

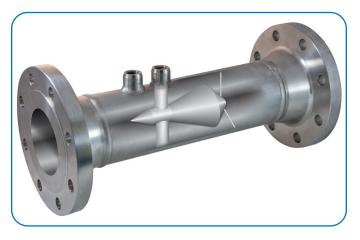
# **Differential Pressure Meter**

## DESCRIPTION

The Preso Cone Differential Pressure Flow Meter has a cone-shaped element which shapes the flow profile ahead of the differential pressure (DP) measurement port without impacting the flow against a sharp surface, creating an extremely stable signal for measurement with minimal wear on the cone edge.

#### **BENEFITS**

- Precise accuracy and repeatability
- Cost effective
- Wide variety of fluids
- Little or no straight run piping requirements
- No additional flow conditioning devices needed
- Low maintenance and long life
- No moving parts
- Wide flow range
- Low head loss



#### **OPERATING PRINCIPLE**

The Preso Cone differential pressure meter utilizes the center element to straighten the flow and create an ideal dynamic which allows differential pressure technology to be used in a unique way providing extensive flexibility in a wide variety of applications.

#### **SPECIFICATIONS**

Applications	Liquids, steam, air and industrial	gases				
	Wafer	14 in. (25102 mm)				
Dine Sizes	Threaded and Socket Weld	1/22 in. (1251 mm)				
Pipe Sizes	Flanged Mount	124 in. (25609 mm)				
	Butt Weld	1/224 in. (12609 mm)				
Repeatability	± 0.1% or better					
Flow Range	10:1 and greater					
Accuracy	$\pm$ 0.5% of actual flow					
Standard Beta Ratio	0.400.80 (special betas availab	le)				
Permanent Pressure Loss	Varies with beta ratio and DP					
Installation Piping Requirements	Typically 03 diameters upstrea in the adjacent pipeline	m and 01 diameters downstream of the cone are required, depending on fittings or valves				
<b>Construction Materials</b>	304/304L, 316/316L stainless stee	el, A106 carbon steel, other materials on request				
End Fittings	Threaded (NPT), flange, wafer, so other end connections on reque					
Approvals	CRN					



**Product Data Sheet** 

#### **PART NUMBER CONSTRUCTION**

# Flanged – 316/316L

FLANGED	1						Next Page
<u>PIPE SIZE</u>							
1 in.	С						
1-1/4 in.	D						
1-1/2 in.	E						
2 in. 2-1/2 in.	F G						
3 in.	H						
4 in.	1						
5 in.	J						
6 in.	К						
8 in.	L						
10 in.	M N						
12 in. 14 in.	0						
16 in.	P						
Other	X						
PIPE SCHEDULE		4					
Standard**		Α					
10		В					
20		C					
30 40		D E					
60		F					
80		G					
100		н					
120		J					
140		K					
160		L					
XH XXH		M N					
55		0					
40S		P					
80S		Q					
Other		Х					
BODY / ELEMENT MATERIAL			2				
316/316L body-316/316L element Other			2 X				
PROCESS CONNECTION			Λ	1			
RF flange 150#				А			
RF flange 300#				В			
RF flange 600#				С			
RF flange 900#				D			
Other				Х			
INSTRUMENT CONNECTION					-		
2 in. RF flange 150# (2 in. and up)					А		
2 in. RF flange 300# (2 in. and up)					В		
2 in. RF flange 600# (2 in. and up)					С		
3 in. RF flange 150# (3 in. and up)					D		
3 in. RF flange 300# (3 in. and up)					E		
3 in. RF flange 600# (3 in. and up)					F		
3 in. RF flange 600# (3 in. and up) 3 in. RF flange 900# (3 in. and up)					G		
					н		
1/4 in. NPT (13 in. NPS)					1		
1/2 in. NPT (3 in. and up)							
1/2 in. socket weld					J		
Other					Х	J	
<u>BETA RATIO</u>							
0.4						4	
0.5						5	
0.6						6	
0.7						7	
0.8						8	
Other						х	1

Continued from Previous Page				
		1		
INSTRUMENT VALVE				
1/4 in. Needle valve CS A		Í		
1/2 in. Needle valve CS B		Í		
1/4 in. Needle valve SS C		Í		
1/2 in. Needle valve SS D 1/2 in. Gate w/cross CS (steam) E		Í		
		Í		
		Í		
-		Í		
Not Required Z CALIBRATION				
Factory Calibration 1		Í		
Special Calibration* 2		Í		
Not Required Z		Í		
TRANSMITTER MOUNTING				
None Z		Í		
Remote Mount 1		Í		
Mounting Bracket 2				
Three Valve Manifold 3				
Five Valve Manifold 4		Í		
Other X		Í		
CERTIFICATIONS	1	Í		
None	Z	Í		
Tracable Material Certifications	1	Í		
NACE MR0-103	2	Í		
NACE MR0-175	3	Í		
Items 1 and 2	4	Í		
Items 1 and 3	5	Í		
Other	Х	Í		
STANDARD NDE TESTING				
None		Ζ		
Hydrostatic Test Only (1/212 in. NPS 150# to 900# flange Others CF)		1		
5% Radiography of Butt Welds		2		
100% Radiography of Butt Welds		3		
5% Magnetic particle/dye penetrant		4		
100% magnetic particle/dye penetrant		5		
Items 2 and 4 (1/212 in. NPSOthers CF)		6		
Items 3 and 4 (1/212 in. NPSOthers CF)		7		
Items 3 and 5 (1/212 in. NPSOthers CF)		8		
Other		Х		
Note: Items 2-8 also include hydrostatic testing				
Other NDE Testing				
None			Z	
100% visual inspection with report			1	
PMI			2	
Post-Weld Hardness testing			3	
Items 1 and 2			4	
Items 1 and 3			5	
Other			Х	
Note on Item 1: 100% visual inspection occurs on all product.				
This is a request for the report.				J
Hardcoating				Z
None Tungsten Carbide (WC) on wedge				2 1
Tungsten Carbide (WC) on wedge				
Tungsten Carbide (WC) on center 1/3 of meter				2 3
Chromium Carbodo (CrC) on wodza				
Chromium Carbode (CrC) on wedge				
Chromium Carbode (CrC) on wedge Chromium Carbode (CrC) on center 1/3 of meter Other				4 X

### Flanged – Carbon Steel

ĺ	PGF -			1				Continued o
Carbon Steel								Next Page
FLANGED								
PIPE SIZE								
1 in.		С						
1-1/4 in.		D						
1-1/2 in.		E						
2 in.		F						
2-1/2 in.		G						
3 in.		н						
4 in.		I						
5 in.		J						
6 in.		K						
8 in.		L						
10 in.		М						
12 in.		N						
14 in.		Ö						
		P						
16 in.								
Other		Х	J					
PIPE SCHEDULE						1		
Standard**			Α			1		
10			В					
20			С					
30			D					
40			Е					
60			F					
80			G					
			H					
100								
120			J					
140			K					
160			L					
XH			М					
XXH			Ν					
5S			0					
40S			Р					
80S			Q					
Other			x					
BODY / ELEMENT MATERIAL			~					
CS body-316/316L element				1				
				X				
Other				X	l			
PROCESS CONNECTION								
RF flange 150#					А			
RF flange 300#					В	1		
RF flange 600#					С			
RF flange 900#					D	1		
Other					Х			
INSTRUMENT CONNECTION						-		
2 in. RF flange 150# (2 in. a	nd up)					Α		
2 in. RF flange 300# (2 in. a						В		
2 in. RF flange 600# (2 in. a						Ċ		
3 in. RF flange 150# (3 in. a						D		
3 in. RF flange 300# (3 in. a						E		
3 in. RF flange 600# (3 in. a						F		
						г G		
3 in. RF flange 900# (3 in. a	na up)							
1/4 in. NPT (13 in. NPS)						н		
1/2 in. NPT (3 in. and up)						I		
1/2 in. socket weld						J		
Other						Х		
<u>BETA RATIO</u>								
0.4							4	
0.5							5	
0.6							6	
0.7							7	
0.8							8	
Other							Х	

	Continued from Previous Page							
		_						
INSTRUMENT VALVE								
1/4 in. Needle valve CS		А						
1/2 in. Needle valve CS		В						
1/4 in. Needle valve SS		С						
1/2 in. Needle valve SS		D						
1/2 in. Gate w/cross CS (steam)		E						
1/2 in. Gate w/cross SS (steam)		F						
Other		Х						
Not Required		Z						
<u>CALIBRATION</u>								
Factory Calibration			1					
Special Calibration*			2					
Not Required			Z	l				
TRANSMITTER MOUNTING								
None				Z				
Remote Mount				1				
Mounting Bracket				2				
Three Valve Manifold				3				
Five Valve Manifold				4				
Other				Х	l			
CERTIFICATIONS					_			
None					Z			
Tracable Material Certificatio	ns				1			
NACE MR0-103					2			
NACE MR0-175					3			
Items 1 and 2					4			
Items 1 and 3					5			
Other					Х			
STANDARD NDE TESTING						7		
None		man Oth	ore CI	-\		Z		
Hydrostatic Test Only (1/21		ingeOth	iers Cr	-)		1 2		
5% Radiography of Butt Weld								
100% Radiography of Butt We						3		
5% Magnetic particle/dye per						4 5		
100% magnetic particle/dye p	Denetrant							
Items 2 and 4 Items 3 and 4						6 7		
Items 3 and 5						8 X		
Other Note: Items 2-8 also include	hydrostatic testing					^		
	nyurostatic testing						J	
<u>Other NDE Testing</u> None							Z	
100% visual inspection with r	enort						1	
PMI (stainless steel only)	-port						2	
Post-Weld Hardness testing (	Carbon Steel Only)						2	
Items 1 and 2	Sarbon Steer Only						2	
Other							X	
Hardcoating							Λ	1
None								7
Tungsten Carbide (WC) on we	døe							1
								2
	nter 1/3 of motor							
Tungsten Carbide (WC) on ce								
	vedge							3

#### Flanged – 304/304L

304/304L Body - 316/316L Element	PGF -			3				Continued Next Page
FLANGED		J			I			
PIPE SIZE								
1 in.		С						
1-1/4 in.		D						
1-1/2 in.		Е						
2 in.		F						
2-1/2 in.		G						
3 in.		н						
4 in.		I						
5 in.		J						
6 in.		K						
8 in.		L						
10 in.		М						
12 in.		Ν						
14 in.		0						
16 in.		P						
Other		X						
		~						
<u>PIPE SCHEDULE</u>								
Standard**			A					
10			В					
20			С					
30			D					
40			Е					
60			F					
80			G					
100			H					
120			J					
140			Κ					
160			L					
XH			М					
XXH			Ν					
5S			0					
40S			Ρ					
80S			Q					
Other			x					
BODY / ELEMENT MATERIAL			Λ					
304L/304L body - 316/316L element				3				
Other				x				
PROCESS CONNECTION				~	1			
RF flange 150#					А			
RF flange 300#					B			
RF flange 600#					C			
					_			
RF flange 900# Other					D			
Other					Х	T		
<u>INSTRUMENT CONNECTION</u> 2 in. RF flange 150# (2 in. and up)								
						A		
2 in. RF flange 300# (2 in. and up)						B		
2 in. RF flange 600# (2 in. and up)						С		
3 in. RF flange 150# (3 in. and up)						D		
3 in. RF flange 300# (3 in. and up)						E		
3 in. RF flange 600# (3 in. and up)						F		
3 in. RF flange 900# (3 in. and up)						G		
1/4 in. NPT (13 in. NPS)						Н		
1/2 in. NPT (3 in. and up)						I		
1/2 in. socket weld						J		
Other						Х		
BETA RATIO							-	
0.4							4	
0.5							5	
0.6							6	
0.7							7	
0.8							8	
Other							x	

Continued from							
Previous Page						·	
	l I						
INSTRUMENT VALVE							
1/4 in. Needle valve CS	A						
1/2 in. Needle valve CS	В						
1/4 in. Needle valve SS	č						
1/2 in. Needle valve SS	D						
1/2 in. Gate w/cross CS (steam)	E						
1/2 in. Gate w/cross SS (steam)	F						
Other	X						
Not Required	z						
CALIBRATION							
Factory Calibration		1					
Special Calibration*		2					
Not Required		Ζ					
TRANSMITTER MOUNTING			•				
None			0				
Remote Mount			1				
Mounting Bracket			2				
Three Valve Manifold			3				
Five Valve Manifold			4				
Other			Х				
CERTIFICATIONS				_			
None				0			
Tracable Material Certifications				1			
NACE MR0-103				2			
NACE MR0-175				3			
Items 1 and 2				4			
Items 1 and 3				5			
Other				Х			
STANDARD NDE TESTING					0		
None					0		
Hydrostatic Test Only					1 2		
5% Radiography of Butt Welds							
100% Radiography of Butt Welds					3 4		
5% Magnetic particle/dye penetrant							
100% magnetic particle/dye penetrant Items 2 and 4					5 6		
Items 3 and 4					0 7		
					8		
Items 3 and 5 Other					× X		
Note: Items 2-8 also include hydrosta	tic tost	ina			~		
Other NDE Testing	tic test	ыıя				l	
None						0	
100% visual inspection with report						1	
PMI (stainless steel only)						2	
Post-Weld Hardness testing (Carbon St	teel On	lv)				2	
Items 1 and 2		• • • •				3	
Other						X	
Note on Item 1: 100% visual inspection	n occur	s on a	all pro	duct		~	
This is a request for the report.		5 511 0					
Hardcoating							•
None							0
Tungsten Carbide (WC) on wedge							1
Tungsten Carbide (WC) on center 1/3 d	of mete	er					2
Chromium Carbode (CrC) on wedge							3
Chromium Carbode (CrC) on center 1/3	3 of me	eter					4
Other	_						X

\*Standard calibration is performed at Badger Meter with five data points (0.5 percent accuracy) \*\* Pipe schedule "Standard" is schedule 40 up to 10" and 3.75" wall at 12" and larger.

#### **Wafer Mount**

	V310L Eler	nent	PGW -							Next Page
16/316L Body - 316 /AFER MOUNT						. <u> </u>	1			Next Page
PIPE SIZE				_						
1 in.	С	150#	1	С	1					
1 in.	c	300#		c	2					
1 in.	c	600#		c	3					
1 in.	c	900/1500#		c	4					
					4 1					
1-1/4 in.	D	150#		D						
1-1/4 in.	D	300#		D	2					
1-1/4 in.	D	600#		D	3					
1-1/4 in.	D	900/1500#		D	4					
1-1/2 in.	E	150#		E	1					
1-1/2 in.	Е	300#		E	2					
1-1/2 in.	E	600#		E	3					
1-1/2 in.	E	900/1500#		E	4					
2 in.	F	150#		F	1					
2 in.	F	300#		F	2					
2 in.	F	600#		F	3					
2 in.	F	900/1500#		F	4					
2-1/2 in.	G	150#		G	1					
2-1/2 in.	G	300#		G	2					
2-1/2 in.	G	600#		G	3					
2-1/2 in.	G	900/1500#		G	4					
3 in.	н	150#		н	1					
3 in.	н	300#		н	2					
3 in.	н	600#		н	3					
3 in.	н	900#		н	4					
3 in.	н	1500#		н	5					
4 in.	1	150#		1	1					
4 in.	i	300#		i	2					
4 in.	i	600#		i	3					
4 in.	i	900#		i	4					
4 in.	i	1500#		i	5					
Other	<u> </u>	10001		x	x					
SCHEDULE				Λ	~	1				
Standard**						А				
10						В				
20						C				
30						D				
40						E				
120						J				
160						L				
XH										
XH XXH						M				
5S						N O				
40S 80S						P				
						Q				
Other	T 1/ / T					Х	l			
BODY / ELEMEN							4			
CS body-316/3							1			
316/316L body							2			
304L/304L bo	dy - 316/3 <i>°</i>	16L element					3			
Other							Х	l		
NSTRUMENT CO								. /		
1/4 in. NPT (1								Н		
1/2 in. NPT (3		)						I		
1/2 in. socket	weld							J		
Other								Х		
<u>BETA RATIO</u>										
0.4									4	
0.5									5	
0.6									6	
0.7									7	
0.8									8	
									Х	

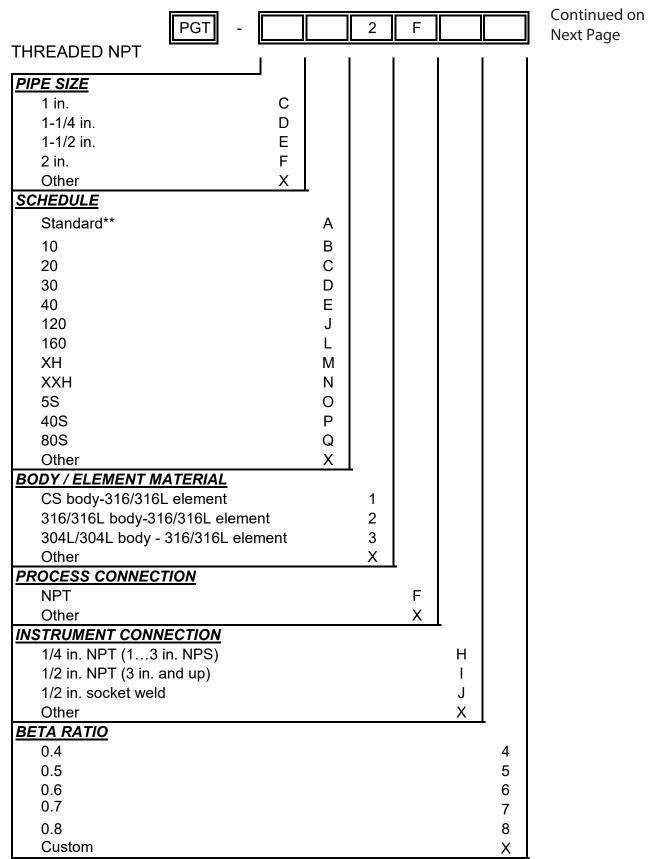
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	1	1	1
INSTRUMENT VALVE			
1/4 in. Needle valve CS A 1/2 in. Needle valve CS B			
1/4 in. Needle valve CS C			
1/2 in. Needle valve SS D			
1/2 in. Gate w/cross CS (steam) E			
1/2 in. Gate w/cross SS (steam) F			
Other X			
Not Required Z			
CALIBRATION			
Factory Calibration 1			
Special Calibration* 2			
Not Required Z			
TRANSMITTER MOUNTING			
None Z			
Remote Mount 1			
Mounting Bracket 2 Three Valve Manifold 3			
Five Valve Manifold 4 Other X			
CERTIFICATIONS			
None Z			
Tracable Material Certifications			
NACE MR0-103 2			
NACE MR0-175 3			
Items 1 and 2 4			
Items 1 and 3 5			
Other X			
STANDARD NDE TESTING	-		
None	Z		
Hydrostatic Test Only	1		
5% Radiography of Butt Welds	2		
100% Radiography of Butt Welds	3		
5% Magnetic particle/dye penetrant	4		
100% magnetic particle/dye penetrant	5		
Items 2 and 4 Items 3 and 4	6		
Items 3 and 4	7 8		
Other	o X		
Note: Items 2-8 also include hydrostatic testing	^		
Other NDE Testing		1	
None		Z	
100% visual inspection with report		1	
PMI (stainless steel only)		2	
Post-Weld Hardness testing (Carbon Steel Only)		2	
Items 1 and 2		3	
Other		Х	
Hardcoating			-
None			Ζ
Tungsten Carbide (WC) on wedge			1
Tungsten Carbide (WC) on center 1/3 of meter			2
Chromium Carbode (CrC) on wedge			3
Chromium Carbode (CrC) on center 1/3 of meter			4
Other			Х

## **Socket Weld Mount**

PIPE SIZE         1 in.       C         1-1/4 in.       D         1-1/2 in.       E         2 in.       F         Other       X         SCHEDULE       A         Standard**       A         10       B         20       C         30       D         40       E         120       J         160       L         XH       M         XSS       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         304L304L body-316/316L element       2         304L304L body-316/316L element       3         Other       X         PROCESS CONNECTION       K         Socket Weld       G         Other       X         I/2 in. NPT (3 in. and up)       1         1/2 in. socket weld       J         Other       X         BETA RATIO       X         0.4       4         0.5       5         0.6	SOCKET WELD MOUNT			2	G			Continued on Next Page
1 in.       C         1-1/4 in.       D         1-1/2 in.       E         2 in.       F         Other       X         SCHEDULE       Standard**         Standard**       A         10       B         20       C         30       D         40       E         120       J         160       L         XH       M         XXH       N         5S       O         403       P         800S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body-316/316L element       3         Other       X         PROCESS CONNECTION       K         Socket Weld       G         Other       X         I/1/in.NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       X         0.4       4         0.5       5		·	1		1	1		Hextruge
1 in.       C         1-1/4 in.       D         1-1/2 in.       E         2 in.       F         Other       X         SCHEDULE       Standard**         Standard**       A         10       B         20       C         30       D         40       E         120       J         160       L         XH       M         XXH       N         5S       O         403       P         800S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body-316/316L element       3         Other       X         PROCESS CONNECTION       K         Socket Weld       G         Other       X         I/1/in.NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       X         0.4       4         0.5       5								
1-1/4 in.       D         1-1/2 in.       E         2 in.       F         Other       X         SCHEDULE       X         Standard**       A         10       B         20       C         30       D         40       E         120       J         160       L         XH       M         XXH       N         5S       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       C         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       H         Socket Weld       G         Other       X         I/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       6         0.7       7         0.8       8		C						
1-1/2 in.       E         2 in.       F         Other       X         ScHEDULE       Standard**         Standard**       A         10       B         20       C         30       C         40       E         120       J         160       L         XH       M         XXH       N         5S       O         40S       P         80S       Q         Other       X         BODY/ELEMENT MATERIAL       C         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body-316/316L element       3         Other       X         PROCESS CONNECTION       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (3 in. and up)       I         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8								
2 in.       F         Other       X         SCHEDULE								
Other         X           SCHEDULE								
SCHEDULE           Standard**         A           10         B           20         C           30         D           40         E           120         J           160         L           XH         M           XXH         N           5S         O           40S         P           80S         Q           Other         X           BODY/ELEMENT MATERIAL         1           CS body-316/316L element         1           316/316L body-316/316L element         2           304L/304L body - 316/316L element         3           Other         X           PROCESS CONNECTION         G           Socket Weld         G           Other         X           INSTRUMENT CONNECTION         I           1/2 in. NPT (13 in. NPS)         H           1/2 in. socket weld         J           Other         X           BETA RATIO         J           0.4         4           0.5         6           0.7         7           0.8         8								
Standard**       A         10       B         20       C         30       D         40       E         120       J         160       L         XH       M         XH       M         XXH       N         5S       O         40S       P         80S       Q         Other       X         BODY/ELEMENT MATERIAL       CS body-316/316L element         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       H         Socket Weld       G         Other       X         I/X in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       J         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8		Λ	J					
20       C			А					
20       C	10		В					
30       D         40       E         120       J         160       L         XH       M         XXH       N         5S       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         I/4 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       J         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8								
120       J         160       L         XH       M         XXH       N         SS       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body-316/316L element       3         Other       X         PROCESS CONNECTION       K         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8								
160       L         XH       M         XXH       N         SS       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.5       5         0.6       6         0.7       7         0.8       8			Е					
XH       M       M         XXH       N       N         5S       O         40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       I         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/4 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       J         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	120		J					
XXH       N       N         5S       O       P         40S       P       Image: Constraint of the system of the syste	160		L					
5S       O       P         40S       P         80S       Q         Other       X         BODY/ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	ХН		Μ					
40S       P         80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	ХХН		Ν					
80S       Q         Other       X         BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body - 316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.5       5         0.6       6         0.7       7         0.8       8	5S		0					
Other         X           BODY / ELEMENT MATERIAL CS body-316/316L element         1           316/316L body-316/316L element         2           304L/304L body - 316/316L element         3           Other         X           PROCESS CONNECTION Socket Weld         G           Other         X           INSTRUMENT CONNECTION 1/4 in. NPT (13 in. NPS)         H           1/2 in. Socket weld         J           Other         X           BETA RATIO         4           0.4         4           0.5         5           0.6         6           0.7         7           0.8         8	40S		Р					
BODY / ELEMENT MATERIAL       1         CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/2 in. NPT (13 in. NPS)       H         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.5       6         0.7       7         0.8       8	80S		Q					
CS body-316/316L element       1         316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/4 in. NPT (13 in. NPS)       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.5       5         0.6       6         0.7       7         0.8       8	Other		Х					
316/316L body-316/316L element       2         304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/4 in. NPT (13 in. NPS)       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	BODY / ELEMENT MATERIAL							
304L/304L body - 316/316L element       3         Other       X         PROCESS CONNECTION       G         Socket Weld       G         Other       X         INSTRUMENT CONNECTION       H         1/4 in. NPT (13 in. NPS)       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	CS body-316/316L element			1				
OtherXPROCESS CONNECTION Socket WeldGSocket WeldGOtherXINSTRUMENT CONNECTION 1/4 in. NPT (13 in. NPS)H1/2 in. NPT (3 in. and up)I1/2 in. NPT (3 in. and up)I1/2 in. socket weldJOtherXBETA RATIO40.440.550.660.770.88	316/316L body-316/316L element			2				
PROCESS CONNECTION           Socket Weld         G           Other         X           INSTRUMENT CONNECTION         H           1/4 in. NPT (13 in. NPS)         H           1/2 in. NPT (3 in. and up)         I           1/2 in. socket weld         J           Other         X           BETA RATIO         4           0.4         4           0.5         5           0.6         6           0.7         7           0.8         8	304L/304L body - 316/316L element			3				
Socket Weld         G           Other         X           INSTRUMENT CONNECTION         H           1/4 in. NPT (13 in. NPS)         H           1/2 in. NPT (3 in. and up)         I           1/2 in. socket weld         J           Other         X           BETA RATIO         4           0.4         4           0.5         5           0.6         6           0.7         7           0.8         8	Other			Х				
Other         X           INSTRUMENT CONNECTION         H           1/4 in. NPT (13 in. NPS)         H           1/2 in. NPT (3 in. and up)         I           1/2 in. socket weld         J           Other         X           BETA RATIO         4           0.4         4           0.5         5           0.6         6           0.7         7           0.8         8	PROCESS CONNECTION				_			
INSTRUMENT CONNECTION         1/4 in. NPT (13 in. NPS)       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	Socket Weld				G			
1/4 in. NPT (13 in. NPS)       H         1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	Other				Х			
1/2 in. NPT (3 in. and up)       I         1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	INSTRUMENT CONNECTION							
1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	1/4 in. NPT (1…3 in. NPS)					Н		
1/2 in. socket weld       J         Other       X         BETA RATIO       4         0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	1/2 in. NPT (3 in. and up)					I		
BETA RATIO           0.4         4           0.5         5           0.6         6           0.7         7           0.8         8						J		
0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	Other					Х		
0.4       4         0.5       5         0.6       6         0.7       7         0.8       8	BETA RATIO						•	
0.6 0.7 0.8 6 7 8							4	
0.7 7 0.8 8	0.5						5	
0.7 7 0.8 8	0.6						6	
	0.8						8	
							X	

Continued from Previous Page			
		· <u> </u>	
INSTRUMENT VALVE         1/4 in. Needle valve CS       A         1/4 in. Needle valve SS       C         Other       X         Not Required       Z			
CALIBRATION         Factory Calibration       1         Special Calibration*       2         Not Required       Z         TRANSMITTER MOUNTING			
NoneZRemote Mount1Mounting Bracket2Three Valve Manifold3Five Valve Manifold4OtherX			
CERTIFICATIONSNoneZTracable Material Certifications1NACE MR0-1032NACE MR0-1753Items 1 and 24Items 1 and 35OtherX			
STANDARD NDE TESTING None Hydrostatic Test Only 5% Radiography of Butt Welds 100% Radiography of Butt Welds 5% Magnetic particle/dye penetrant 100% magnetic particle/dye penetrant Items 2 and 4 Items 3 and 4 Items 3 and 5 Other Note: Items 2-8 also include hydrostatic testing	Z 1 2 3 4 5 6 7 8 X		
Other NDE TestingNone100% visual inspection with reportPMI (stainless steel only)Post-Weld Hardness testing (Carbon Steel Only)Items 1 and 2Other		Z 1 2 3 X	
Hardcoating None Tungsten Carbide (WC) on wedge Tungsten Carbide (WC) on center 1/3 of meter Chromium Carbode (CrC) on wedge Chromium Carbode (CrC) on center 1/3 of meter Other			Z 1 2 3 4 X

# **Threaded NPT**



Continued from		1		
Previous Page				
	I.	1	I .	
INSTRUMENT VALVE				
1/4 in. Needle valve CS A				
1/4 in. Needle valve CS C				
Other X				
Not Required Z CALIBRATION				
Factory Calibration 1				
-				
TRANSMITTER MOUNTING None Z				
Remote Mount 1				
Mounting Bracket 2 Three Value Manifold		1		
Three Valve Manifold 3		1		
Five Valve Manifold 4		1		
Other X				
CERTIFICATIONS	_			
None	Z			
Tracable Material Certifications	1			
NACE MR0-103	2			
NACE MR0-175	3			
Items 1 and 2	4			
Items 1 and 3	5			
Other	Х			
STANDARD NDE TESTING				
None		Z		
Hydrostatic Test Only		1		
5% Radiography of Butt Welds		2		
100% Radiography of Butt Welds		3		
5% Magnetic particle/dye penetrant		4		
100% magnetic particle/dye penetrant		5		
Items 2 and 4		6		
Items 3 and 4		7		
Items 3 and 5		8		
Other		Х		
Note: Items 2-8 also include hydrostatic testi	ng			
Other NDE Testing			•	
None			Ζ	
100% visual inspection with report			1	
PMI (stainless steel only)			2	
Post-Weld Hardness testing (Carbon Steel Only	y)		2	
Items 1 and 2			3	
Other			X	
Hardcoating				
None				Ζ
Tungsten Carbide (WC) on wedge				1
Tungsten Carbide (WC) on center 1/3 of meter	-			2
Chromium Carbode (CrC) on wedge				3
Chromium Carbode (CrC) on center 1/3 of met	ter			4
Other				X
				~

#### **Butt Weld**

	PGB	-		2	E			Continued or
BUTT WELD MOUNT						1	1	Next Page
PIPE SIZE								
<u>1 in.</u>		С						
1-1/4 in.		D						
1-1/2 in.		E						
2 in.		F						
2-1/2 in.		G						
3 in.		н						
4 in. 5 in.		l J						
5 m. 6 in.		K						
8 in.		L						
10 in.		M						
12 in.		Ν						
14 in.		0						
16 in.		Р						
Other		Х						
PIPE SCHEDULE Standard**			^					
10			A B					
20			C					
30			D					
40			E					
60			F					
80			G					
100			Н					
120			J					
140			K					
160 XH			L M					
XXH			N					
58			0					
40S			P					
80S			Q					
Other			Х					
BODY / ELEMENT MATE								
CS body-316/316L ele				1				
316/316L body-316/31 304L/304L body - 316	16L element /316L elemen	t		2				
Other				3 X				
PROCESS CONNECTION	N			Λ	1			
Butt Weld	-				Е			
Other					Х			
INSTRUMENT CONNECT						-		
2 in. RF flange 150# (2						А		
2 in. RF flange 300# (2						В		
2 in. RF flange 600# (2						С		
3 in. RF flange 150# (3 3 in. RF flange 300# (3	3 in. and up)					D E		
3 in. RF flange 600# (						F		
3 in. RF flange 900# (						G		
1/4 in. NPT (13 in. N						Ĥ		
1/2 in. NPT (3 in. and						I		
1/2 in. socket weld						J		
Other						Х		
<u>BETA RATIO</u>								
0.4 0.5							4	
0.6							5 6	
							ю 7	
07							1	I
0.7 0.8							8	

	Continued from	י דייין		·				·
	Previous Page							
	5	i i					1	1
1/2 in. Gate w. Other Not Required CALIBRATION Factory Calibra Special Calibra Not Required TRANSMITTER M None Remote Mou Mounting Br Three Valve M Other CERTIFICATION None	ALVE valve CS valve CS valve SS valve SS /cross CS (steam) /cross SS (steam) /cross	A B C D E F X Z	1 2 Z	Z 1 2 3 4 X	Z 1 2 3 4 5 X			
100% Radiog 5% Magnetic 100% magnet Items 2 and 4 Items 3 and 4 Items 3 and 5 Other Note: Items <i>Other NDE Testin</i> None 100% visual i PMI (stainles Post-Weld H	Test Only phy of Butt Welds graphy of Butt Welds particle/dye pene etic particle/dye pene tic particle/dye pene 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	etrant enetrant <b>aydrostat</b> port		-		Z 1 2 3 4 5 6 7 8 X	Z 1 2 2	
Items 1 and 2 Other	2						3 X	
Hardcoating								1
None Tungsten Ca Tungsten Ca Chromium C	rbide (WC) on wec rbide (WC) on cent arbode (CrC) on w arbode (CrC) on ce	ter 1/3 o edge						Z 1 2 3 4 X

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