Preso®
Differential Pressure Flow Meters

Ellipse® Pitot Tube Meter

Annular Threaded Steam Flow Meter

DESCRIPTION

The Preso ELLIPSE® Annular Threaded Steam Flow Meter is a multi-ported, self averaging differential pressure flow element for steam applications. The Ellipse flow meter is designed with a series of ports facing the upstream velocity pressures and flow sensing ports strategically located ahead of the trailing edge flow separation.

COMPONENTS

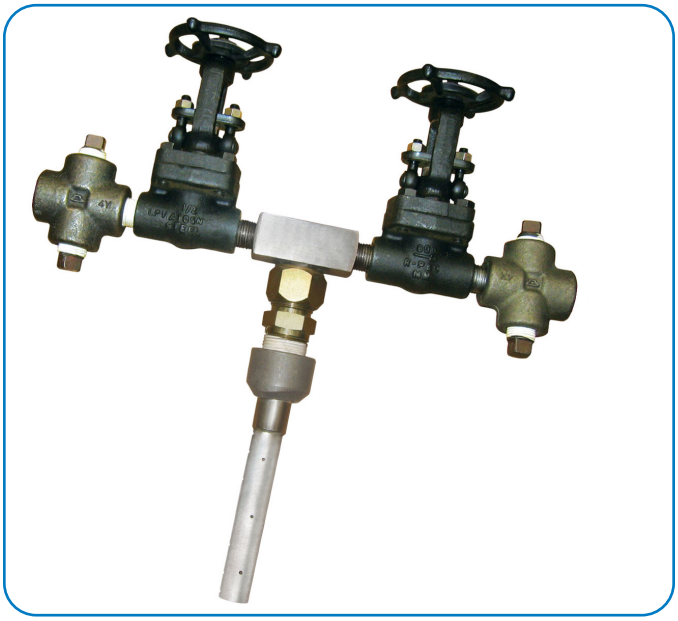
All sensors are furnished with 1/2 in. instrument gate valves (class 800), threaded cross tees, threaded weld fitting, compression fitting, and ID tag as standard equipment. Available options include integral 3-valve or 5-valve transmitter mount manifold and integral RTD temperature sensor.

FEATURES

- Patented elliptical design
- Single point pipe entry for DP, temperature and static pressure
- No dampening software required
- Low pressure loss (typically 3% of DP in a 12 in. (304 mm) line) due to the patented aerodynamic profile
- NIST traceable calibration, optional independent labs
- Accuracy: ±0.75% of reading, repeatability: ±0.1% of reading
- Turndown Ratio: 17:1; no vacuum effects
- No moving part construction provides long, trouble-free service life
- True static pressure measurement rather than a calculated value
- Overcomes loss of accuracy caused by fluid separation at the sensor body

CONFIGURATION

The flow element has a two-piece construction: an elliptical shape and two 100% independent flow sensing chambers. This construction prevents signal degradation and mixing, and does not require dampening hardware or software. The impact velocity sensing holes (high pressure) are located along the leading edge and the true static sensing holes (low pressure) are on the exterior probe side. This does not generate any vortices or vacuum effects that impinge on the static pressure measurement sensing area and has a drag coefficient of 0.32 or less. Each flow sensor is complete with instrument shutoff valves with provisions to accept a transmitter or direct indicating meter. An identification tag is supplied with specific flow station measurement information, as required.



MAXIMUM ALLOWABLE DP (INCHES OF WATER COLUMN)

Pipe Size	Single Support Probe Size (in.)		Double Support Probe Size (in.)	
	7/8	1-1/4	7/8	1-1/4
2 in. (50.80 mm)	880	—	2380	—
2-1/2 in. (63.50 mm)	525	—	1558	—
3 in. (76.20 mm)	396	—	1283	—
3-1/2 in. (88.90 mm)	283	—	1117	—
4 in. (101.60 mm)	197	—	980	—
5 in. (127.00 mm)	153	—	757	—
6 in. (152.40 mm)	126	—	669	—
8 in. (203.20 mm)	114	360	512	—
10 in. (254.80 mm)	100	240	315	960
12 in. (304.80 mm)	87	175	250	700
14 in. (355.60 mm)	53	147	195	585
16 in. (406.40 mm)	—	113	—	450
18 in. (457.20 mm)	—	90	—	360
20 in. (508.00 mm)	—	74	—	295
24 in. (609.60 mm)	—	68	—	270
26 in. (660.40 mm)	—	50	—	215
30 in. (762.00 mm)	—	34	—	155
32 in. (812.80 mm)	—	—	—	—
36 in. (914.40 mm)	—	—	—	—
42 in. (1066.80 mm)	—	—	—	—

Badger Meter

PTT-DS-00777-EN-05 (August 2021)

Product Data Sheet

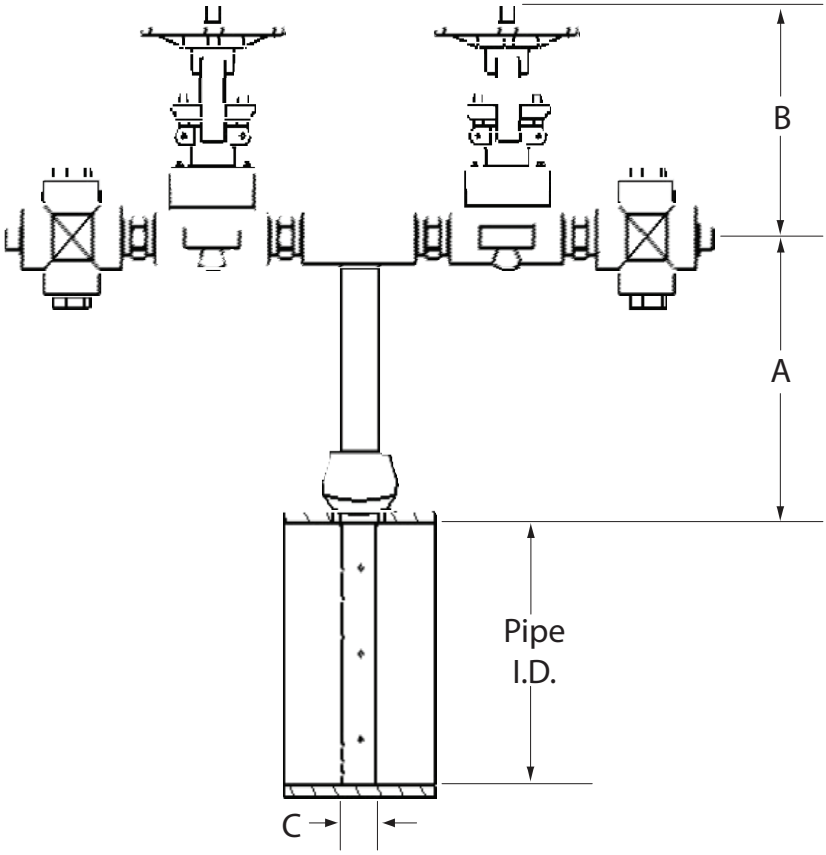
SPECIFICATIONS

Applications	Steam
Pipe Size	2…48 in. (50…1220 mm)
Pressure	600 PSI (4100 kPa) max.
Temperature	480 F (250 C) max.
Accuracy	±0.75% of reading
Repeatability	±0.1%
Turndown Ratio	17:1 with no vacuum effect
Reynolds Number	>75,000: Maintains most accurate flow measurements <75,000: Consult factory for estimated results
Resonance	If greater than 0.8, use double support per ASME PTC 19.3

STANDARD COMPONENTS

Component	**Specifications**
Head	T-type
Connection	316 SS 1/4 in. or 1/2 in. FNPT
Compression Fitting	CS with SS ferrule
Weld Fitting	CS 3000 lb. — ASTM A105
Ellipse Sensor	316/316L SS
ID Tag	SS with wire

DIMENSIONS



	Probe Length		Probe Width
	A	**B**	**C**
AS	6.63 in. (168.28 mm)	5.81 in. (147.65 mm)	0.87 in. (22.23 mm)
AS1	6.75 in. (171.45 mm)	5.81 in. (147.65 mm)	1.25 in. (31.75 mm)

PART NUMBER CONSTRUCTION

Ellipse®
Annular Threaded Steam
7/8 in. DIAMETER

PAS - [ ][ ][ ][ ][ ][ ][ ][ ][ ]

PIPE SIZE

2 in.	A
2-1/2 in.	B
3 in.	C
3-1/2 in.	D
4 in.	E
5 in.	F
6 in.	G
8 in.	H
10 in.	I
12 in.	J
14 in.	K

SCHEDULE

STD	A
20	B
30	C
40	D
60	E
80	F
100	G
120	H
140	I
160	J
XH	K
XXH	L
5S	M
10S	N
40S	O
80S	P

PIPE ORIENTATION

Horizontal	A
Vertical	B

PROBE MATERIAL

316/316L SS	1
Monel®	2
Inconel®	3
Hastelloy®	4
Other	X

INSTRUMENT CONNECTION

1/2 in. NPT	A
1/2 in. Socket	B
TT3 (Integral 3-Valve Trans Mount - Max Temp 225° F)	C
TT5 (Integral 5-Valve Trans Mount - Max Temp 225° F)	D
(RTD is not available with Integral 5-Valve Manifold. If RTD is required, select "E" Transmitter Flange Connection and the appropriate manifold valve under the Instrument Valve section below.)	
Transmitter Flange Connection	E

CONNECTION

CS Compression Fitting w/SS Ferrule	A
SS Compression Fitting w/SS Ferrule	B

PIPE MOUNTING

A105 CS 3000#	1
316/316L SS 3000#	2
A105 CS 3000# w/Double Support	3
316/316L SS 3000# w/Double Support	4
Not Required	Z

INSTRUMENT VALVE

1/2 in. Gate CS w/Cross	A
1/2 in. Gate SS w/Cross	B
Not Required	Z
ONLY AVAILABLE WITH OPTION "E" UNDER INSTRUMENT CONNECTION	
Flg x Flg 3-Valve Manifold CS - Max Temp 225° F	E
Flg x Flg 3-Valve Manifold SS - Max Temp 225° F	F
Flg x Flg 5-Valve Manifold CS - Max Temp 225° F	G
Flg x Flg 5-Valve Manifold SS - Max Temp 225° F	H
Customer Supplied Valve Manifold	I

RTD (Max Temp 480° F, consult factory for higher temp options)

100 Ohm RTD 3-Wire w/Explosion Proof Head	1
100 Ohm RTD 3-Wire, Integral w/Aluminum Head	2
Not Required	Z

Stainless Steel ID Tag supplied as standard.
Tag information must be included with order.

NOTE: Make sure that DP and Resonance are withing acceptable limits. (See chart in the Ellipse Brochure)

Ellipse®
Annular Threaded Steam
1-1/4 in. DIAMETER

PAS1 - [ ][ ][ ][ ][ ][ ][ ][ ][ ]

PIPE SIZE									
12 in.	J								
14 in.	K								
16 in.	L								
18 in.	M								
20 in.	N								
24 in.	O								
30 in.	P								
36 in.	Q								
42 in.	R								
48 in.	S								
SCHEDULE									
STD		A							
20		B							
30		C							
40		D							
60		E							
80		F							
100		G							
120		H							
140		I							
160		J							
XH		K							
XXH		L							
5S		M							
10S		N							
40S		O							
80S		P							
PIPE ORIENTATION									
Horizontal			A						
Vertical			B						
PROBE MATERIAL									
316/316L SS				1					
Monel®				2					
Inconel®				3					
Hastelloy®				4					
Other				X					
INSTRUMENT CONNECTION									
1/2 in. NPT					A				
1/2 in. Socket					B				
TT3 (Integral 3-Valve Trans Mount - Max Temp 225° F)					C				
TT5 (Integral 5-Valve Trans Mount - Max Temp 225° F)					D				
(RTD is not available with Integral 5-Valve Manifold. If RTD is required, select "E" Transmitter Flange Connection and the appropriate manifold valve under the Instrument Valve section below.)									
Transmitter Flange Connection					E				
CONNECTION									
CS Compression Fitting w/SS Ferrule						A			
SS Compression Fitting w/SS Ferrule						B			
PIPE MOUNTING									
A105 CS 3000#							1		
316/316L SS 3000#							2		
A105 CS 3000# w/Double Support							3		
316/316L SS 3000# w/Double Support							4		
Not Required							Z		
INSTRUMENT VALVE									
1/2 in. Gate CS w/Cross								A	
1/2 in. Gate SS w/Cross								B	
Not Required								Z	
ONLY AVAILABLE WITH OPTION "E" UNDER INSTRUMENT CONNECTION									
Flg x Flg 3-Valve Manifold CS - Max Temp 225° F								E	
Flg x Flg 3-Valve Manifold SS - Max Temp 225° F								F	
Flg x Flg 5-Valve Manifold CS - Max Temp 225° F								G	
Flg x Flg 5-Valve Manifold SS - Max Temp 225° F								H	
Customer Supplied Valve Manifold								I	
RTD (Max Temp 480° F, consult factory for higher temp options)									
100 Ohm RTD 3-Wire w/Explosion Proof Head									1
100 Ohm RTD 3-Wire, Integral w/Aluminum Head									2
Not Required									Z

Stainless Steel ID Tag supplied as standard.
Tag information must be included with order.

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Control. Manage. Optimize.

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