

BARTON 7000 Series Liquid Turbine Meters



Cameron's BARTON[®] 7000 series turbine meters are designed for a broad range of precise liquid measurement applications. Based on more than 40 years of turbine manufacturing experience, this built-to-order series features a range of sizes, materials, bearing systems, and options.

Features

- Linearity (BARTON Models 7100 and 7200)
 - $\pm 1\%$ of reading over flow range for meters smaller than 1-in.
 - $\pm 0.25\%$ of reading over flow range for meters 1 in. and larger
 - $\pm 0.15\%$ of reading over limited ranges (1 in. and larger meters contact factory for details)
- Linearity (BARTON Model 7300)
 - $\pm 0.25\%$ of reading over flow range
 - $\pm 0.15\%$ of reading over limited ranges (contact factory for details)
- Repeatability
 - $\pm 0.02\%$ of reading
- Symmetrical bi-directional design Ideal for reverse flow applications, where flow capacities are the same in either direction. Electronic options provide instantaneous flow direction sensing.
- High quality bearings Model 7100/7300 meters come standard with wear-resistant tungsten carbide sleeve bearings, and model 7200 meters are designed with self-lubricating, precision stainless steel bearings with dry lubricant impregnated ball separators.

Performance

The average K-factor for each turbine is determined by using water as the test media. Standard testing is performed with eight flow rates evenly distributed across the flow range and two repeatability points.

Meter linearity indicates that no data point will exceed the average of all the data points within the linear meter capacity.

To ensure accurate operation, the turbine meter should be installed in a straight length of pipe of the same diameter as the turbine meter, extending at least 10 diameters upstream and five diameters downstream.

Accessories

Cameron offers a broad range of accessories and companion electronics for use with the BARTON 7000 series turbine meter, including:

- Meter runs
- Pre-amplifiers
- Totalizers
- Flow computers
- Connectors and cables

Companion electronics can be supplied to meet explosion-proof or intrinsic safety requirements.

Contact your local Cameron sales representative for more information.

Model Selection Criteria

Use the following table to determine the correct model for a liquid application. For assistance with meter sizing for your application, contact your Cameron sales representative.

Meter Fluid Requirements	Model 7100	Model 7200	Model 7300 (High-Res Output)
Hydrocarbon measurement	x		x
Liquids with specific gravity < 0.5		x	
Liquids with viscosity < 0.5 cP		x	
Other liquids	x		
Process piping and fluids (free of solids)		x	
Solids likely in process piping and/or fluids			x
Meter sizes	3/8 in. to 8 in.	3/8 in. to 3 in.	4 in. to 12 in.
Bearing type	Tungsten carbide sleeve bearings	440C stainless ball bearings	Tungsten carbide sleeve bearings

7100 Model Selection

Model	Meter Size		Flow Range Linear Range (water)				Meter Output		
	Nominal		Minimum		Maximum		Nominal	Nominal	Maximum
	in.	mm	US GPM	m ³ /hr	US GPM	m ³ /hr	Pulses/gal.	Pulses x 1000/m ³	Frequency (Hz)
7183	3/8	10	.45	0.10	4	0.9	19,000	5020	1270
7184	1/2	15	0.88	0.20	8.2	1.8	13,400	3540	1790
7185	5/8	18	1.6	0.36	16	3.63	7700	2034	2050
7186	3/4	20	2.3	0.52	23	5.2	3380	893	1300
7101	1	25	5.0	1.14	50	11.4	1340	354	1117
7145	1-1/4	32	10	2.28	80	18.2	630	166	840
7146	1-1/2	40	13	3.0	130	29.5	405	107	878
7102	2	50	24	5.5	240	54.5	240	63.4	960
7125	2-1/2	65	44	10	440	100	115	30.4	845
7103	3	80	70	15.9	700	159	76	20.1	890
7104	4	100	105	24	1250	284	32	8.5	670
7106	6	150	250	57	2500	567.8	8.8	2.3	370
7108	8	200	540	122.4	5400	1226	3.6	0.95	324

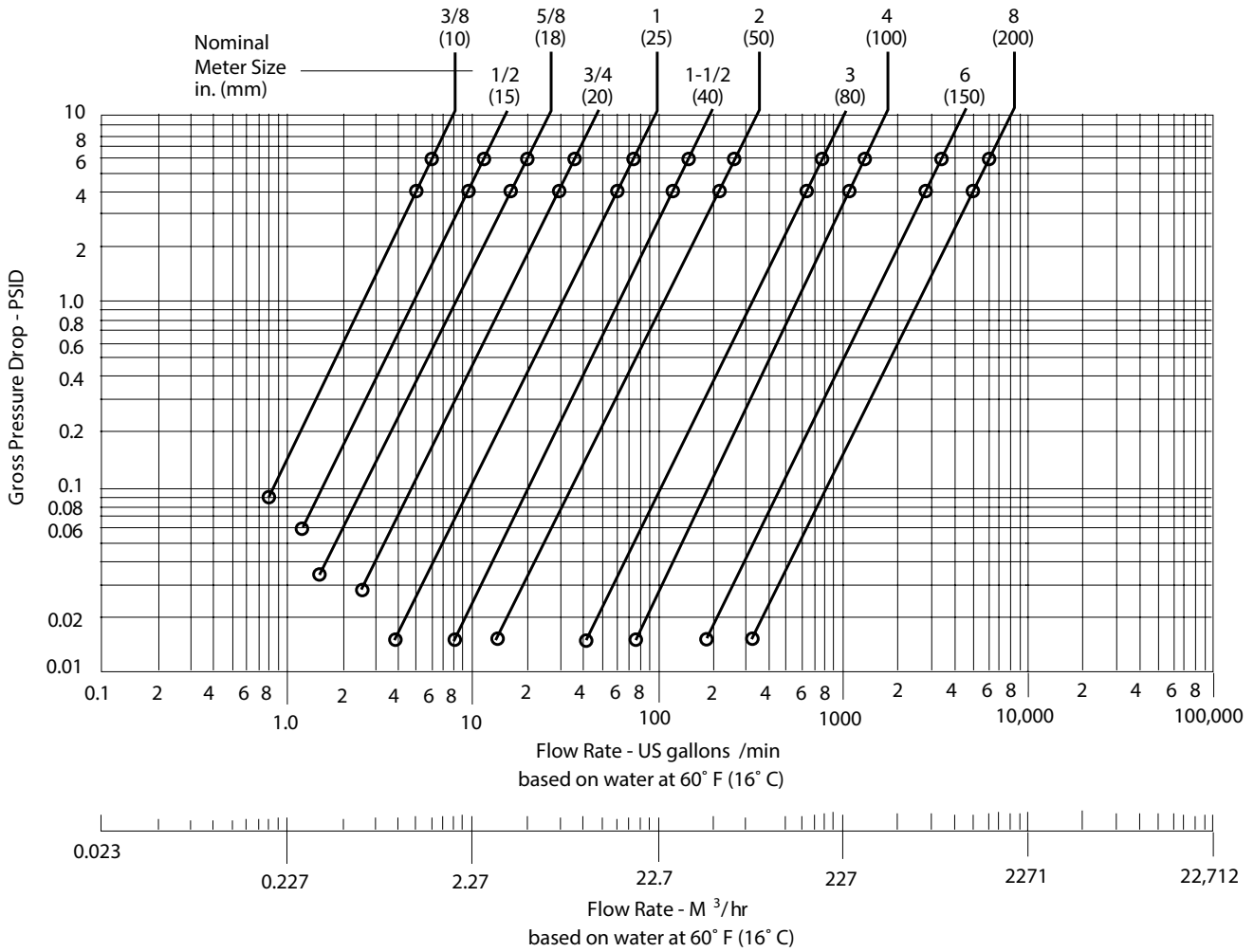
7200 Model Selection

Model	Meter Size		Flow Range Linear Range (water)				Meter Output		
	Nominal		Minimum		Maximum		Nominal	Nominal	Maximum
	in.	mm	US GPM	m ³ /hr	US GPM	m ³ /hr	Pulses/gal.	Pulses x 1000/m ³	Frequency (Hz)
7283	3/8	10	0.5	0.11	5	1.14	15,500	4095	1291
7284	1/2	15	1.0	0.23	10	2.27	10,500	2774	1750
7285	5/8	18	1.6	0.36	16	3.65	6400	1691	1706
7286	3/4	20	2.3	0.52	23	5.2	2700	713	1035
7201	1	25	5.0	1.14	50	11.4	1100	291	920
7245	1-1/4	32	6.0	1.4	90	20.4	510	135	765
7246	1-1/2	40	13	3.0	130	29.5	320	84.5	693
7202	2	50	24	5.5	240	54.5	190	50.2	760
7203	3	80	58	13	580	132	59	15.6	570

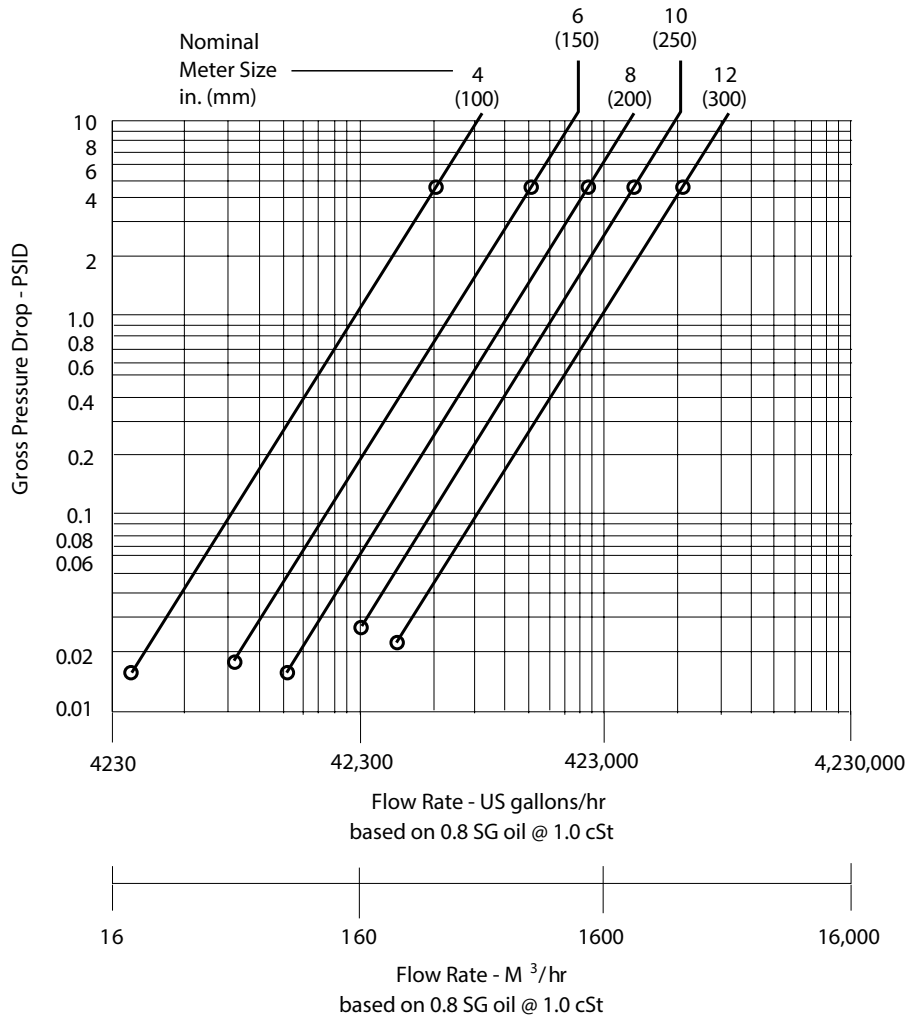
7300 Model Selection

Model	Meter Size		Flow Range Linear Range (water)				Meter Output		
	Nominal		Minimum		Maximum		Nominal	Nominal	Maximum
	in.	mm	US GPM	m ³ /hr	US GPM	m ³ /hr	Pulses/gal.	Pulses x 1000/m ³	Frequency (Hz)
7304	4	100	115	26	1150	260	66	17.4	1265
7306	6	150	250	57	2250	511	26	6.9	975
7308	8	200	540	123	5400	1226	15	4	1350
7310	10	250	800	182	8000	1817	7.8	2.1	1040
7312	12	300	1250	284	12500	2838	5.7	1.5	1190

7100/7200 Pressure Drop



7300 Pressure Drop



Specifications

Compliances	CSA certified for hazardous areas, Class I, Division I, Group B, C, D; Class II, E, F, G; Class III, NEMA 4 waterproof to NEC (USA) and CEC (Canadian) standards.			
	ATEX certified, EEx d IIC			
	Compliant with ANSI 12.27.01-2003 single seal requirements and manufactured to ASME B31.3 pressure requirements			
	Available with CE mark for Pressure Equipment Directive (PED, 97/23/CE). "CRN 0F10734.2C" compliant.			
Pressure Rating	Threaded Meters			
	Connection Size (in.)	psi	bar	mPa
	< 1	5000	345	34.5
	1	4400	303	30.3
	1-1/4	4000	276	27.6
	1-1/2	3200	220	22.1
	2	2650	183	18.3
Flanged Meters Flanged meter pressure ratings are based on ASME B16.5, DIN, or BS10 as applicable.				
End Connections	Flanged	ASME B16.5 (BS EN 1759), DIN (BS EN 1092), BS10		
	Threaded	Standard: NPT; Others available on request		
Conduit Connections (Magnetic Pickup)	3/4" MNPT (coil boss)	1 standard Additional coil boss available for meters 1" and above		
Materials	Rotor Blades ¹	Model 7100/7200	430 stainless steel	
		Model 7300	Shrouded 316 stainless steel with nickel bars	
	Bearings	Model 7100/7300	Tungsten carbide (sleeve type)	
		Model 7200	440C stainless steel, self-lubricating (ball type)	
	Body Flanges ¹	316 stainless steel		
Internals ¹	316 stainless steel			
Temperature Range ²	Model 7100/7300	-20° F to 300° F (-29° C to 148° C), standard -20° F to 450° F (-29° C to 232° C), optional		
	Model 7200	-20° F to 450° F (-29° C to 232° C), standard		
Pressure Drop	Model 7100/7200	See pressure drop curve on page 4.		
	Model 7300	See pressure drop curve on page 5.		
Linearity	Model 7100/7200	± 1% of reading over flow range of fractional size meters ± 0.25% of reading over flow range of meters 1" size and above ± 0.15% of reading over limited ranges (contact factory)		
	Model 7300	± 0.25% of reading over flow range of meters 4" size and above ± 0.15% of reading over limited ranges (contact factory)		
Repeatability	All Models	± 0.02 of reading		
Output	Type	Sine wave		
	Voltage	Varies with meter size and flow rate (typically 20 mV to 5 V, peak-to-peak)		
	Frequency	Proportional to flow		

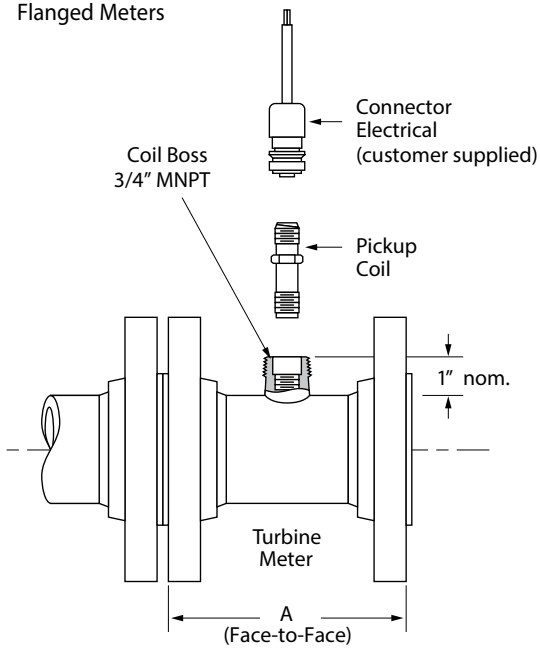
¹ Other materials are available on request.

² Observe the temperature rating of companion electronics where applicable. Use remote mount electronics with extensions to avoid temperature extremes. For information regarding higher or lower temperature ratings, contact your Cameron sales representative.

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Dimensions

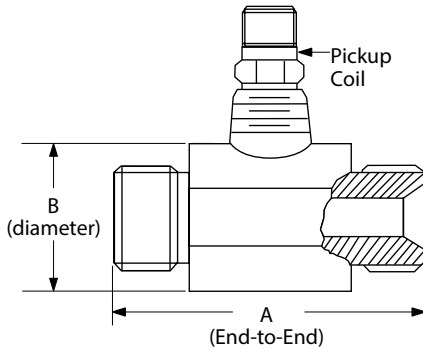
Flanged Meters



Flanged Meter Face-to-Face Dimensions (Dim. A)

Models	Up to 600 ASME		900 and 1500 ASME		2500 ASME	
	in.	mm	in.	mm	in.	mm
7183, 7283	5	127	7	178	7	178
7184, 7284	5	127	7	178	7	178
7185, 7285	5.5	140	7	178	7	178
7186, 7286	5.5	140	7	178	7	178
7101, 7201	5.5	140	8	203	8	203
7145, 7245	6	152	8	203	8	203
7146, 7246	6	152	9	229	9	229
7102, 7202	6.5	165	9	229	9	229
7125, 7225	7	178	10	254	10	254
7103, 7203	10	254	10	254	11	279
7104, 7304	12	305	12	305	12	305
7106, 7306	14	356	14	356	—	—
7108, 7308	16	406	—	—	—	—
7310	20	508	—	—	—	—
7312	24	610	—	—	—	—

Threaded Meters



Threaded Meter Dimensions

Models	Thread (NPT)	End to End (Dim. A)		Diameter (Dim. B)	
		in.	mm	in.	mm
7183, 7283	1/2	2.75	70	1.125	28.6
7184, 7284	1/2	2.75	70	1.125	28.6
7185, 7285	3/4	2.75	70	1.25	32
7186, 7286	3/4	3.25	83	1.44	36.6
7101, 7201	1	3.5	89	1.69	42.9
7145, 7245	1-1/4	3.88	99	2.38	60.5
7146, 7246	1-1/2	4.38	111	2.50	63.5
7102, 7202	2	4.75	121	3.00	76.2