

FPD470 Wedge flowmeter

Differential pressure – primary flow element

Robust, reliable, high performance flow solutions for difficult applications, slurries and high viscosity liquid

Measurement made easy



Symmetrical robust element for long-term accuracy

- no sharp edge to wear
- handles slurries and high solids content
- capable of bi-directional flow

Accurate performance down to Reynolds number 500

- 0.5 % calibrated accuracy
- large potential flow range
- ideally suited to measurement of viscous liquids

Minimum upstream / downstream straight pipe needed

- handles non-ideal installations

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Overview

WEDGE™ flow elements utilize V-shaped restrictions to produce a square root relationship between differential pressure and volumetric flow. Elements are designed for either clean or dirty service and are offered in various materials, pipe sizes, and pressure ratings. The differential pressure is measured by a differential pressure transmitter. Various process connections on the WEDGE are provided for either pneumatic or electronic transmitters or other differential pressure sensing devices. Wedge meters can be flow calibrated and supplied with a factory calibration report, this includes calculations for the user's process when such data is supplied. The differential pressure measurement is used to calculate flow using a standard wedge flow equation.

The flow element consists of a body and wedge flow restriction. This restriction creates a differential pressure in proportion to the square of the volumetric flow rate. The wedge restriction has no critical surface dimensions, or sharp edges, to affect measurement accuracy as the result of normally expected wear.

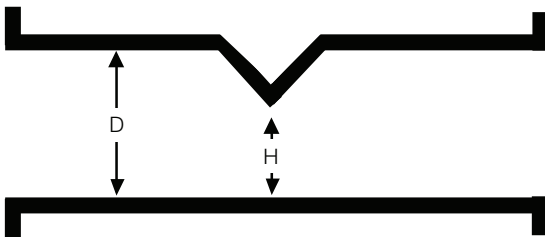


Fig. 1: Primary flow element – restriction schematic

Primary flow element types

Flanged transmitter connections (model FPD470F)



Chemical-tee transmitter connections (model FPD470C)



Pipe-tap transmitter connections (model FPD470P)



Performance specification

Transmitter connections

Connection to the transmitter can be selectable from a range.

FPD470F

2 or 3 in. RF flange (SCH 80 I.D.)

FPD470C

Chemical-tee type – 8-hole mounting pattern

FPD470P

1/2, 3/8, 1/4 in. NPT

WEDGE element standard H/D ratios – see Fig. 1, page 2

This H/D ratio equals the height of the opening under restriction divided by the internal pipe diameter:

0.2, 0.3, 0.4, 0.5, 0.6, 0.7 (restrictions per model code)

Pipe size (in.)	Wedge ratio (H/D)	Accuracy in % of flow rate	
		Calibrated	Un-calibrated
1/2	0.2, 0.3, 0.4, 0.5	0.75 %	+5 %
1 and 1 1/2	0.2, 0.3, 0.4, 0.5	0.5 %	+5 %
2 and 3	0.2, 0.3, 0.4, 0.5	0.5 %	+5 %
4 to 20	0.3, 0.4, 0.5, 0.6, 0.7	0.5 %	+5 %

*Water calibrated in factory flow lab –

refer to calibration report supplied with each calibrated instrument

Table 1: H/D ratios

To determine H/D ratio and differential pressure, refer to SolveDp sizing software.

Process flange connection

- ANSI Class 150 raised face
- ANSI Class 300 raised face
- ANSI Class 600 raised face

(contact ABB for additional end flange ratings)

Process end connection

ABB offers a wide range of process end connections including ANSI and DIN flanges.

Internal bore

A range of schedules and wall thicknesses are available to suit specific requirements, these should be selected to ensure the meter is suitable for the design temperature and pressure. The most typical schedule for a WEDGE is schedule 80.

Flange style

- Standard weight pipe is the same as Schedule 40 on 100 to 250 mm (4 to 10 in.) size
 - Standard weight wall is 9.5 mm (0.375 in.) on 300 to 600 mm (12 to 24 in.) pipe size
 - Standard weight not available on 3 in. and smaller
 - X-Strong wall pipe is the same as Schedule 80 on 15 to 200 mm (0.5 to 8 in.) size
 - X-Strong wall is 12.7 mm (0.5 in.) on 250 to 600 mm (10 to 24 in.) pipe size
- (contact ABB for information on additional pipe schedules)

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Materials of construction

Process wetted parts

Standard materials of construction are carbon steels and 316 SST but ABB is able to offer over 30 different materials. Below are examples of a few different available materials:

- 25 % Cr Super Duplex (UNS S32750)
- C276 Alloy (UNS N010276)
- 347H stainless steel

Welding

Pressure retaining welds are completed following the Section IX code and also meet the PED specifications. World-renowned suppliers are used to ensure quality and assurance of welding processes and welding consumable certificates show the mechanical capabilities as well as full traceability of each batch.

Chemical-tee gasket material

Supplied with FPD470C chemical-tee version

Up to 340 °C (645 °F) graphite.

Sealability per ASTM F37A (1/32) 0.50 ml/hr
(part no.155S1043 for 2 gasket kit)

Pressure Equipment Directive (PED)

Wedgemeters can fall under the pressure equipment directive, if this option is selected ABB will perform the calculations per PED Module H and if it falls under the CATII or CATIII classification will create a technical file to facilitate the request.

Physical specification

Accuracy

Calibrated

25 mm (1 in.) or larger: ± 0.5 % of actual flow when operated within the calibrated range

15 mm ($1/2$ in.): ± 0.75 % of actual flow when operated within the calibrated range

Un-calibrated

± 5.0 % of actual flow when using nominal K_d^2 from sizing program. Applies to bi-directional flow

Bi-directional

Same as above when K_d^2 designated as reverse flow coefficient

Repeatability

± 0.2 %

Temperature and pressure rating

The temperature and pressure rating is dependent on line schedule, materials of construction and process or tapping connection rating.

Chemical-tee instrument connection

FPD470C chemical-tee is 300 psi max. or the end flange rating per ANSI B16.5, whichever is lower

Flanged instrument connection

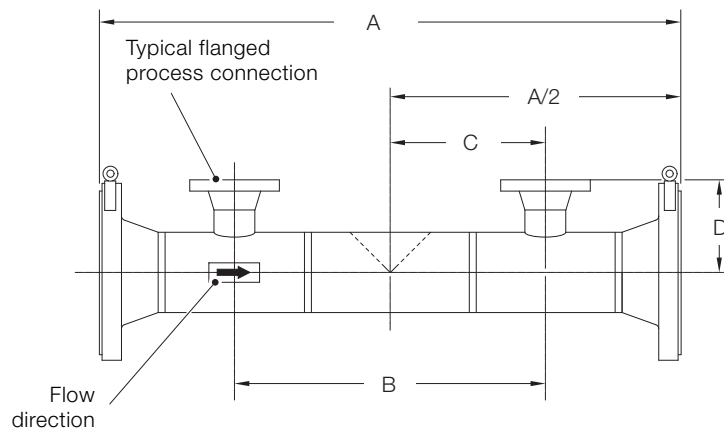
MWP is per ANSI B16.5

Pipe-tap connection

MWP is per ANSI B16.5

Dimensions and weights

Series FPD470F with flanged tapplings and RFWN end flanges
Sizes 40, 50 and 80 mm (1½, 2 and 3 in.)

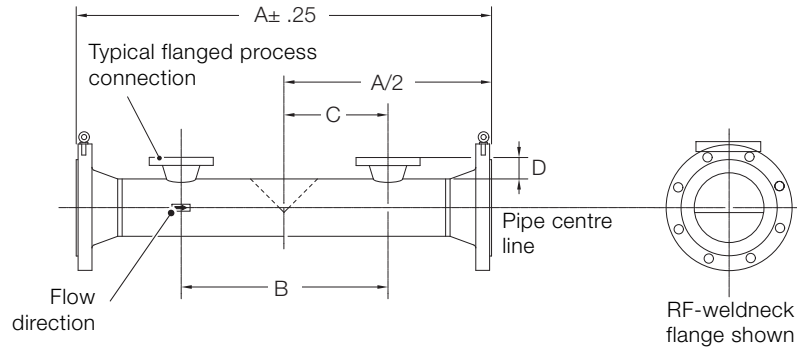


Pipe size mm (in.)	A ±4.58 mm (±0.18 in.)			B	C	D mm (in.)			Approximate weight kg (lbs.)		
	Flange rating					Flange rating			Flange rating		
	150	300	600			150	300	600	150	300	600
40 (1½)	530 (20.86)	543 (21.37)	559 (22)	292 (11.5)	146 (5.75)	207 (8.18)	214 (8.43)	212 (8.37)	25 (55)	28 (61)	32 (71)
50 (2)	546 (21.5)	559 (22)	577 (22.75)	292 (11.5)	146 (5.75)	216 (8.5)	222 (8.75)	231 (9.12)	28 (62)	32 (70)	38 (84)
80 (3)	645 (24.5)	641 (25.25)	660 (26)	311 (12.25)	155 (6.13)	155 (6.13)	166 (6.56)	175 (6.88)	35 (78)	42 (92)	46 (102)

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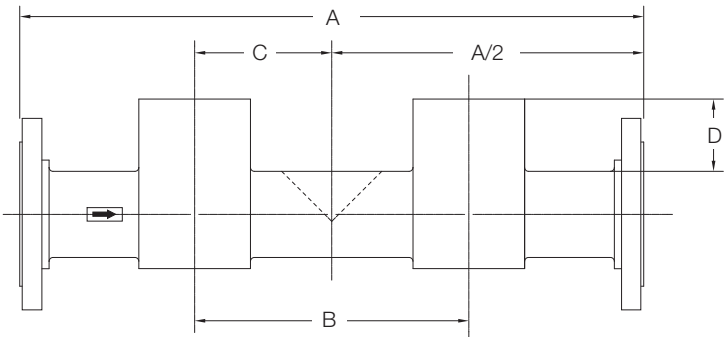
Differential pressure – primary flow element

Sizes 100 to 600 mm (4 to 24 in.)



Pipe size mm (in.)	A ±6.35 mm (±0.25 in.)			B	C	D max (ref) mm (in.)			Approximate weight kg (lbs.)		
	Flange rating					Flange rating			Flange rating		
	150	300	600			150	300	600	150	300	600
100 (4)	901 (35.5)	920 (36.25)	990 (39)	381 (15)	190 (7.5)	70 (2.75)	79 (3.12)	89 (3.5)	61 (135)	68 (150)	79 (175)
150 (6)	1028 (40.5)	1047 (41.25)	1098 (43.25)	457 (18)	228 (9)	70 (2.75)	79 (3.12)	89 (3.5)	73 (160)	95 (210)	122 (270)
200 (8)	1092 (43)	1111 (43.75)	1168 (46)	521 (20.5)	260 (10.25)	70 (2.75)	79 (3.12)	89 (3.5)	95 (210)	120 (265)	166 (365)
250 (10)	1143 (45)	1174 (46.25)	1257 (49.5)	597 (23.5)	298 (11.75)	70 (2.75)	79 (3.12)	89 (3.5)	122 (270)	156 (345)	238 (525)
300 (12)	1321 (52)	1352 (53.25)	1416 (55.75)	673 (26.5)	336 (13.25)	70 (2.75)	79 (3.12)	89 (3.5)	159 (350)	181 (400)	
350 (14)	1397 (55)	1428 (56.25)	1485 (58.5)	736 (29)	356 (14)	70 (2.75)	79 (3.12)	89 (3.5)	186 (410)	277 (610)	
400 (16)	1473 (58)	1511 (59.5)	1587 (62.5)	775 (30.5)	387 (15.25)	70 (2.75)	79 (3.12)	89 (3.5)	227 (500)	342 (755)	
450 (18)	1574 (62)	1613 (63.5)	1676 (66 00)	851 (33.5)	413 (16.75)	70 (2.75)	79 (3.12)	89 (3.5)	227 (500)	395 (870)	
500 (20)	1686 (66.37)	1720 (67.75)	1790 (70.5)	940 (37)	470 (18.5)	70 (2.75)	79 (3.12)	89 (3.5)	318 (700)	499 (1100)	
600 (24)	1854 (73)	1886 (74.25)	1968 (77.5)	1066 (42)	533 (21)	70 (2.75)	79 (3.12)	89 (3.5)	433 (955)	594 (1310)	

Series FPD470C with chemical-tee tapings and RFSO end flanges
 Sizes 15 to 80 mm (½ to 3 in.)

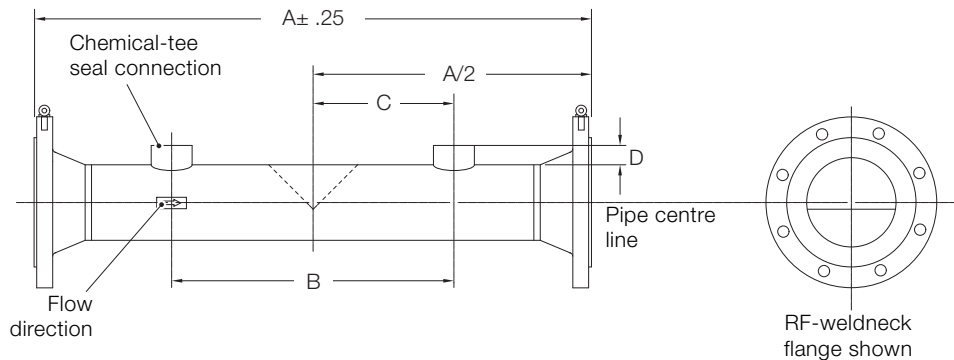


Pipe size mm (in.)	A ±3.3 mm (±0.13 in.)	B mm (in.)	C mm (in.)	D mm (in.)	Approximate weight kg (lbs.)		
					Flange rating		
					150	300	600
15 (½)	457 (18)	165 (6.5)	82.5 (3.25)	25 (1)	10 (23)	10 (23)	10 (23)
25 (1)	482 (19)	179 (7.06)	90 (3.53)	38 (1.5)	11.8 (26)	13 (29)	13.6 (30)
40 (1½)	508 (20)	203 (8)	101 (4)	47 (1.86)	19.5 (43)	22 (49)	23 (51)
50 (2)	533 (21)	213 (8.38)	106 (4.19)	57 (2.25)	23 (51)	25 (55)	27 (59)
80 (3)	609 (24)	263 (10.35)	131 (5.19)	70 (2.75)	31 (69)	36 (79)	38 (84)

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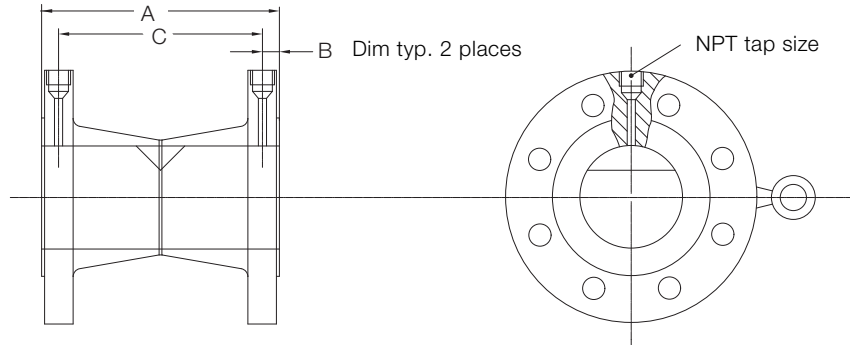
Differential pressure – primary flow element

Series FPD470C with chemical-tee tappings and RFWN end flanges
 Sizes 100 to 600 mm (4 to 24 in.)



Pipe size mm (in.)	A ±6.35 mm (±0.25 in.)			B mm (in.)	C mm (in.)	D mm (in.)	Approximate weight kg (lbs.)		
	Flange rating						Flange rating		
	150	300	600				150	300	600
100 (4)	901 (35.5)	920 (36.25)	965 (38)	381 (15)	190 (7.5)	24 (0.94)	29 (65)	34 (75)	50 (110)
150 (6)	1028 (40.5)	1047 (41.25)	1098 (43.25)	457 (18)	228 (9)	24 (0.94)	41 (90)	59 (130)	88 (195)
200 (8)	1092 (43)	1111 (43.75)	1168 (46)	521 (20.5)	260 (10.25)	24 (0.94)	52 (115)	79 (175)	129 (285)
250 (10)	1143 (45)	1174 (46.25)	1257 (49.5)	597 (23.5)	298 (11.75)	24 (0.94)	75 (165)	127 (280)	204 (450)
300 (12)	1321 (52)	1352 (53.25)	1416 (55.75)	673 (26.5)	336 (13.25)	24 (0.94)	106 (235)	172 (380)	
350 (14)	1397 (55)	1428 (56.25)	1485 (58.5)	711 (28)	356 (14)	24 (0.94)	140 (310)	283 (625)	
400 (16)	1473 (58)	1511 (59.5)	1587 (62.5)	775 (30.5)	387 (15.25)	24 (0.94)	186 (410)	290 (640)	
450 (18)	1574 (62)	1613 (63.5)	1676 (66.00)	851 (33.5)	413 (16.75)	24 (0.94)	227 (500)	367 (810)	
500 (20)	1686 (66.37)	1720 (67.75)	1790 (70.5)	940 (37)	470 (18.5)	24 (0.94)	286 (630)	456 (1005)	
600 (24)	1854 (73)	1886 (74.25)	1968 (77.5)	1066 (42)	533 (21)	24 (0.94)	395 (870)	539 (1190)	

Series FPD470P with RFWN end flanges
Sizes 50 to 150 mm (2 to 6 in.)

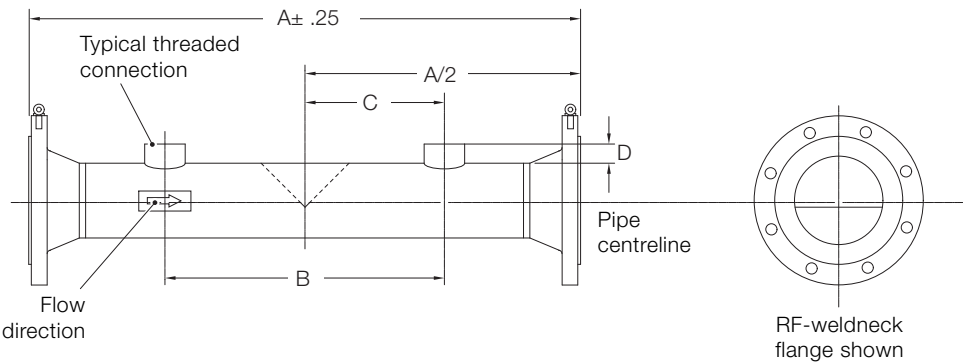


Pipe size mm (in.)	A mm (in.)			B mm (in.)			C mm (in.)			NPT tap size (in.)			Approximate weight kg (lbs.)		
	Flange rating			Flange rating			Flange rating			Flange rating			Flange rating		
	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600
50 (2)	127 (5.00)	171 (6.75)	171 (6.75)	11 (0.44)	24 (0.94)	24 (0.94)	105 (4.13)	124 (4.87)	124 (4.87)	1/4	1/2	1/2	6.3 (14)	12.2 (27)	16 (36)
75 (3)	140 (5.50)	178 (7.00)	178 (7.00)	13 (0.52)	24 (0.94)	24 (0.94)	112 (4.44)	130 (5.12)	130 (5.12)	3/8	1/2	1/2	11 (25)	10.4 (23)	23.5 (52)
100 (4)	190 (7.50)	222 (8.75)	254 (10.00)	12.7 (0.50)	24 (0.94)	24 (0.94)	165 (6.50)	174 (6.87)	206 (8.12)	3/8	1/2	1/2	16 (35)	24 (66)	34 (76)
150 (6)	254 (10.00)	276 (10.87)	323 (12.75)	14 (0.56)	24 (0.94)	24 (0.94)	223 (8.80)	228 (9.00)	174 (6.87)	3/8	1/2	1/2	24.5 (54)	48 (106)	50 (110)

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Differential pressure – primary flow element

Sizes 200 to 600 mm (8 to 24 in.)



Pipe size mm (in.)	A ±6.35 mm (±0.25 in.)			B mm (in.)	C mm (in.)	D mm (in.)	Approximate weight kg (lbs.)		
	Flange rating						Flange rating		
	150	300	600				150	300	600
200 (8)	1092 (43)	1111 (43.75)	1168 (46)	520 (20.5)	260 (10.25)	24 (0.94)	52 (115)	79 (175)	129 (285)
250 (10)	1143 (45)	1174 (46.25)	1257 (49.5)	597 (23.5)	298 (11.75)	24 (0.94)	75 (165)	127 (280)	204 (450)
300 (12)	1320 (52)	1352 (53.25)	1416 (55.75)	673 (26.5)	336 (13.25)	24 (0.94)	107 (235)	172 (380)	
350 (14)	1397 (55)	1428 (56.25)	1485 (58.5)	711 (28)	356 (14)	24 (0.94)	140 (310)	283 (625)	
400 (16)	1473 (58)	1511 (59.5)	1587 (62.5)	775 (30.5)	387 (15.25)	24 (0.94)	186 (410)	290 (640)	
450 (18)	1575 (62)	1612 (63.5)	1676 (66)	851 (33.5)	425 (16.75)	24 (0.94)	226 (500)	367 (810)	
500 (20)	1676 (66.37)	1720 (67.75)	1790 (70.5)	940 (37)	470 (18.5)	24 (0.94)	286 (630)	455 (1005)	
600 (24)	1854 (73)	1886 (74.25)	1968 (77.5)	1066 (42)	533 (21)	24 (0.94)	394 (870)	539 (1190)	

Ordering information

WEDGE flowmeter		FPD470	X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XX	XXX	
Product design																							
Pipe-tap		P																					
Flanged taps		F																					
Chemical tee taps		C																					
Restriction design																							
Single wedge		W1																					
Line nominal bore																							
DN 15 (1/2 in.)					015																		
DN 20 (3/4 in.)					020																		
DN 25 (1 in.)					025																		
DN 32 (1 1/4 in.)					032																		
DN 40 (1 1/2 in.)					040																		
DN 50 (2 in.)					050																		
DN 65 (2 1/2 in.)					065																		
DN 80 (3 in.)					080																		
DN 90 (3 1/2 in.)					090																		
DN 100 (4 in.)					100																		
DN 125 (5 in.)					125																		
DN 150 (6 in.)					150																		
DN 200 (8 in.)					200																		
DN 250 (10 in.)					250																		
DN 300 (12 in.)					300																		
DN 350 (14 in.)					350																		
DN 400 (16 in.)					400																		
DN 450 (18 in.)					450																		
DN 500 (20 in.)					500																		
DN 550 (22 in.)					550																		
DN 600 (24 in.)					600																		
DN 650 (26 in.)					650																		
DN 700 (28 in.)					700																		
DN 750 (30 in.)					750																		
DN 800 (32 in.)					800																		
DN 850 (34 in.)					850																		
DN 900 (36 in.)					900																		
DN 950 (38 in.)					950																		
DN 1000 (40 in.)					001																		
DN 1050 (42 in.)					051																		
DN 1100 (44 in.)					101																		
DN 1150 (46 in.)					151																		
DN 1200 (48 in.)					201																		
Others					999																		
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FPD470 Wedge flowmeter

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WEDGE flowmeter		FPD470	X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XXX	XX	XXX
See page 11																						
Pipe schedule																						
Schedule 5S			S1																			
Schedule 5			S2																			
Schedule 10S			S3																			
Schedule 10			S4																			
Schedule 20			S5																			
Schedule 30			S6																			
Schedule 40S			S7																			
Schedule 40			S8																			
Schedule STD			S9																			
Schedule 60			T1																			
Schedule 80S			T2																			
Schedule 80			T3																			
Schedule XS			T4																			
Schedule 100			T5																			
Schedule 120			T6																			
Schedule 140			T7																			
Schedule 160			T8																			
Schedule XXS			T9																			
Others			Z9																			
Continued on next page...																						

WEDGE flowmeter
FPD470

X	XX	XXX	XX	XX
See pages 11				12

Pipe material

Carbon steel	C3
316 / 316L stainless steel	S6
304 / 304L stainless steel	S4
316H stainless steel	H6
304H stainless steel	H4
Low temperature carbon steel	C4
High yield carbon steel (Gr 52)	C5
High yield carbon steel (Gr 65)	C6
High yield carbon steel (Gr 60)	C7
310 stainless steel	S3
321 stainless steel	S2
321H stainless steel	S1
347 stainless steel	S5
347H stainless steel	S7
317 / 317L stainless steel	S8
904L stainless steel	S9
22 % Cr Duplex (UNS S31803)	D1
25 % Cr Super Duplex (UNS S32750)	D2
25 % Cr Super Duplex (UNS S32760)	D3
6 % Mo SS (UNS S31254)	M1
Alloy 20 (UNS N08020)	U1
Alloy 200 (UNS N02200)	U2
Alloy 400 (UNS N04400)	M4
Alloy 600 (UNS N06600)	U3
Alloy 625 (UNS N06625)	N2
Alloy 800 (UNS N08800)	U4
Alloy 825 (UNS N08825)	U5
Alloy C-22 (UNS N06022)	U6
Alloy C-276 (UNS N010276)	U7
5Cr-1/2Mo low alloy F5 (UNS K41545)	F3
9Cr-1Mo-V low alloy F91 (UNS K91560)	F7
1 1/4Cr-1/2Mo low alloy F11 (UNS K11597)	F4
2 1/4Cr-1Mo low alloy F22 (UNS K21590)	F5
90/10 CuNi (UNS C70600)	P2
Titanium grade 2	T2
Titanium grade 5	T5
Tantalum	L1
Others	Z9

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WEDGE flowmeter		FPD470		X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
				See pages 11		12	13															
Restriction material																						
316 / 316L stainless steel																				S6		
Carbon steel																				C3		
316 / 316L stainless steel																				S6		
304 / 304L stainless steel																				S4		
316H stainless steel																				H6		
304H stainless steel																				H4		
Low temperature carbon steel																				C4		
High yield carbon steel (Gr 52)																				C5		
High yield carbon steel (Gr 65)																				C6		
High yield carbon steel (Gr 60)																				C7		
310 stainless steel																				S3		
321 stainless steel																				S2		
321H stainless steel																				S1		
347 stainless steel																				S5		
347H stainless steel																				S7		
317 / 317L stainless steel																				S8		
904L stainless steel																				S9		
22 % Cr Duplex (UNS S31803)																				D1		
25 % Cr Super Duplex (UNS S32750)																				D2		
25 % Cr Super Duplex (UNS S32760)																				D3		
6 % Mo SS (UNS S31254)																				M1		
Alloy 20 (UNS N08020)																				U1		
Alloy 200 (UNS N02200)																				U2		
Alloy 400 (UNS N04400)																				M4		
Alloy 600 (UNS N06600)																				U3		
Alloy 625 (UNS N06625)																				N2		
Alloy 800 (UNS N08800)																				U4		
Alloy 825 (UNS N08825)																				U5		
Alloy C-22 (UNS N06022)																				U6		
Alloy C-276 (UNS N010276)																				U7		
5Cr-1/2Mo low alloy F5 (UNS K41545)																				F3		
9Cr-1Mo-V low alloy F91 (UNS K91560)																				F7		
1 1/4Cr-1/2Mo low alloy F11 (UNS K11597)																				F4		
2 1/4Cr-1Mo low alloy F22 (UNS K21590)																				F5		
90/10 CuNi (UNS C70600)																				P2		
Titanium grade 2																				T2		
Titanium grade 5																				T5		
Tantalum																				L1		
Others																				Z9		
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WEDGE flowmeter
FPD470

X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XX	XXX
See pages 11							12	13	14											

H/D ratio

0.2	H2																			
0.3	H3																			
0.4	H4																			
0.5	H5																			
0.6	H6																			
0.7	H7																			
Others	Z9																			

Process connection type

Weld prepared ends	P1																			
Raised face socket weld flange	S1																			
Full face socket weld flange	S2																			
Raised face threaded flange	T3																			
Full face threaded flange	T4																			
Raised face weld neck end flange	R2																			
Raised face slip-on flange	R3																			
Oval RTJ weld neck end flange	J2																			
Octagonal RTJ weld neck end flange	J4																			
Flat face weld neck end flange	F2																			
Flat face slip-on flange	F3																			
DIN tongue and groove flange	D1																			
Hub joint	H1																			
Compact flange	C1																			
Lap joint flange	L1																			
Wafer	W1																			
Threaded BSPT	T1																			
Threaded NPT	T2																			
Others	Z9																			

Continued on next page...

FPD470 Wedge flowmeter

Differential pressure – primary flow element

WEDGE flowmeter		FPD470		X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
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WEDGE flowmeter
FPD470

X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XX	XXX
See pages 11										12	13	14	15	16						

Tapping type

Pipe nipple (butt weld or male tapping)	N1
Nipolet (butt weld or male tapping)	N2
Nipoflange RF	N3
Nipoflange RTJ	N4
Nipoflange FF	N5
Socket weld female (rating = Y0)	S1
Threaded female	T1
Flanged RF	F1
Flanged RTJ (not DIN)	F2
Flanged FF (not DIN)	F3
3-Valve integral manifold	M1
5-Valve integral manifold	M2
3-Valve direct manifold	M3
5-Valve direct manifold	M4
Kidney flange (1/2 in. tapping only)	K1
Chemical-tee	C1
Others	Z9

Tapping size

1/4 in.	T1
3/8 in.	T2
1/2 in.	T3
3/4 in.	T4
1 in.	T5
1 1/2 in.	T6
2 in.	T7
3 in.	T8
4 in.	T9
5 in. (chemical-tee only)	V1

Continued on next page...

FPD470 Wedge flowmeter

Differential pressure – primary flow element

WEDGE flowmeter		FPD470		X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XX	XXX					
														See pages 11		12	13	14	15	16	17								
Tapping rating																													
Others														Z9															
Socket weld														S1															
Butt weld														B1															
Chemical-tee														C1															
BSPT F														T1															
BSPT M														T2															
NPT F														T3															
NPT M														T4															
ASME Class 150														A1															
ASME Class 300														A3															
ASME Class 600														A6															
ASME Class 900														A7															
ASME Class 1500														A8															
ASME Class 2500														A9															
DIN PN 6														D0															
DIN PN 10														D1															
DIN PN 16														D2															
DIN PN 25														D3															
DIN PN 40														D4															
DIN PN 63														D5															
DIN PN 100														D6															
Flanges JIS 7.5K														J0															
Flanges JIS 10K														J1															
Flanges JIS 5K														J2															
Flanges JIS 20K														J3															
Flanges JIS 30K														J4															
API 2000 PSI TYPE 6BX														P1															
API 3000 PSI TYPE 6BX														P2															
API 5000 PSI TYPE 6BX														P3															
API 10000 PSI TYPE 6BX														P4															
API 15000 PSI TYPE 6BX														P5															
API 20000 PSI TYPE 6BX														P6															
Others														Z9															
Number of tapping sets length and type																													
One set														TN1															
Two sets														TN2															
Three sets														TN3															
Four sets														TN4															
Others														TNZ															
Pipe orientation																													
Horizontal																										PNH			
Vertical																											PNV		

Continued on next page...

WEDGE flowmeter

FPD470

X	XX	XXX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX	XXX	XX	XXX	XXX	XX	XXX
See pages 11			12	13	14	15		16	17		See page 18										

Welding code

ASME B31.3 cyclic service	K1
ASME B31.3 category D service	K2
ASME B31.3 category M service	K3
ASME B31.4	K4
ASME B31.5	K5
PED B3.1 SEP level	K6
PED B3.1 category H	K7
Others	K9

Surface treatment

Primer to ABB standard (primer only)	HF1
Painted to ABB standard (primer and top coat)	HF2
Other (specify in detail)	HFZ

Certification

Material certificates acc. EN 10204 3.1	C2
Material certificates acc. EN 10204 3.2	C3
Material certificates acc. NACE, latest revision	CN
Dye penetrant inspection	C9
Radiography	C8
Positive material identification (NITRON XRF)	CA
100 % dimensional check	C6
Others	CZ

Testing

Impact testing @ -46 °C (-50.8 °F)	CH1
Impact testing @ -196 °C (-320.8 °F)	CH2
Hardness survey	CH3
HIC testing	CH4
Magnetic particle inspection	CH5
Ultrasonic inspection	CH6
Heat treatment trace	CH7
Pressure test (internal)	CH8
Others	CHZ

Calibration

Bi-directional flow calibration with water	RW2
Others	RWZ

Documentation language (default = M5 / English)

German	M1
Italian	M2
Spanish	M3
French	M4
English	M5
Chinese	M6

Added requirements

Material source limitations apply	MS1
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Sales



Service

DS/FPD470-EN Rev. A 07.2016

