

**Models AE100D, AE200D, and AE300D
Magnetic Flow Tube
[Style:S2]**

Manual Change No. 05-023-2E

Please use the attached sheets for the pages listed below in IM 1E7D0-01E (11th).

Page and Item	Contents of Correction
Page 5-3 Fluid Temperature and Pressure	Limitations for 350 and 400mm are added.
Page 5-4 MODEL AND SUFFIX CODE	Process Connection E1 is added only for 200mm.
Page 5-5 MODEL AND SUFFIX CODE	Process Connection E2 for AE300 is corrected to E1.
Page 5-10 EXTERNAL DIMENTIONS	Process Connection D1 for AE215 is deleted from the table as D2 be applied.
Page 7-1 PED	CATEGORY III for AE335MG/MN/SC is corrected to CATEGORY II.

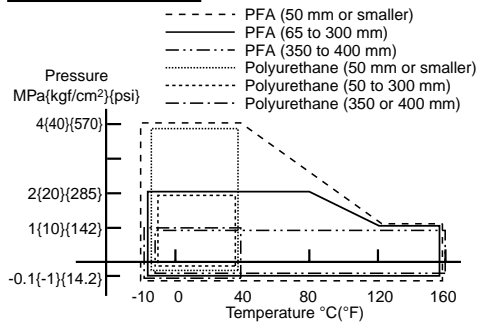
English Units (Size: inch, Flowrate: GPM)

Size	Min. Range @1.0ft/s	Max. Range @33ft/s
0.1	0.0241	0.8031
0.2	0.0964	3.212
0.4	0.3856	12.850
0.5	0.6024	20.078
1	2.4095	80.31
1.5	5.422	180.70
2	9.638	321.2
2.5	15.06	501.9
3	21.685	722.8
4	38.56	1,285.0
5	60.24	2007.8
6	86.74	2,891.3
8	154.21	5,140
10	240.95	8,031
12	347.0	11,565
14	472.3	15,741
16	616.9	20,560

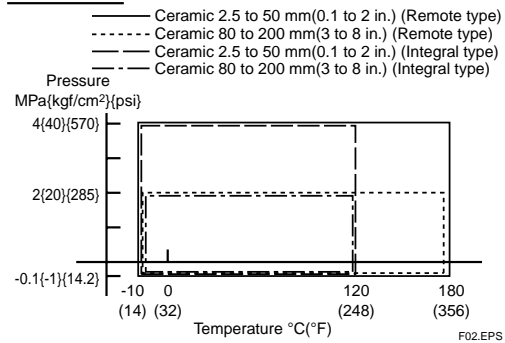
T07.EPS

Fluid Temperature and Pressure: General Purpose /Explosion proof

PFA, Polyurethane Lining



Ceramic Lining



F02.EPS

Note1: Those limits show maximum allowable fluid pressure for Flow Tube itself. Further fluid pressure should also be limited according to process connection.

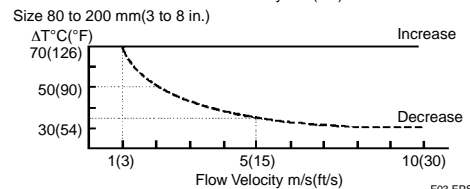
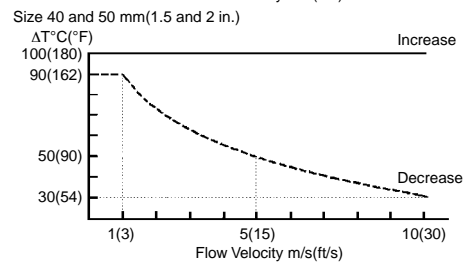
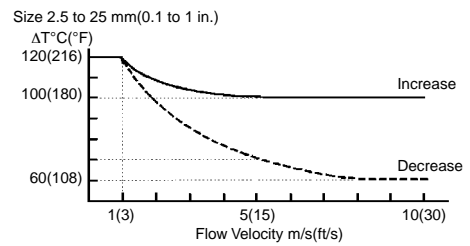
Note 2: For Explosion proof type, maximum fluid pressure should be 2MPa or lower (for 350 and 400 mm, 1 MPa or lower) except CENELEC ATEX explosion proof version, and for fluid temperature refer to descriptions of "HAZARDOUS AREA CLASSIFICATION".

■ TERMINAL CONNECTION

Terminal Symbols	Description
A	Flow signal output
B	
C	
EX1	Excitation current input
EX2	
⊕	Protective grounding (Outside of the terminal box)

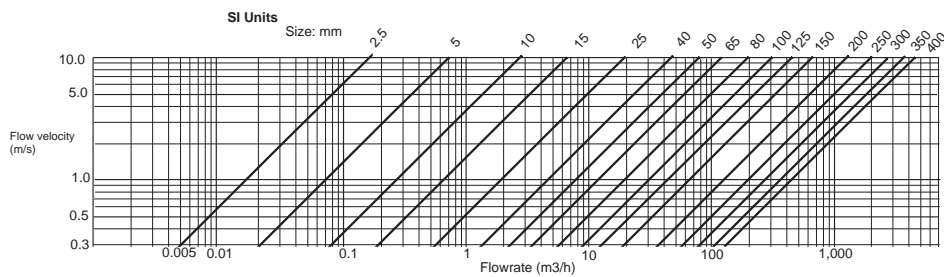
T10.EPS

Reasonable Figures for Thermal Shock of Ceramic Lining:

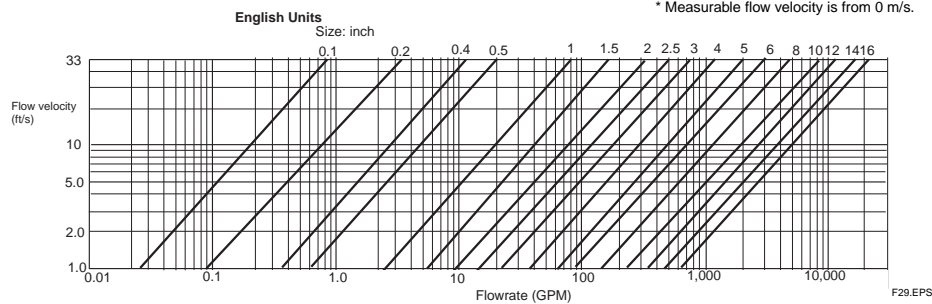


F03.EPS

■ SIZING DATA



* Measurable flow velocity is from 0 m/s.



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MODEL AND SUFFIX CODE

General Purpose/Explosion Proof, Remote Type Flow Tube AE100/200 series

○: Available -: Not available

Model	Suffix Code	Description	Use					
			DG			DN		
			Lining					
			A	U	C	A	C	
AE102	.....	Size 2.5 mm (0.1in.)	○	-	○	○	○	Note 1
AE105	.....	Size 5 mm (0.2in.)	○	-	○	○	○	Note 1
AE110	.....	Size 10 mm (0.4in.)	○	-	○	○	○	Note 1
AE115	.....	Size 15 mm (0.5in.)	○	-	○	○	○	Note 1
AE202	.....	Size 25 mm (1in.)	○	○	○	○	○	
AE204	.....	Size 40 mm (1.5in.)	○	○	○	○	○	
AE205	.....	Size 50 mm (2in.)	○	○	○	○	○	
AE206	.....	Size 65 mm (2.5in.)	○	-	-	-	-	
AE208	.....	Size 80 mm (3in.)	○	○	○	○	○	
AE210	.....	Size 100 mm (4in.)	○	○	○	○	○	
AE212	.....	Size 125 mm (5in.)	○	-	-	-	-	
AE215	.....	Size 150 mm (6in.)	○	○	○	○	○	
AE220	.....	Size 200 mm (8in.)	○	○	○	○	○	
Use	DG DN	General Purpose Ex-proof(CENELEC ATEX,FM,CSA,SA)	○	○	○	-	-	Note 4
Lining	-A	Fluorocarbon PFA	○	-	-	○	-	
	-U	Polyurethane	-	○	-	-	-	
	-C	Ceramic	-	-	○	-	○	
Process Connection (Note 3)	K1	JIS 10K wafer	○	○	○	○	○	Not available with 65/125mm
	K2	JIS 20K wafer	○	○	○	○	○	
	B1	ANSI 150 wafer	○	○	○	○	○	Not available with 65/125mm
	B2	ANSI 300 wafer	○	○	○	○	○	
	E1	DIN PN10 wafer	○	○	○	○	○	Size 200 mm(8in.) only
	E2	DIN PN10/16 wafer	○	○	○	○	○	Note 2
	E4	DIN PN40 wafer	○	○	○	○	○	Note 6
	H1	JIS F12(JIS75M) wafer	○	○	○	○	○	Size 80 mm(3in.) or larger
	J1	JIS 10K flange	○	○	-	○	-	Not available with 65/125mm
	J2	JIS 20K flange	○	○	-	○	-	
	A1	ANSI 150 flange	○	○	-	○	-	Size 200mm (8in.)only
	A2	ANSI 300 flange	○	○	-	○	-	
	D1	DIN PN10 flange	○	○	-	○	-	Note 2
	D2	DIN PN16 flange	○	○	-	○	-	Note 6
	D4	DIN PN40 flange	○	○	-	○	-	Size 80/100/150/200mm only
	G1	JIS F12(JIS75M) flange	○	○	-	-	-	Ceramic lining, size 2.5/ 5/10mm only
	U1	Union Joint (weld joint)	-	-	○	-	○	
	U2	Union Joint (R1/4 or R3/8)	-	-	○	-	○	
	U3	Union Joint (1/4NPT or 3/8NPT)	-	-	○	-	○	
Electrode Material	-L	Stainless Steel (SUS316L)	○	○	-	○	-	Not available with 65/125mm
	-P	Platinum-iridium	○	-	-	-	-	
	-E	Platinum-alumina cermet	-	-	○	○	○	
	-H	Hastelloy C276 equivalent	○	-	-	○	-	
	-T	Tantalum	○	-	-	○	-	
	-V	Titanium	○	-	-	○	-	
Earth Ring/Earth Electrode Material	S	Stainless Steel (SUS316)	○	○	○	○	○	Note 5 Must for ceramic, 2.5/ 5/10mm Not available with 65/125mm Note 5 Not available with 65/125mm
	P	Platinum-iridium	○	-	○	○	○	
	N	None	○	○	○	○	○	
	H	Hastelloy C276 equivalent	○	-	○	○	○	
	T	Tantalum	○	-	○	○	○	
	V	Titanium	○	-	○	-	○	
Electrical Connection	J	JIS G1/2 female	○	○	○	○	-	
	A	ANSI 1/2NPT female	○	○	○	○	○	
	D	DIN Pg13.5 female	○	○	○	○	○	
	M	ISO M20 X1.5 female	○	○	○	○	○	
Optional Code	/□	Refer to "Optional Specifications."						

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Note 1: Process connection for size 2.5 to 10mm (0.1 to 0.4in.), wafer type is equal to one for 15mm (0.5in.). Provide 15mm process flanges for these flow tubes.

Note 2: Select PN16 when requirement of PN10 for sizes 80mm (3in.) to 150mm(6in.) because of same mating dimensions. Not available with 65, 125mm.

Note 3: Flange type is available for size 15mm or larger, PFA or Polyurethane lining.

Note 4: Select ANSI 1/2 NPT female electrical connection(codeA) in case of requirement of FM/CSA explosion proof type.

For CENELEC ATEX explosion proof type, select ANSI 1/2NPT(code A) or ISO M20× 1.5 (code M) electrical connection.

Note 5: Platinum-iridium and tantalum electrodes are not available with 65, 125mm and ceramics 150, 200mm.

Note 6: Select "PN40" when requirement of PN10, PN16, PN25 for sizes 50mm or less wafer or flange process connection because of same mating dimension. "PN40" is available for CENELEC ATEX, but not available for FM, CSA, or SAA ex-proof version.

General Purpose /Explosion Proof, Remote Type Flow Tube AE300 series

○: Available –: Not available

Model	Suffix Code	Description	Use				
			DG	DN			
			Lining				
			A	U	A		
AE325 AE330 AE335 AE340	..... ..... ..... .....	Size 250mm (10in.) Size 300mm (12in.) Size 350mm (14in.) Size 400mm (16in.)	○ ○ ○ ○	○ ○ ○ ○	○ ○ ○ ○		
Use	DG DN	..... .....	General Purpose Ex-proof(CENELEC ATEX, SAA)	○ –	○ –	○ ○	
Lining	-A -U	..... .....	Fluorocarbon PFA Polyurethane	○ –	– ○	○ –	
Process Connection	K1 B1 E1 H1 J1 J2 A1 A2 D1 D2 G1	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	JIS 10K Wafer ANSI 150 Wafer DIN PN10 Wafer JIS F12 Wafer JIS 10K flange JIS 20K flange ANSI 150 flange ANSI 300 flange DIN PN10 flange DIN PN16 flange JIS F12(JIS75M) flange	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	– – – – ○ ○ ○ ○ ○ ○ ○	Only for size 250, 300mm Only for size 250, 300mm Only for size 250, 300mm Only for size 250, 300mm Only for size 250, 300mm Only for size 250, 300mm
Electrode Material	-L -P -H -T -V	..... ..... ..... ..... .....	Stainless Steel (SUS316L) Platinum-iridium Hastelloy C276 equivalent Tantalum Titanium	○ ○ ○ ○ ○	○ – – – –	○ ○ ○ ○ ○	Only for flange type Only for flange type Only for flange type Only for flange type
Earth Ring Material	S H V N	..... ..... ..... .....	Stainless Steel (SUS316) Hastelloy C276 equivalent Titanium None	○ ○ ○ ○	○ – – ○	○ ○ ○ ○	Only for flange type Only for flange type
Electrical Connection	J A D M	..... ..... ..... .....	JIS G1/2 female ANSI 1/2NPT female DIN Pg13.5 female ISO M20 x 1.5 female	○ ○ ○ ○	○ ○ ○ ○	– ○ ○ ○	
Optional Code		/□	Refer to "Optional Specifications."				

Note : For ATEX explosion proof type, select ANSI1/2NPT(code A) or ISO M20x 1.5(code M) electrical connection.

T16.EPS

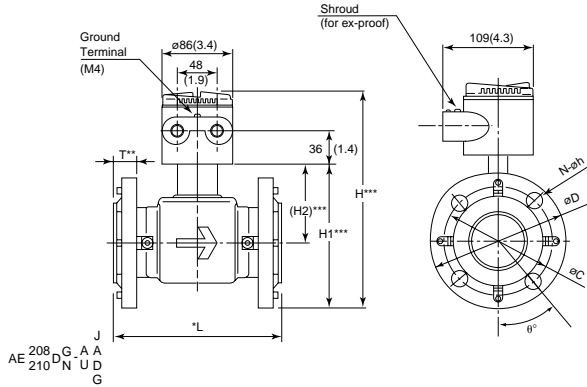
Sanitary, Remote Type Flow Tube:

Model	Suffix code	Description
AE202	.....	Size 25 mm(1in.)
AE204	.....	Size 40 mm(1.5in.)
AE205	.....	Size 50 mm(2in.)
AE206	.....	Size 65 mm(2.5in.)
AE208	.....	Size 80 mm(3in.)
AE210	.....	Size 100 mm(4in.)
Use	DH	..... Sanitary type
Lining	-A	..... PFA
Process Connection	C1	..... ISO(IDF) clamp
Electrode Material	-L	..... Stainless steel (SUS316L)
Earth Ring	N	..... None
Electrical Connection	J A D M JIS G1/2 female ANSI 1/2 NPT female DIN Pg13.5 female ISO M20 X1.5 female
Optional Code		/□ Refer to "Optional Specifications."

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80 and 100mm(3 and 4in.) Flange Type:

Unit: mm
(approx. inch)



- * The face-to-face length is longer by approx.22mm(0.89 in.) for earth ring P.T.
- ** The thickness(T) is longer by approx. 11mm(0.43 in.)for earth ring P.T.
- * The face-to-face length is shorter by approx. 6mm(0.24 in.) for non earth ring type.
- ** The thickness(T) is shorter by approx. 3mm(0.12 in.) for non earth ring type.
- * The face-to-face length is longer by approx.2mm(0.08 in.) for optional code/FRG.
- ** The thickness(T) is longer by approx. 1mm(0.04 in.) for optional code/FRG.
- *** The height is shorter by 2.5mm(0.1 in.)for ex-proof type.

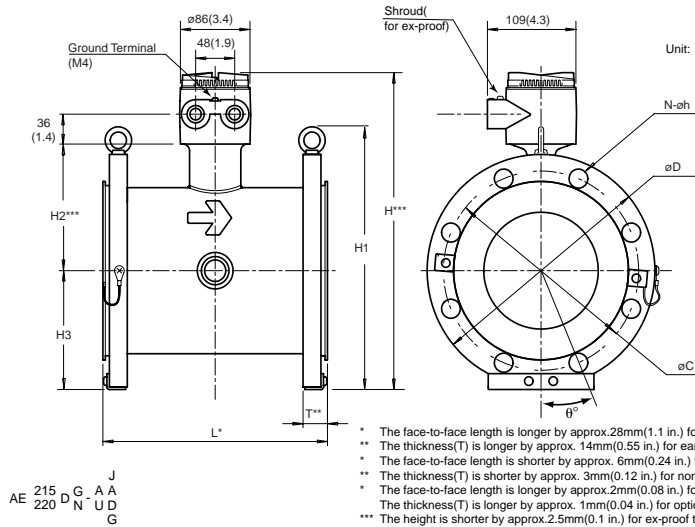
Type	General(G), Ex-proof(N)																
Size code	208							210									
Size	80(3)							100(4)									
Lining code	A(PFA), U(Polyurethane)																
Process Connection	J1	J2	A1	A2	D2	G1	J1	J2	A1	A2	D2	G1					
Height	H***	288(11.3)***	296(11.7)***	291(11.4)***	300(11.8)***	296(11.7)***	301(11.9)***	324(12.8)***	331(13.0)***	333(13.1)***	346(13.6)***	329(13.0)***	338(13.3)***				
Height	H1***	202(8.0)***	210(8.3)***	205(8.1)***	214(8.4)***	210(8.3)***	215(8.5)***	238(9.4)***	245(9.6)***	247(9.7)***	260(10.2)***	243(9.6)***	252(9.9)***				
Height	H2***	109.5(4.3)***							132.5(5.2)***								
Outer dia.	øD	185(7.2)	200(7.9)	191(7.5)	210(8.3)	200(7.9)	211(8.3)	210(8.3)	225(8.9)	229(9.1)	254(10)	220(8.7)	238(9.4)				
Thickness	T**	25(1) -31(1.2)**	29(1.1) -35(1.4)**	31(1.2) -38(1.5)**	36(1.4) -43(1.7)**	26(1) -32(1.3)**	25(1) -31(1.2)**	25(1) -31(1.2)**	31(1.2) -37(1.5)**	31(1.2) -38(1.5)**	39(1.5) -46(1.8)**	26(1) -32(1.3)**	25(1) -32(1.3)**				
Pitch circle dia.	øC	150(5.1)	160(6.3)	152(6.0)	168(6.6)	160(6.3)	168(6.6)	175(6.9)	185(7.3)	191(7.5)	200(7.9)	180(7.1)	195(7.7)				
Hole dia.	øh	19(0.7)	23(0.9)	19(0.7)	22(0.9)	18(0.7)	19(0.7)	19(0.7)	23(0.9)	19(0.7)	22(0.9)	18(0.7)	19(0.7)				
Number of holes	N	8	8	4	8	8	4	8	8	8	8	8	4				
Bolt hole pitch	ø°	22.5	22.5	45	22.5	22.5	45	22.5	22.5	22.5	22.5	22.5	19				
Face-to-face	L*	200(7.9)*							250(9.8)*								
Weight kg(lb)		13(28.6)	15(33.0)	15.3(33.7)	18.3(40.3)	15(33.1)	15.5(34.2)	21.0(46.3)	24.2(53.4)	25.0(55.1)	32.4(71.4)	22.7(50.1)	24.1(53.1)				

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Process connection : J1 ; JIS10K J2 ; JIS20K A1 ; ANSI 150 A2 ; ANSI 300 D2 ; DIN PN16 G1 ; JIS F12

150 and 200mm(6 and 8in.) Flange Type:

Unit: mm
(approx. inch)



- * The face-to-face length is longer by approx.28mm(1.1 in.) for earth ring P.T.
- ** The thickness(T) is longer by approx. 14mm(0.55 in.) for earth ring P.T.
- * The face-to-face length is shorter by approx. 6mm(0.24 in.) for non earth ring type.
- ** The thickness(T) is shorter by approx. 3mm(0.12 in.) for non earth ring type.
- * The face-to-face length is longer by approx.2mm(0.08 in.) for optional code/FRG.
- ** The thickness(T) is longer by approx. 1mm(0.04 in.) for optional code/FRG.
- *** The height is shorter by approx.2.5mm(0.1 in.) for ex-proof type.

Type	General(G), Ex-proof(N)																
Size code	215							220									
Size	150(6)							200(8)									
Lining code	A(PFA), U(Polyurethane)																
Process connection	J1	G1	A1	J2	A2	D2	J1	G1	A1	J2	A2	D1	D2				
Face-to-face	L	270(10.6)*												340(13.4)*			
Outer dia.	øD	280(11)	290(11.4)	279(11.0)	305(12)	318(12.5)	285(11.2)	330(13)	342(13.5)	343(13.5)	350(13.8)	381(15.0)	340(13.4)	340(13.4)			
Height	H***	382(15)**	387(15.2)**	381(15.0)**	394(15.5)**	401(15.8)**	384(15.1)**	432(17.0)**	438(17.2)**	438(17.3)**	442(17.4)**	457(18.0)**	437(17.2)**	437(17.2)**			
Height	H1	317(12.5)	327(12.9)	316(12.4)	342(13.4)	354(13.9)	322(12.7)	367(14.4)	379(14.9)	379(14.9)	387(15.2)	419(16.4)	377(14.8)	377(14.8)			
Height	H2***	152.5(6.0)***							177.5(7.0)***								
Height	H3	143(5.6)	148(5.8)	143(5.6)	156(6.1)	162(6.4)	148(5.7)	168(6.6)	174(6.9)	175(6.9)	178(7.0)	194(7.6)	173(6.8)	173(6.8)			
Pitch circle dia.	øC	240(9.4)	247(9.7)	241(9.5)	260(10.2)	270(10.6)	240(9.4)	290(11.4)	299(11.8)	298(11.7)	305(12)	330(10.6)	295(11.6)	295(11.6)			
Number of holes	N	8	6	8	12	12	8	12	8	8	12	12	8	12			
Bolt hole pitch	ø°	22.5	30	22.5	15	15	22.5	15	22.5	22.5	15	15	22.5	15			
Hole dia.	øh	23(0.9)	19(0.7)	23(0.9)	25(1)	22(0.9)	23(0.9)	19(0.9)	23(0.9)	23(0.9)	25(1.0)	25(1.0)	22(0.9)	22(0.9)			
Thickness(A)	T**	30(1.2)**	30(1.2)**	33.4(1.3)**	36(1.4)**	44.5(1.8)**	30(1.2)**	30(1.2)**	32(1.3)**	36.4(1.4)**	38(1.5)**	49.1(1.9)**	32(1.3)**	32(1.3)**			
Thickness(U)	T**	31(1.2)**	31(1.2)**	34.4(1.4)**	37(1.5)**	45.5(1.8)**	31(1.2)**	31(1.2)**	33(1.3)**	37.4(1.5)**	39(1.5)**	50.1(2.0)**	33(1.3)**	33(1.3)**			
Weight(General) kg(lb)		29(63.9)	31(68.3)	31(68.3)	37(81.6)	48(105.8)	31(68.3)	41(90.2)	46(101.2)	49(107.8)	52(114.4)	73(160.6)	45(99.2)	46(101.2)			
Weight(Ex-proof) kg(lb)		32(70.6)	34(75.0)	34(75.0)	40(88.2)	51(112.5)	34(75.0)	46(101.4)	51(112.5)	54(119.1)	57(125.7)	78(172.0)	50(110.3)	51(112.5)			

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Process connection : J1 ; JIS10K J2 ; JIS20K A1 ; ANSI 150 A2 ; ANSI 300 D1 ; DIN PN10 D2 ; DIN PN16 G ; JIS F12

7. PRESSURE EQUIPMENT DIRECTIVE

This chapter is described further requirements and notices concerning the PED (Pressure Equipment Directive). The description in this chapter is prior to other description in this User's Manual.

(1) Technical Data

Module : H

Type of Equipment : Piping

Type of Fluid : Liquid and Gas

Group of Fluid : 1 and 2

General Purpose / Explosion Proof

MODEL	DN (mm)*	PS (MPa)*	PS-DN (MPa-mm)	CATEGORY**
AE102DG/DN	2.5	4	10	Article 3, *** paragraph 3
AE105DG/DN	5	4	20	Article 3, *** paragraph 3
AE110DG/DN	10	4	40	Article 3, *** paragraph 3
AE115DG/DN	15	4	60	Article 3, *** paragraph 3
AE202DG/DN	25	4	100	Article 3, *** paragraph 3
AE204DG/DN	40	4	160	II
AE205DG/DN	50	4	200	II
AE206DG/DN	65	2	130	II
AE208DG/DN	80	2	160	II
AE210DG/DN	100	2	200	II
AE212DG/DN	125	2	250	II
AE215DG/DN	150	2	300	II
AE220DG/DN	200	2	400	III
AE325DG/DN	250	2	500	III
AE330DG/DN	300	2	600	III
AE335DG/DN	350	1	700	II
AE340DG/DN	400	1	800	III

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Sanitary

MODEL	DN (mm)*	PS (MPa)*	PS-DN (MPa-mm)	CATEGORY**
AE202DH	25	1	25	Article 3, *** paragraph 3
AE204DH	40	1	40	I
AE205DH	50	1	50	I
AE206DH	65	1	65	I
AE208DH	80	1	80	I
AE210DH	100	1	100	I

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* PS: Maximum allowable pressure for Flow Tube
DN: Nominal size

** Referred to Table 6 covered by ANNEX II of EC Directive on Pressure Equipment Directive 97/23/EC)

*** AE102DG/DN to AE202DG/DN, and AE202DH are not attached CE mark of PED because they do not come under CE marking of PED.

(2) Installation



WARNING

- Please tighten the bolts for piping-joint according to the prescribed torque values.
- Please take measure to protect the flowmeters from forces caused by vibration through piping.

(3) Operation



WARNING

- The temperature and pressure of fluid should be applied under the normal operating condition.
- The ambient temperature should be applied under the normal operating condition.
- Please pay attention to prevent the excessive pressure like water hammer, etc. When water hammer is to be occurred, please take measures to prevent the pressure from exceeding PS(maximum allowable pressure) by setting the safety valve, etc. at the system and the like.
- When external fire is to be occurred, please take safety measures at the device or system not to influence the flowmeters.
- Please avoid the fluid exceeding the corrosion proof of lining and electrode.
- Please pay attention not to be abrade the metal pipe, when the fluid to abrade the lining such as slurry and sand are contained.