

DESCRIPTION

The Ellipse® Annular Low Pressure Wet Tap Flow Meter is a multi-ported, self-averaging differential pressure flow element for liquid (without system shutdown), air and gas 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 valves, threaded weld fitting, threaded ball valve, threaded cage nipple, threaded 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

- 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)
- Accuracy: $\pm 0.75\%$ of reading, repeatability: $\pm 0.1\%$ 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 shut off valves with provisions to accept a transmitter or direct indicating meter. An identification tag is supplied with specific flow station measurement information as required.



SPECIFICATIONS

Applications	Liquid (without system shutdown), air, gas
Pipe Sizes	2...48 inches (50... 1220 mm)
Pressure	150 psi (1034 kPa) maximum
Temperature	150° F (66° C) maximum
Accuracy	$\pm 0.75\%$ of reading
Repeatability	$\pm 0.1\%$
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.

STANDARD COMPONENTS

Component	Specifications
Head	T-type
Connection	316 SS 1/4 in. or 1/2 in. FNPT
Compression Fitting	CS with SS ferrule
Isolation Ball Valves	316 SS, NPT
Reducer Coupling	CD
Weld Fitting	CS 3000 lb, ASTM A105
Nipples	CS, schedule 40
Ellipse Sensor	316 SS
ID Tag	316 SS with wire
Instrument Valves	2 per sensor, 1/4 in. or 1/2 in., CS

7/8 in. DIAMETER

PAHR -

<u>PIPE SIZE</u>		
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	
16 in.	L	
18 in.	M	
20 in.	N	
24 in.	O	
30 in.	P	
36 in.	Q	
<u>SCHEDULE</u>		
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	
<u>PIPE ORIENTATION</u>		
Horizontal	A	
Vertical	B	
<u>PROBE MATERIAL</u>		
316/316L SS	1	
Monel®	2	
Inconel®	3	
Hastelloy®	4	
Other	X	
<u>INSTRUMENT CONNECTION</u>		
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	
<u>CONNECTION</u>		
CS Compression Fitting w/SS Ferrule	A	
SS Compression Fitting w/SS Ferrule	B	
<u>INSERTION MECHANISM</u>		
CS Nipple & SS Isolation Valve	A	
SS Cage Nipple & SS Isolation Valve	B	
Other	X	
<u>PIPE MOUNTING*</u>		
A105 CS 3000#	1	
316/316L SS 3000#	2	
Not Required	Z	
<u>INSTRUMENT VALVE</u>		
1/2 in. Needle CS	A	
1/2 in. Needle SS	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	
<u>RTD (Max Temp 480° F, consult factory for higher temp options)</u>		
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 within acceptable limits. (See chart in the Ellipse Brochure)
*Double Supports are not recommended for Hot Tap / Wet Tap models.

Ellipse®

Annular Low Pressure Wet Tap
1-1/4 in. DIAMETER

PAHR1

PIPE SIZE

12 in.
14 in.
16 in.
18 in.
20 in.
24 in.
30 in.
36 in.
42 in.
48 in.
60 in.
72 in.

J
K
L
M
N
O
P
Q
R
S
T
U

SCHEDULE

STD
20
30
40
60
80
100
120
140
160
XH
XXH
5S
10S
40S
80S

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

PIPE ORIENTATION

Horizontal
Vertical

A
B

PROBE MATERIAL

316/316L SS
Monel®
Inconel®
Hastelloy®
Other

1
2
3
4
X

INSTRUMENT CONNECTION

1/2 in. NPT
1/2 in. Socket
TT3 (Integral 3-Valve Trans Mount - Max Temp 225° F)
TT5 (Integral 5-Valve Trans Mount - Max Temp 225° F)
(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

A
B
C
D
E

CONNECTION

CS Compression Fitting w/SS Ferrule
SS Compression Fitting w/SS Ferrule

A
B

INSERTION MECHANISM

CS Nipple & SS Isolation Valve
SS Cage Nipple & SS Isolation Valve
Other

A
B
X

PIPE MOUNTING*

A105 CS 3000#
316/316L SS 3000#
Not Required

1
2
Z

INSTRUMENT VALVE

1/2 in. Needle CS
1/2 in. Needle SS
1/2 in. Gate CS
1/2 in. Gate SS
Not Required
ONLY AVAILABLE WITH OPTION "E" UNDER INSTRUMENT CONNECTION
Fig x Flg 3-Valve Manifold CS - Max Temp 225° F
Fig x Flg 3-Valve Manifold SS - Max Temp 225° F
Fig x Flg 5-Valve Manifold CS - Max Temp 225° F
Fig x Flg 5-Valve Manifold SS - Max Temp 225° F
Customer Supplied Valve Manifold

A
B
C
D
Z
E
F
G
H
I

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

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

1
2
Z

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

NOTE: Make sure that DP and Resonance are within acceptable limits. (See chart in the Ellipse Brochure)
*Double Supports are not recommended for Hot Tap / Wet Tap models.

Control. Manage. Optimize.

Preso and Ellipse are registered trademarks of Badger Meter, Inc. Other trademarks appearing in this document are the property of their respective entities. Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists. © 2021 Badger Meter, Inc. All rights reserved.

www.badgermeter.com