

WedgeMaster FPD570

Compact wedge flowmeter

Combining durability with simplicity



Compact flowmeter with integral transmitter, manifold and temperature element

- for volumetric- or mass-flow metering available for pipe sizes DN25 to DN150 (1 to 6 in.)
- problems caused by impulse piping eliminated by mounting the transmitter and manifold directly on to the meter
- complete with manifold and ABB DP or Multivariable transmitter

Corrosion and erosion resistant

- V-shaped restriction eliminates damage from the secondary phase
- no critical surface dimensions to wear and affect performance
- durable with excellent long term stability

Minimum requirements for straight pipe

- flow is conditioned within the meter body without compromising on performance
- 5 pipe diameters upstream and 3 diameters downstream is all that is needed for specified performance, enabling the meter to be used in difficult pipework configurations

Calibrated for optimum accuracy

- all meters water-calibrated to verify actual meter coefficient, providing a metering accuracy of up to 0.5 % of reading when used within calibrated range

Factory acceptance report

- supplied with report detailing results of critical inspection checks, plus certification data

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WedgeMaster – compact wedge flowmeter

WedgeMaster is a wedge-based flowmeter designed to greatly simplify specification, installation and commissioning.

Its one-piece flowmeter assembly features the following:

- Wedgemeter element with a choice of pipe sizes from DN25 to DN150 (1 to 6 in.)
- Integral 3-valve instrument manifold (optional 5-valve manifold available)
- Optional integral temperature element for corrected volume / mass calculations
- Integral DP or multivariable transmitter, factory-fitted to the manifold
- Fully leak tested

Benefits

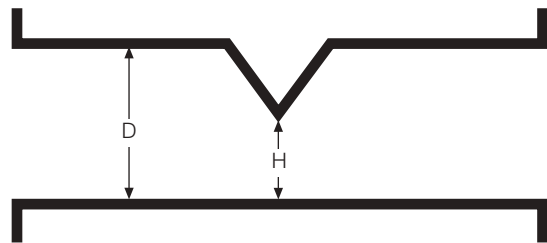
WedgeMaster avoids many of the difficulties involved in the sizing, selection, procurement, installation and commissioning of conventional DP flowmeter installations.

- With all the major components in one assembly, WedgeMaster eliminates the problems of sourcing multiple components. It provides large savings in cost and time due to the simplicity of purchasing, design and installation.
- Integral transmitter and manifold with compact tapping connections eliminates the need to run and connect impulse piping and offers:
 - reduced possibility of impulse line blockage
 - reduced number of potential leakage points
- The assembly is pressure-tested in the factory, ensuring that the connections between the tapping points and the transmitter are completely free of leaks.
- Every flowmeter is flow calibrated, ensuring the performance of the complete flowmeter, not just the flow element.
- The 'Plugged Impulse Line Detection' (PILD) feature generates a warning via HART communication if either or both of the impulse lines become fully or partially obstructed (for example, by foreign material or ice). The meter can also be configured to drive the analog output signal to the 'Alarm current'.



- New 'through-the-glass' (TTG) keypad technology enables configuration without the need to remove the transmitter covers, even in hazardous areas.
- Factory configuration saves the user time during commissioning and ensures that the flowmeter output span truly matches that of the application flowrate.

WedgeMaster utilizes a V-shaped restriction to produce a differential pressure that has a square root relationship to volumetric flow.



WedgeMaster is available with 4 standard wedge ratios to cover a wide range of application flow rates. The wedge ratio is defined as H/D where H is the wedge opening height and D is the nominal pipe diameter. The restriction is V-shaped at an optimum angle to give the best possible characteristics when measuring viscous fluids. The element is suitable for applications where the pipe Reynolds number is as low as 500 (well into the laminar flow zone) and as high as several million.

Versions

WedgeMaster is available in two versions:

WedgeMaster V

- compact Wedge flowmeter for measurement of liquids, gases and steam in volumetric units (actual volume). It uses the ABB 266DSH transmitter and provides a flow rate and total display with an output of 4 to 20 mA proportional to the actual volume flowrate.

WedgeMaster V has a stainless steel body and an alloy transmitter case (optionally stainless steel).

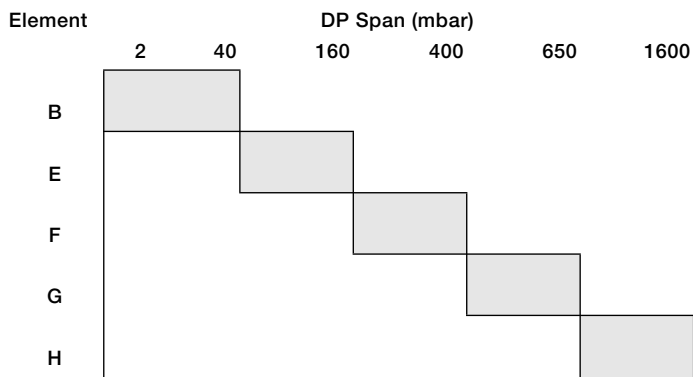
WedgeMaster M

- compact Wedge flowmeter, providing measurement directly in either mass- or corrected volume-units for liquids and steam. Gas flow measurement is provided directly in reduced volume units. It uses the ABB 267CS or 266CSH multivariable transmitter to measure DP, temperature and pressure, providing a flowrate and total display and transmits a 4 to 20 mA signal proportional to the mass- or corrected volume-flowrate.

WedgeMaster M has a stainless steel body, an alloy transmitter case (optionally stainless steel) and an optional internal temperature element.

DP Span limits

There are up to 5 DP sensor ranges available. For optimum accuracy, select the sensor where the full scale DP is in the shaded area and is as close as possible to the maximum range of the sensor.



Performance specifications

Standard H/D ratios

0.2, 0.3, 0.4, 0.5

(Restrictions apply depending on actual model code)

Process connection

ANSI Class 300, 600, 900, 1500, 2500 RF and RTJ or Wafer body

(Restrictions apply depending on actual model code)

Construction materials

Process wetted parts

- Body: carbon steel, 316 stainless steel
- Restriction: carbon steel, 316 stainless steel

Mounting hardware

- 3- or 5-valve manifold: 316 stainless steel with PTFE packing
- Impulse lines / fittings: 316 stainless steel

Accuracy

Calibrated

±0.5 % of actual flow when operated within the calibrated range

Bi-directional

As above when Kd2 designated as reverse flow coefficient

Repeatability

±0.2 %

Pressure Rating

100 bar (1440 lbf/in²)

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Weights

Size mm (in.)	Flange Rating	Weight kg (lbs)
25 (1)	ASME CL300	20 (44)
	ASME CL600	20 (44)
	ASME CL900	24 (53)
	ASME CL1500	24 (53)
	ASME CL2500	26 (57)
40 (1 1/2)	ASME CL300	22 (49)
	ASME CL600	24 (53)
	ASME CL900	28 (62)
	ASME CL1500	28 (62)
	ASME CL2500	38 (84)
50 (2)	ASME CL300	24 (53)
	ASME CL600	26 (57)
	ASME CL900	38 (84)
	ASME CL1500	38 (84)
	ASME CL2500	54 (119)

Size mm (in.)	Flange Rating	Weight kg (lbs)
80 (3)	ASME CL300	30 (66)
	ASME CL600	36 (79)
	ASME CL900	44 (97)
	ASME CL1500	60 (132)
	ASME CL2500	102 (225)
100 (4)	ASME CL300	38 (84)
	ASME CL600	54 (119)
	ASME CL900	62 (137)
	ASME CL1500	82 (181)
	ASME CL2500	148 (326)
150 (6)	ASME CL300	54 (119)
	ASME CL600	90 (198)
	ASME CL900	116 (256)
	ASME CL1500	166 (366)
	ASME CL2500	360 (794)

Maximum process temperature

230 °C (446 °F)

At the transmitter sensor

Silicone oil filled sensor F to H:

–40 and 121 °C (–40 and 250 °F)

Silicone oil filled sensor B, E:

–25 and 121 °C (–13 and 250 °F)

Inert (Galden) filled sensor F to H:

–20 and 100 °C (–4 and 212 °F)

Inert (Galden) filled sensor E:

–10 and 100 °C (14 and 212 °F)

Inert (Halocarbon) filled sensor F to H:

–20 and 100 °C (–4 and 212 °F)

Inert (Halocarbon) filled sensor E:

–10 and 100 °C (14 and 212 °F)

IMPORTANT

For hazardous atmosphere applications see the temperature range specified on the certificate / approval relevant to the type of protection

Ambient temperature limits

Note. LCD display may not be clearly readable below –20 °C (–4 °F) or above 70 °C (158 °F)

WedgeMaster V

V2: Sensors A to E incl: –25 and 85 °C (–13 and 185 °F)
Other sensors: –40 and 85 °C (–40 and 185 °F)

WedgeMaster M

M2: –40 and 85 °C (–40 and 185 °F)

Storage limits

–50 to 85 °C (–58 to 185 °F)

LCD integral display:

– –40 to 85 °C (–40 to 185 °F)

Integral display

WedgeMaster V2, M2

- Wide screen LCD, 128 x 64 pixel, 52.5 x 27.2 mm (2.06 x 1.07 in.) dot matrix
- Multilanguage
- 4 keys for flowmeter configuration and management
- Totalized and instantaneous flow indication
- Display may also indicate diagnostic messages and provides configuration facilities

WedgeMaster M1

19-segment alphanumeric display (2-line, 6-character) with additional bar chart display, optionally with back illumination.

Environmental limits

Electromagnetic compatibility (EMC)

Complies with EN 61326 and NAMUR NE-21

Surge immunity level (with surge protector)

4 kV (according to IEC 1000-4-5 EN 61000-4-5)

Pressure equipment directive (PED)

Complies with 97/23/EEC Category III Module H

Humidity

Relative humidity:

- up to 100 %

Condensing, icing:

- admissible

Vibration resistance

Accelerations up to 2 g at frequency up to 1000 Hz (according to IEC 60068-2-6)

Shock resistance

Acceleration:

- 50 g

Duration:

- 11 ms (according to IEC 60068-2-27)

Wet and dust-laden atmospheres

The meter is dust- and sand-tight and protected against immersion effects as defined by EN 60529 (1989) to IP 67 (IP 68 on request) or by NEMA to 4X

Hazardous atmospheres

With or without integral display

Combined ATEX code EW

(= E1 + E2 + E3 below)

Combined ATEX and FM Approvals code EN

(= E1 + E2 + E3 + E4 + E6 below)

Intrinsic safety:

- ATEX Europe (code E1)
- II 1/2 G Ex ia IIC T6/T5/T4; IP67
- II 1 D Ex iaD 20 T85 °C
- II 1/2 D Ex iaD 21 T85 °C; IP67

Explosion proof:

- ATEX Europe (code E2)
- II 1/2 G Ex d IIC T6
- II 1/2 D Ex tD A21 T85 °C (–50 °C • Ta • +75 °C); IP67

Type 'N':

- ATEX Europe (code E3) type examination
- II 3 G Ex nL IIC T6/T5/T4
- II 3 D Ex tD A22 T85 °C; IP67

FM Approvals US (code E6) and Canada (code E4)

Explosion proof (US):

- Class I, Div. 1, Groups A, B, C, D

Explosion proof (Canada):

- Class I, Div. 1, Groups B, C, D

Dust ignition proof:

- Class II, Div. 1, Groups E, F, G

Suitable for:

- Class II, Div. 2, Groups F, G; Class III, Div.1, 2

Non-incendive:

- Class I, Div. 2, Groups A, B, C, D

Intrinsically safe:

- Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G
- Class I, Zone 0 AEx ia IIC T6/T4, Zone 0 (FM US)
- Class I, Zone 0 Ex ia IIC T6/T4, Zone 0 (FM Canada)

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FM Approvals US

Intrinsically safe (code EA):

- Class I; Division 1; Groups A, B, C, D;
- Class I; Zone 0; Group IIC; AEx ia IIC

Explosionproof (code EB):

- Class I, Division 1, Groups A, B, C, D;
- Class II/III, Division 1, Groups E, F, G

Refer to certificates for ambient temperature ranges (within the limits -50 to 85 °C [-58 to 185 °F]) related to the different temperature classes

CSA Approvals Canada (code EE):

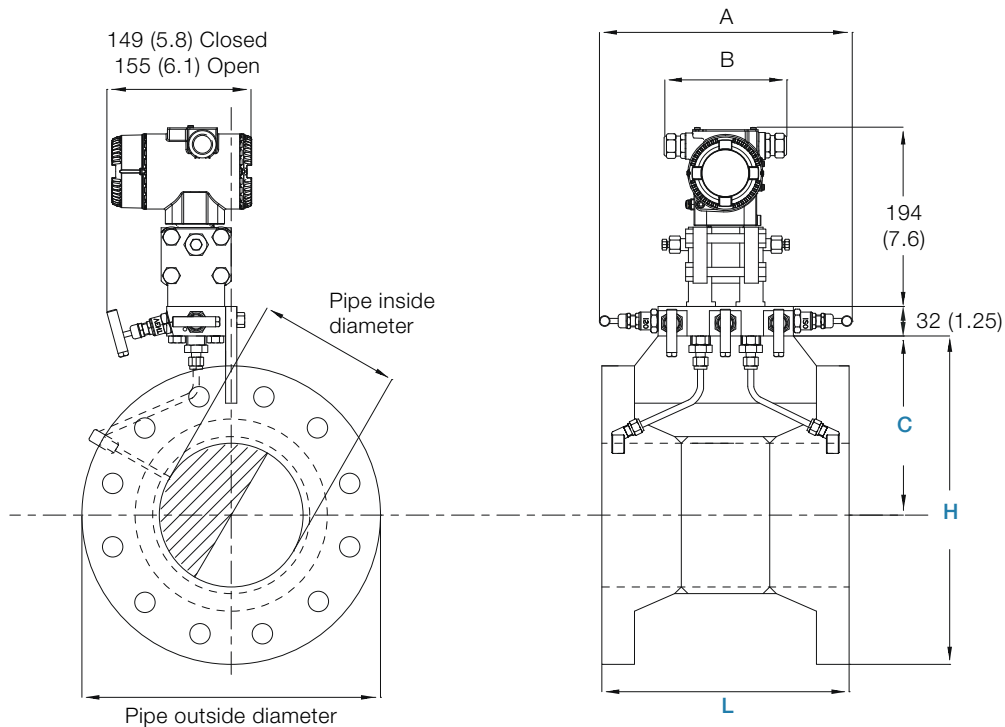
Explosion Proof:

- Class I, Division 1, Groups B, C, D;
- Class II/III, Division 1, Groups E, F, G

Dimensions

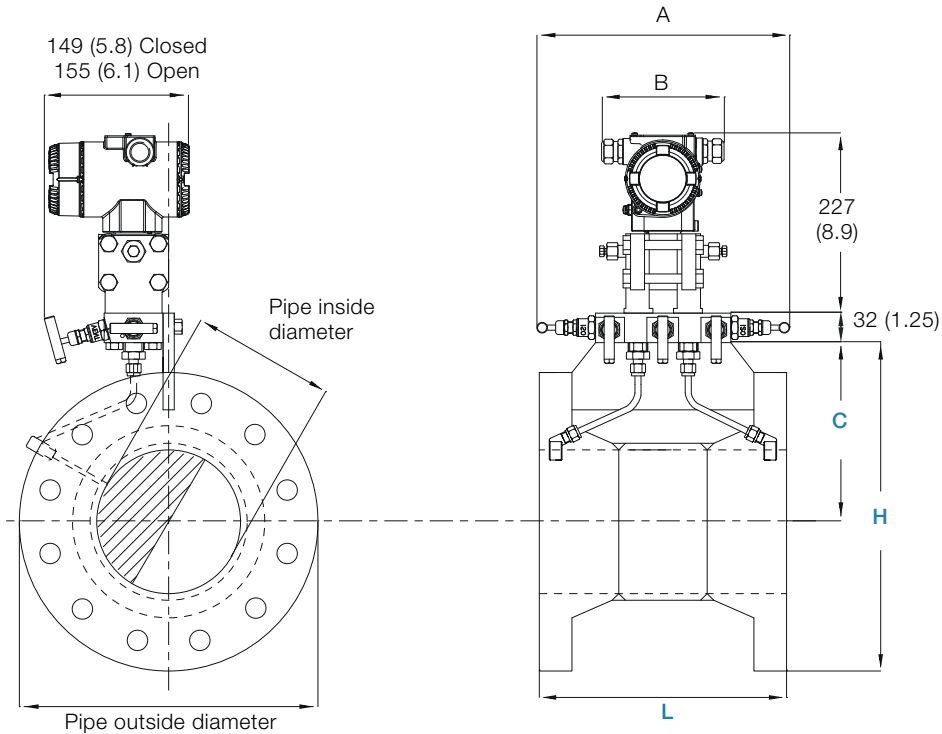
WedgeMaster M1

Dimensions in mm (in.)



WedgeMaster V2, M2

Dimensions in mm (in.)



Size

Dimension	Model	25 (1)	40 (1.5)	50 (2)	80 (3)	100 (4)	150 (6)
C	300LB	102 (4.02)	118 (4.65)	123 (4.84)	145 (5.71)	167 (6.57)	199 (7.83)
	600LB	102(4.02)	118 (4.65)	123 (4.84)	145 (5.71)	177 (6.97)	218 (8.58)
	900LB	115 (4.53)	129 (5.08)	148 (5.83)	161 (6.34)	186.5 (7.34)	230.5 (9.07)
	1500LB	115 (4.53)	129 (5.08)	148 (5.83)	173.5 (6.83)	196 (7.72)	237 (9.33)
	2500LB	119.5 (4.70)	142 (5.59)	157.5 (6.20)	192.5 (7.58)	218 (8.58)	281.5 (11.08)
L	300LB	121 (4.76)	134 (5.28)	137 (5.39)	181 (7.13)	219 (8.62)	320 (12.60)
	600LB	124 (4.88)	140 (5.51)	147 (5.79)	191 (7.52)	254 (10.00)	335 (13.19)
	900LB	147 (5.79)	166 (6.54)	204 (8.03)	204 (8.03)	254 (10.00)	330 (12.99)
	1500LB	147 (5.79)	166 (6.54)	204 (8.03)	235 (9.25)	248 (9.76)	368 (14.49)
	2500LB	178 (7.01)	223 (8.78)	254 (10.00)	337 (13.27)	381 (15.00)	547 (21.54)
H	300LB	164 (6.46)	196 (7.72)	206 (8.11)	250 (9.84)	294 (11.57)	358 (14.09)
	600LB	164 (6.46)	196 (7.72)	206 (8.11)	250 (9.84)	314 (12.36)	396 (15.59)
	900LB	190 (7.48)	218 (8.58)	256 (10.08)	282 (11.10)	333 (13.11)	421 (16.57)
	1500LB	190 (7.48)	218 (8.58)	256 (10.08)	307 (12.09)	352 (13.86)	434 (17.09)
	2500LB	199 (7.83)	244 (9.61)	275 (10.83)	345 (13.58)	396 (15.59)	523 (20.59)

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Ordering information

		Main code													Optional code						
WedgeMaster compact wedge flowmeter		FPD570	XX	XXX	X	X	XX	XX	XX	X	X	X	X	X	X	XX	XX	XX	XX	XX	XX
Model and design level																					
WedgeMaster V, for volume flow, design level 2 (266DSH)		V2																			
WedgeMaster M, for mass flow, design level 1 (267CS)		M1																			
WedgeMaster M, for mass flow, design level 2 (266CSH)		M2																			
Meter size																					
25 mm (1 in.)		025																			
40 mm (1½ in.)		040																			
50 mm (2 in.)		050																			
80 mm (3 in.)		080																			
100 mm (4 in.)		100																			
125 mm (5 in.)		125																			
150 mm (6 in.)		150																			
Fluid																					
Liquid		L																			
Gas		G																			
Steam		S																			
H/D ratio																					
0.2		2																			
0.3		3																			
0.4		4																			
0.5		5																			
Body material / restriction material																					
Carbon steel / carbon steel		A1																			
Carbon steel / AISI 316 SST		A6																			
AISI 316 SST / AISI 316 SST		S6																			
Process connection type																					
RFWN (raised face weld neck), standard face ¹		R1																			
RFWN (raised face weld neck), smooth face		R2																			
RTJ (ring-type joint) weld neck ²		T2																			
Wafer ³		W1																			

Continued on next page ...

¹ Not available with pipe sizes 15 ... 80 mm (½ ... 3 in.)

² Available only with pipe sizes 40 ... 200 mm (½ ... 8 in.) / pressure rating ASME CL 1500 / CL 2500

³ Available only with pipe sizes 25 ... 100 mm (1 ... 4 in.) / maximum pressure rating PN 100 / ASME CL 600

WedgeMaster compact wedge flowmeter

FPD570

XX	XXX	X	X	XX	XX	XX	X	X	X	X	X	X	XX
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 See page 8

Optional code

XX	XX	XX	XX	XX	XX
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 See page 11

Pressure rating													
ASME CL 300						A3							
ASME CL 600						A6							
ASME CL 900						A7							
ASME CL 1500						A8							
ASME CL 2500						A9							
Pipeline orientation													
Horizontal							H						
Vertical							V						
Manifold													
Integral 3-valve manifold								3					
Integral 5-valve manifold								5					
DP span limits													
0.05 ... 1 kPa / 0.5 ... 10 mbar / 0.2 ... 4 in. H ₂ O	(all transmitters)								A				
0.14 ... 4 kPa / 1.4 ... 40 mbar / 0.56 ... 16 in. H ₂ O	(only with WedgeMaster V2)								B				
0.2 ... 6 kPa / 2 ... 60 mbar / 0.8 ... 24 in. H ₂ O	(only with WedgeMaster M1)								C				
0.27 ... 16 kPa / 2.7 ... 160 mbar / 1.08 ... 64 in. H ₂ O	(only with WedgeMaster V2 (266DSH))								E				
0.4 ... 40 kPa / 4 ... 400 mbar / 1.6 ... 160 in. H ₂ O									F				
0.65 ... 65 kPa / 6.5 ... 650 mbar / 2.6 ... 260 in. H ₂ O	(only with WedgeMaster V2)								G				
1.6 ... 160 kPa / 16 ... 1600 mbar / 6.4 ... 642 in. H ₂ O	(only with WedgeMaster V2)								H				
2.5 ... 250 kPa / 25 ... 2500 mbar / 10 ... 1000 in. H ₂ O	(only with WedgeMaster M1)								L				
Others									Z				
Transmitter seal material													
Without seal									0				
Viton									3				
PTFE									4				
EPDM									5				
Perbunan									6				

Continued on next page...

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WedgeMaster compact wedge flowmeter	Main code													Optional code								
	FPD570	XX	XXX	X	X	XX	XX	XX	X	X	X	X	X	X	X	XX	XX	XX	XX	XX	XX	
		See page 8					See page 9															
Electronic housing material / electrical connection																						
Aluminium alloy / 1/2-14 NPT																					A	
Aluminium alloy / M20 x 1.5																					B	
AISI 316L SST / 1/2-14 NPT																					S	
AISI 316L SST / M20 x 1.5																					T	
Others																					Z	
Integrated digital display (LCD)																						
None (blind)																					0	
LCD display																					1	
LCD display (backlit)																					2	
TTG (through-the-glass) integral digital LCD display																					5	
Output signal																						
HART digital communication and 4 ... 20 mA																					H1	
HART digital communication and 4 ... 20 mA, SIL2 and SIL3 certified to IEC 61508 ¹																					H2	
PROFIBUS PA ²																					P1	
FOUNDATION Fieldbus ²																					F1	
MODBUS RS 485 ³																					M1	
Wireless HART ¹																					W1	

¹ Design level 2 only

² Not with WedgeMaster V1 (364DS)

³ WedgeMaster M only

Option H2 is for model V2 only

Option P1,F1,M1 for model V2 only

WedgeMaster compact wedge flowmeter	Main code												Optional code						
	FPD570	XX	XXX	X	X	XX	XX	XX	X	X	X	X	X	XX	XX	XX	XX	XX	XX
Temperature element																			
Integral																		AT	
Remote (element not included)																		AR	
Calibration																			
Bi-directional water calibration																		CM	
Standard water calibration at reference conditions																		CW	
Certificates																			
Material monitoring with inspection certificate 3.1 acc. EN 10204																			C2
Certificate of conformance																			C4
X-Ray NDE of welds																			C8
Dye penetrant NDE of welds																			C9
Positive Material Identification (PMI)																			CA
Hydrostatic pressure test certificate																			CB
Material monitoring NACE MR 01-75 with inspection certificate 3.1 acc. EN 10204																			CN
PED certificate (Pressure Equipment Directive 97 / 23 / EC)																			CP
Others																			CZ
Explosion protection certification																			
Factory mutual (FM) – intrinsically safe																			EA
Factory mutual (FM) - explosion proof																			EB
Canadian standard association (CSA) – explosion proof																			EE
ATEX + FM + CSA																			EN
ATEX II 1/2 GD EEx ia + ATEX II 1/2 GD EEx d + ATEX EEx nL																			EW
Documentation language																			
German																			M1
Italian																			M2
Spanish																			M3
French																			M4
English																			M5
Chinese																			M6
Special applications																			
Degreased (oil- and grease-free) with inert capsule filling for oxygen applications																			P1
Gold-plated diaphragm (silicone oil-filled) for hydrogen applications																			P2

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