	1
HP 20	5.50	1.875	4.92	1-1/4
HP 24	Contact Factory			1-1/2
HP 32	Contact Factory			2

ENGLISH UNITS

TABLE 3- With 20 Point Loop and standard K Factor Calibrations. Frequency output is linear over the entire flow range with liquids up to 1.26 centistokes. With 20 point calibration, output is linear at any one specific (calibrated) viscosity within the LINEAR VISCOSITY LIMIT shown. (Frequency output 120-1200 Hz)

Cox Model	K Range			Cycles/ Gallon (K Factor)	Extended Range†			
	Gallons/ minute	Pounds/ Hour	**Δp		Gallons/ minute	Pounds/ Hour	Freq. Output (Hz)	Flow Ratio
HP 8-4	0.25-2.5	95-950	3.5	28,800	0.25-3.0	95-1140	120/1440	1:12
HP 8-6	0.50-5.0	190-1900	4.5	14,400	0.50-6.0	190-2280	120/1440	1:12
HP 8	0.75-7.5	285-2850	6.0	9,600	0.60-9.0	230-3420	96/1440	1:15
HP 10	1.25-12.5	475-4750	5.0	5760	1.0-15	380-5700	96/1440	1:15
HP 12	2.5-25	950-9500	5.0	2880	1.5-30	570-11,400	72/1440	1:20
HP 16	5.0-50	1900-19,000	5.0	1440	2.5-60	950-22,800	60/1440	1:24
HP 20	7.5-75	2850-28,500	5.5	960	3.0-90	1140-34,200	48/1440	1:30
HP 24	12.5-125	4750-47,500	6.0	576	5.0-150	1900-57,000	48/1440	1:30
HP 32	25-250	9500-95,000	6.5	288	6.2-300	2375-114,000	30/1440	1:48

** Pressure drop in Table 3 based upon liquid, specific gravity 0.76 at 1200 Hz and PPH Ranges are based on MIL-C-7024C, Type 2 at 80°F.

† EXTENDED RANGE-With 20-point Calibration, frequency output is linear over entire range with liquids up to 1.26 centistokes. Over 2.0 centistokes output is non-linear but repeatable.

TABLE 4- For meter dimensions, see Table 2.

Cox Model	Linear Range†		Linear Flow Ratio	Repeatable Range		Repeatable Flow Ratio	Δp†	Freq. @ Max. Flow
	Gallons/ minute	Pounds/ Hour**		Gallon/ minute	Pounds/ Hour			
HPC 8-4	0.20-3.0	76-1,140	15-1	0.05-3.0	19-1,140	60-1	6.5	1500 Hz
HPC 8-6	0.30-6.0	114-2,280	20-1	0.06-6.0	23.5-2,280	100-1	8.5	
HPC 8	0.40-9.5	152-3,600	24-1	0.09-9.5	35.5-3,600		8.5	
HPC 10	0.50-15.5	190-5,900	30-1	0.16-15.5	59-5,900		9.0	
HPC 12	1.00-30	380-11,400	30-1	0.30-30	114-11,400	150-1	9.0	
HPC 16	1.60-65	610-24,700	40-1	0.45-65	170-24,700		9.0	
HPC 20	1.90-95	720-36,000	50-1	0.65-95	247-36,000	150-1	8.5	
HPC 24	2.60-155	990-59,000	60-1	1.05-155	400-59,000		9.0	
HPC 32	3.10-310	1,180-118,000	100-1	2.10-310	800-118,000		9.0	

** Based on Maximum Flow Condition (1500 Hz)

† Linearity and Repeatability is based on using a hydrocarbon fuel at one centistoke; not applicable to water.

Note 1. The Modulated Carrier Series requires signal conditioning.

Note 2. When ordering HP/HPC meters, please specify linear or non-linear (repeatable) calibration.

Precision Turbine Flow Meter—HP Series

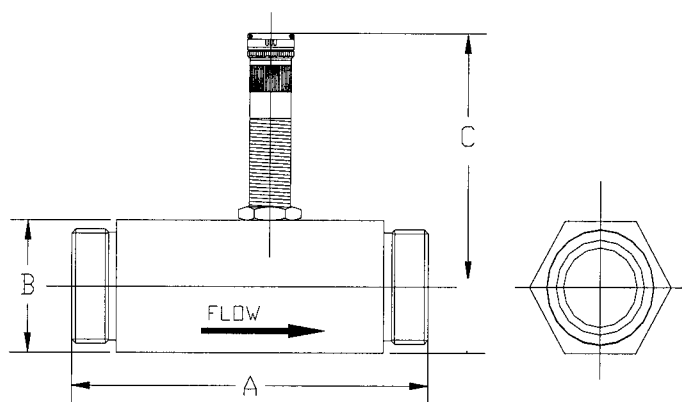


TABLE2 Dimensions also apply to HPC Series meters.

Cox Model	A MM	B C MM	Tube Size MM (max)	(inches)
HP 8-4	82.6	41.28	110.5	13
HP 8-6	82.6	41.28	111.0	13
HP 8	88.9	41.28	113.0	13
HP 10	101.6	41.28	114.3	16
HP 12	114.3	41.28	115.8	19
HP 16	120.7	41.28	118.9	25
HP 20	139.7	47.63	125.0	32
HP 24	Contact Factory			40
HP 32	Contact Factory			50

METRIC UNITS

TABLE3- With 20 Point Loop and standard K Factor Calibrations. Frequency output is linear over the entire flow range with liquids up to 1.26 centistokes. With 20 point calibration, output is linear at any one specific (calibrated) viscosity within the LINEAR VISCOSITY LIMIT shown. (Frequency output 120-1200 Hz)

Cox Model	K Range			Cycles/ liters (K Factor)	Extended Range†			
	Liters/ minute	Kilograms/ Hour	**Δp Kg/cm2		Liters/ minute	Kilograms/ Hour	Freq. Output (Hz)	Flow Ratio
HP 8-4	.946/9.46	43.1/431	.25	7610	.946/11.4	43.1/517	120/1440	1:12
HP 8-6	1.89/18.9	86.2/862	.32	3805	1.89/22.7	86.2/1034	120/1440	1:12
HP 8	2.84/28.4	129.3/1293	.42	2236	2.27/34.1	104/1551	96/1440	1:15
HP 10	4.731/47.3	216/2155	.35	2642	3.79/56.8	172.4/2586	96/1440	1:15
HP 12	9.462/94.6	431/4309	.35	761	5.68/114	259/5171	72/1440	1:20
HP 16	18.92/189	862/8618	.35	380	9.46/227	431/10,342	60/1440	1:24
HP 20	28.4/284	1293/12,927	.39	254	11.4/341	517/15,513	48/1440	1:30
HP 24	47.3/473	2155/21,546	.42	152	18.9/568	862/25,855	48/1440	1:30
HP 32	94.6/946	4309/43,091	.46	76.089	23.5/1136	1077/51,710	30/1440	1:48

** Pressure drop in Table 3 based upon liquid, specific gravity 0.76 at 1200 Hz and PPH Ranges are based on MIL-C-7024C, Type 2 at 80°F.

† EXTENDED RANGE- With 20-point Calibration, frequency output is linear over entire range with liquids up to 1.26 centistokes. Over 2.0 centistokes output is non-linear but repeatable.

TABLE4- For meter dimensions, see Table 2.

Cox Model	Linear Range†		Linear Flow Ratio	Repeatable Range Repeatable Δp†		Freq. @ Kg/ cm2	Max. Flow
	Liters/ minute	Kilograms/ Hour**		Liters/ minute	Kilograms/ Hour		
HPC 8-4	.757-11.4	34.5/517	15-1	.189/11.4	8.6/517	60-1	1500 Hz
HPC 8-6	1.14/22.7	51.7/1034.2	20-1	.227/22.7	10.7/1034	100-1	
HPC 8	1.51/36	68.9/1633	24-1	.341/36	16.1/1633		
HPC 10	1.89/59	86.2/2676	30-1	.605/59	26.7/2676		
HPC 12	3.79/114	172.4/5171	30-1	1.14/114	51.7/5171	150-1	
HPC 16	6.06/246	277/11,204	40-1	1.70/246	77.1/11,204		
HPC 20	7.19/360	327/16,329	50-1	2.46/360	112/16,330		
HPC 24	9.84/587	449/26,762	60-1	3.97/587	181/26,762		
HPC 32	11.7/1173	535/53,524	100-1	7.95/1173	363/53,524		

** Based on Maximum Flow Condition (1500 Hz)

† Linearity and Repeatability is based on using a hydrocarbon fuel at one centistoke; not applicable to water.

Note 1. The Modulated Carrier Series requires signal conditioning.

Note 2. When ordering HP/HPC meters, please specify linear or non-linear (repeatable) calibration.

Precision Turbine Flow Meter—HP Series

INSTALLATION

COX Turbine Flowmeters mount directly in the line and can be installed in any position without affecting performance.

To reduce flow turbulence, a straight section of tube approximately 10 diameters in length upstream of the flowmeter is recommended, and a similar section about 5 diameters downstream.

Where impractical due to space limitations, careful attention to location of valves, bends, etc., is suggested. (Flow straightener sections are available from COX Instrument). Upstream filtration (10 micron) is also helpful to extend bearing life and to prevent possible damage to the rotor, but is not an absolute necessity.

Electrical installation requires 2-conductor, shielded cable to the readout device.



*Proven Performance
for Over 50 Years*

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

15555 North 79th Place • Scottsdale, AZ 85260
tel: (480) 922-7446 • fax: (480) 948-3610
www.cox-instruments.com

©2007- Cox Instruments 090804