Lana Sarrate

Liquid Gas

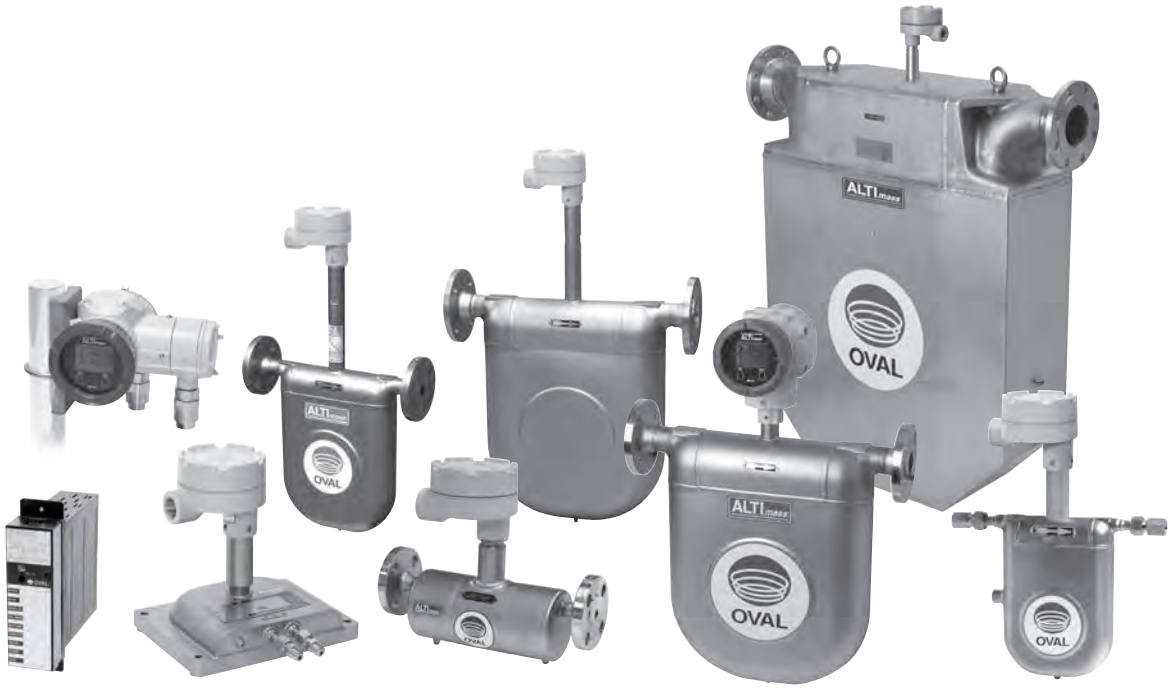
OVAL

High Performance Coriolis Flowmeters

ALTImass Type U

GENERAL SPECIFICATION

GS.No.GBN120E–33



■ GENERAL

Equipped with a sophisticated transmitter (self diagnosis feature, large size display, and field reconfiguration capability using touch panel), “ALTImass Type U” is an all round high performance Coriolis flowmeter capable of mass flow measurement at a high degree of accuracy. Notable functionality in applications where measurement of extra low flows, short-duration filling process, etc. together with routine flowrate measurements.

■ FEATURES

1.Significant improvement in zero point stability error. (compared to previous transmitters)

2.High measuring accuracy of density: ±0.0005 g/mL (CA003 to CA250)

3.Fast response: Ten times faster than previous models.

4.Increased output signals
Pulse output (dual outputs), current output (dual outputs), and status output (single output)

5.You can reconfigure transmitter parameters using touch panel (also through communication device).

6.Increased self-diagnostic capabilities: checking for cable faults, pipeline vibration, and monitoring transmitter temperatures, to name a few.

7.Enhanced maintenance functions
Error logging, storing factory shipping data, and downloading programs

8.Two alarm indicators provided

9.Compatible with various communication protocols
(HART communication, FOUNDATION fieldbus communication, PROFIBUS communication, Modbus communication)

10. Air-entrained fluid measurement can be done by adjusting Gas Mixed Flow Alarm (Slug Alm.) among self-diagnostic capabilities.

11. Rack-mount transmitter available (refer to GS No.GEJ516E for details)

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■ GENERAL PERFORMANCE

● Flowrate

Type	Model	Inch	Guaranteed min. rate (kg/h)	Min. setting rate (kg/h)	Maximum service rate (kg/h)	Maximum allowable rate (kg/h)	Zero stability (kg/h)
Standard model	CA00A	1/4″	0.024 (0.4g/min)	0.12 (2g/min)	2.4 (40g/min)	3.6 (60g/min)	0.00024
	CA001		0.09 (1.5g/min)	0.45 (7.5g/min)	9 (150g/min)	13.5 (225g/min)	0.0009
	CA003	3/8″	0.72 (0.9 ※1)	3.6	72	144 (180 ※1)	0.0018
	CA006	3/8″	3.6	18	360	720	0.018
	CA010	1/2″	12	60	1200	2400	0.06
	CA015	1/2″	36	180	3600	7200	0.18
Standard model and Low temperature explosionproof service model	CA025	1″	108	540	10800	21600	0.54
	CA040	1·1/2″	390	1950	39000	78000	1.95
	CA050	2″					
	CA080	3″	1200 (1.2t/h)	6000 (6t/h)	120000 (120t/h)	240000 (240t/h)	6
	CA100	4″	3420 (3.42t/h)	17100 (17.1t/h)	342000 (342t/h)	684000 (684t/h)	17.1
	CA150	6″					
	CA15H	6″	7000 (7t/h)	35000 (35t/h)	700000 (700t/h)	1400000 (1400t/h)	35
	CA200	8″					
	CA20H	8″	14000 (14t/h)	70000 (70t/h)	1400000 (1400t/h)	2800000 (2800t/h)	70
	CA250	10″					
High pressure service model	CA010	Rc3/8	24	120	840	1680	0.21
	CA015	Rc3/4	78	390	2550	5100	0.636
High temperature service model	CA025	1″	108	540	10800	21600	1.08
	CA040	1·1/2″	390	1950	39000	78000	3.9
	CA050	2″					
	CA080	3″	1200 (1.2t/h)	6000 (6t/h)	120000 (120t/h)	240000 (240t/h)	12
	CA100	4″	3420 (3.42t/h)	17100 (17.1t/h)	342000 (342t/h)	684000 (684t/h)	34.2
	CA150	6″					

※1: When maximum allowable range 180 kg/h is adopted, the minimum flow rate is 0.9 kg/h.
※: For gas measurement, maximum permissible flow velocity varies with the type of gas. Some gas may not be properly measured. Please consult OVAL sales office or nearest representative.

● Accuracy

		Standard model and Low temperature explosionproof service model	High accuracy option (※4)	CA00A CA001	High pressure service mode (※5)	High temperature service model	Analog output accuracy
Liquids	Accuracy	±0.1% (※1, 3)	±0.05%	±0.2% (※1)	±0.2%±ZS	±0.1%±ZS	Accuracy ±0.1% of full scale
	Repeatability	±0.05% (※2, 3)	±0.025%	±0.05% (※2)	±0.1%±1/2ZS	±0.05%±1/2ZS	
Gases	Accuracy	±0.5%±ZS	—	±0.5%±ZS	±0.5%±ZS	—	
	Repeatability	±0.25%±1/2	—	±0.25%±1/2	±0.25%±1/2ZS	—	

※1: ±ZS is applied for flow rates below 5% (2.5% in case of CA003) of the maximum service rate. (within guaranteed flow range)
※2: ±1/2 ZS is applied for flow rates below 5% (2.5% in case of CA003, 10% in case of CA00A and CA001) of the maximum service rate. (within guaranteed flow range)
※3: Accuracy of liquid measurement is ± 0.1% ± ZS, and repeatability of liquid measurement is ± 0.05% ± 1/2ZS in case of CA20H and CA250.
※4: High accuracy option is available for limited size and conditions. Please consult OVAL sales office or nearest representative.
※5: Measurement above maximum service flow rate, the accuracy will be [±0.3% ±ZS] of RD.
※: Accuracy is based on factory calibration accuracy (mass flowrate and density accuracy).
※: If you request volume flow measurement for the purpose of taxing or transactions, Please consult OVAL sales office or nearest representative.
※: Please consult OVAL for cryogenic fluid measurement such as LNG.
※: ZS = Zero stability error

$$\text{Zero stability error} = \frac{\text{Zero stability}}{\text{Flowrate at the moment}} \times 100\%$$ (Zero stability and flowrate during the test should read in the same measurement unit.)

● Density (Liquids)

Type	Model	Inch	Density (Liquids)		
			Metering range	Accuracy (Option)	Analog output accuracy
Standard model	CA00A	1/4″	0.3 to 2g/mL	±0.003g/mL	Accuracy ±0.1% of full scale
	CA001				
	CA003	3/8″		±0.0005g/mL	
	CA006	3/8″			
	CA010	1/2″			
	CA015	1/2″			
Standard model and Low temperature explosionproof service model	CA025	1″			
	CA040	1·1/2″			
	CA050	2″			
	CA080	3″			
	CA100	4″			
	CA150	6″			
	CA15H	6″			
	CA200	8″			
	CA20H	8″			
	CA250	10″			

Type	Model	Inch	Density (Liquids)		
			Metering range	Accuracy (Option)	Analog output accuracy
High pressure service model	CA010	Rc3/8	0.3 to 2g/mL	±0.004g/mL	Accuracy ±0.1% of full scale
	CA015	Rc3/4			
High temperature service model	CA025	1″	0.3 to 2g/mL	±0.003g/mL	
	CA040	1·1/2″			
	CA050	2″			
	CA080	3″			
	CA100	4″			
	CA150	6″			

※: The accuracy is based on the calibration accuracy at factory. When measuring a cryogenic fluid such as LNG, Please consult OVAL sales office or nearest representative.

● External appearance of the products

Remote-mount transmitter	Rack-mount transmitter	Standard				High pressure service model	High temperature service model	Low temperature explosionproof service model
PA0K	PA5K	CA00A, CA001	CA003	CA006 to CA080	CA100 to CA250	CA010, CA015	CA025 to CA150	CA025 to CA250
		1/4″	3/8″	3/8″ to 3″	4″ to 10″	Rc3/8, Rc3/4	1″ to 6″	1″ to 10″

■ GENERAL SPECIFICATIONS

1.Sensor unit general specifications

● Standard model (CA00A, CA001 and CA003)

Item		Description		
Model		CA00A	CA001	CA003
Nominal size		1/4″		10mm, 3/8″ (※1), DN15
Materials	**Wetted parts**	SUS316L		SUS316L, SUS316L+Alloy C, AlloyC (※2)
	Housing	SUS304		
	O-rings	Fluorine rubber (std.: FKM), PTFE (option)		—
Process connection		R 1/4		JIS 10, 20, 30, 40, 63K RF/ASME(JPI)150, 300, 600RF/ DIN PN 10, 16, 25, 40RF (※3), IDF Ferrule (※4), Screw
Applicable fluid		Liquid and gas		
Density range		0 to 2.0g/mL		
Viscosity range		Maximum 10000mPa·s (※5)		
Temperature range		–200 to +200°C (※6) (※7)		
Tube withstand (at 20°C)		—		Wetted parts materials: SUS316L Maximum 10MPa, Alloy C Maximum 15MPa (Depends on flange rating)
Maximum operating pressure	**Liquid**	15MPa at 20°C		
	Gas	0.98MPa		
Sensor housing withstand (MPa) (※8)		—		7.2
Flow direction		Bidirectional		
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.		
Dusttight, waterproof configuration		IP66 / 67		

※1: 1/2" for ASME and JPI flanged sensors.
※2: When wetted parts are made from Alloy C, only screw type connection is available.
※3: DIN flanges are available only to meters of the wet part material, "SUS316L" and "SUS316+Alloy C".
※4: For application with foods, this product does not comply with CE marking.
※5: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※6: Refer to page 23, 24, 25 for explosionproof specifications. In case of non-explosionproof type, the maximum measurement temperature of integral type is 130°C. However, the product must be used within the maximum ambient temperature of 45°C.
※7: Refer to page 26 for the ambient temperature.
※8: This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the breakdown test pressure at OVAL (distorted enclosures do not constitute a failure of the test), or the data obtained from the FEM analysis, whichever is lower (or safer).
※: For products conforming to the high pressure gas safety regulations and CE marking, Please consult OVAL sales office or nearest representative.
※: Remote-mount transmitter only. (with dedicated interconnect cable)

● Standard model (CA006 to CA080)

Item		Description						
Model		CA006	CA010	CA015	CA025	CA040	CA050	CA080
Nominal size		10mm, 3/8″(※1), DN15	15mm, 1/2″, DN15		25mm, 1″, DN25	40mm, 1･1/2″, DN40	50mm, 2″, DN50	80mm, 3″, DN80
Materials	**Wetted parts**	SUS316L, SUS316L + Alloy C, Alloy C						
	Housing	SUS304						
Process connection		JIS 10, 20, 30, 40, 63K RF/ASME(JPI)150, 300, 600RF/DIN PN 10, 16, 25, 40RF (※2), IDF Ferrule (※3), Screw						
Applicable fluids		Liquid and gas						
Density range		0 to 2.0g/mL						
Viscosity range		Maximum 10000mPa·s (※4)						
Temperature range		Remote-mount: –200 to +200°C, Integral-mount: –200 to +150°C (※5) (※6)						
Tube withstand (at 20˚C)		9.4MPa						
Maximum operating pressure		Depends on flange rating						
Sensor housing withstand (MPa) (※7)		3.8	3.0	2.2	1.6	1.8		1.4
Flow direction		Bidirectional						
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.						
Dusttight, waterproof configuration		IP66 / 67						

※1: 1/2" for ASME and JPI flanged sensors.
※2: DIN flanges are available only to meters of the wet part material, "SUS316L" and "SUS316+Alloy C".
※3: For application with foods, this product does not comply with CE marking.
※4: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※5: Refer to page 23, 24, 25 for explosionproof specifications. Refer to page 26 for the ambient temperature.
※6: In case of PED specification, the minimum temperature lower limit is –196°C.
※7: This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the breakdown test pressure at OVAL (distorted enclosures do not constitute a failure of the test), or the data obtained from the FEM analysis, whichever is lower (or safer).
※: For products conforming to the high pressure gas safety regulations and CE marking, Please consult OVAL sales office or nearest representative.

● Standard model (CA100 to CA250)

Item		Description					
Model		CA100	CA150	CA15H	CA200	CA20H	CA250
Nominal size		100mm, 4″, DN100	150mm, 6″, DN150		200mm, 8″, DN200		250mm, 10″, DN250
Materials	**Wetted parts**	SUS316L					
	Housing	SUS304					
Process connection		JIS 10, 20, 30K RF/ASME(JPI) 150, 300, 600RF/DIN PN 10, 16, 25, 40RF					
Applicable fluids		Liquid					
Density range		0.3 to 2.0g/mL					
Viscosity range		Maximum 10000mPa·s (※1)					
Temperature range		Remote-mount: –200 to +200°C, Integral-mount: –200 to +150°C (※2) (※3)					
Tube withstand (at 20°C)		13.56MPa		10.6MPa		8.8MPa	
Maximum operating pressure		Depends on flange rating					
Flow direction		Bidirectional					
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.					
Dusttight, waterproof configuration		IP66 / 67					

※1: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※2: Refer to page 23, 24, 25 for explosionproof specifications. Refer to page 26 for the ambient temperature.
※3: In case of PED specification, the minimum temperature lower limit is –196°C.
※: For products conforming to the high pressure gas safety regulations, Please consult OVAL sales office or nearest representative.

● High pressure service model (CA010 and CA015)

Item		Description	
Model		CA010 (High pressure service)	CA015 (High pressure service)
Materials	**Wetted parts**	Flow tube: Alloy C, Manifold: Alloy C equivalent (CX2MW)	
	Housing	SUS304	
Process connection		Screw Rc3/8	Screw Rc3/4
Applicable fluid		Liquid and gas	
Density range		0.3 to 2.0g/mL	
Viscosity range		Maximum 10000mPa·s (※1)	
Temperature range		Remote-mount: –200 to +200°C, Integral-mount: –200 to +150°C (※2) (※3)	
Maximum operating pressure		36MPa at room temperature	43MPa at room temperature
Sensor housing withstands (MPa) (※4)		3.0MPa	2.2MPa
Flow direction		Bidirectional	
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.	
Dusttight, waterproof configuration		IP66 / 67	

※1: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※2: Refer to page 23, 24, 25 for explosionproof specifications. Refer to page 26 for the ambient temperature.
※3: In case of PED specification, the minimum temperature lower limit is –196°C.
※4: This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the breakdown test pressure at OVAL (distorted enclosures do not constitute a failure of the test), or the data obtained from the FEM analysis, whichever is lower (or safer).
※: For products conforming to the high pressure gas safety regulations and CE marking, Please consult OVAL sales office or nearest representative.

● PED Specifications (Maximum operating pressure)•••CA040 to CA250

Unit: MPa

Operating Temperature	ASME Flange Rating			DIN Flange Rating			
	150 lb	300 lb	600 lb	PN10	PN16	PN25	PN40
to 38°C	1.90	4.96	9.93 ①	1.00	1.60	2.50	4.00
to 50°C	1.84	4.81	9.62 ②	1.00	1.60	2.50	4.00
to 100°C	1.62	4.22	8.44 ③	1.00	1.60	2.50	4.00
to 150°C	1.48	3.85	7.70 ④	0.90	1.45	2.27	3.63
to 200°C	1.37	3.57	7.13 ⑤	0.84	1.34	2.10	3.37
to 250°C	1.21	3.34	6.68	0.79	1.27	1.98	3.18
to 300°C	1.02	3.16	6.32	0.74	1.18	1.85	2.97
to 350°C	0.84	3.03	6.07	0.71	1.14	1.78	2.85

① For CA20H and CA250, 8.8MPa is maximum operating pressure
② For CA20H and CA250, 8.5MPa is maximum operating pressure
③ For CA20H and CA250, 7.4MPa is maximum operating pressure
④ For CA20H and CA250, 6.7MPa is maximum operating pressure
⑤ For CA20H and CA250, 6.2MPa is maximum operating pressure
※: Only SUS316L is available as the major parts material.

● High temperature service model (CA025 to CA150)

Item		Description					
Model		CA025 (High temp. service model)	CA040 (High temp. service model)	CA050 (High temp. service model)	CA080 (High temp. service model)	CA100 (High temp. service model)	CA150 (High temp. service model)
Nominal size		25mm, 1″, DN25	40mm, 1•1/2″, DN40	50mm, 2″, DN50	80mm, 3″, DN80	100mm, 4″, DN100	150mm, 6″, DN150
Materials	**Wetted parts**	SUS316L			SUS316L SUS316L + Alloy C Alloy C	SUS316L	
	Housing	SUS304					
Process connection		25 to 80mm: JIS 10, 20, 30, 40, 63K RF/ASME (JPI) 150, 300, 600RF/DIN PN 10, 16, 25, 40RF 100 and 150mm: JIS 10, 20, 30K RF/ASME (JPI) 150, 300, 600RF/DIN PN 10, 16, 25, 40RF					
Applicable fluids		Liquid					
Density range		0.3 to 2.0g/mL					
Viscosity range		Maximum 10000mPa·s (※1)					
Temperature range (※2)		–40 to +350°C (Remote-mount only)					
Tube withstand (at 20˚C)		9.4MPa				13.5MPa	
Maximum operating pressure		Depends on flange rating					
Sensor housing withstand (MPa) (※3)		1.6	1.8		1.4	–	
Flow direction		Bidirectional					
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.					
Dusttight, waterproof configuration		IP66 / 67					

Heat Tracer Specifications (CA025 to CA080 Option)

Applicable fluids	Hot water, Saturated steam, Overheated steam
Heat retention fluid Maximum output pressure	0.98MPa
Joint port for heat retention fluid	ϕ10 stainless tube
Recommended joint	Tube joint manufactured by Swagelok Company

※1: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※2: Allowable ambient temperature permitted for the sensor unit is up to 50°C
※3: This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the breakdown test pressure at OVAL (distorted enclosures do not constitute a failure of the test), or the data obtained from the FEM analysis, whichever is lower (or safer).
※: For products conforming to the high pressure gas safety regulations, Please consult OVAL sales office or nearest representative.
※: Remote-mount transmitter only. (with dedicated interconnect cable)
※: Correspondence is not to be used for cooling purposes.

● Low temperature explosionproof service model (CA025 to CA250)

Item		Description									
Model		CA025	CA040	CA050	CA080	CA100	CA150	CA15H	CA200	CA20H	CA250
Nominal size		25mm, 1″, DN25	40mm, 1•1/2″, DN40	50mm, 2″, DN50	80mm, 3″, DN80	100mm, 4″, DN100	150mm, 6″, DN150		200mm, 8″, DN200		250mm, 10″, DN250
Materials	**Wetted parts**	SUS316L, SUS316L + Alloy C, Alloy C				SUS316L					
	Housing	SUS304									
Process connection (※1)		JIS 10, 20, 30, 40, 63K RF/ ASME (JPI) 150, 300, 600RF DIN PN 10, 16, 25, 40RF (※2), IDF Ferrule (※3)				JIS 10, 20, 30K RF/ASME (JPI) 150, 300, 600RF DIN PN 10, 16, 25, 40RF (※2)					
Applicable fluids		Liquid and gas				Liquid					
Density range		0.3 to 2.0g/mL									
Viscosity range		Maximum 10000mPa·s (※4)									
Temperature range		–200 to +50°C (Remote-mount only) (※5) (※6)									
Tube withstand		9.4MPa at 20°C				13.56MPa at 20°C		10.6MPa at 40°C		8.8MPa at 40°C	
Maximum operating pressure		Depends on flange rating									
Sensor housing withstand (※7)		1.6MPa	1.8MPa		1.4MPa	–					
Flow direction		Bidirectional									
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.									
Dusttight, waterproof configuration		IP66 / 67									

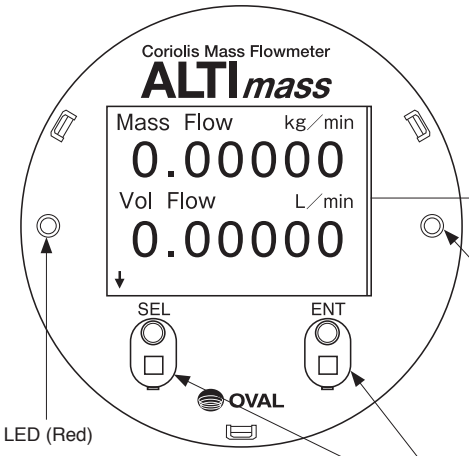
※1: When “SUS316L” or “SUS316L+Alloy C” is selected for the materials of wetted parts, the flange material is termed as “SUS316”. (CA025 to CA080)
※2: For the material of DIN flange, you cannot select “Alloy C”.
※3: For application with foods, this product does not comply with CE marking.
※4: If the viscosity is 10000mPa·s or more, Please consult OVAL sales office or nearest representative.
※5: Refer to page 26 for the ambient temperature.
※6: In case of PED specification, the minimum temperature lower limit is –196°C.
※7: This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the breakdown test pressure at OVAL (distorted enclosures do not constitute a failure of the test) or the data obtained from the FEM analysis, whichever is lower (or safer).
※: For products conforming to the high pressure gas safety regulations and CE marking, Please consult OVAL sales office or nearest representative.

2. Transmitter specifications (For the rack-mount transmitter, refer to GS No.GEJ516E.)

Item		Description
Model		PA0K
Power supply		85 to 264VAC 50/60Hz or 20 to 30VDC (Safety rated 100 to 240VAC 50/60Hz)
Power consumption		Maximum 15W
Ambient temperature		–40 to +55°C (※1)
Transmission length (separate type)		Maximum 200m (CA00A, CA001: Maximum 100m) (dedicated 9-core cable used) (※2)
Applicable EU directive		EMC Directive: 2014/30/EU ATEX Directive: 2014/34/EU LVD Directive: 2014/35/EU
Applicable EN standards		EMC：EN61326-1: 2013 ClassA ATEX: EN60079-0: 2012+A11: 2013 EN60079-1: 2014 EN60079-11: 2012 IECEx: IEC60079-0: 2011 IEC60079-1: 2014-06 IEC60079-11: 2011 LVD: EN61010-1: 2010
Explosionproof configuration		TIIS, ATEX, IECEx, KCs, CSA, EAC, NEPSI, ITRI Refer to page 23, 24, 25 for details.
Maritime certification		DNV GL Refer to page 25 for details.
Dusttight, waterproof configuration		IP66 / 67
Transmitter configuration		Integral or Remote-mount
Painting		Sensor: Munsell 10B8/4, Covers (front and rear): 2.5PB4/10
Display		LCD display provided (128×64 dots), backlit (white, orange) Infrared light sensors: 2, LED: 2 (green, red)
Weight		Integral-mount model 3.6kg approx., Remote-mount model 5.0kg approx.
Communication protocol ※Optional except for HART	HART (Standard)	HART protocol version 7, Bell202 (※3)
	Modbus	RS-485 Modbus protocol, Baudrate : 9600bps, 19200bps, 38400bps (Standard) RTU or ASCII, Response time : 25 to 50 ms
	FOUNDATION fieldbus	AI block×4, IT block×2, with Link Master function
	PROFIBUS PA	AI block×4, TOT block×2
Damping (default)		Flow rate 0.8sec, density 4sec, temperature 2.5sec.
Low flow cutoff (default)		Under 0.6% of maximum service flow rate
Pulse output (※5)		Open drain output (equivalent to open collector output) [Min. 10V to Maximum 30V, 50mADC, ON resiatance 0.6Ω or less] or Voltage pulse (Low level: 1.5V maximum, High level: 13V min. Output impedance: 2.2kΩ) Setting range: 0.1 to 10000Hz (Maximum output 11000Hz)
Analog output (※5)		4 to 20mADC (maximum load 600Ω) Select two outputs from instant flowrate (mass or volume) temperature, and density.
Status output (※5)		Open drain output (equivalent to open collector output) [Maximum 30V, 50mADC, ON resiatance 0.6Ω or less] Select one output from error (※4), flow direction, or high/low alarm (default is error)
Status input (※5)		Contact-closure input (Form "a" contact) Short: 200Ω maximum, Open: 100kΩ min. Select one output from remote zero, total reset, 0% signal lock, or function off (default is function off).
Other standard		OIML R117-1:2007 MID (WELMEC 7.2, 8.8)

※1: Below –20°C, the display loses its visibility due to weakened contrast. Both the display and infrared sensor may exhibit slow responses below –20°C.
※2: If signal transmission length exceeds 200 meters, Please consult OVAL sales office or nearest representative.
The operating temperature range of the dedicated cable (PVC: model code CBP2) is –15 to +80°C.
To use in an environment that exceeds the above temperature range, use dedicated cable (PTFE: model code CBT2) instead.
※3: Of the two analog output systems,only analog output 1 is available for HART communication.
※4: Of error outputs, "zero is in progress" status output can also be set up.
※5: When FOUNDATION fieldbus, PROFIBUS PA is selected as the communication protocol, all input and output signals will be turned off.
※: Denoising parts are embedded in the lines between power source, output, communication, and the chassis.
Lower the applied voltage to the following levels in order to conduct insulation test or withstand voltage test on these lines.
AC: 200V, DC: 250V

■ DISPLAY



Display modes

- ①Mass instant flowrate
- ②Volume instant flowrate
- ③Density
- ④Temperature
- ⑤Pulse count 1 (mass or volume)
- ⑥Pulse count 2 (mass or volume)
- ⑦Total 1 (mass or volume)
- ⑧Total 2 (mass or volume)
- ⑨Analog 1 (% instant)
- ⑩Analog 2 (% instant)
- ⑪Status information
- ⑫Mode select (parameter setup)

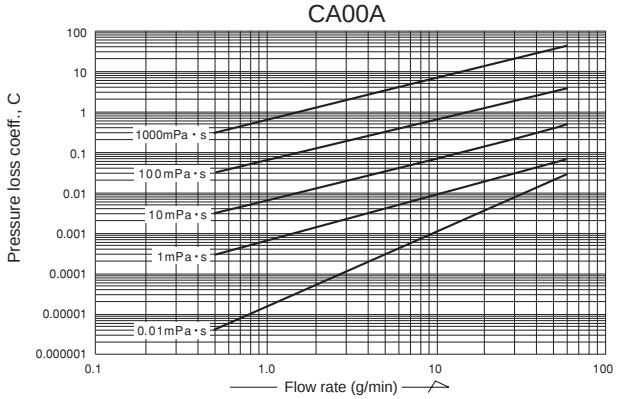
Communication interfaces FOUNDATION fieldbus, PROFIBUS PA display different contents.
For further information, refer to the instruction manuals of respective communication interfaces.

Modes are selectable using your finger on the front glass of the display (infrared optical sensor).

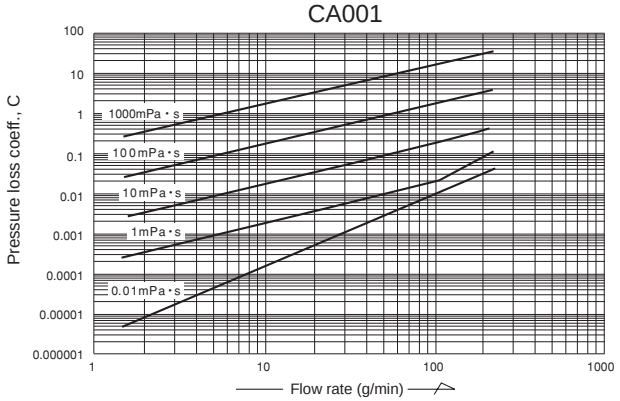
※ LCD backlight comes in two colors: white and orange. Color changes according to the status of flowmeter. Backlight comes off automatically if the optical sensor does not respond for a certain period of time.
※ Backlight duration is selectable.

■ PRESSURE LOSSES

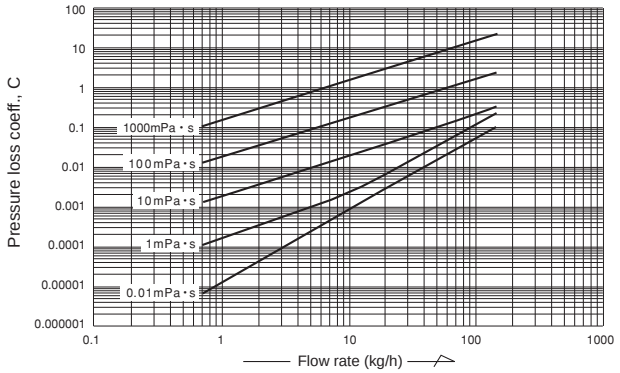
CA00A



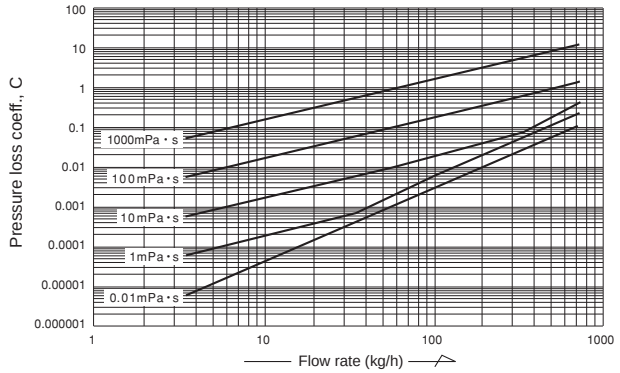
CA001



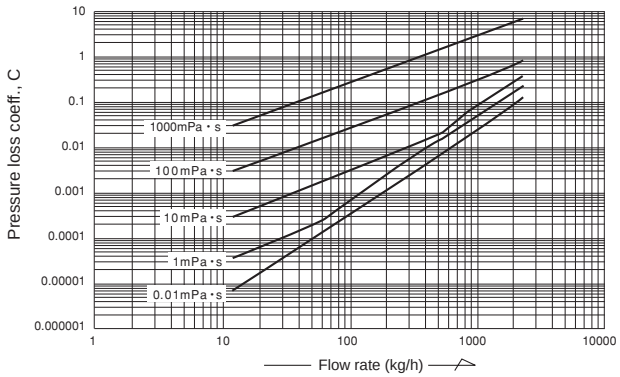
CA003



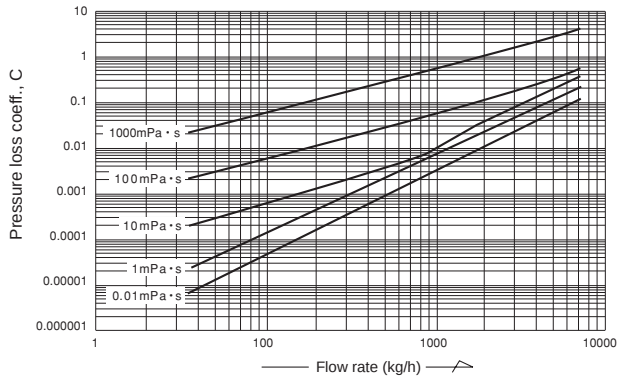
CA006



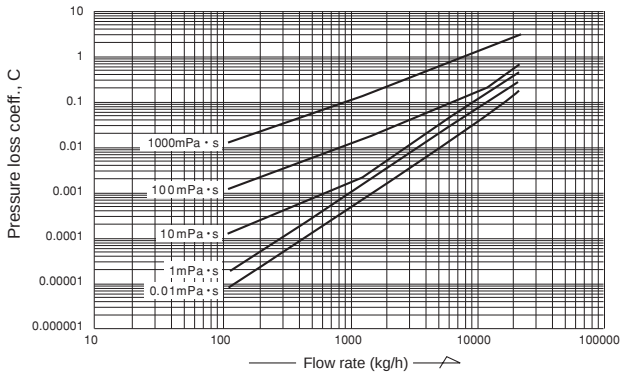
CA010



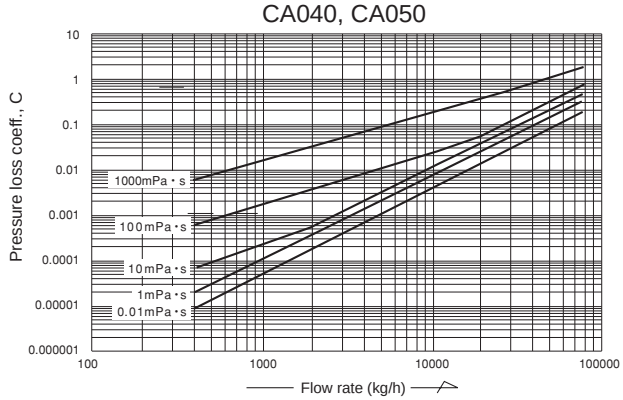
CA015



CA025

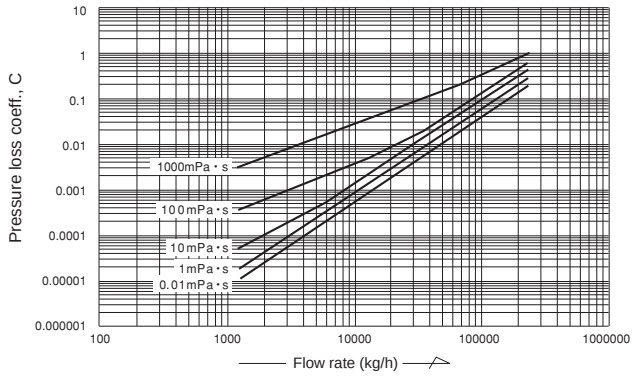


CA040, CA050

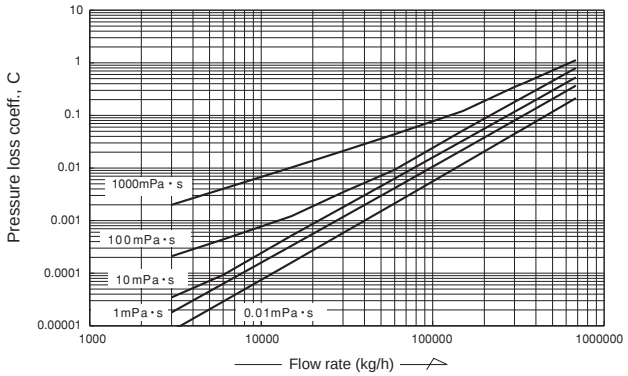


■ PRESSURE LOSSES

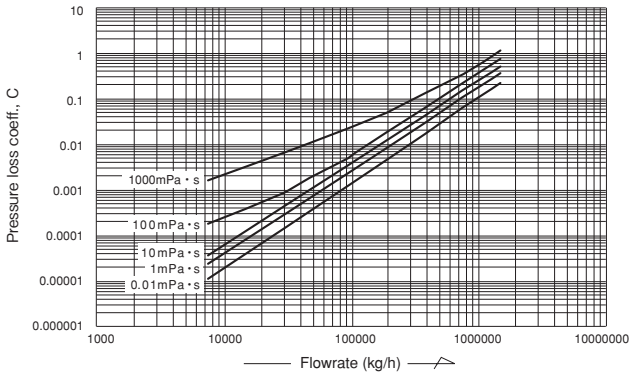
CA080



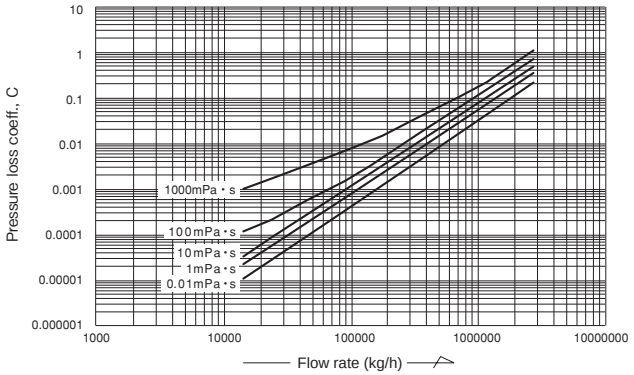
CA100, CA150



CA15H, CA200



CA20H, CA250



How to determine pressure loss (※1)

1. Seeing the graph of the type of flowmeter to be used, find the pressure loss coefficient C from the flowrate (g/min. or kg/h) and viscosity (mPa·s). Dividing this value C by specific gravity d (1 for water) gives the pressure loss, or

$$\Delta P = \frac{C}{d} \text{ (MPa)}$$

2. For high viscosity liquids not shown in these graphs, calculate the pressure loss by the following formula:

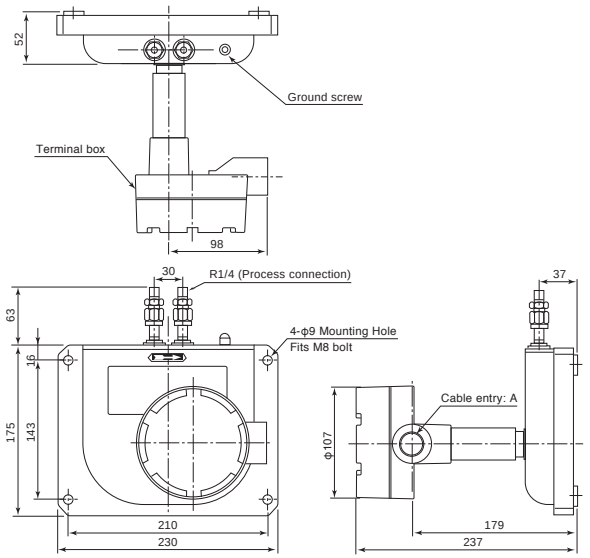
$$\Delta P_2 = C \times \frac{\mu_2}{\mu_1} \times \frac{1}{d}$$

where ΔP_2 : Pressure loss of high viscosity liquid (MPa)
μ_1 : Maximum viscosity shown in the graph (mPa·s)
μ_2 : Viscosity of high-viscosity liquid (mPa·s)
d : Specific gravity of high-viscosity liquid (1 for water)
C : Pressure loss coefficient found from the maximum viscosity curve at a given flowrate

※1: Pressure loss is calculated with Newtonian fluid. For Non-Newtonian fluid, Please consult OVAL sales office or nearest representative.

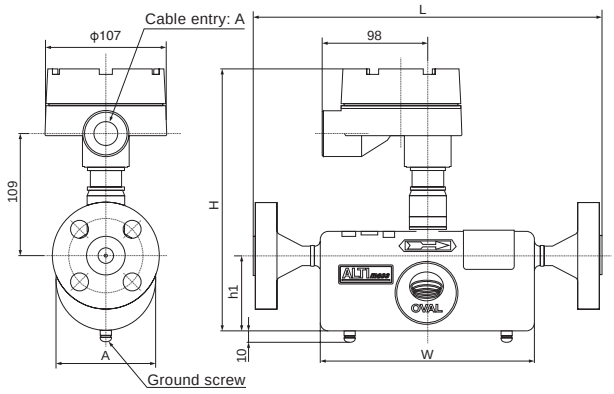
■ DIMENSIONS [Unit in mm]

- **Sensor unit CA00A and CA001**
- **Sensor unit Remote-mount / screw connection type**



Approx. weight: 9kg

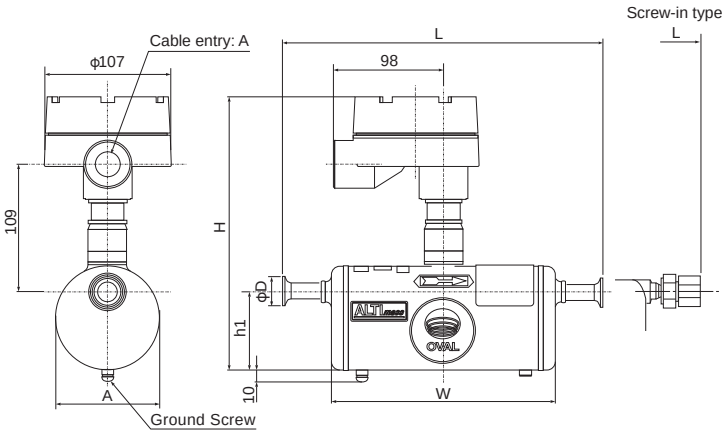
- **Sensor unit CA003**
- **Transmitter Remote-mount / flange connection type**



Model	JIS						ASME, JPI				DIN			H	h1	A	W	Approx. Weight kg (JIS 10K)
	Nom. size mm	10K	20K	30K	40K	63K	Nom. size inch	150	300	600	Nom. size DN	PN10, 16	PN25, 40					
		L						L				L						
CA003	10	275	275	293	293	313	1/2"	301	310	322	15	281	281	230	67	89.1	192	5.0

※: This table is applied to material code "S" and "M". In case of code "H", Please consult OVAL sales office or nearest representative.
※: As long as flange O.D. and bolt holes remain the same while flange rating may differ, the flange thickness with the higher rating is chosen in the above.
※: DIN flanges are available only to meters of the material code, "S" and "M".
※: Flange size for model CA003 is 1/2" in case of ASME or JPI.

- **Sensor unit CA003**
- **Transmitter Remote-mount / ferrule or screw connection type**

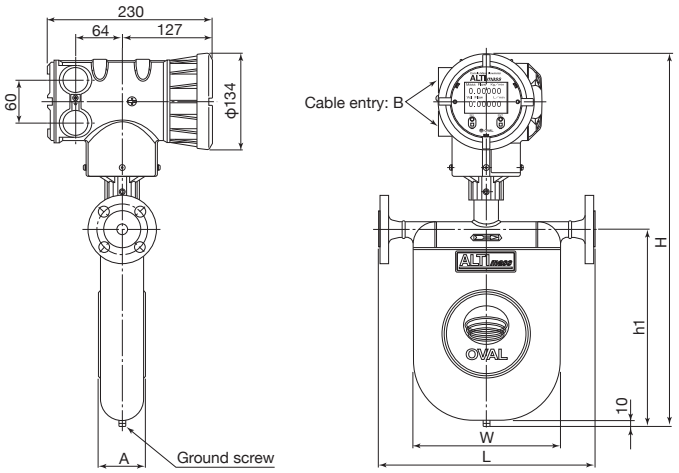


Model	Ferrule		L	H	h1	A	W	ϕ D	Approx. Weight (kg)
	Nom. size	Connection							
CA003	10	Ferrule 10A	265	230	67	89.1	192	34	4.5

Model	Screw	L	Approx. Weight (kg)
	Connection		
CA003	Rc 3/8	332	4.5

■ DIMENSIONS [Unit in mm]

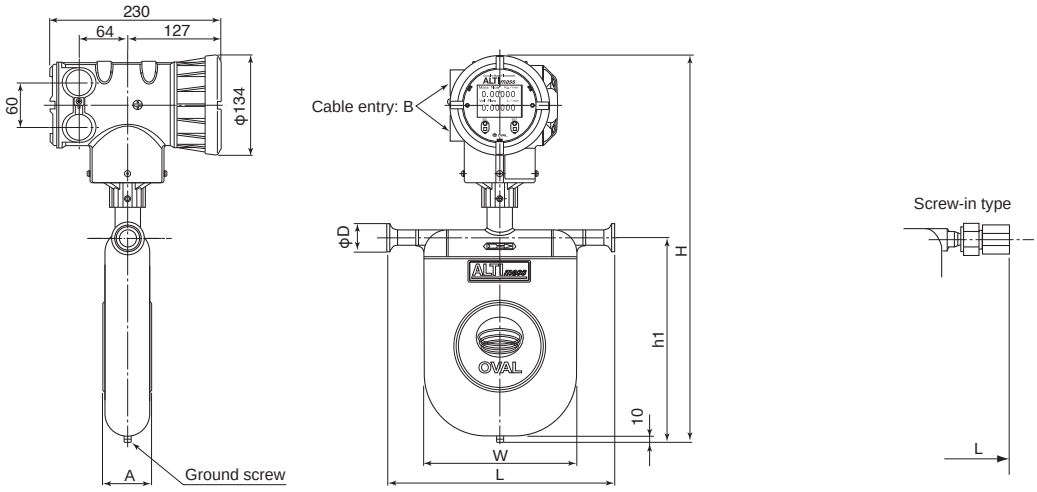
● **Sensor unit CA006 to CA080**
● **Transmitter Integral-mount / flange connection type**



Model	JIS						ASME, JPI				DIN			H	h1	A	W	Approx. Weight kg (JIS 10K)
	Nom. size	10K	20K	30K	40K	63K	Nom. size	150	300	600	Nom. size	PN10, 16	PN25, 40					
	mm	L					inch	L			DN	L						
CA006	10	242	242	260	260	280	1/2"	267	276	289	15	247	247	424	180	53	148	7
CA010	15	256	256	276	276	294	1/2"	282	291	303	15	261	261	462	218	53	163	7.8
CA015	15	299	299	319	319	343	1/2"	325	334	347	15	305	305	512	268	65	205	8.8
CA025	25	380	380	400	400	422	1"	411	424	437	25	380	380	580	329	83	262	13.3
CA040	40	513	513	541	541	585	1·1/2"	547	560	575	40	513	513	710	452	121	385	23
CA050	50	513	523	561	561	595	2"	550	563	582	50	513	519					
CA080	80	657	675	725	725	771	3"	698	717	737	80	659	675	880	602	174	510	57
CA080	100	887	899	911	—	—	4"	913	931	977	100	863	889	880	602	174	510	63

※: This table is applied to material code "S" and "M". In case of code "H", Please consult OVAL sales office or nearest representative.
※: As long as flange O.D. and bolt holes remain the same while flange rating may differ, the flange thickness with the higher rating is chosen in the above.
※: DIN flanges are available only to meters of the material code, "S" and "M".

● **Sensor unit CA006 to CA080**
● **Transmitter Integral-mount / ferrule or screw connection type**

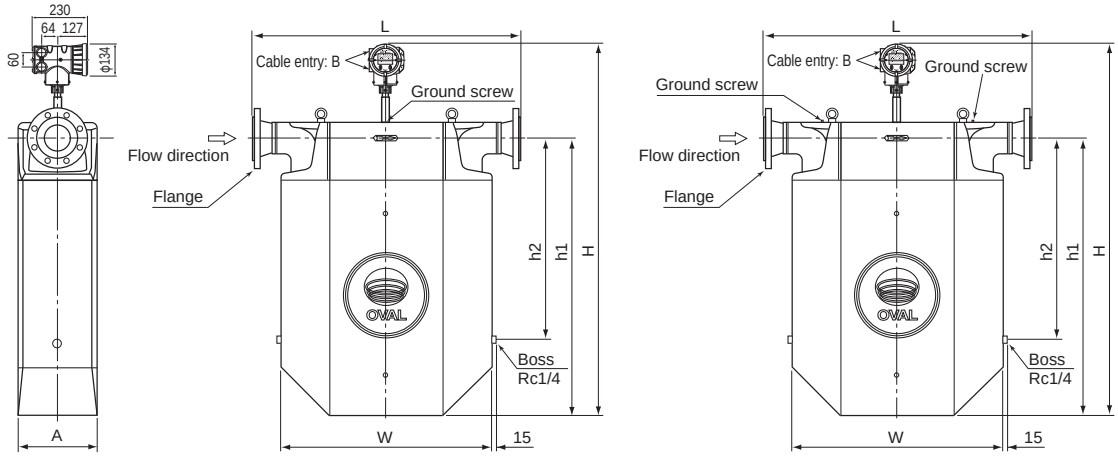


Model	Ferrule		L	H	h1	A	W	ϕ D	Approx. Weight (kg)
	Nom. size	Connection							
CA006	10	Ferrule 10A	231.5	434	180	53	148	34	5.7
CA010	15	Ferrule 15A	256	462	218	53	163	34	6.3
CA015	15	Ferrule 15A	289	512	268	65	205	34	7.1
CA025	25	Ferrule 25 (ISO), IDF 1S	370	580	329	83	262	50.5	10.7
CA040	40	Ferrule 38 (ISO), IDF 1.5S	493	710	452	121	385	50.5	19
CA050	50	Ferrule 51 (ISO), IDF 2S						64	
CA080	80	Ferrule 76.1 (ISO), IDF 3S	658.5	880	602	174	510	91	51

Model	Screw	L	Approx. Weight (kg)
	Connection		
CA006	Rc 3/8	296	5.7
CA010	Rc 3/8	312	6.3
CA015	Rc 3/4	382	7.1

■ DIMENSIONS [Unit in mm]

● **CA100 to CA250 (Integral-mount)**



(CA100, CA150)

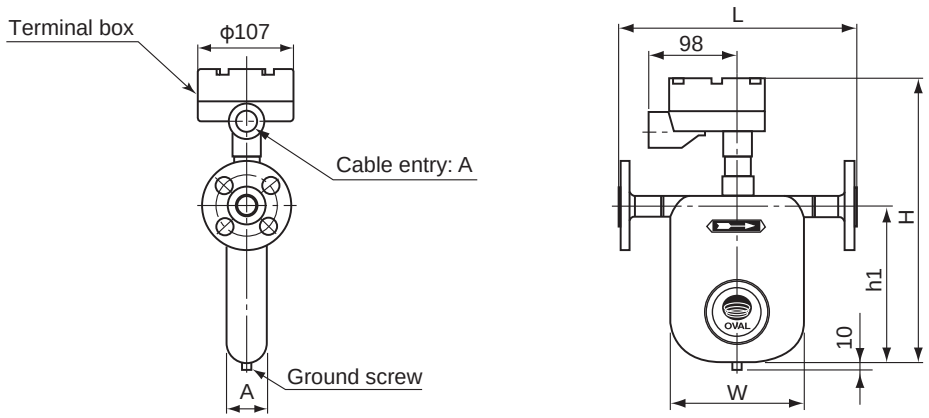
(CA15H to CA250)

Unit in mm

Model	Flange		L	H	h1	h2	A	W	Approx. Weight kg (JIS 10K)
	Nom. size	Flange rating							
CA100	100	JIS 10K	992	1403	1015	660	300	810	231
		JIS 20K	1006						
		JIS 30K	1016						
	4″	ASME, JPI 150	1018						
		ASME, JPI 300	1036						
		ASME, JPI 600	1082						
	DN100	PN 10, 16	968						
		PN 25, 40	994						
CA150	150	JIS 10K	1300	1403	1015	660	300	810	246
		JIS 20K	1320						
		JIS 30K	1330						
	6″	ASME, JPI 150	1318						
		ASME, JPI 300	1338						
		ASME, JPI 600	1388						
	DN150	PN 10, 16	1250						
		PN 25, 40	1290						
CA15H	150	JIS 10K	1015	1604	1190	851	320	810	310
		JIS 20K	1055						
		JIS 30K	1099						
	6″	ASME, JPI 150	1087						
		ASME, JPI 300	1107						
		ASME, JPI 600	1157						
	DN150	PN 10, 16	1019						
		PN 25, 40	1059						
CA200	200	JIS 10K	1330	1604	1190	851	320	810	340
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA20H	200	JIS 10K	1330	1830	1390	960	420	1110	610
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA250	250	JIS 10K	1699	1830	1390	960	420	1110	650
		JIS 20K	1743						
		JIS 30K	1805						
	10″	ASME, JPI 150	1773						
		ASME, JPI 300	1805						
		ASME, JPI 600	1887						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
		PN 40	1779						

■ DIMENSIONS [Unit in mm]

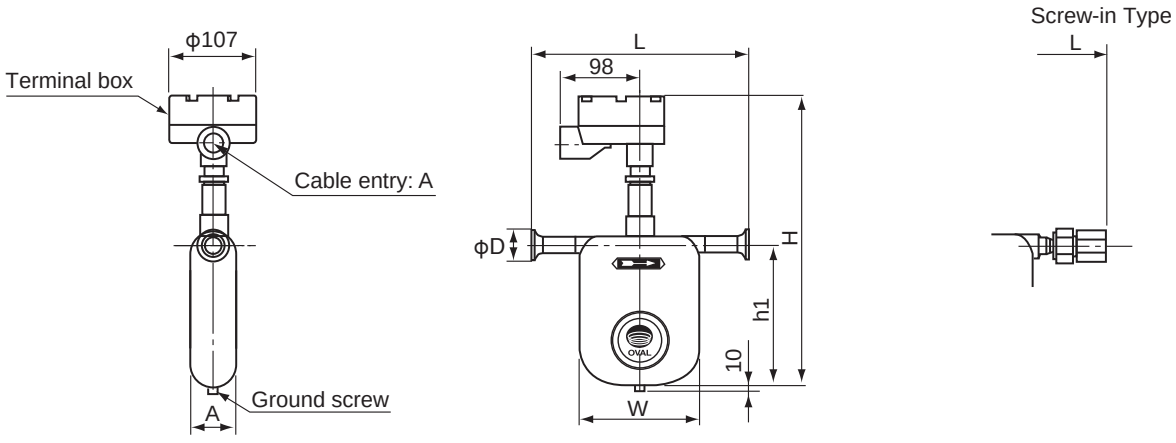
● **Sensor unit CA006 to CA080**
● **Transmitter Remote-mount / flange connection type**



Model	JIS						ASME, JPI				DIN			H	h1	A	W	Approx. Weight kg (JIS 10K)
	Nom. size mm	10K	20K	30K	40K	63K	Nom. size inch	150	300	600	Nom. size DN	PN10, 16	PN25, 40					
		L						L				L						
CA006	10	242	242	260	260	280	1/2"	268	277	289	15	247	247	324	180	53	148	4.0
CA010	15	256	256	276	276	294	1/2"	282	291	303	15	261	261	362	218	53	163	4.7
CA015	15	299	299	319	319	343	1/2"	325	334	347	15	305	305	412	268	65	205	5.6
CA025	25	380	380	400	400	422	1"	411	424	437	25	380	380	480	329	83	262	10.4
CA040	40	513	513	541	541	585	1·1/2"	547	560	575	40	513	513	610	452	121	385	20
CA050	50	513	523	561	561	595	2"	550	563	582	50	513	519					
CA080	80	657	675	725	725	771	3"	698	717	737	80	659	675	780	602	174	510	54
CA080	100	887	899	911	—	—	4"	913	931	977	100	863	889	780	602	174	510	60

※: This table is applied to material code "S" and "M". In case of code "H", Please consult OVAL sales office or nearest representative.
※: As long as flange O.D. and bolt holes remain the same while flange rating may differ, the flange thickness with the higher rating is chosen in the above.
※: DIN flanges are available only to meters of the material code, "S" and "M".

● **Sensor unit CA006 to CA080**
● **Transmitter Remote-mount / ferrule or screw connection type**

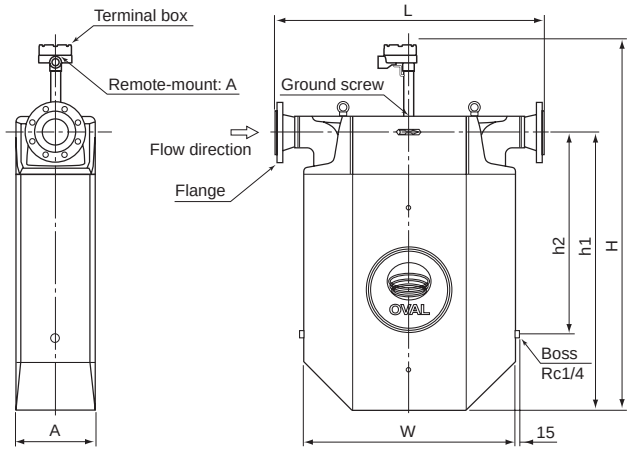


Model	Ferrule		L	H	h1	A	W	ϕ D	Approx. Weight (kg)
	Nom. size	Connection							
CA006	10	Ferrule 10A	231.5	324	180	53	148	34	2.8
CA010	15	Ferrule 15A	256	362	218	53	163	34	3.4
CA015	15	Ferrule 15A	289	412	268	65	205	34	4.2
CA025	25	Ferrule 25 (ISO), IDF 1S	370	480	329	83	262	50.5	7.8
CA040	40	Ferrule 38 (ISO), IDF 1.5S	493	610	452	121	385	50.5	16
CA050	50	Ferrule 51 (ISO), IDF 2S						64	
CA080	80	Ferrule 76.1 (ISO), IDF 3S	658.5	780	602	174	510	91	48

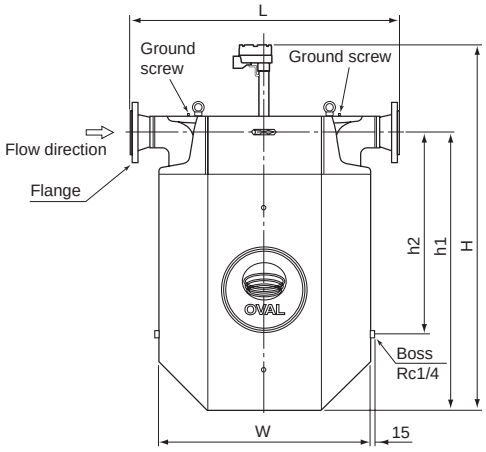
Model	Screw	L	Approx. Weight (kg)
	Connection		
CA006	Rc 3/8	296	2.8
CA010	Rc 3/8	312	3.4
CA015	Rc 3/4	382	4.2

■ DIMENSIONS [Unit: mm]

● **CA100 to CA250 (Remote-mount)**



(CA100, CA150)



(CA15H to CA250)

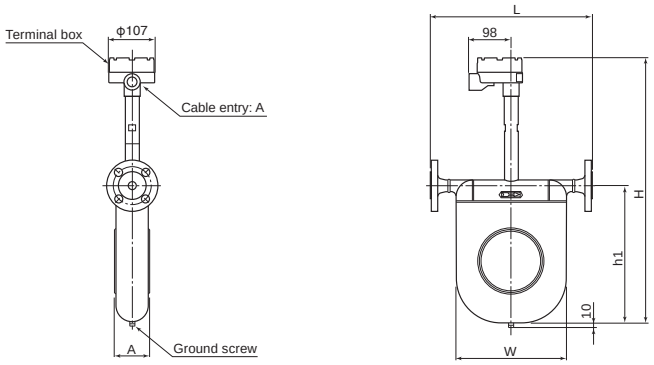
Unit in mm

Model	Flange		L	H	h1	h2	A	W	Approx. Weight kg (JIS 10K)
	Nom. size	Flange rating							
CA100	100	JIS 10K	992	1309	1015	660	300	810	231
		JIS 20K	1006						
		JIS 30K	1016						
	4″	ASME, JPI 150	1018						
		ASME, JPI 300	1036						
		ASME, JPI 600	1082						
	DN100	PN 10, 16	968						
		PN 25, 40	994						
CA150	150	JIS 10K	1300	1309	1015	660	300	810	246
		JIS 20K	1320						
		JIS 30K	1330						
	6″	ASME, JPI 150	1318						
		ASME, JPI 300	1338						
		ASME, JPI 600	1388						
	DN150	PN 10, 16	1250						
		PN 25, 40	1290						
CA15H	150	JIS 10K	1015	1510	1190	851	320	810	310
		JIS 20K	1055						
		JIS 30K	1099						
	6″	ASME, JPI 150	1087						
		ASME, JPI 300	1107						
		ASME, JPI 600	1157						
	DN150	PN 10, 16	1019						
		PN 25, 40	1059						
CA200	200	JIS 10K	1330	1510	1190	851	320	810	340
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA20H	200	JIS 10K	1330	1736	1390	960	420	1110	610
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA250	250	JIS 10K	1699	1736	1390	960	420	1110	650
		JIS 20K	1743						
		JIS 30K	1805						
	10″	ASME, JPI 150	1773						
		ASME, JPI 300	1805						
		ASME, JPI 600	1887						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
		PN 40	1779						

※: Approximate weights in the table above are of JIS 10K.

■ DIMENSIONS [Unit: mm]

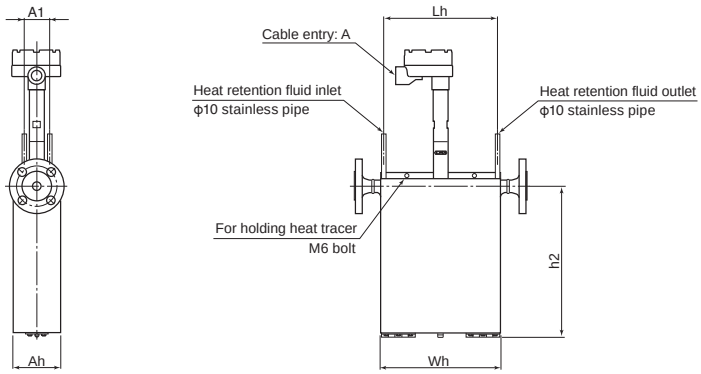
● Sensor unit CA025 (High temperature service model) to CA080 (High temperature service model)
● Transmitter Remote-mount / flange connection type



Model	JIS						ASME, JPI				DIN			H	h1	A	W	Approx. weight kg (JIS 10K)
	Nom. size	10K	20K	30K	40K	63K	Nom. size	150	300	600	Nom. size	PN10, 16	PN25, 40					
	mm	L					inch	L			DN	L						
CA025 (High temp. service model)	25	380	380	400	400	422	1"	411	424	437	25	380	380	638	329	83	262	10.9
CA040 (High temp. service model)	40	513	513	541	541	585	1·1/2"	547	560	575	40	513	513	768	452	121	385	20.3
CA050 (High temp. service model)	50	513	523	561	561	595	2"	550	563	582	50	513	519					20.7
CA080 (High temp. service model)	80	657	675	725	725	771	3"	699	717	737	80	659	675	960	602	174	510	54.1

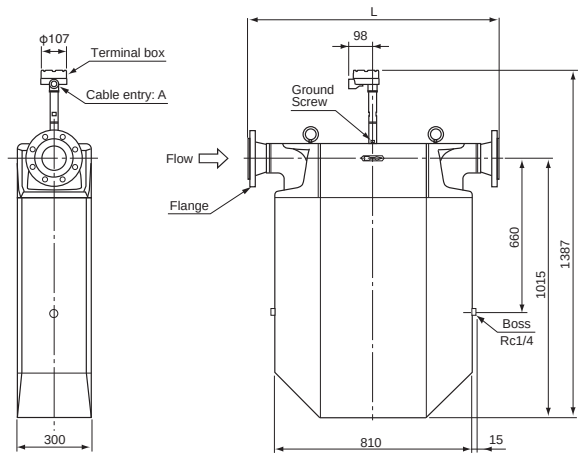
※: As long as flange O.D. and bolt holes remain the same while flange rating may differ, the flange thickness with the higher rating is chosen in the above.
※: DIN flanges are available only to meters of the material code, "S" and "M".

● Sensor unit with Heat Tracer : CA025 to CA080
● Transmitter Remote-mount / flange connection type



Sensor unit model	Nom. size	Compatible With Heat Tracer	Lh	h2	Ah	A1	Wh	Approx. weight kg (JIS 10K)
CA025	25 (1″)	HT1-025A	254	340	106	56	268	16.9
CA040	40 (1•1/2″)	HT1-040A	376	464	144	70	390	31.8
CA050	50 (2″)							32.2
CA080	80 (3″)	HT1-080A	501	612	198	110	545	75.1

● Sensor unit CA100 (High temperature service model) and CA150 (High temperature service model)
● Transmitter Remote-mount / flange connection type

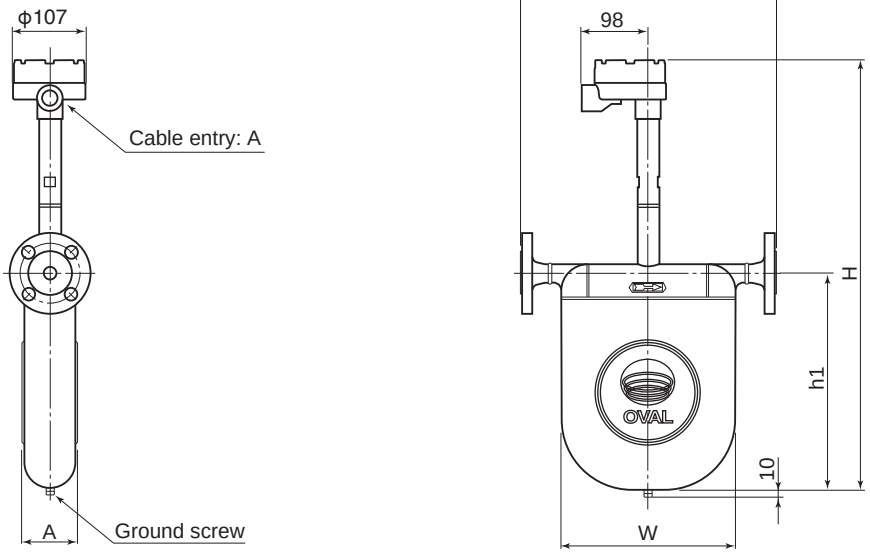


Model	Flange		L	Approx. Weight kg (JIS 10K)
	Nom. size	Flange rating		
CA100	100	JIS 10K	992	231
		JIS 20K	1006	235
		JIS 30K	1016	241
	4″	ASME, JPI 150	1018	237
		ASME, JPI 300	1036	245
		ASME, JPI 600	1082	255
	DN100	PN 10, 16	968	231
		PN 25, 40	994	241
CA150	150	JIS 10K	1300	246
		JIS 20K	1320	253
		JIS 30K	1330	265
	6″	ASME, JPI 150	1318	248
		ASME, JPI 300	1338	265
		ASME, JPI 600	1388	292
	DN150	PN 10, 16	1250	246
		PN 25, 40	1290	265

※: Approximate weights in the table above are of JIS 10K.
For specifications of other flange ratings, see the approval drawing (or delivery specification).

■ DIMENSIONS [Unit: mm]

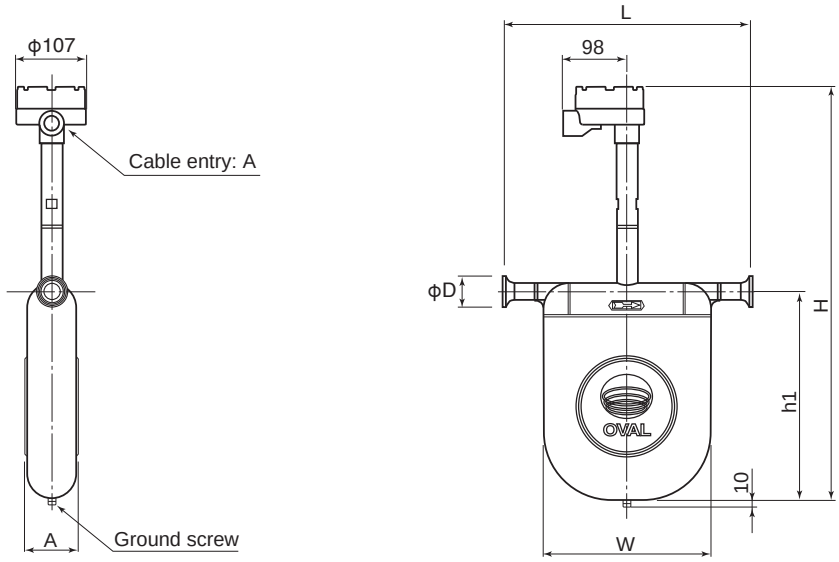
● **Sensor unit CA025 (Low temperature explosionproof service model) to CA080 (Low temperature explosionproof service model)**
● **Transmitter Remote-mount / flange connection type**



Model	JIS						ASME, JPI				DIN								Approx. weight kg (JIS 10K)
	Nom. size mm	10K	20K	30K	40K	63K	Nom. size inch	150	300	600	Nom. size DN	PN10, 16	PN25, 40	H	h1	A	W		
		L						L				L							
CA025	25	380	380	400	400	422	1"	411	424	437	25	380	380	660	329	83	262	10.9	
CA040	40	513	513	541	541	585	1·1/2"	547	560	575	40	513	513	790	452	121	385	20.3	
CA050	50	513	523	561	561	595	2"	550	563	582	50	513	519					21	
CA080	80	657	675	725	725	771	3"	699	717	727	80	659	675	960	602	174	510	54	

※: This table is applied to material code "S" and "M". In case of code "H", Please consult OVAL sales office or nearest representative.
※: As long as flange O.D. and bolt holes remain the same while flange rating may differ, the flange thickness with the higher rating is chosen in the above.
※: DIN flanges are available only to meters of the material code, "S" and "M".

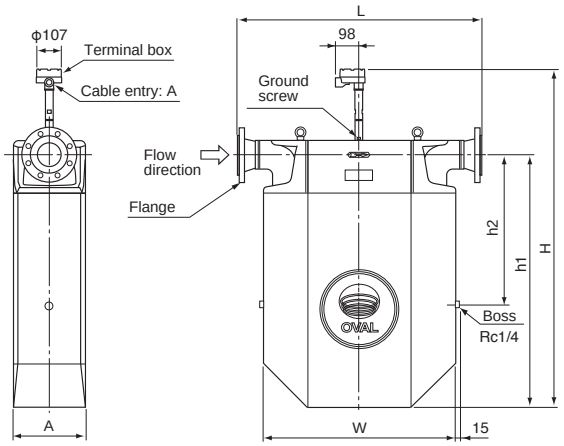
● **Sensor unit CA025 (Low temperature explosionproof service model) to CA080 (Low temperature explosionproof service model)**
● **Transmitter Remote-mount / ferrule connection type**



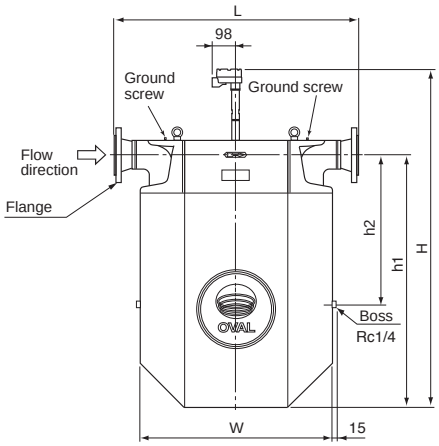
Model	Ferrule		L	H	h1	A	W	ϕ D	Approx. Weight (kg)
	Nom. size	Connection							
CA025	25	Ferrule 25 (ISO), IDF 1S	370	660	329	83	262	50.5	8.3
CA040	40	Ferrule 38 (ISO), IDF 1.5S	493	790	452	121	385	50.5	17
CA050	50	Ferrule 51 (ISO), IDF 2S						64	
CA080	80	Ferrule 76.1 (ISO), IDF 3S	658.5	960	602	174	510	91	48

■ DIMENSIONS [Unit: mm]

● **Low temperature explosionproof service model: CA100 to CA250**



(CA100, CA150)



(CA15H to CA250)

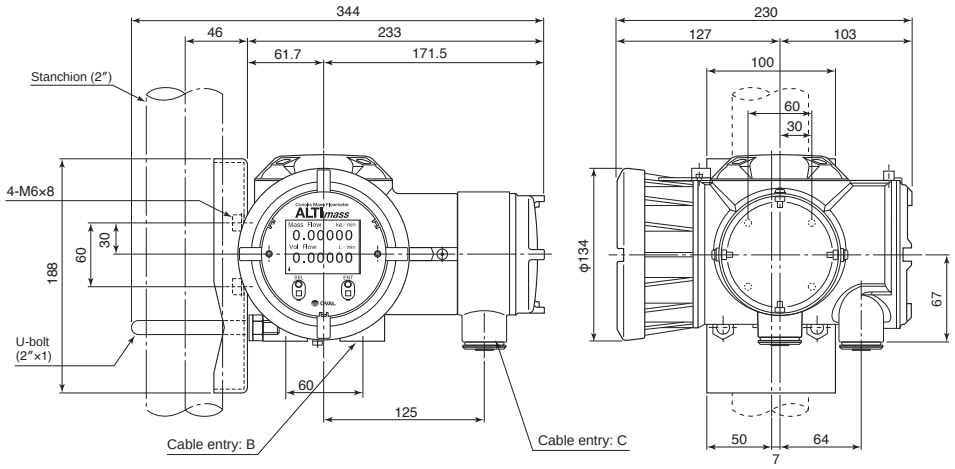
Unit in mm

Model	Flange		L	H	h1	h2	A	W	Approx. Weight kg (JIS 10K)
	Nom. size	Flange rating							
CA100 (Low temperature explosionproof service model)	100	JIS 10K	992	1387	1015	660	300	810	231
		JIS 20K	1006						
		JIS 30K	1016						
	4″	ASME, JPI 150	1018						
		ASME, JPI 300	1036						
		ASME, JPI 600	1082						
	DN100	PN 10, 16	968						
		PN 25, 40	994						
CA150 (Low temperature explosionproof service model)	150	JIS 10K	1300	1387	1015	660	300	810	246
		JIS 20K	1320						
		JIS 30K	1330						
	6″	ASME, JPI 150	1318						
		ASME, JPI 300	1338						
		ASME, JPI 600	1388						
	DN150	PN 10, 16	1250						
		PN 25, 40	1290						
CA15H (Low temperature explosionproof service model)	150	JIS 10K	1015	1588	1190	851	320	810	310
		JIS 20K	1055						
		JIS 30K	1099						
	6″	ASME, JPI 150	1087						
		ASME, JPI 300	1107						
		ASME, JPI 600	1157						
	DN150	PN 10, 16	1019						
		PN 25, 40	1059						
CA200 (Low temperature explosionproof service model)	200	JIS 10K	1330	1588	1190	851	320	810	340
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA20H (Low temperature explosionproof service model)	200	JIS 10K	1330	1814	1390	960	420	1110	610
		JIS 20K	1368						
		JIS 30K	1418						
	8″	ASME, JPI 150	1418						
		ASME, JPI 300	1438						
		ASME, JPI 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CA250 (Low temperature explosionproof service model)	250	JIS 10K	1699	1814	1390	960	420	1110	650
		JIS 20K	1743						
		JIS 30K	1805						
	10″	ASME, JPI 150	1773						
		ASME, JPI 300	1805						
		ASME, JPI 600	1887						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
		PN 40	1779						

※: Approximate weights in the table above are of JIS 10K. For specifications of other flange ratings, see the approval drawing (or delivery specification).

■ DIMENSIONS [Unit: mm]

● **Remote-mount transmitter (For the rack-mount transmitter, refer to GS No.GEJ516E.)**



※: While stanchion mounting hardware is furnished as standard accessories, the stanchion itself must be provided by the customer.

■ LIST OF TRANSMITTER AND SENSOR CABLE ENTRY

〈Cable entry: A〉

Remote-mount Sensor

Explosionproof specifications	Connection thread specifications	Note
Non-explosionproof	Domestic: G3/4, Overseas: G3/4	
TIIS	G3/4	Adapter is connected (※1)
ATEX, IECEx	G3/4	Adapter is connected (※2)
KCs	G3/4	
CSA	G3/4	Adapter is connected (※3)
EAC	G3/4	Adapter is connected (※2)
NEPSI	G3/4	Adapter is connected (※2)
ITRI	G3/4	Adapter is connected (※2)

※1: An adapter to convert G3/4 to “G1/2” is connected.
※2: An adapter to convert G3/4 to “M20×1.5” is connected.
※3: You can choose an adapter to convert G3/4 to “1/2″NPT,” or to “M20×1.5.”

〈Cable entry: B〉

Integral-mount transmitter, Remote-mount transmitter

Explosionproof specifications	Connection thread specifications	Note
Non-explosionproof	Domestic: G3/4, Overseas: G3/4	
TIIS	G3/4	Cable gland is supplied.
ATEX, IECEx	M25×1.5	(※1)
KCs	M25×1.5	
CSA	M25×1.5	Adapter is connected (※2)
EAC	M25×1.5	(※1)
NEPSI	M25×1.5	
ITRI	M25×1.5	

※1: A cable gland can be supplied. Please contact us.
※2: You can choose an adapter to convert M25×1.5 to one of “3/4″NPT”, “1/2″NPT”, or “M20×1.5”.

〈Cable entry: C〉

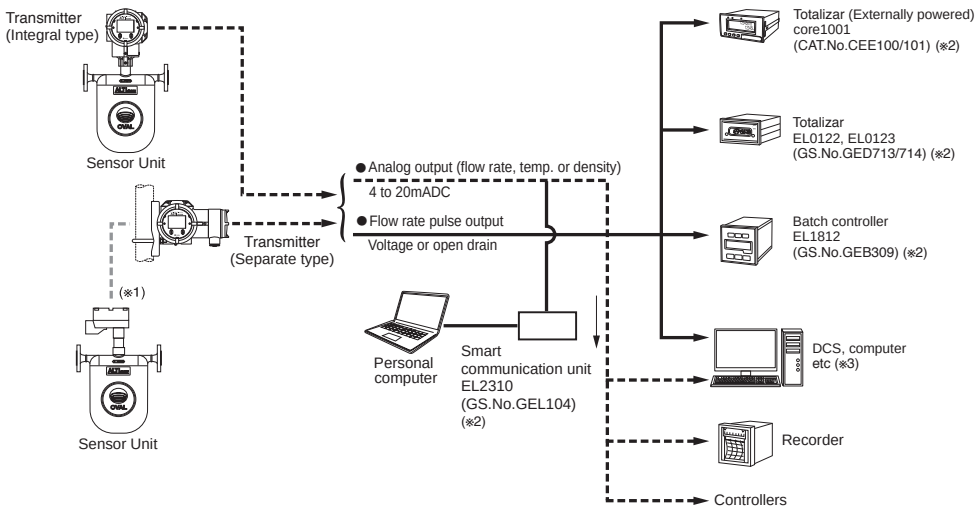
Remote-mount transmitter

Explosionproof specifications	Connection thread specifications	Note
Non-explosionproof	G3/4	
TIIS	G3/4	Cable gland is supplied.
ATEX, IECEx	G3/4	Adapter is connected (※1)
KCs	G3/4	
CSA	G3/4	Adapter is connected (※2)
EAC	G3/4	Adapter is connected (※1)
NEPSI	G3/4	Adapter is connected (※1)
ITRI	G3/4	Adapter is connected (※1)

※1: An adapter to convert G3/4 to “M20×1.5” is connected.
※2: You can choose an adapter to convert G3/4 to “1/2″NPT,” or to “M20×1.5.”

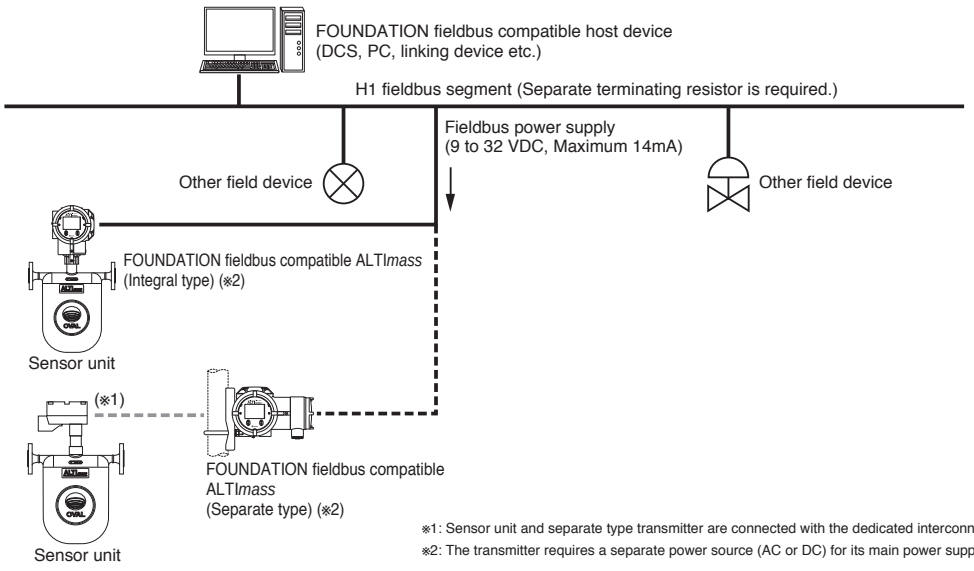
■ REMOTE MEASURING SYSTEM

● HART protocol



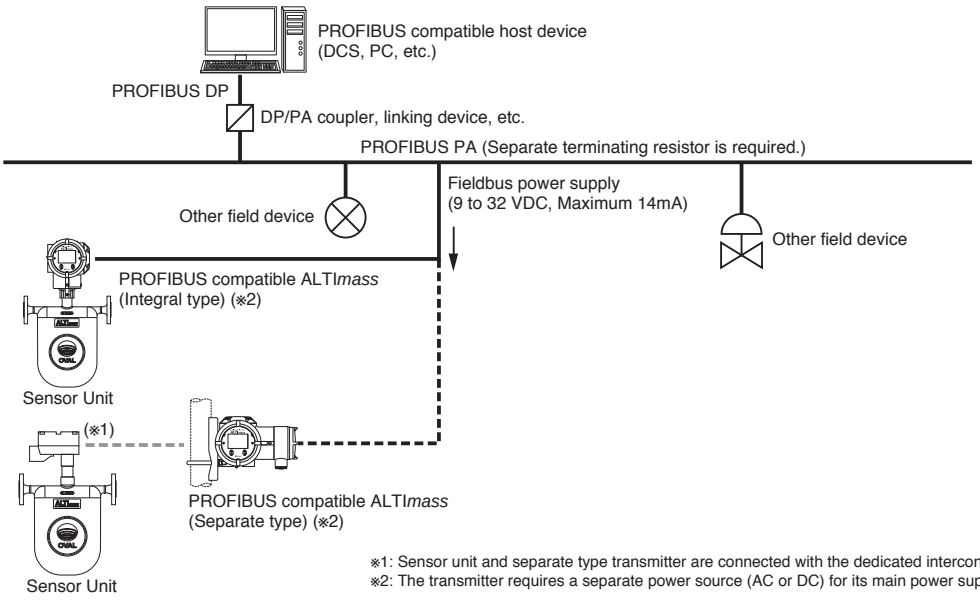
※1: In case of the separate type, the sensor unit and transmitter are connected with dedicated interconnect cable.
※2: For detailed information about companion instruments, see respective product catalogs and GS sheets.
※3: Only HART protocol version 7 model is capable of communication.

● FOUNDATION fieldbus



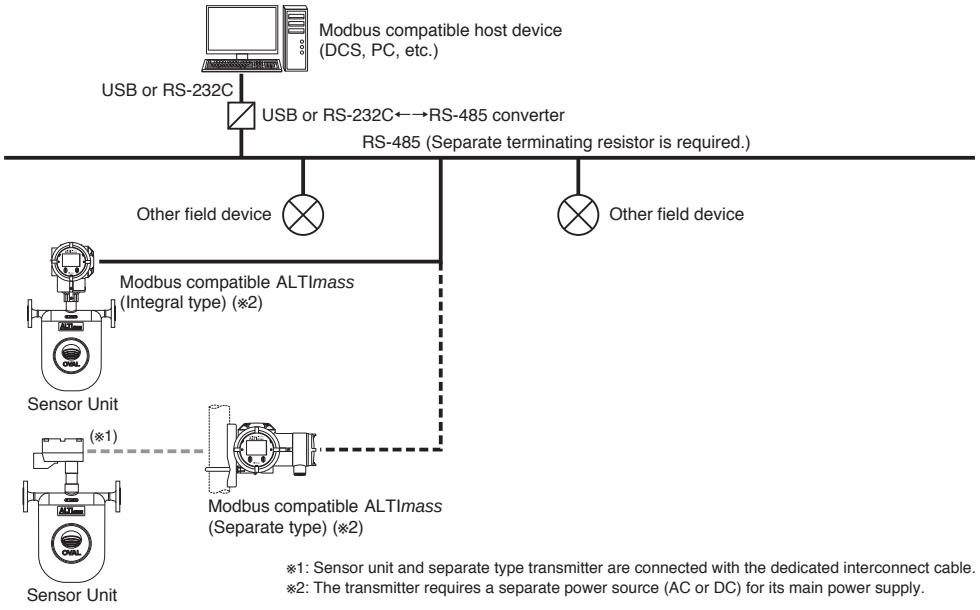
※1: Sensor unit and separate type transmitter are connected with the dedicated interconnect cable.
※2: The transmitter requires a separate power source (AC or DC) for its main power supply.

● PROFIBUS



※1: Sensor unit and separate type transmitter are connected with the dedicated interconnect cable.
※2: The transmitter requires a separate power source (AC or DC) for its main power supply.

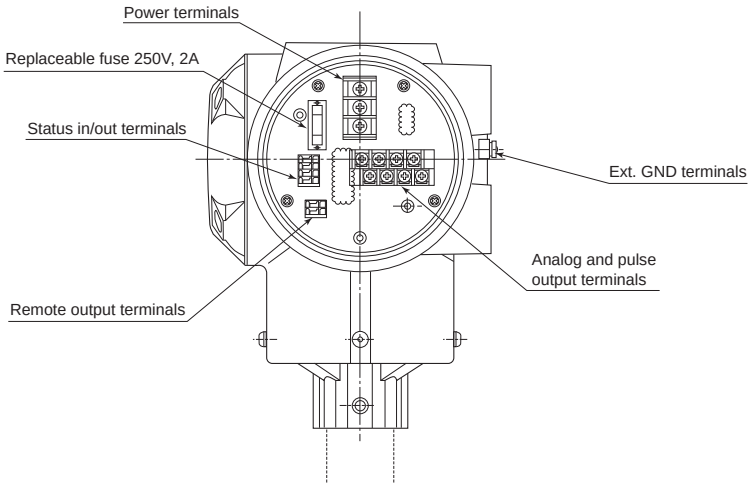
● **Modbus**



※1: Sensor unit and separate type transmitter are connected with the dedicated interconnect cable.
※2: The transmitter requires a separate power source (AC or DC) for its main power supply.

■ WIRING DIAGRAM

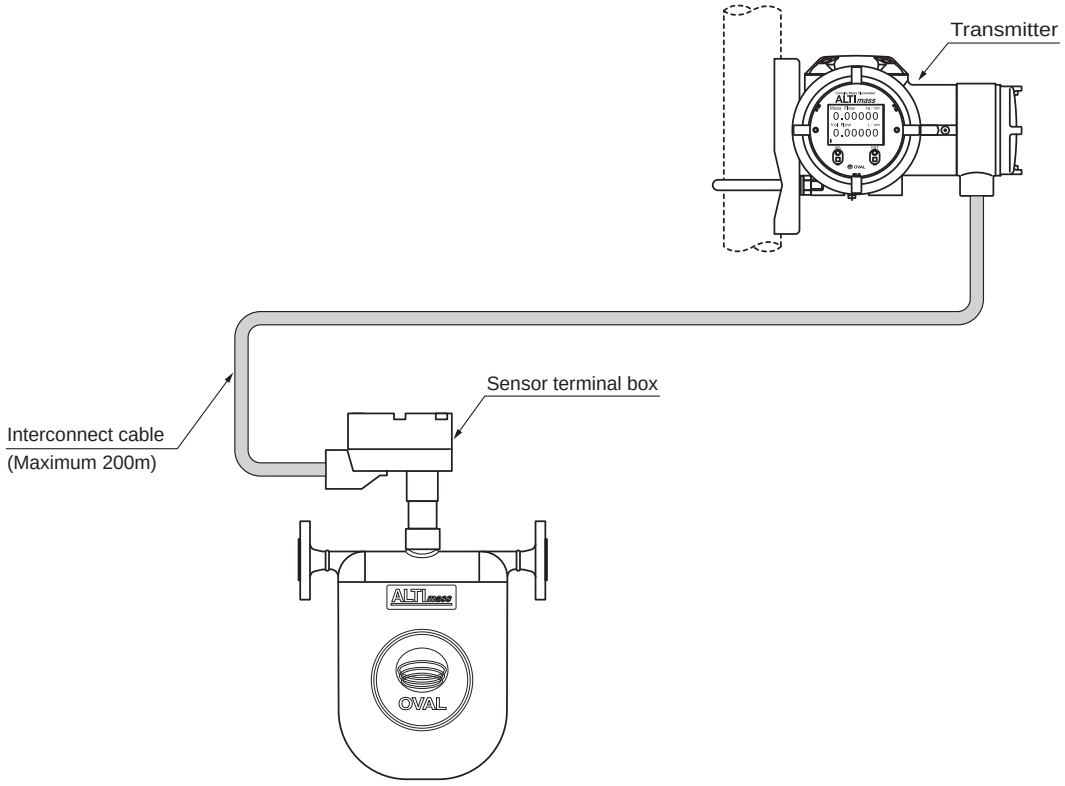
● **Transmitter power and input/output signal wiring**

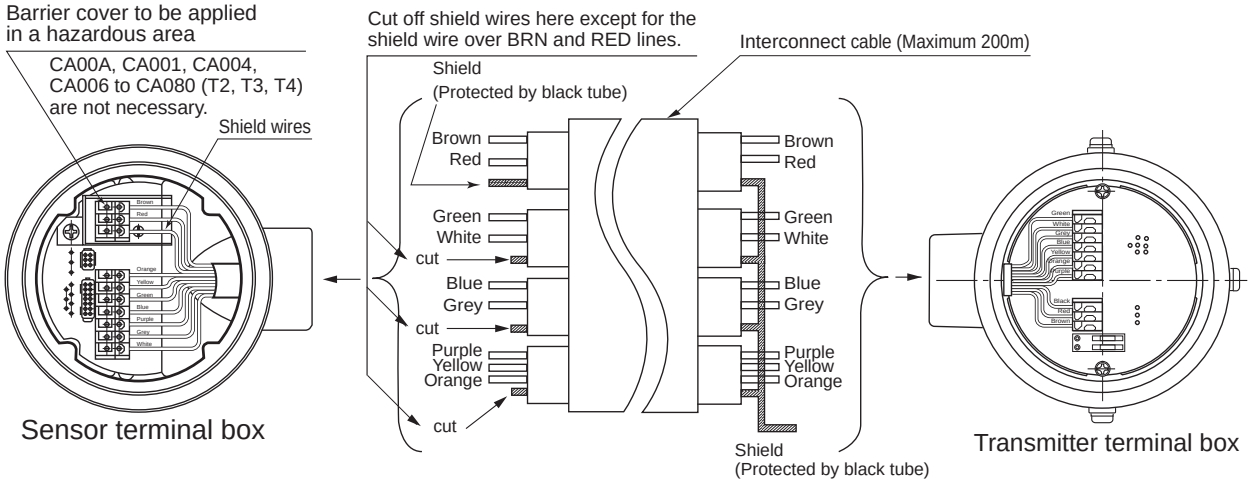


● **Terminal identification and description**

Item	Label	Description	Remarks
Signal	A1 (+)	Analog output 1 (4 to 20mA)	1. Maximum load resistance is 600Ω for analog output 1 and 2. 2. Pulse output (voltage pulse) transmission length is Maximum 10m (at 10kHz) Maximum 100m (at 1kHz) Maximum 1km (at 100Hz) finished O.D: 0.75sq 3. In case of TIIS explosionproof type used under the ambient temperature of 45°C or higher, use a cable resistant to the temperature of 75°C or higher. 4. These input and output signals are invalid for FOUNDATION fieldbus, PROFIBUS PA.
	A1 (–)		
	A2 (+)	Analog output 2 (4 to 20mA)	
	A2 (–)		
	P1 (+)	Pulse output 1 (voltage/open drain output)	
	P1 (–)		
	P2 (+)	Pulse output 2 (voltage/open drain output)	
	P2 (–)		
	S.I. (+)	Status input (contact input)	
	S.I. (–)		
	S.O (+)	Status output (open drain output)	
	S.O (–)		
	I/O (+)	Expanded in/out (Modbus communication, etc.)	Modbus communication: Maximum transmission length1200m at 0.75sq FOUNDATION fieldbus or PROFIBUS PA communication: Maximum transmission length 1900m at 0.8sq
	I/O (–)		
Power	L (+)	Power (with DC power: +)	
	GND	Earth ground	
	N (–)	Power (with DC power: –)	

● **Wiring between Sensor Unit and Remote-mount Transmitter**





NOTE 1. Do not fail to use dedicated interconnect cable.

2. Shield wire preparation

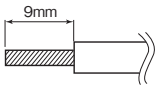
(1) Transmitter end:

As shown in the above figure, bundle shield wires colored in brown/red, green/white, blue/grey and purple/yellow/orange and cover the wires with a black tube. Then connect only one wire to the terminal box (black) taking care to avoid potential contact with the housing or conductive parts.

(2) Sensor end:

As shown in the figure, cover the brown/red shield wire with a black tube and connect it to the terminal box taking care to avoid potential contact with the housing or conductive parts. Clip all shield wires except brown/ red as shown in the above figure.

(3) Recommended cable end treatment:

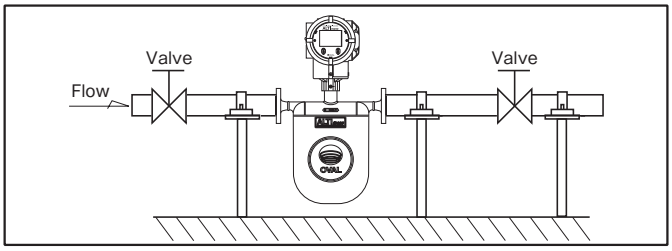


※: Use of a crimp pin terminal is not necessary.

■ STANDARD INSTALLATION

1. Typical Installation (See figure at right.)

1) Avoid pipeline stresses on the meter.
2) The meter should be supported near and between connections to the process pipelines.
3) Avoid supporting the meter body directly.
4) Pipeline should be arranged such that the meter is constantly filled with the process fluid. Avoid, however, installing it in a pocket where slurries may build up.
5) Provide a valve downstream of the meter to allow zeroing by obtaining a true zero flow. We recommend to provide another valve upstream of the meter for servicing or maintenance.



2. Precautions at Installation

1) Locate the meter at least one meter from large transformers, motors, or other sources of electromagnetic induction. Also avoid installation near the sources of excessive vibration, such as motors and pumps.
2) In case of measurement of a process fluid which requires heat retention, heat trace may be applied directly to the sensor body. Heat trace should be held below 200˚C. Explosionproof models require the temperature to be held below their maximum allowable levels.
3) To ensure consistent volume flow and density measurements, make sure to retain heat.
4) The sensor unit has an airtight construction. To prevent inner dew condensation at low temperature operation, the casing is filled with argon gas. For this reason, please take extra caution not to drop or apply impact on the sensor.
5) In a horizontal run, install the sensor having the transmitter placed on top as shown in the figure.
6) A control valve should be located downstream of the meter. In an arrangement where cavitation may possibly take place, locate it at least 5 meters away.
7) To ensure consistent and accurate measurement, the Coriolis flowmeter should be placed in an environment where pipeline oscillation is held below 0.3G.
8) Sudden temperature change may damage the performance of the flowmeter. Keep the temperature change of the fluid within ±12°C/min. for both heating and cooling.

3. Prevention of Cavitation

Cavitation can causes a loss of meter accuracy in measurement. For this reason, maintain line pressure that will not cause cavitation upstream and downstream of the meter. Avoid pipe arrangements that will open to atmosphere immediately downstream of the meter. Care must be taken particularly with high vapor pressure liquids. In practice, we recommend to keep the back pressure in the meter (downstream pressure) above the value calculated by the formula below:

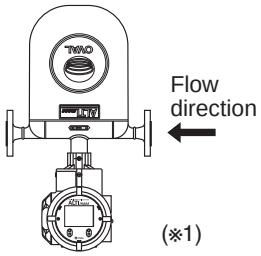
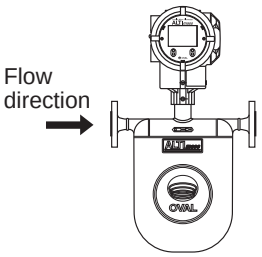
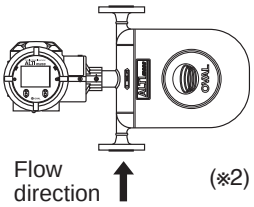
$Pd=3\Delta P+1.3Pv$

Pd : Downstream pressure (MPa[absolute])
ΔP: Pressure loss across the meter (MPa)
Pv : Steam pressure of the process fluid at measurement (MPa[absolute])

4. Physical orientation

(1) CA003 thru CA250

Recommended physical orientation varies with the type of process fluid. [No. 2 in the figure below shows basic orientation for liquid service.]

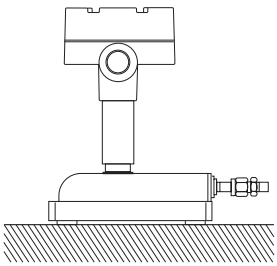
	Horizontal run		Vertical run
	No.1	No.2	No.3
Orientation			
Fluids	● Gases ● Slurries	● Liquids	● Slurries (requiring cleaning) ● Liquids ● Gases

※1: For installation orientation No.1, be careful not to allow back-streaming of drain from the power cable connection as well as disconnection between the sensor during maintenance and transmitter replacement.
※2: The measuring tube of the CA003 is in double-loop configuration without self-draining feature.
※: Do not forget to specify the physical orientation when you order.

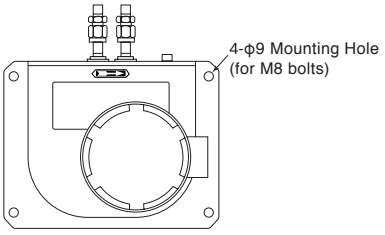
(2) CA00A and CA001

The instrument can be installed either on a bench or a wall. The following physical orientation is suggested.
(In wall mounting, secure the instrument with bolts, using the mounting holes provided on the sensor unit.)

◆ Bench mount



◆ Wall mount



■ EXPLOSIONPROOF SPECIFICATION (For the rack-mount transmitter, refer to GS No.GEJ516E.)

1. TIIS Explosionproof

● **Integral type**

- Transmitter symbol: Ex d [ib] IIC T4 X
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Explosionproof applied temperature: +59°C
- Sensor symbol: Ex ib IIC T3, T4
- Communication: HART, Modbus, PROFIBUS and FOUNDATION fieldbus (FISCO)

※ If the class of sensor's explosion proof is T3, explosive atmosphere that can be handled shall be up to T3.

● **Separate type**

- Transmitter symbol: Ex d [ib] IIC T6 X
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: Ex ib IIB/IIC T1, T2, T3, T4, T5
- Communication: HART, Modbus, PROFIBUS and FOUNDATION fieldbus (FISCO)

※ Explosion specifications such as group, temperature class, ambient temperature, and fluid temperature vary depending on the combination of transmitter and sensor. Refer to the table below for the explosionproof specification of each combination. The blank cells indicate unavailable combination.

	Temperature class (Xmtr-sensor: spec.)	T1 (Xmtr-sensor: separate type)		T2 (Xmtr-sensor: separate type)	T3 (Xmtr-sensor: integral type)	T3 (Xmtr-sensor: separate type)
	Group	IIB	IIC	IIC	IIC	IIC
Model / Ambient temp./ Fluid temp.	CA00A	—	—	—	—	–40°C to +60°C/ –40°C to +150°C
	CA001	—	—	—	—	
	CA003	—	—	–20°C to +60°C/ –20°C to +200°C	—	–20°C to +60°C/ –20°C to +150°C
	CA006/CA010	—	—	–40°C to +60°C/ –40°C to +200°C	–40°C to +55°C/ –40°C to +150°C	–40°C to +60°C/ –40°C to +150°C
	CA015	—	—			
	CA025	–20°C to +50°C/ –20°C to +350°C	—			
	CA040/CA050		—			
	CA080	—	–20°C to +50°C/ –20°C to +350°C			
	CA100/CA150	—				
	CA15H/CA200	—	—			
	CA20H/CA250	—	—			

	Temperature class (Xmtr-sensor: spec.)	T4 (Xmtr-sensor: integral type)	T4 (Xmtr-sensor: separate type)	T5 (Xmtr-sensor: separate type)
	Group	IIC	IIC	IIC
Model / Ambient temp./ Fluid temp.	CA00A	—	–40°C to +60°C/ –40°C to +80°C	—
	CA001	—		—
	CA003	—	–20°C to +60°C/ –20°C to +90°C	—
	CA006/CA010	–40°C to +55°C/ –40°C to +80°C	–40°C to +60°C/ –40°C to +80°C	—
	CA015			—
	CA025			–20°C to +50°C/ –200°C to +50°C
	CA040/CA050			
	CA080			
	CA100/CA150			
	CA15H/CA200			
	CA20H/CA250			

2. ATEX, IECEx Explosionproof

● **Integral type**

- Transmitter symbol: II2G Ex db ib IIC T4 Gb
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: II2G Ex ib IIC T4 Gb
- Sensor to be connected: CA006 to CA250
- Communication: HART, Modbus, PROFIBUS and FOUNDATION fieldbus (FISCO)

● **Separate type**

- Transmitter symbol: II2G Ex db [ib] IIC T6 Gb
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: II2G Ex ib IIC T1, T2, T3, T4, T5 Gb
- Communication: HART, Modbus, PROFIBUS and FOUNDATION fieldbus (FISCO)

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high temperature sensors High and low temperature sensors

Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA250
	Temperature class: T3	–40°C to +130°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

3. KCs Explosionproof

● **Integral type**

- Transmitter symbol: Ex d ib IIC T4
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: Ex ib IIC T4
- Sensor to be connected: CA006 to CA250
- Communication: HART, PROFIBUS and FOUNDATION fieldbus (FISCO)

● **Separate type**

- Transmitter symbol: Ex d ［ib］ IIC T6
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: Ex ib IIC T1, T2, T3, T4, T5
- Communication: HART, PROFIBUS and FOUNDATION fieldbus (FISCO)

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high and low temperature sensors High and low temperature sensors
Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA250
	Temperature class: T3	–40°C to +130°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

4. CSA Explosionproof

● **Integral type**

- Transmitter symbol: Class I, Zone 1, Ex d ib IIC T4 Gb
  Class I, Zone 1, AEx d ib IIC T4 Gb (Integral type)
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: Class I, Zone 1, Ex ib IIC T4 Gb
  Class I, Zone 1, AEx ib IIC T4 Gb
- Sensor to be connected: CA006 to CA250
- Communication: HART, Modbus, PROFIBUS and FOUNDATION fieldbus (FISCO)

● **Separate type**

- Transmitter symbol: Class I, Zone 1, Ex d [ib] IIC T6 Gb
  Class I, Zone 1, AEx d [ib] IIC T6 Gb
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: Class I, Zone 1, Ex ib IIC T1, T2, T3, T4, T5 Gb
  Class I, Zone 1, AEx ib IIC T1, T2, T3, T4, T5 Gb
- Communication: HART, PROFIBUS and FOUNDATION fieldbus (FISCO)

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high and low temperature sensors High and low temperature sensors
Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA250
	Temperature class: T3	–40°C to +130°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

5. EAC Explosionproof

● **Integral type**

- Transmitter symbol: 1 Ex d ib IIC T4 Gb X
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: 1 Ex ib IIC T4 Gb
- Sensor to be connected: CA006 to CA250
- Communication: HART, PROFIBUS and FOUNDATION fieldbus (FISCO)

● **Separate type**

- Transmitter symbol: 1 Ex d [ib] IIC T6 Gb X
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: 1 Ex ib IIC T1, T2, T3, T4, T5 Gb
- Communication: HART, PROFIBUS and FOUNDATION fieldbus (FISCO)

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high temperature sensors High and low temperature sensors
Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA150
	Temperature class: T3	–40°C to +130°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

6. NEPSI Explosionproof

● **Integral type**

- Transmitter symbol: Ex d ib IIC T4 Gb
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: Ex ib IIC T4 Gb
- Sensor to be connected: CA006 to CA250
- Communication: HART, Modbus

● **Separate type**

- Transmitter symbol: Ex d [ib] IIC T6 Gb
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: Ex ib IIC T1, T2, T3, T4, T5 Gb
- Communication: HART, Modbus

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high temperature sensors High and low temperature sensors
Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA250
	Temperature class: T3	–40°C to +130°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

7. ITRI Explosionproof

● **Integral type**
- Transmitter symbol: Ex d ib IIC T4 Gb
- Transmitter and sensor ambient temperature: –40°C to +55°C
- Fluid temperature: –40°C to +80°C
- Sensor symbol: Ex ib IIC T4 Gb
- Sensor to be connected: CA006 to CA250
- Communication: HART, PROFIBUS

● **Separate type**
- Transmitter symbol: Ex d ib IIC T6 Gb
- Transmitter ambient temp.: –40°C to +55°C
- Sensor symbol: Ex ib IIC T1, T2, T3, T4, T5 Gb
- Communication: HART, PROFIBUS

Sensor ambient temperature (Separate type only)	–40°C to +60°C –20°C to +50°C	Other than high and low temperature sensors High and low temperature sensors

Fluid temperature (Separate type only)	Temperature class: T1	–20°C to +350°C: CA025 to CA150
	Temperature class: T2	–40°C to +200°C: CA003 to CA250
	Temperature class: T3	–40°C to +150°C
	Temperature class: T4	–40°C to +80°C
	Temperature class: T5	–200°C to +50°C: CA025 to CA250

■ ABOUT MARITIME CERTIFICATION

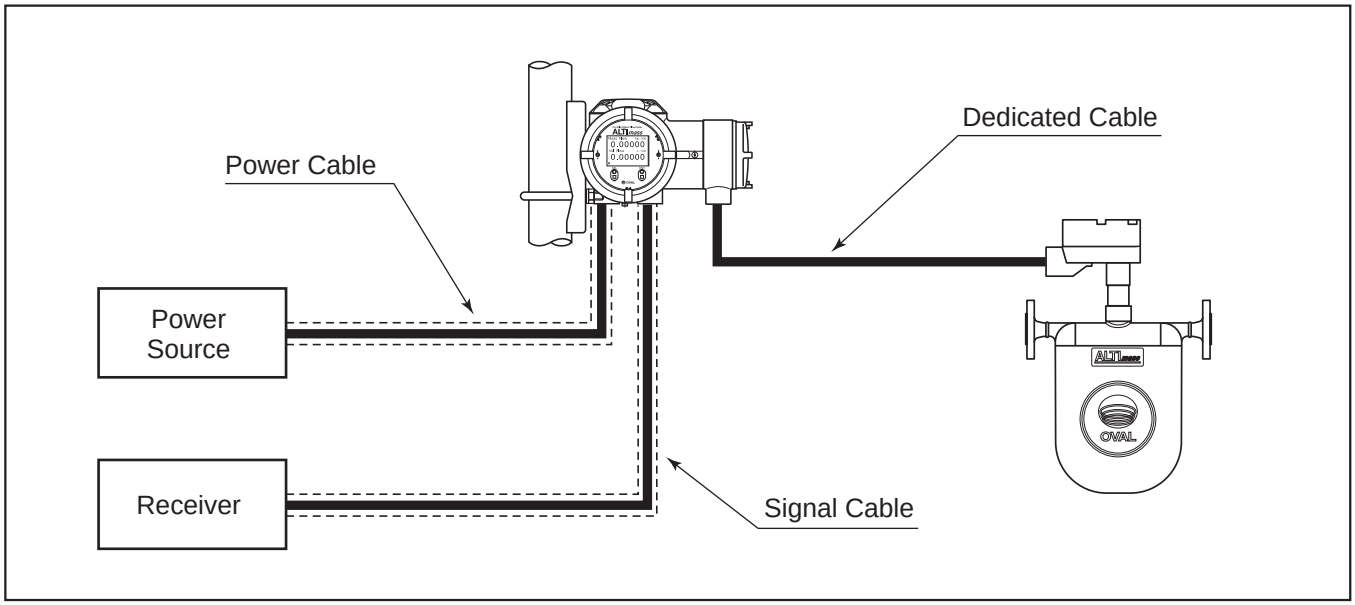
This product is approved for the ship classification under the conditions below.

Item		Contents
Classification Society		DNV GL
Applicable Sensor	Type U	CA00A, CA001, CA003, CA006, CA010, CA015, CA025, CA040, CA050, CA080 (CA100, CA150, CA15H, CA200, CA20H, CA250) ※1
Location Classes		Temperature D (–25°C to +55°C) Humidity B (Relative Humidity: less than 100%) Vibration A (2 to 13.2Hz with 1mm amplitude, 13.2 to 100Hz with 0.7g acceleration) ※ Install at the place where mechanical vibration from engine, compressor, pump and so on is not introduced into transmitter directly. EMC A (All locations except bridge and open deck) Enclosure C (IP56)

(Note) ※1: Sensors in parentheses are certified only as Remote-mount type.

■ REGARDING CABLE WIRING

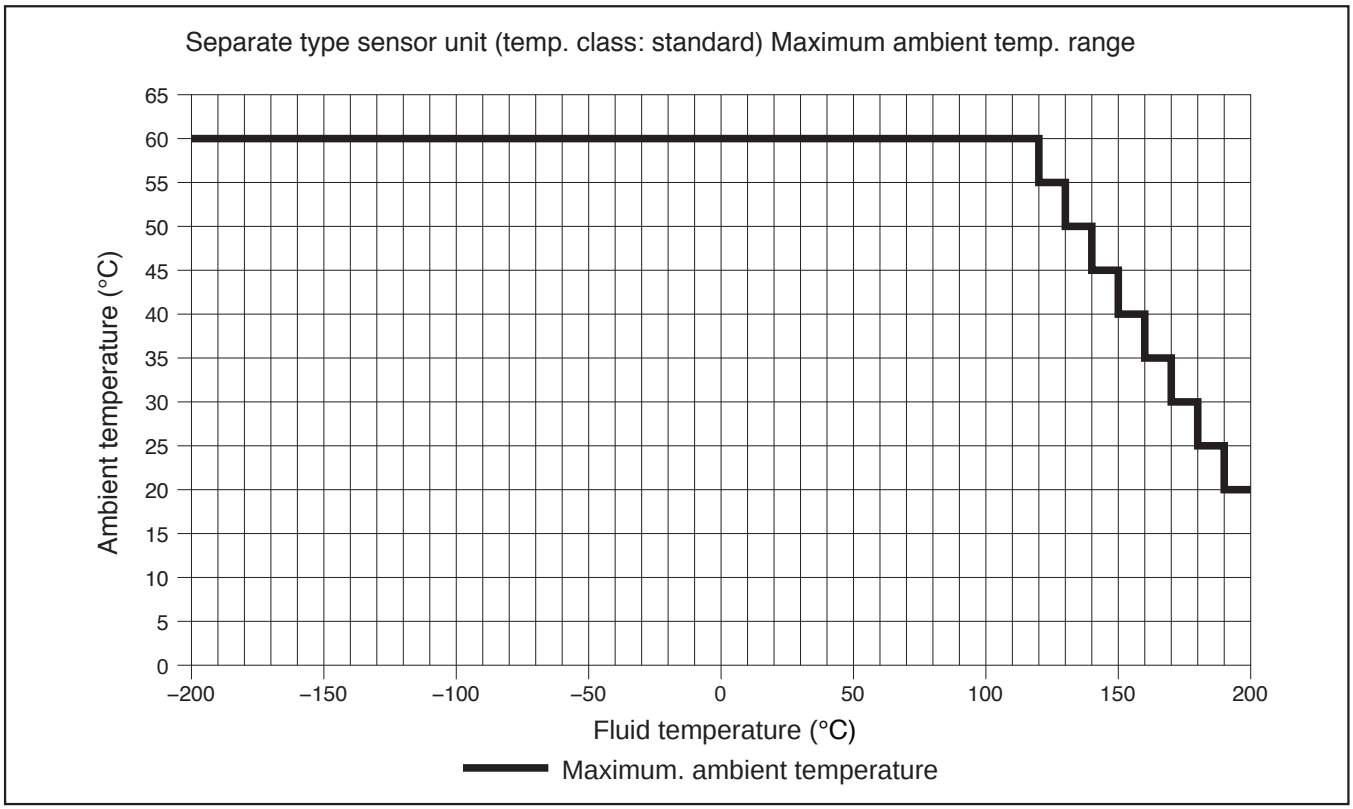
If using ALTImass as certified equipment for maritime applications, use metal conduit tube, marine cable (with shield), etc. for the power and signal cables and connect shielded sections to the transmitter housing.
Be sure to use the dedicated cable for the connection between the sensor and the transmitter, and implement waterproofing treatment which satisfies IP56.



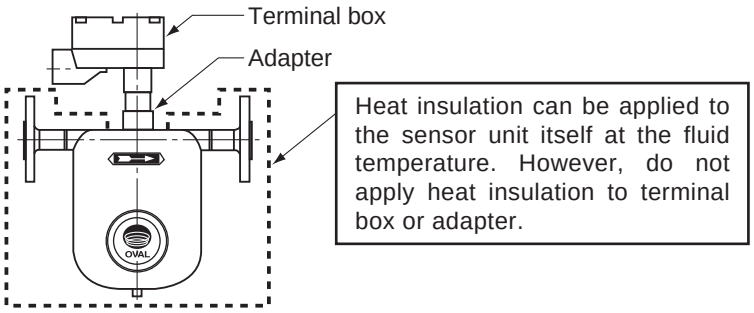
■ AMBIENT TEMPERATURE

Allowable ambient temperature permitted for the sensor unit is as described in the table below.
(The following table describes the condition for the non-explosionproof models. For the explosionproof models, make sure to satisfy the temperature conditions described in “Explosionproof Specification” in page 23 to 25, as well as the condition described below.)

Sensor unit temp. class	Transmitter construction	
	Integral type	Separate type
Standard (200°C and lower)	[Fluid temperature] 150°C and lower [Ambient temperature] –40 to +55°C	[Sensor unit ambient temp.] –40°C to maximum ambient temp.in the graph below
High temperature service model (350°C and lower)	None	[Sensor unit ambient temp.] –40 to +55°C
Low-temperature explosionproof service model	None	[Sensor unit ambient temp.] –20 to +50°C

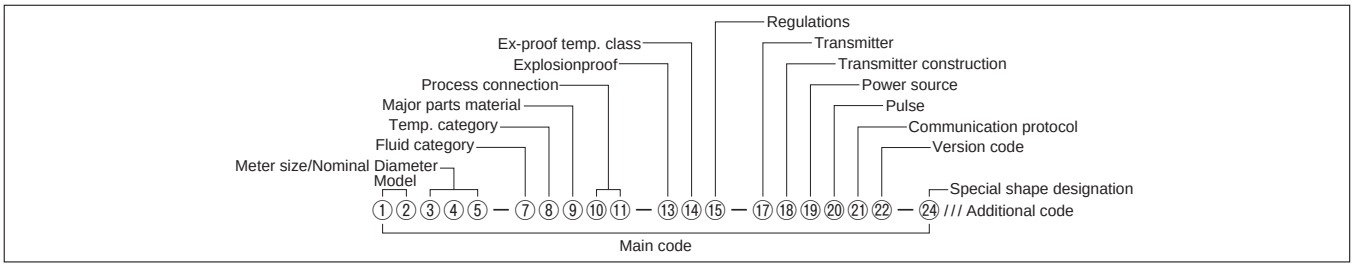


※Please contact us in the case the ambient temperature exceeds maximum ambient temperature in the graph.



Heat insulation can be applied to the sensor unit itself at the fluid temperature. However, do not apply heat insulation to terminal box or adapter.

■ PRODUCT CODE EXPLANATION



● Main code (CA00A to CA080)

○ : Compatible, × : Not applicable, △ : Request inquiries

①	②	Model					Selector Chart										
C	A	ALTImass Type U															
③	④	⑤	Meter size/Nominal Diameter														
			JIS Flange	ASME·JPI Flange	DIN Flange	Ferrule	Screw										
0	0	A					R1/4										
0	0	1					R1/4										
0	0	3	10mm	1/2″	DN 15	10A	Rc3/8										
0	0	6	10mm	1/2″	DN 15	10A	Rc3/8										
0	1	0	15mm	1/2″	DN 15	15A	Rc3/8										
0	1	5	15mm	1/2″	DN 15	15A	Rc3/4										
			25mm	1″	DN 25												
0	2	5	25mm	1″	DN 25	25 (ISO), IDF 1S											
			40mm	1″·1/2″	DN 40												
0	4	0	40mm	1″·1/2″	DN 40	38 (ISO), IDF 1.5S											
0	5	0	50mm	2″	DN 50	51 (ISO), IDF 2S											
0	8	0	80mm	3″	DN 80	76.1 (ISO), IDF 3S											
			100mm	4″	DN 100												
								CA00A, CA001	CA003	CA006	CA010	CA015	CA025	CA040, CA050	CA080	High temp. service: CA025, CA040, CA050	High temp. service: CA080	Low temp. explosionproof service: CA025, CA040, CA050, CA080
⑥	—																	
⑦	**Fluid category**																	
L	Liquid							○	○	○	○	○	○	○	○	○	○	○
G	Gas							○	○	○	○	○	○	○	○	×	×	○
⑧	**Temp. category ※1**																	
2	Standard (200°C and lower)							○	○	○	○	○	○	○	○	×	×	×
3	High temp. (350°C and lower)							×	×	×	×	×	×	×	×	○	○	×
4	Low temp. explosionproof (–200°C to +50°C)							×	×	×	×	×	×	×	×	×	×	○
⑨	**Major parts material**																	
S	SUS316L							○	○	○	○	○	○	○	○	○	○	○
M	SUS316L+Alloy C							×	○	○	○	○	○	○	○	×	○	○
H	Alloy C ※2							×	○	○	○	○	○	○	○	×	○	○
P	Alloy C (High Pressure) ※3							×	×	×	○	○	×	×	×	×	×	×
⑩	⑪	**Process connection**																
J	1	JIS10K	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
J	2	JIS20K	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
J	3	JIS30K	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
J	4	JIS40K	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
J	6	JIS63K	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
A	1	ASME150	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
A	3	ASME300	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
A	6	ASME600	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
P	1	JPI150	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
P	3	JPI300	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
P	6	JPI600	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
D	1	DIN PN10 ※4	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
D	B	DIN PN16 ※4	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
D	3	DIN PN25 ※4	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
D	4	DIN PN40 ※4	(Standard nominal size ※5)					×	○	○	○	○	○	○	○	○	○	○
K	1	JIS10K	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
K	2	JIS20K	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
K	3	JIS30K	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
B	1	ASME150	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
B	3	ASME300	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
B	6	ASME600	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
Q	1	JPI150	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
Q	3	JPI300	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
Q	6	JPI600	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
E	1	DIN PN10 ※4	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
E	B	DIN PN16 ※4	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
E	3	DIN PN25 ※4	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
E	4	DIN PN40 ※4	(Expanded nominal size ※6, ※7)					×	×	×	×	△	△	×	○	×	×	×
T	T	Screw (Male)						○	×	×	×	×	×	×	×	×	×	×
T	C	Screw (Female)						×	○	○	○	○	×	×	×	×	×	×
H	S	ISO Ferrule						×	○	○	○	○	○	○	○	×	×	×
Z	9	Special						○	○	○	○	○	○	○	○	○	○	○

※1: Explosionproof specifications are restricted depending on the temp. class.
※2: When "H" is chosen for "Major parts material ⑨ ", CA003 are always threaded connection, and CA006 to CA080 are loose flange type.
※3: When "P" for high pressure is chosen as "Major parts material ⑨ ", threaded connection is always applied.
※4: DIN flange is applied only when "S" and "M" are chosen for "Major parts material ⑨ ".
※8: "2, 3" for "Communication protocol ㉑ " are not applicable.
※9: CRN is applicable only to CSA explosionproof and ASME flange models.
※10: When selecting "B" for "Regulations ⑮ " following limitations apply:
Code ③④⑤ are only to size 040, 050 and 080.
Code ⑨ is only to S.
Code ⑩⑪ are only to A1, A3, A6, D1, DB, D3 and D4.
※11: Applicable specifications differ with the rack-mount transmitter.
For detailed product code explanation, refer to GS No.GEJ516E.
※12: The maximum measurement temperature of integral type is 150°C.
"High temp. and low temp. type CA00A to CA003" are only remote-mount transmitter.

⑫	—	
⑬	**Explosionproof**	
0	Non-explosionproof	
1	TIIS	
2	ATEX, IECEx	
3	KCs	
4	CSA (C-US)	
5	EAC	
7	NEPSI ※8	
T	ITRI ※8	
⑭	**Ex-proof temp. class**	
0	Non-explosionproof	
1	T1	
2	T2	
3	T3	
4	T4	
5	T5	
⑮	**Regulations**	
0	Standard	
G	High Pressure Gas Safety Act (Approved product)	w/Material test certificate
H	High Pressure Gas Safety Act (Individual test)	w/Material test certificate
J	High Pressure Gas Safety Act (Completion inspection)	w/Material test certificate
M	Gas Business Act	w/Material test certificate
T	Fire Service Act	w/Material test certificate
S	Ship Classification Society Pattern Approval	Remote-mount only
P	Ship Classification Society Pattern Approval + w/Material test certificate Remote-mount only	
C	CRN (Canadian Registration Number) Pattern approval ※9	
K	CRN (Canadian Registration Number) Pattern approval + w/Material test certificate ※9	
F	w/Material test certificate	
B	PED ※10	
⑯	—	
⑰	**Transmitter ※11**	
1	ALTImass	
3	Rack-mount transmitter (Refer to GS No.GEJ516E.)	
⑱	**Transmitter construction ※12**	
1	Integral-mount	
2	Remote-mount	
⑲	**Power source**	
1	20 to 30VDC	
2	85 to 264VAC (safety rating: 100 to 240VAC) 50/60Hz	
⑳	**Pulse**	
0	When "2, 3" are chosen for "Communication interface ㉑ "	
B	Voltage	
G	Open drain (open collector output equivalent) (Standard)	
㉑	**Communication protocol**	
1	HART communication (HART protocol version 7, Bell202)	
2	FOUNDATION Fieldbus H1 communication (ITK version6)	
3	PROFIBUS PA communication (Profile version3.02)	
4	Modbus communication (RS-485 Modbus protocol)	
㉒	**Version code**	
A	Version code: A (CA003 only)	
B	Version code: B	
㉓	—	
㉔	**Special shape designation**	
0	Standard	
Z	Special shape (including polishing, long neck)	

※5: The standard nominal size of each model is as follows.

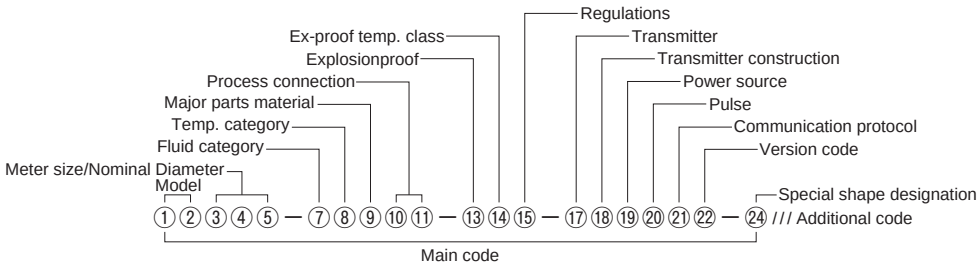
Model	JIS Flange	ASME•JPI Flange	DIN Flange
CA003	10mm	1/2″	DIN15
CA006	10mm	1/2″	DIN15
CA010	15mm	1/2″	DIN15
CA015	15mm	1/2″	DIN15
CA025	25mm	1″	DIN25
CA040	40mm	1·1/2″	DIN40
CA050	50mm	2″	DIN50
CA080	80mm	3″	DIN80

※6: The expanded nominal size of each model is as follows.

Model	JIS Flange	ASME•JPI Flange	DIN Flange
CA015 (Request inquiries)	25mm	1″	DIN25
CA025 (Request inquiries)	40mm	1·1/2″	DIN40
CA080	100mm	4″	DIN100

※7: Expanded nominal size is applied only when "S" and "M" are chosen for "Major parts material ⑨ ".

■ PRODUCT CODE EXPLANATION



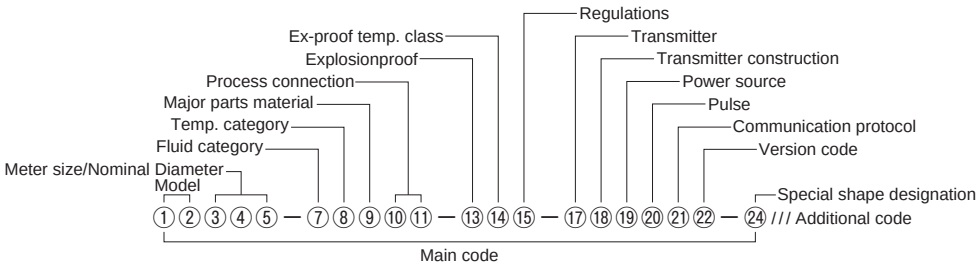
● Main code (CA100 to CA250)

①	②	Model				CA100, CA150, CA15H, CA200, CA20H, CA250	High temp. service: CA100, CA150	Low temp. explosionproof service: CA100, CA150, CA15H, CA200, CA20H, CA250
C	A	ALTImass Type U						
③	④	⑤	Meter size/Nominal Diameter					
			JIS Flange	ASME·JPI Flange	DIN Flange			
1	0	0	100mm	4″	DN 100			
1	5	0	150mm	6″	DN 150			
1	5	H	150mm	6″	DN 150			
2	0	0	200mm	8″	DN 200			
2	0	H	200mm	8″	DN 200			
2	5	0	250mm	10″	DN 250			
⑥	—							
⑦	**Fluid category**							
L	Liquid					○	○	○
⑧	**Temp. category ※1**							
2	Standard (200°C and lower)					○	×	×
3	High temp. (350°C and lower)					×	○	×
4	Low temp. explosionproof (–200°C to +50°C)					×	×	○
⑨	**Major parts material**							
S	SUS316L					○	○	○
⑩	⑪	**Process connection**						
J	1	JIS10K				○	○	○
J	2	JIS20K				○	○	○
J	3	JIS30K				○	○	○
A	1	ASME150				○	○	○
A	3	ASME300				○	○	○
A	6	ASME600				○	○	○
P	1	JPI150				○	○	○
P	3	JPI300				○	○	○
P	6	JPI600				○	○	○
D	1	DIN PN10				○	○	○
D	B	DIN PN16				○	○	○
D	3	DIN PN25				○	○	○
D	4	DIN PN40				○	○	○
Z	9	Special				○	○	○

※1: Explosionproof specifications are restricted depending on the temp. class.
※2: "2, 3" for "Communication protocol ㉑ " are not applicable.
※3: CRN is applicable only to CSA explosionproof and ASME flange models.
※4: When selecting "B" for "Regulations ⑮ " following limitations apply:
Code ⑩⑪ are only to A1, A3, A6, D1, DB, D3 and D4.
※5: Applicable specifications differ with the rack-mount transmitter.
For detailed product code explanation, refer to GS No.GEJ516E.
※6: When selecting explosionproof other than TIIS with fluid temperature exceeding 80°C, only "(transmitter) separate type" is applicable.
"High temp. and low temp. type" can only be "(transmitter) separate type".

⑫	—
⑬	**Explosion-proof**
0	Non-explosionproof
1	TIIS
2	ATEX, IECEx
3	KCs
4	CSA (C-US)
5	EAC
7	NEPSI ※2
T	ITRI ※2
⑭	**Ex-proof temp. class**
0	Non-explosionproof
1	T1
2	T2
3	T3
4	T4
5	T5
⑮	**Regulations**
0	Standard
G	High Pressure Gas Safety Act (Approved product) CA100 and CA150 only ※w/Material test certificate
H	High Pressure Gas Safety Act (Individual test) ※w/Material test certificate
J	High Pressure Gas Safety Act (Completion inspection) ※w/Material test certificate
M	Gas Business Act ※w/Material test certificate
T	Fire Service Act ※w/Material test certificate
S	Ship Classification Society Pattern Approval
P	Ship Classification Society Pattern Approval + w/Material test certificate
C	CRN (Canadian Registration Number) Pattern approval ※3
K	CRN (Canadian Registration Number) Pattern approval + w/Material test certificate ※3
F	w/Material test certificate
B	PED ※4
⑯	—
⑰	**Transmitter ※5**
1	ALTImass
3	Rack-mount transmitter (Refer to GS No.GEJ516E.)
⑱	**Transmitter construction ※6**
1	Integral-mount
2	Remote-mount
⑲	**Power source**
1	20 to 30VDC
2	85 to 264VAC (safety rating: 100 to 240VAC) 50/60Hz
⑳	**Pulse**
0	When "2, 3" are chosen for "Communication interface ㉑ "
B	Voltage
G	Open drain (open collector output equivalent) (Standard)
㉑	**Communication protocol**
1	HART communication (HART protocol version 7, Bell202)
2	FOUNDATION Fieldbus H1 communication (ITK version6)
3	PROFIBUS PA communication (Profile version3.02)
4	Modbus communication (RS-485 Modbus protocol)
㉒	**Version code**
B	Version code: B
㉓	—
㉔	**Special shape designation**
0	Standard
Z	Special shape

■ PRODUCT CODE EXPLANATION



● Additional code

Category of High Pressure Gas				
H	P	0	Other than High Pressure Gas	
H	P	1	Toxic gas and flammable gas	
H	P	2	Toxic gas	
H	P	3	Flammable gas	
H	P	4	Other than toxic or flammable gas	
Density calibration				
M	0	0	Density calibration	
Special test (instrumental error)				
A	1	0	Taxed custody transfer	
A	2	0	By certified measurer	
A	9	9	Designation of instrumental error test method	Addition of one (1) test point, etc.
Flow direction				
F	L	0	Left to right	
F	R	0	Right to left	
F	D	0	Bottom to top	Electric conduit must face bottom
Designated special paint on body				
B	X	0	Customer designation	
Designated special paint on transmmiter				
S	F	0	Corrosion proof	Special treatment
S	D	0	Salt Proof	
S	E	0	Acid Proof	Special treatment
S	X	0	Customer designation	Special treatment
Cleansing				
T	W	0	Oil free and Water free treatment	
T	F	0	Food cleansing	
Accuracy				
R	A	5	±0.05% RD	

Document				
D	S	J	SPEC. & DWG (Approval Drawing) (Japanese)	
D	S	E	SPEC. & DWG (Approval Drawing) (English)	
D	R	0	Re-submission of SPEC. & DWG	
D	C	J	Final DWG (Japanese)	
D	C	E	Final DWG (English)	
D	P	J	Strength Calculation sheet (Japanese)	
D	P	E	Strength Calculation sheet (English)	
S	E	J	Inspection Certificate (Calibration report) (Japanese)	
S	E	E	Inspection Certificate (Calibration report) (English)	
S	T	J	Pressure test report (Japanese)	
S	T	E	Pressure test report (English)	
S	A	J	Airtight test report (Japanese)	
S	A	E	Airtight test report (English)	
D	D	J	Dimensional check record (Japanese)	
D	D	E	Dimensional check record (English)	
S	P	J	Penetrant test report (Japanese)	Welded part of pressure resistant vessel
S	P	E	Penetrant test report (English)	Welded part of pressure resistant vessel
S	R	J	Radiographic inspection report (Japanese)	Welded part of pressure resistant vessel
S	R	E	Radiographic inspection report (English)	Welded part of pressure resistant vessel
S	X	J	PMI test report (Japanese)	
S	X	E	PMI test report (English)	
S	S	J	Impact test report (Japanese)	Manifold only
S	S	E	Impact test report (English)	Manifold only
D	Y	J	WPS/PQR (Japanese)	
D	Y	E	WPS/PQR (English)	
D	9	J	Photo (Japanese)	
D	9	E	Photo (English)	
D	T	J	Inspection procedure (Japanese)	
D	T	E	Inspection procedure (English)	
C	A	J	Traceability certificate: A set	Only available in Japanese
C	B	J	Traceability certificate: B set	Only available in Japanese
C	C	J	Traceability certificate: C set	Only available in Japanese
C	D	J	Traceability certificate: D set	Only available in Japanese
Witness Test				
V	1	0	Required	

■ FORMER PRODUCT CODE EXPLANATION

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Contact OVAL if you wish to order with the old product code for reasons such as type approval.

Item	Product code ① ②	③ ④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	Description	Selector Chart: CA00A, CA001	CA003	CA006	CA010, CA015	CA025, CA040, CA050, CA080	High temp. service: CA025, CA040, CA050 (below 350°C)	High temp. service: CA080 (below 350°C)	Low temp. explosionproof service:CA025, CA040, CA050, CA080
Model	C A															ALTI*mass* Type U								
Nominal size		0 0 A														1/4″ connection								
		0 0 1														1/4″ connection								
		0 0 3														10mm connection (3/8″)								
		0 0 6														10mm connection (3/8″)								
		0 1 0														15mm connection (1/2″)								
		0 1 5														15mm connection (1/2″)								
		0 2 5														25mm connection (1″)								
		0 4 0														40mm connection (1·1/2″)								
		0 5 0														50mm connection (2″)								
		0 8 0														80mm connection (3″)								
Fluid category			L													Liquid service	○	○	○	○	○	○	○	○
			G													Gas service	○	○	○	○	○	×	×	○
Temp. category (※1)				2												Standard (below 200°C)	○	○	○	○	○	×	×	×
				3												High temperature service (below 350°C)	×	×	×	×	×	○	○	×
				4												Low temperature explosionproof service (–200°C to +50°C)	×	×	×	×	×	×	×	○
Pressure category					1											Standard	○	○	○	○	○	○	○	○
					2											High pressure service (※2)	×	×	×	○	×	×	×	×
Major parts material						S										SUS316L	○	○	○	○	○	○	○	○
						M										SUS316L + Alloy C	×	○	○	○	○	×	○	○
						H										Alloy C (※3)	×	○	○	○	○	×	○	○
						X										Other material	○	○	○	○	○	○	○	○
Process connection							A									Screw-in	○	○	○	○	×	×	×	×
							B									Ferrule	×	○	○	○	○	×	×	×
							C									JIS 10K	×	○	○	○	○	○	○	○
							D									JIS 20K	×	○	○	○	○	○	○	○
							E									JIS 30K	×	○	○	○	○	○	○	○
							F									JIS 40K	×	○	○	○	○	○	○	○
							G									JIS 63K	×	○	○	○	○	○	○	○
							H									ASME 150	×	○	○	○	○	○	○	○
							J									ASME 300	×	○	○	○	○	○	○	○
							K									ASME 600	×	○	○	○	○	○	○	○
							L									JPI 150	×	○	○	○	○	○	○	○
							M									JPI 300	×	○	○	○	○	○	○	○
							N									JPI 600	×	○	○	○	○	○	○	○
							P									DIN PN 10 (※4)	×	○	○	○	○	○	○	○
							Q									DIN PN 16 (※4)	×	○	○	○	○	○	○	○
							R									DIN PN 25 (※4)	×	○	○	○	○	○	○	○
							S									DIN PN 40 (※4)	×	○	○	○	○	○	○	○
							Z									Other than above	×	○	○	○	○	○	○	○
Transmitter construction (※5)								1								Integral-mount	×	×	○	○	○	×	×	×
								2								Remote-mount	○	○	○	○	○	○	○	○
Power source									1							20 to 30VDC								
									2							85 to 264VAC (Safety rated 100 to 240VAC), 50/60Hz								
Analog output (※6, 7, 8)										A						Output 1: Mass flow / Output 2: Mass flow								
										B						Output 1: Mass flow / Output 2: Density								
										C						Output 1: Mass flow / Output 2: Temperature								
										D						Output 1: Mass flow / Output 2: Volume flow (true density)								
										E						Output 1: Mass flow / Output 2: Volume flow (fixed density)								
										F						Output 1: Density / Output 2: Temperature								
										G						Output 1: Volume flow (true density) / Output 2: Density (true density)								
										H						Output 1: Volume flow (fixed density) / Output 2: Density								
										J						Output 1: Volume flow (true density) / Output 2: Temperature								
										K						Output 1: Volume flow (fixed density) / Output 2: Temperature								
										X						Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication								
Pulse output (※6, 7, 8)											A					Output 1: Mass flow	Single pulse							
											B					Output 1: Volume flow (true density)								
											C					Output 1: Volume flow (fixed density)								
											D					Output 1: Mass flow / Output 2: Mass flow	Double pulse							
											E					Output 1: Mass flow / Output 2: Volume flow (true density)								
											F					Output 1: Mass flow / Output 2: Volume flow (fixed density)								
											G					Output 1: Vol. flow (true dens.) / Output 2: Vol. flow (true dens.)								
											H					Output 1: Vol. flow (fixed dens.) / Output 2: Vol. flow (fixed dens.)								
											J					Output 1: Volume flow (true dens.) / Output 2: Mass flow								
											K					Output 1: Volume flow (fixed dens.) / Output 2: Mass flow								
											X					Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication								
Pulse output type (※6)												0				Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication								
												1				Open drain pulse (equivalent to open collector pulse) (standard)								
												2				Voltage pulse								
Communication protocol													1			HART communication / HART protocol version 7, Bell202								
													2			FOUNDATION fieldbus H1 communication (※6) / ITK version6								
													3			PROFIBUS PA communication (※6) / Profile version3.02								
													4			Modbus communication / RS-485 Modbus protocol								
Explosionproof rating														0		Non-explosionproof								
														1		TIIS								
														2		ATEX, IECEx								
														3		KCs								
														4		CSA								
														5		EAC								
														7		NEPSI (※9)								
														T		ITRI (※9)								
Explosionproof temperature class															0	Non-explosionproof								
															1	T1								
															2	T2								
															3	T3								
															4	T4								
															5	T5								

※1: Explosionproof specifications are restricted based on temperature class.
※2: If "High pressure service" is selected for the pressure category, process connection will be "Screw-in".
※3: When "H" (Alloy C) is selected as major part material code, only loose flange is applicable for CA006.
※4: DIN flange is applied only when "S" and "M" are chosen for "Major parts material".
※5: Other than TIIS explosionproof specification is required and the fluid's temp. exceeds 80°C, only "(transmitter) separate type" is applicable.
"High temp. and low temp. type CA00A to CA003" are only "(transmitter) separate type".
※6: When FOUNDATION fieldbus, PROFIBUS is selected for communication protocol, product code categories of analog output is "X" and pulse output is "X" (pulse output type:"0").
※7: When "Volume flow (fixed density)" is selected for analog output or pulse output, fixed density will be applied.
※8: Simultaneous output of both "Volume flow (fixed density)" and "Volume flow (true density)" for analog output and pulse output is not available.
※9: "2, 3" for "Communication protocol " are not applicable.

■ FORMER PRODUCT CODE EXPLANATION

The new product code has been implemented since April 2017.
Therefore, the product code explanation of the old product code will not be updated after April 2017.
Contact OVAL if you wish to order with the old product code for reasons such as type approval.

Item	Product code ① ②	③ ④ ⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	Description	Selector Chart: CA100, CA150 CA15H, CA200, CA20H, CA250	Selector Chart: High temp. service: CA100, CA150 (below 350°C)	Selector Chart: Low temp. explosionproof service: CA100, CA150,CA15H,CA200,CA20H,CA250
Model	C A															ALTI*mass* Type U			
Nominal size		1 0 0														100mm connection (4″)			
		1 5 0														150mm connection (6″)			
		1 5 H														150mm connection (6″)			
		2 0 0														200mm connection (8″)			
		2 0 H														200mm connection (8″)			
		2 5 0														250mm connection (10″)			
Fluid category			L													Liquid service	○	○	○
Temp. category (※1)				2												Standard (below 200°C)	○	×	×
				3												High temperature service (below 350°C)	×	○	×
				4												Low temperature explosionproof service (–200°C to +50°C)	×	×	○
Pressure category					1											Standard	○	○	○
Major parts material						S										SUS316L	○	○	○
Process connection							C									JIS 10K	○	○	○
							D									JIS 20K	○	○	○
							E									JIS 30K	○	○	○
							H									ASME 150	○	○	○
							J									ASME 300	○	○	○
							K									ASME 600	○	○	○
							L									JPI 150	○	○	○
							M									JPI 300	○	○	○
							N									JPI 600	○	○	○
							P									DIN PN 10	○	○	○
							Q									DIN PN 16	○	○	○
							R									DIN PN 25	○	○	○
							S									DIN PN 40	○	○	○
							Z									Other than above	○	○	○
Transmitter construction (※2)								1								Integral-mount	○	×	×
								2								Remote-mount	○	○	○
Power source									1							20 to 30VDC			
									2							85 to 264VAC (Safety rated 100 to 240VAC), 50/60Hz			
Analog output (※3, 4, 5)										A						Output 1: Mass flow / Output 2: Mass flow			
										B						Output 1: Mass flow / Output 2: Density			
										C						Output 1: Mass flow / Output 2: Temperature			
										D						Output 1: Mass flow / Output 2: Volume flow (true density)			
										E						Output 1: Mass flow / Output 2: Volume flow (fixed density)			
										F						Output 1: Density / Output 2: Temperature			
										G						Output 1: Volume flow (true density) / Output 2: Density (true density)			
										H						Output 1: Volume flow (fixed density) / Output 2: Density			
										J						Output 1: Volume flow (true density) / Output 2: Temperature			
										K						Output 1: Volume flow (fixed density) / Output 2: Temperature			
										X						Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication			
Pulse output (※3, 4, 5)											A					Output 1: Mass flow			
											B					Output 1: Volume flow (true density)			
											C					Output 1: Volume flow (fixed density)			
											D					Output 1: Mass flow / Output 2: Mass flow			
											E					Output 1: Mass flow / Output 2: Volume flow (true density)			
											F					Output 1: Mass flow / Output 2: Volume flow (fixed density)			
											G					Output 1: Vol. flow (true dens.) / Output 2: Vol. flow (true dens.)			
											H					Output 1: Vol. flow (fixed dens.) / Output 2: Vol. flow (fixed dens.)			
											J					Output 1: Volume flow (true dens.) / Output 2: Mass flow			
											K					Output 1: Volume flow (fixed dens.) / Output 2: Mass flow			
											X					Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication			
Pulse output type (※3)												0				Non-output / In the case of FOUNDATION fieldbus, PROFIBUS communication			
												1				Open drain pulse (equivalent to open collector pulse) (standard)			
												2				Voltage pulse			
Communication protocol													1			HART communication / HART protocol version 7, Bell202			
													2			FOUNDATION fieldbus H1 communication (※3) / ITK version6			
													3			PROFIBUS PA communication (※3) / Profile version3.02			
													4			Modbus communication / RS-485 Modbus protocol			
Explosionproof rating														0		Non-explosionproof			
														1		TIIS			
														2		ATEX, IECEx			
														3		KCs			
														4		CSA			
														5		EAC			
														7		NEPSI (※6)			
														T		ITRI (※6)			
Explosionproof temperature class															0	Non-explosionproof			
															1	T1			
															2	T2			
															3	T3			
															4	T4			
															5	T5			

※1: Explosionproof specifications are restricted based on temperature class.
※2: Other than TIIS explosionproof specification is required and the fluid's temp. exceeds 80°C, only "(transmitter) separate type" is applicable.
"High temp. and low temp. type are only "(transmitter) separate type".
※3: When FOUNDATION fieldbus, PROFIBUS is selected for communication protocol, product code categories of analog output is "X" and pulse output is "X" (pulse output type:"0").
※4: When "Volume flow (fixed density)" is selected for analog output or pulse output, fixed density will be applied.
※5: Simultaneous output of both "Volume flow (fixed density)" and "Volume flow (true density)" for analog output and pulse output is not available.
※6: "2, 3" for "Communication protocol " are not applicable.

■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

(Fill in the form below to the extent possible. Further details will be finalized in later consultation.)

・Fill in the blanks. Tick the boxes ☐ that apply.

1. Sensor unit	CA	
2. Process fluid (※1)	Name:_____ SP. gr :_____ Viscosity :_____ Concentration :_____%	
3. Flow range	Maximum_____ Normal_____ Full scale_____ ☐ kg/h ☐ Others_____	
4. Fluid temperature	Maximum_____°C Normal_____°C Min._____°C	
5. Operating pressure	Maximum_____MPa Normal_____MPa Min._____MPa	
6. Ambient temperature	Maximum_____°C Min._____°C	
7. Fluid flow direction	☐ Left → Right ☐ Right → Left ☐ Bottom → Top (☐ Top → Bottom) Orientation: See sketch on page 23.	
8. Nominal size	_____mm or _____inch	
9. Required accuracy	± _____% of reading ± _____% of full scale	
10. Process connection	☐ Flanged connection (Flange rating) ☐ Ferrule connection ☐ Screw connection	
11. Explosionproof	☐ Not required ☐ TIIS ☐ ATEX ☐ IECEx ☐ KCs ☐ CSA ☐ EAC ☐ NEPSI ☐ ITRI	
12. Power supply	_____V ☐ AC ☐ DC	
13. Output specifications	Pulse output	☐ Volt. pulse: [0]: 1.5V [1]: 13VDC min. Out. impedance: 2.2kΩ
		☐ Open drain output (equivalent to open collector output) [Min.10V to Maximum 30V, 50mADC, ON resiatance 0.6Ω or less]
		☐ Output frequency: Any point from 0.1 to 10000Hz at full scale
		Two outputs from flow rate (mass or volume).
	Analog output	4 to 20mADC Maximum load: 600Ω
		2 outputs from instant. flow rate (mass, volume), temp. or density (option)
	Additional damping	0 to 200s. (variable)
	Alarm output	Slug flow High_____g/mL Low_____g/mL
14. Communication protocol	☐ HART ☐ FOUNDATION fieldbus ☐ PROFIBUS ☐ Modbus (Address:)	
15. Transmission length	Sensor unit (→) m Transmitter (→) m Receiving instrument	
16. Receiver	☐ Totalizer ☐ Indicator ☐ Recorder ☐ Flow controller ☐ Batch controller	
	☐ Density computer ☐ Computer ☐ Others	
17. Dedicated cable length	In case of Remote-mount type_____m	
18. In case of separate type transmitter	☐ Stanchion type w/bracket and 2″ U bolt	
19. No. of units required		
20. Application		
21. Other considerations		
22. Cable gland	☐ Standard ☐ ATEX directive compliant ☐ ATEX directive compliant for earthed cable	
23. Maritime certification	☐ Not required ☐ DNV GL	

※1: Special fluids, such as of high viscosity or slurries, should be stated precisely and in detail.

The specification as of June 2019 is stated in this GS Sheet. Specifications and design are subject to change without notice.

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