

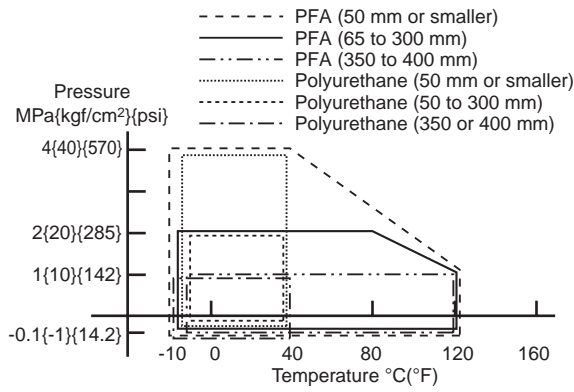
**Models AE100, AE200 and AE300  
Integral Type Magnetic Flowmeter  
[Style S1:AE\*\*\*SC]  
[Style S2:AE\*\*\*M\*]**

Manual Change No. 05-023-1E

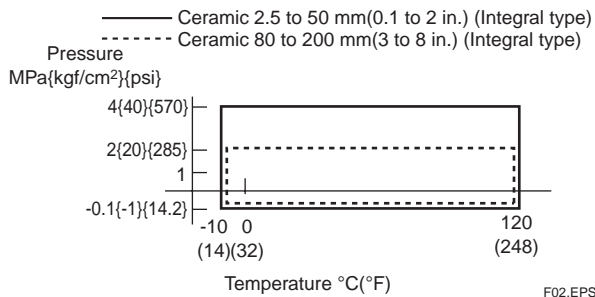
Please use the attached sheets for the pages listed below in IM 1E7B0-02E (16th).

Page and Item	Contents of Correction
Page 10-4 Fluid Temperature and Pressure	Limitations for 350 and 400mm are added.
Page 10-6 MODEL AND SUFFIX CODE	Process Connection E1 is added only for 200mm.
Page 10-7 MODEL AND SUFFIX CODE	Process Connection E2 for AE300 is corrected to E1.
Page 10-12 EXTERNAL DIMENTIONS	Process Connection D1 for AE215 is deleted from the table as D2 be applied.
Page 13-1 PED	CATEGORY III for AE335MG/MN/SC is corrected to CATEGORY II.

**PFA, Polyurethane Lining**



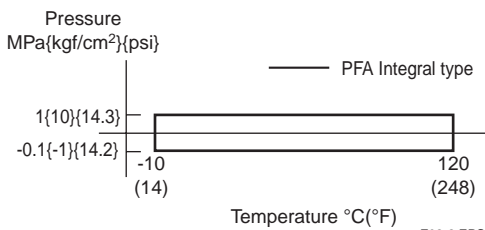
**Ceramic Lining**



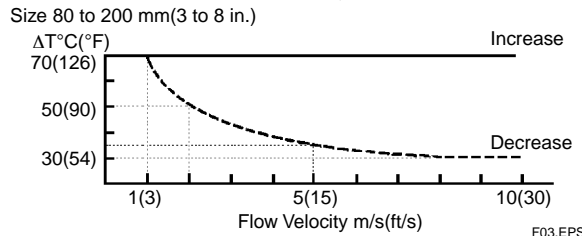
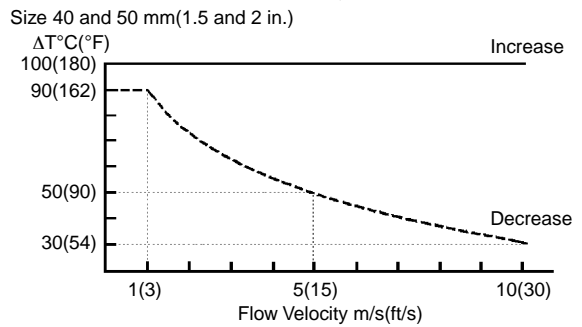
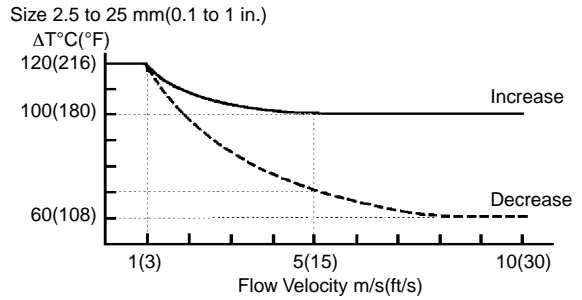
**Note 1:** Those limits show maximum allowable fluid pressure for Flow Tube itself. Further fluid pressure should also be limited according to process connection.

**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".

**Sanitary**



**Reasonable Figures for Thermal Shock of Ceramic Lining:**



**■ TERMINAL CONNECTION**

Terminal Symbols	Description
[ P+ P- ]	] Pulse, alarm or status output
[ I+ I- ]	] Current output 4 to 20 mA DC
[ L/+ N/- ]	] Power supply
[ Ⓧ ]	] Protective grounding

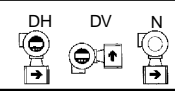
**For Fieldbus Communication Type**

Terminal Symbols	Description
[ P+ P- ]	] Not used
[ I+ I- ]	] Fieldbus communication signal
[ L/+ N/- ]	] Power supply
[ Ⓧ ]	] Protective grounding

■ MODEL AND SUFFIX CODE

General Purpose/Explosion Proof, Integral Type AE100/200 series

○: Available -: Not available

Model	Suffix Code	Description	Use								
			MG		SC		MN				
			Lining								
			A	U	C	A	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	MG	General purpose type	○	○	○	-	-	-	-		
	MN	CENELEC,FM,CSA,SAA Ex-proof	-	-	-	-	-	○	○		Note 4
	SC	TIIS (JIS) Flameproof	-	-	-	○	○	-	-		Note 5
Lining	-A	Fluorocarbon PFA	○	-	-	○	-	-	-		
	-U	Polyurethane	-	○	-	-	-	-	-		
	-C	Ceramic	-	-	○	-	○	-	○		
Process Connection (Note 3)	K1	JIS 10K wafer	○	○	○	○	○	○	○		
	K2	JIS 20K wafer	○	○	○	○	○	○	○		Not available with 65/125mm
	B1	ANSI 150 wafer	○	○	○	○	○	○	○		
	B2	ANSI 300 wafer	○	○	○	○	○	○	○		Not available with 65/125mm
	E1	DIN PN10 wafer	○	○	○	○	○	○	○		Size 200 mm(8in.) only
	E2	DIN PN10/16 wafer	○	○	○	○	○	○	○		Note 2
	E4	DIN PN40 wafer	○	○	○	-	-	-	-		Note 7
	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	○	○	-	○	-	○	-		
	A2	ANSI 300 flange	○	○	-	○	-	○	-		
	D1	DIN PN10 flange	○	○	-	○	-	○	-		Size 200mm (8in.)only
	D2	DIN PN16 flange	○	○	-	○	-	○	-		Note 2
	D4	DIN PN40 flange	○	○	-	-	-	-	-		Note 7
G1	JIS F12(JIS75M) flange	○	○	-	○	-	○	-		Size 80/100/150/200mm only	
U1	Union Joint (weld joint)	-	-	○	-	○	-	○		} Ceramic lining, size 2.5/ 5/10mm only	
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 6
	P	Platinum-iridium	○	-	○	○	○	○	○		Must for ceramic, 2.5/5/10mm
	N	None	○	○	○	○	○	○	○		Not available with 65/125mm
	H	Hastelloy C276 equivalent	○	-	○	○	○	○	○		Note 6
	T	Tantalum	○	-	○	○	○	○	○		Note 6
	V	Titanium	○	-	○	○	○	○	○		Not available with 65/125mm
Electrical Connection	J	JIS G1/2 female	○	○	○	○	○	-	-		
	A	ANSI 1/2NPT female	○	○	○	-	-	○	○		
	D	DIN Pg13.5 female	○	○	○	-	-	○	○		
	M	ISO M20×1.5 female	○	○	○	-	-	○	○		
Power Supply	-A1	80 to 264 V AC/100 to 130 V DC	○	○	○	○	○	○	○		
	-D1	20.4 to 28.8 V DC	○	○	○	○	○	○	○		
Indicator	DH	7seg.LCD(Horizontal Mounting)	○	○	○	○	○	○	○		
	DV	7seg.LCD(Vertical Mounting)	○	○	○	○	○	○	○		
	N	None	○	○	○	-	-	○	○		
Optional Code		<input type="checkbox"/> Refer to "Optional Specifications."									

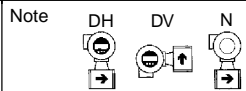
T11.EPS

- 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 1/2NPT female electrical connection(code A) 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: Select JIS G1/2 female electrical connection (code J) and optional code /JF3 with /G11, /G12 in case of requirement of TIIS(JIS) Flameproof type.
- Note 6: Platinum-iridium and Tantalum earth electrodes are not available with 65, 125mm and ceramics 150, 200mm.
- Note 7: 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, Integral Type AE300 series

○: Available -: Not available

Model	Suffix Code	Description	Use		
			MG	MN	
			Lining		
			A	U	A
AE325	.....	Size 250mm (10in.)	○	○	○
AE330	.....	Size 300mm (12in.)	○	○	○
AE335	.....	Size 350mm (14in.)	○	○	○
AE340	.....	Size 400mm (16in.)	○	○	○
Use	MG	General Purpose	○	○	-
	MN	Ex-proof(CENELEC ATEX,SAA)	-	-	○
Lining	-A	Fluorocarbon PFA	○	-	○
	-U	Polyurethane	-	○	-
Process Connection	K1	JIS 10K wafer	○	○	-
	B1	ANSI 150 wafer	○	○	-
	E1	DIN PN10 wafer	○	○	-
	H1	JIS F12 wafer	○	○	-
	J1	JIS 10K flange	○	○	○
	J2	JIS 20K flange	○	○	○
	A1	ANSI 150 flange	○	○	○
	A2	ANSI 300 flange	○	○	○
	D1	DIN PN10 flange	○	○	○
D2	DIN PN16 flange	○	○	○	
G1	JIS F12(JIS75M) flange	○	○	○	
Electrode Material	-L	Stainless Steel (SUS316L)	○	○	○
	-P	Platinum-iridium	○	-	○
	-H	Hastelloy C276 equivalent	○	-	○
	-T	Tantalum	○	-	○
	-V	Titanium	○	-	○
Earth Ring Material	S	Stainless Steel (SUS316)	○	○	○
	H	Hastelloy C276 equivalent	○	-	○
	V	Titanium	○	-	○
	N	None	○	○	○
Electrical Connection	J	JIS G1/2 female	○	○	-
	A	ANSI 1/2NPT female	○	○	○
	D	DIN Pg13.5 female	○	○	○
	M	ISO M20×1.5 female	○	○	○
Power Supply	-A1	80 to 264 V AC/100 to 130 V DC	○	○	○
	-D1	20.4 to 28.8 V DC	○	○	○
Indicator	DH	7seg.LCD(Horizontal Mounting)	○	○	○
	DV	7seg.LCD(Vertical Mounting)	○	○	○
	N	None	○	○	○
Optional Code	/□	Refer to "Optional Specifications."			



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

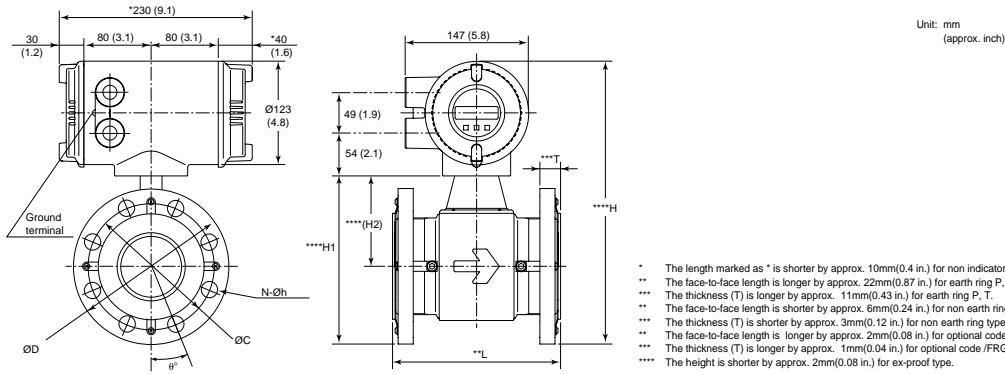
T12.EPS

Sanitary, Integral Type

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	MH	Sanitary type
Lining	-A	PFA
Process Connection	C1	ISO(IDF) clamp
Electrode Material	-L	Stainless steel (SUS316L)
Earth Ring	N	None
Electrical Connection	J	JIS G1/2 femal
	A	ANSI 1/2 NPT female
	D	DIN Pg13.5 female
	M	ISO M20 × 1.5 female
Power Supply	-A1	80 to 264 V AC /100 to 130 V DC
	-D1	20.4 to 28.8V DC
Indicator	DH	7Seg. LCD (Horizontal Mounting)
	DV	7Seg. LCD (Vertical Mounting)
	N	None
Optional Code	/□	Refer to Optional Specifications.

T17.EPS

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



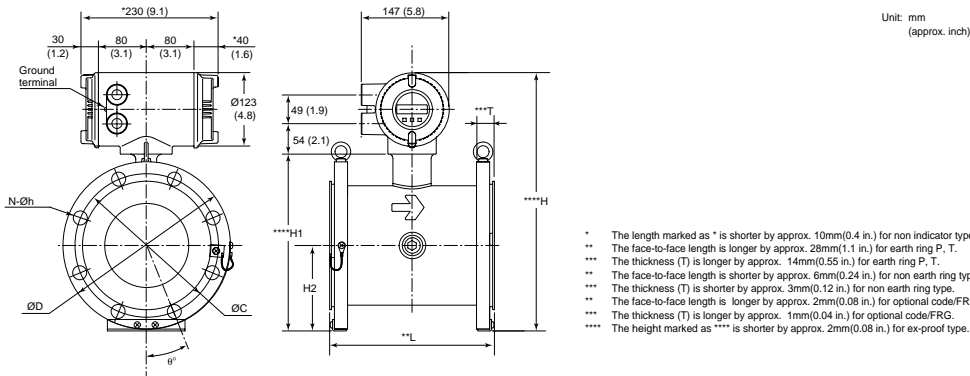
- \* The length marked as \* is shorter by approx. 10mm(0.4 in.) for non indicator type.
- \*\* The face-to-face length is longer by approx. 22mm(0.87 in.) for earth ring P. T.
- \*\*\* The thickness (T) is longer by approx. 11mm(0.43 in.) for earth ring P. T.
- \*\*\*\* The face-to-face length is shorter 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 approx. 2mm(0.08 in.) for ex-proof type.

Size code	208						210						
	80(3.0)						100(4.0)						
Size	80(3.0)						100(4.0)						
Lining	A(PFA), U(Polyurethane)						A(PFA), U(Polyurethane)						
Process connection	J1	J2	A1	A2	D2	G1	J1	J2	A1	A2	D2	G1	
Height	***H	341.5 (13.4)	349 (13.7)	344.3 (13.6)	353.8 (13.9)	349 (13.7)	354.5 (14.0)	377 (14.8)	384.5 (15.1)	386.3 (15.2)	399 (15.0)	382 (15.4)	
Height	****H1	201.5 (7.9)	209 (8.2)	204.3 (8.0)	213.8 (8.4)	209 (8.2)	214.5 (8.4)	237 (9.3)	244.5 (9.6)	246.3 (9.7)	259 (10.2)	242 (9.5)	
Height	****H2	109(4.3)						132(5.2)					
Outer diameter	D	185 (7.3)	200 (7.9)	190.5 (7.5)	209.6 (8.3)	200 (7.9)	211 (8.3)	210 (8.3)	225 (8.9)	228.6 (9.0)	254 (10.0)	220 (8.7)	238 (9.4)
Thickness	***T	25(1.0) to 31(1.2)	29(1.1) to 35(1.4)	31(1.2) to 38(1.5)	36(1.4) to 43(1.7)	26(1.0) to 32(1.3)	25(1.0) to 32(1.3)	25(1.0) to 31(1.5)	31(1.2) to 38(1.5)	31(1.2) to 39(1.5)	39(1.5) to 46(1.8)	26(1.0) to 32(1.3)	25(1.0) to 32(1.3)
Pitch circle dia.	C	150 (5.9)	160 (6.3)	152.4 (6.0)	168.1 (6.6)	160 (6.3)	168 (6.6)	175 (6.9)	185 (7.3)	190.5 (7.5)	200.2 (7.9)	180 (7.1)	195 (7.7)
Bolt hole pitch	ø <sup>h</sup>	22.5	22.5	45	22.5	22.5	45	22.5	22.5	22.5	22.5	22.5	45
Dia. of hole	h	19 (0.7)	23 (0.9)	19.1 (0.7)	22.4 (0.9)	18 (0.7)	19 (0.7)	19 (0.7)	23 (0.9)	19.1 (0.7)	22.4 (0.9)	18 (0.7)	19 (0.7)
Number of holes	N	8	8	4	8	8	4	8	8	8	8	8	4
Face-to-face length	**L	200(7.9)						250(9.8)					
Weight kg (lb)		15.3 (33.7)	17.3 (38.1)	17.6 (38.8)	20.6 (45.4)	17.3 (38.1)	17.8 (39.2)	23.3 (51.3)	26.5 (58.4)	27.3 (60.1)	34.7 (76.4)	25.0 (55.1)	26.4 (58.1)

F11.EPS

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



- \* The length marked as \* is shorter by approx. 10mm(0.4 in.) for non indicator type.
- \*\* 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 marked as \*\*\*\* is shorter by approx. 2mm(0.08 in.) for ex-proof type.

Size code	215						220							
	150(6.0)						200(8.0)							
Size	150(6.0)						200(8.0)							
Lining	A (PFA), U (Polyurethane)						A (PFA), U (Polyurethane)							
Process connection	J1	G1	A1	J2	A2	D2	J1	G1	A1	J2	A2	D1	D2	
Face-to-face length	**L	270 (10.6)						340 (13.4)						
Outer diameter	D	280 (11.0)	290 (11.4)	280 (11.0)	305 (12.0)	320 (12.6)	285 (11.2)	330 (13.0)	342 (13.5)	345 (13.6)	350 (13.8)	380 (15.0)	340 (13.4)	340 (13.4)
Height	****H	435 (17.1)	440.5 (17.3)	245.5 (17.1)	448.5 (17.7)	455.5 (17.9)	438.5 (17.3)	485 (19.1)	491.5 (19.4)	491.5 (19.4)	495.5 (19.5)	508.5 (20.0)	488.5 (19.2)	488.5 (19.2)
Height	****H1	295 (11.6)	300.5 (11.8)	295.5 (11.6)	308.5 (12.1)	315.5 (12.4)	298.5 (11.8)	345 (13.6)	351.5 (13.8)	351.5 (13.8)	355.5 (14.0)	368.5 (14.5)	348.5 (13.7)	348.5 (13.7)
Height	H2	143 (5.6)	148 (5.8)	143 (5.6)	156 (6.1)	163 (6.4)	146 (5.7)	168 (6.6)	174 (6.9)	176 (6.9)	178 (7.0)	193 (7.6)	173 (6.8)	173 (6.8)
Pitch circle dia.	C	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 (12.0)	330 (13.0)	295 (11.6)	295 (11.6)
Bolt hole pitch	ø <sup>h</sup>	22.5	30	22.5	15	15	22.5	15	22.5	22.5	15	15	22.5	15
Number of holes	N	8	6	8	12	12	8	12	8	8	12	12	8	12
Dia. of hole	h	23 (0.9)	19 (0.7)	23 (0.9)	25 (1.0)	22 (0.9)	22 (0.9)	23 (0.9)	19 (0.7)	23 (0.9)	25 (1.0)	25 (1.0)	22 (0.9)	22 (0.9)
Thickness (PFA)	***T	30	30	33.4	36	44.5	30	30	32	36.4	38	49.1	32	32
Thickness (Polyurethane)	***T	31	31	34.4	37	45.5	31	31	33	37.4	39	50.1	33	33
Weight kg (lb) (General)		31.3 (68.9)	33.3 (73.3)	33.3 (73.3)	39.3 (86.6)	50.3 (110.8)	33.3 (73.3)	43.3 (95.4)	48.3 (106.4)	51.3 (113.0)	54.3 (120.0)	75.3 (165.9)	47.3 (104.2)	48.3 (106.4)
Weight kg (lb) (EX-proof)		34.3 (75.6)	36.3 (80.0)	36.3 (80.0)	42.3 (93.2)	53.3 (117.4)	36.3 (80.0)	48.3 (106.4)	53.3 (117.4)	56.3 (124.0)	59.3 (130.6)	80.3 (176.9)	52.3 (115.2)	53.3 (117.4)

F12.EPS

Process connection : J1; JIS10K J2; JIS20K A1; ANSI 150 A2; ANSI 300 D1; DIN PN10 D2; DIN PN16 G1; JIS F12

# 13. 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**
AE102MG/MN/SC	2.5	4	10	Article 3,*** paragraph 3
AE105MG/MN/SC	5	4	20	Article 3,*** paragraph 3
AE110MG/MN/SC	10	4	40	Article 3,*** paragraph 3
AE115MG/MN/SC	15	4	60	Article 3,*** paragraph 3
AE202MG/MN/SC	25	4	100	Article 3,*** paragraph 3
AE204MG/MN/SC	40	4	160	II
AE205MG/MN/SC	50	4	200	II
AE206MG/MN/SC	65	2	130	II
AE208MG/MN/SC	80	2	160	II
AE210MG/MN/SC	100	2	200	II
AE212MG/MN/SC	125	2	250	II
AE215MG/MN/SC	150	2	300	II
AE220MG/MN/SC	200	2	400	III
AE325MG/MN/SC	250	2	500	III
AE330MG/MN/SC	300	2	600	III
AE335MG/MN/SC	350	1	700	II
AE340MG/MN/SC	400	1	800	III

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### Sanitary

MODEL	DN (mm)*	PS (MPa)*	PS-DN (MPa-mm)	CATEGORY**
AE202MH	25	1	25	Article 3,*** paragraph 3
AE204MH	40	1	40	I
AE205MH	50	1	50	I
AE206MH	65	1	65	I
AE208MH	80	1	80	I
AE210MH	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)
- \*\*\* AE102MG/MN/SC to AE202MG/MN/SC, and AE202MH 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.