

## GENERAL

Equipped with a sophisticated transmitter (including extensive diagnostics, a large display, and field configurability via keypad), the Cameron CT Series are high-performance Coriolis flow meters capable of mass flow measurement with a high degree of accuracy. Particularly worth noting are its uses in non-routine flow rate measurement, including measurement of extra low-volume flows, short-duration filling processes, etc.

## FEATURES

- Outstanding zero stability performance
- High-accuracy density:  $\pm 0.0005$  g/mL (Models CC003 to CC250)
- Fast response and calculation frequency
- Dual independent pulse outputs, dual independent analog outputs, one status input and one status output
- Configurable via keypad or digital communications
- Extensive self-diagnostic capabilities (connection faults, pipeline vibration, media pulsation, etc.)
- Enhanced maintenance functions (event/user change logging and downloads, recoverable factory configuration and calibration, etc.)
- User-configurable alarms
- Compatible with HART and Modbus communication protocols

## UNITS

The specifications for the CT Series meters are presented in both U.S. customary units and metric units. For U.S. customary units, see [page 2](#) through [page 22](#). For metric units, see [Appendix A: Metric Units, page A-1](#).

## ADDITIONAL INFORMATION

To view available product configurations and to request additional information, see Appendix B, beginning on [page B-1](#).



**GENERAL PERFORMANCE**

**Flow Rate**

Meter type	Model	Size (in.)	Guaranteed minimum rate (lb/min)	Minimum setting rate (lb/min)	Maximum service rate (lb/min)	Maximum allowable rate (lb/min)	Uncertainty ⑤		Repeatability ⑤		Zero stability (lb/min)	Analog output uncertainty				
							Liquids	Gases	Liquids	Gases						
Low-flow	CC00A	1/4	0.00088	0.0044	0.088	0.132	±0.2% of reading (±ZS) ⑤	±0.5% of reading (±ZS)	±0.05% of reading (±1/2 ZS)	±0.25% of reading (±1/2 ZS)	0.000013	±0.1% of full scale				
	CC001		0.0033	0.0165	0.33	0.496					0.00005					
	CC003	1/2	0.026 (0.033) ①	0.13	2.65	5.29 (6.61) ①					0.000066					
	CC006	1/2	0.132	0.66	13.23	26.46					0.00066					
	CC010	1/2	0.44	2.2	44.09	88.18					0.0022					
	CC015	1/2	1.32	6.61	132	265					0.0066					
Standard and Low-temperature	CC025	1	3.97	19.8	397	794	±0.1% of reading ②	±0.05% of reading ③	±0.05% of reading (±1/2 ZS)	±0.25% of reading (±1/2 ZS)	0.0198	±0.1% of full scale				
	CC040	1-1/2	14.33	71.7	1433	2866					0.071					
	CC050	2									0.22					
	CC080	3	44.09	220	4409	8818					0.628					
	CC100	4	126	628	12566	25133					±0.1% of reading (±ZS) ④		—	±0.05% of reading (±1/2 ZS)	—	1.286
	CC150	6														2.572
	CC15H	6	257	1286	25721	51441										1.286
	CC200	8														2.572
	CC20H	8	514	2572	51441	102883										2.572
CC250	10	0.628														
High-pressure	CC010	3/8	0.88	4.41	30.86	61.73	±0.2% of reading (±ZS) ⑤	±0.5% of reading (±ZS)	±0.1% of reading (±1/2 ZS)	±0.25% of reading (±1/2 ZS)		0.0077				±0.1% of full scale
	CC015	3/4	2.87	14.33	93.7	187						0.0234				
High-temperature	CC025	1	3.97	19.8	397	794	±0.1% of reading (±ZS)	—	±0.05% of reading (±1/2 ZS)	—		0.0396				±0.1% of full scale
	CC040	1-1/2	14.33	71.7	1433	2866					0.143					
	CC050	2									0.441					
	CC080	3	44.09	220	4409	8818					1.257					
	CC100	4	126	628	12566	25133					1.257					
	CC150	6									0.441					

- When a maximum allowable range 6.61 lb/min is adopted, the minimum flow rate is 0.033 lb/min.
- ±ZS is applied for flow rates below 5% (2.5% for Model CC003) of the maximum service rate (within the guaranteed flow range).
- ±1/2 ZS is applied for flow rates below 5% (2.5% for Model CC003) of the maximum service rate (within the guaranteed flow range).
- If an uncertainty of ±0.1% of reading is required, consult Cameron.
- Above maximum service flow rate, the uncertainty is ±0.3% of reading (±ZS).

- \* If you request volume flow measurement for the purpose of fiscal transactions or weights and measurements transactions, contact Cameron.
- \* In gas measurement, the maximum permissible flow velocity varies with the type of gas and some may be beyond the bounds of measurement. If so, contact Cameron.
- \* ZS = Zero stability error (During testing, zero stability and current flow rate should be read in the same measurement unit.)

$$\text{Zero stability error} = \frac{\text{Zero stability}}{\text{Current flow rate}} \times 100\%$$

**Volumetric Flow Rate ①**

Model	Units	Guaranteed minimum rate	Minimum setting rate	Maximum service rate	Maximum allowable
CC00A	gal/hr	0.006	0.032	0.635	0.952
CC001	gal/hr	0.023	0.119	2.38	3.57
CC003	gal/hr	0.19	0.952	19.04	38.07
CC006	gal/min	0.016	0.08	1.58	3.17
CC010	gal/min	0.053	0.264	5.28	10.6
CC015	gal/min	0.159	0.793	11.5	31.7
CC025	gal/min	0.476	2.38	47.6	95.2
CC040	gal/min	1.72	8.59	172	344
CC050	gal/min				
CC080	bb/hr	7.55	37.8	755	1511
CC100	bb/hr	21.5	108	2153	4306
CC150	bb/hr				
CC15H	bb/hr	44.1	220	4407	8813
CC200	bb/hr				
CC20H	bb/hr	88.1	441	8813	17627
CC250	bb/hr				
CC010*	gal/min	0.106	0.529	3.7	7.4
CC015*	gal/min	0.344	1.719	11.2	22.5

**Density (Liquids)**

Meter type	Model	Size (in.)	Metering range	Uncertainty	Analog output uncertainty
Low-flow	CC00A	1/4	0.3 to 2g/mL	±0.003 g/mL	±0.1% of full scale
	CC001				
	CC003	1/2			
	CC006	1/2			
	CC010	1/2			
	CC015	1/2			
Standard and Low-temperature	CC025	1	0.3 to 2g/mL	±0.0005 g/mL	±0.1% of full scale
	CC040	1-1/2			
	CC050	2			
	CC080	3			
	CC100	4			
	CC150	6			
	CC15H	6			
	CC200	8			
	CC20H	8			
	CC250	10			
High-pressure	CC010	3/8	0.3 to 2 g/mL	±0.004 g/mL	±0.1% of full scale
	CC015	3/4			
High-temperature	CC025	1	0.3 to 2g/mL	±0.003g/mL	±0.1% of full scale
	CC040	1-1/2			
	CC050	2			
	CC080	3			
	CC100	4			
	CC150	6			

\* High-pressure models

1. Calculations based on water (specific gravity of 1) at 59°F (mass = 62.37 lb/ft<sup>3</sup>). Actual flow ranges vary with media density. To determine the flow range for your fluid, divide the values above by the fluid's specific gravity.

## GENERAL SPECIFICATIONS

## Sensor Unit General Specifications

## Low-Flow Models (CC00A, CC001 and CC003)

Item		Description		
Model		CC00A	CC001	CC003
Nominal size		1/4"		
Materials	Wetted parts ①	SUS316L		SUS316L, Alloy C22
	Housing	SUS304		
	O-rings	Fluoro-elastomer (standard Viton®), PTFE (option)		—
Process connection		1/4-18 FNPT		ASME 100, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 ③ RF, IDF Ferrule ④, Threaded
Applicable fluid		Liquid and gas		
Density range		0 to 2.0 g/mL		
Temperature range		-328°F to 392°F ⑥		
Tube withstand @ 100°F		—		Wetted parts materials: SUS316L maximum 1440 psig; Alloy C22 maximum 2185 psig (depending on flange rating)
Maximum operating pressure @ 100°F	Liquid	2176 psi		
	Gas	142 psig		
Sensor housing withstand ⑤		—		1044 psig
Flow direction		Bi-directional		
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.		
Dust-tight, waterproof configuration		IP66/67		

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - DIN flanges are only available for meter material SUS316L.
  - For application with foods, this product does not comply with CE marking.
  - This pressure does not represent the rated test pressure of a pressure vessel. It represents 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
  - Refer to [Explosion-proof Specifications, page 22](#) for details. In case of non-explosion-proof type, the maximum measurement temperature is 266°F. However, the product must be used within the maximum ambient temperature of 113°F. Higher temperature limits can be achieved with the high-temperature models.
- \* Only available with separately-mounted transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).  
\* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

## Standard Models (CC006 through CC080)

Item		Description						
Model		CC006	CC010	CC015	CC025	CC040	CC050	CC080
Nominal size		10 mm, 1/2", DN15	15 mm, 1/2", DN15		25 mm, 1", DN25	40 mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80
Materials	Wetted parts ①	SUS316L, Alloy C22						
	Housing	SUS304						
Process connection		ASME 150, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 RF ③; IDF Ferrule ④; Threaded						
Applicable fluids		Liquid and gas						
Density range		0 to 2.0 g/mL						
Temperature range		-328°F to 392°F ⑥						
Tube withstand @ 100°F		SUS316L: 1520 psig; Alloy C22: 2276 psig						
Maximum operating pressure		Depends on flange rating						
Sensor housing withstand ⑤		551 psig	435 psig	319 psig	232 psig	261 psig	203 psig	
Flow direction		Bi-directional						
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.						
Dust-tight, waterproof configuration		IP66/67						

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - DIN flanges are only available for meter material SUS316L.
  - For application with foods, this product does not comply with CE marking.
  - This pressure does not represent the rated test pressure of a pressure vessel. It represents 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
  - Refer to [Explosion-proof Specifications, page 22](#) for details. In case of non-explosion-proof type, the maximum measurement temperature is 266°F. However, the product must be used within the maximum ambient temperature of 113°F. Higher temperature limits can be achieved with the high-temperature models.
- \* Available with either integrally-mounted or separately-mounted transmitter.  
\* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

**GENERAL SPECIFICATIONS**

**High-Flow Models (CC100 through CC250)**

Item		Description					
Model		CC100	CC150	CC15H	CC200	CC20H	CC250
Nominal size		100 mm, 4", DN100	150 mm, 6", DN150		200 mm, 8", DN200		250 mm, 10", DN250
Materials	Wetted parts ❶	SUS316L					
	Housing	SUS304					
Process connection ❷		ASME 150, 300, 600 RF; DIN PN 10, 16, 25, 40 RF					
Applicable fluids		Liquid					
Density range		0.3 to 2.0 g/mL					
Viscosity range		Maximum 10000 CP					
Temperature range		-328°F to 392°F ❸					
Tube withstand @ 100°F		1924 psig	1551 psig		1300 psig		
Maximum operating pressure		Depends on flange rating					
Flow direction		Bi-directional					
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.					
Dust-tight, waterproof configuration		IP66/67					

1. When SUS316L is selected for the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  2. Models CC20H and CC250 available only up to ASME Class 300 flanges.
  3. Refer to [Explosion-proof Specifications, page 22](#) for details. When flowing non-combustible product, the maximum media temperature is 266°F. However, the maximum ambient temperature is 113°F. Higher temperature limits can be achieved with the high-temperature models.
- \* For products conforming to the high-pressure gas safety regulations, consult Cameron.

**High-Pressure Models (CC010 and CC015)**

Item		Description	
Model		CC010	CC015
Materials	Wetted parts	Flow Tube and Manifold: Alloy C22	
	Housing	SUS304	
Process connection		3/8-18 FNPT	3/4-14 FNPT
Applicable fluid		Liquid and gas	
Density range		0.3 to 2.0 g/mL	
Temperature range		Integrally-mounted: -4°F to 194°F; Separately-mounted: -328°F to 392°F	
Maximum operating pressure (@ 68°F)		5221 psig	6237 psig
Sensor housing withstand ❶		435 psig	319 psig
Flow direction		Bi-directional	
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.	
Dust-tight, waterproof configuration		IP66/67	

1. This pressure does not represent the rated test pressure of a pressure vessel. It represents 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the real For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

## GENERAL SPECIFICATIONS

## High-Temperature Models (CC025 through CC150)

Item		Description					
Model		CC025	CC040	CC050	CC080	CC100	CC150
Nominal size		25 mm, 1", DN25	40 mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80	100 mm, 4", DN100	150 mm, 6", DN150
Materials	Wetted parts <sup>①</sup>	SUS316L			SUS316L, Alloy C22		SUS316L
	Housing	SUS304					
Process connection		1" to 3": ASME 150, 300, 600, 900 <sup>④</sup> RF; DIN PN 10, 16, 25, 40 RF 4" and 6": ASME 150, 300, 600 RF; DIN PN 10, 16, 25, 40 RF					
Applicable fluids		Liquid					
Density range		0.3 to 2.0 g/mL					
Temperature range <sup>②</sup>		-40°F to 662°F					
Tube withstand @ 100°F		SUS316L: 1520 psig; Alloy C22: 2276 psig				1924 psig	
Maximum operating pressure		Dependent on flange rating					
Sensor housing withstand <sup>③</sup>		232 psig	261 psig	203 psig	—		
Flow direction		Bi-directional					
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.					
Dust-tight, waterproof configuration		IP66/67					

Optional Heat Tracer Specifications (Available for Models CC025 through CC080) <sup>⑤</sup>

Applicable fluids	Hot water, saturated steam, overheated steam
Heat retention fluid maximum output pressure	142 psig
Joint port for heat retention fluid	10 mm stainless tubing
Recommended joint	Standard stainless steel ferrule-type compression fitting for 10 mm tubing

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
- Allowable ambient temperature permitted for the sensor unit is up to 122°F.
- This pressure does not represent the rated test pressure of a pressure vessel. It represents 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
- ASME 900 flanges are only available in Alloy C22 material.
- Heat trace should only be used for heating the meter. Do not use for cooling of flowing media.

- \* For products conforming to the high-pressure gas safety regulations, consult Cameron.
- \* Only available with separately-located transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).

## Low-Temperature Models (CC025 through CC250)

Item		Description										
Model		CC025	CC040	CC050	CC080	CC100	CC150	CC15H	CC200	CC20H	CC250	
Nominal size		25 mm, 1", DN25	40 mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80	100 mm, 4", DN100	150 mm, 6", DN150		200 mm, 8", DN200		250 mm, 10", DN250	
Materials	Wetted parts <sup>①</sup>	SUS316L, Alloy C22					SUS316L					
	Housing	SUS304										
Process connection		ASME 150, 300, 600, 900 <sup>③</sup> RF; DIN PN 10, 16, 25, 40 RF <sup>②</sup> ; IDF Ferrule <sup>④</sup>				ASME 150, 300, 600 RF; DIN PN 10, 16, 25, 40 RF <sup>②</sup>			ASME 150, 300 RF; DIN PN 10, 16, 25, 40 RF <sup>②</sup>			
Applicable fluids		Liquid and gas					Liquid					
Density range		0.3 to 2.0 g/mL										
Temperature range		-328°F to 122°F										
Tube withstand @ 100°F		1520 psig			1924 psig		1551 psig		1300 psig			
Maximum operating pressure		Dependent on flange rating										
Sensor housing withstand <sup>⑤</sup>		232 psig	261 psig	203 psig	—							
Flow direction		Bi-directional										
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.										
Dust-tight, waterproof configuration		IP66/67										

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
- DIN flanges are only available for meter material SUS316L.
- ASME 900 flanges are only available in Alloy C22 material.
- For application with foods, this product does not comply with CE marking.
- This pressure does not represent the rated test pressure of a pressure vessel. It represents 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.

- \* Only available with separately-mounted transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).
- \* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

**GENERAL SPECIFICATIONS**




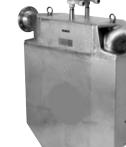


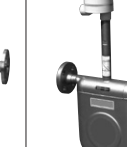
**Transmitter Specifications**

Item	Description
Model	PA0K
Power supply	85 to 264 VAC, 50/60 Hz or 20 to 30 VDC (Safety rated 100 to 240 VAC, 50/60 Hz)
Power consumption	Maximum 15W
Ambient temperature	-40°F to 131°F ❶
Transmission length (separately-mounted)	Maximum 200 m (interconnect cable used) ❷
Applicable EU directive	EMC Directive: 2004/108/EC; ATEX Directive: 94/9/EC
Applicable EN standards	EMC—EN55011: 1998/A1, 1999/A2, 2002 Group 1, Class B; EN61000-6-2: 2001; EN061326-1: 2006 ATEX—EN60079-0: 2012; EN60079-1: 2007; EN60079-11: 2012 IECEX—IEC60079-0: 2011; IEC60079-1: 2007-04; IEC60079-11: 2011
Explosion-proof configuration	CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page 22</a> for details.
Dust-tight, waterproof configuration	IP66/67
Transmitter configuration	Integral or separately-mounted
Finish	Paint type: Baked enamel; Paint color: Light gray (RAL7035)
Display	LCD display provided (128×64 dots), backlit (white, orange) ; Two infrared light sensors; Two LEDs (green and red)
Weight (approximate)	Integrally-mounted model, 7.94 lb; Separately-mounted model, 11.02 lb
Communication interface ❸	HART (Standard)
	Modbus (Optional)
	Protocol Version 7, Bell 202 ❹ RS-485: Baud rate: 9600 bps, 19200 bps, 38400 bps; RTU or ASCII; Response time: 25 to 50 ms
Damping (default)	Flow rate, 0.8 sec.; Density, 4.0 sec.; Temperature, 2.5 sec.
Low-flow cutoff (default)	Less than 0.6% of maximum service flow rate
Pulse output	Open drain (equivalent to open collector): 10V to 30V, 50 mADC, ON resistance ≤0.6 Ω OR Voltage: 1.5V maximum (low level) to 13V minimum (high level), output impedance: 2.2 kΩ; Setting range: 0.1 to 10000 Hz (Maximum: 11000 Hz)
Analog output	4 to 20 mADC (maximum load: 600 Ω); Select two outputs from instant flowrate (mass or volume) temperature, and density.
Status output	Open drain (equivalent to open collector)—30V maximum, 50 mADC, ON resistance ≤0.6 Ω; Select one from error (default) ❺, flow direction, or high/low alarm
Status input	Contact-closure (Form "a" contact): 200 Ω maximum (short), 100 kΩ minimum (open); Select one output from remote zero, total reset, 0% signal lock, or function off (default)

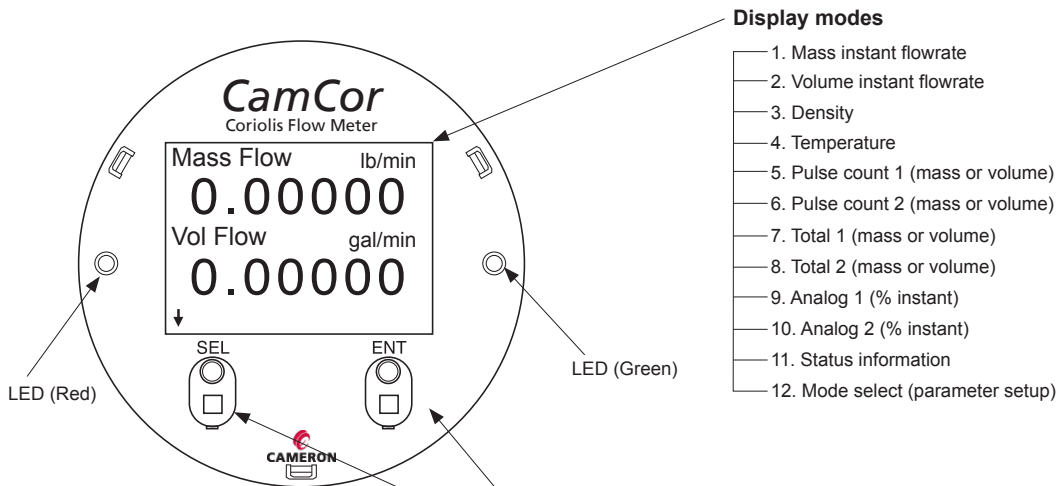
1. Below -4°F, the display loses its visibility due to weakened contrast. Both the display and infrared sensor may exhibit slow responses below -4°F.
2. If the sensor-to-transmitter communications cable length exceeds 200 meters, consult Cameron.
3. HART communications are available only across the Analog Output 1.
4. The status output can also be configured to activate when meter zeroing is in process.
5. Electrical noise filtering components are installed in connections between power source, output, communications, and chassis.

**EXTERNAL APPEARANCE**

**CT Series Models**

Low-flow and Standard Models				High-pressure Model	High-temperature Model	Low-temperature Model
CC00A, CC001	CC003	CC006 to CC080	CC100 to CC250	CC010, CC015	CC025 to CC150	CC025 to CC250
1/4"	1/2"	1/2" to 3"	4" to 10"	3/8" and 3/4"	1" to 6"	1" to 10"
						

**Display**

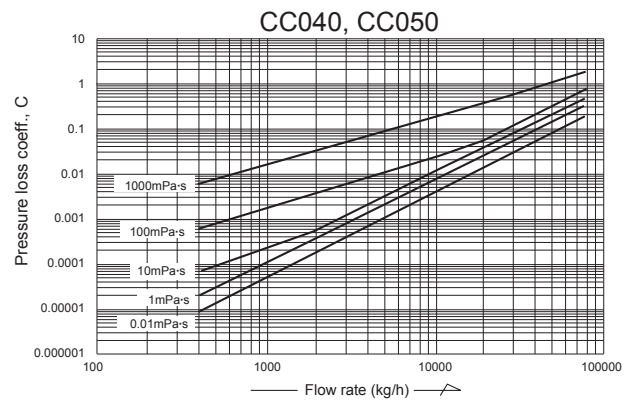
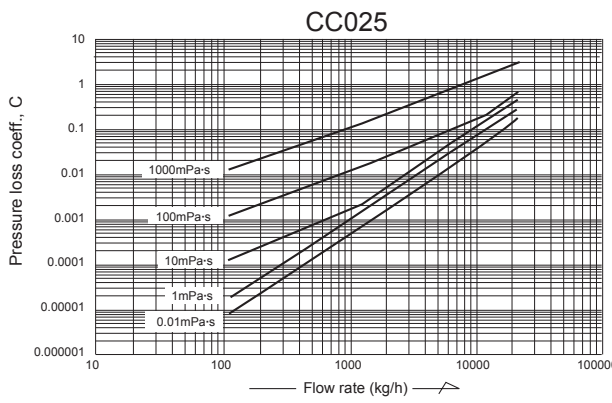
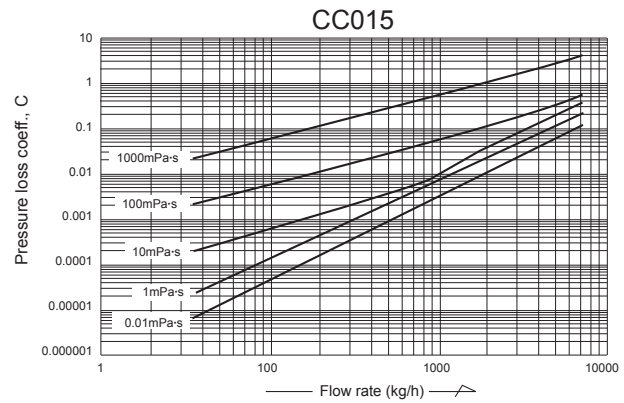
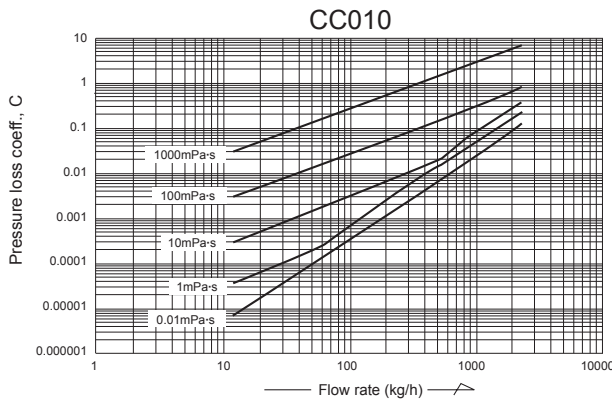
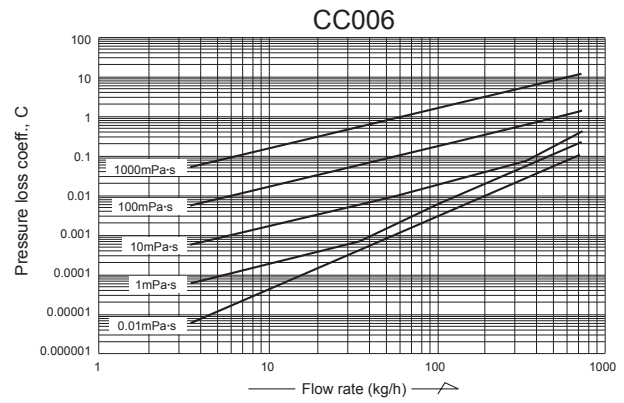
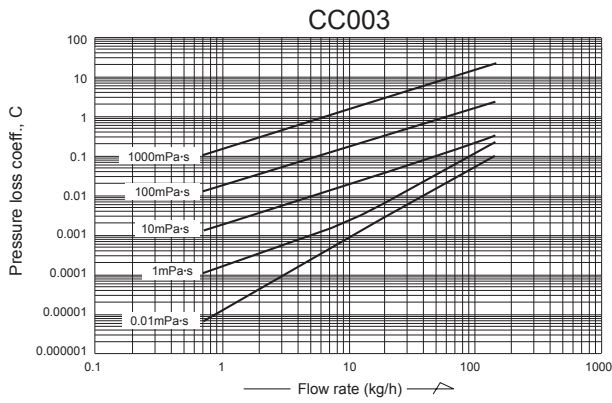
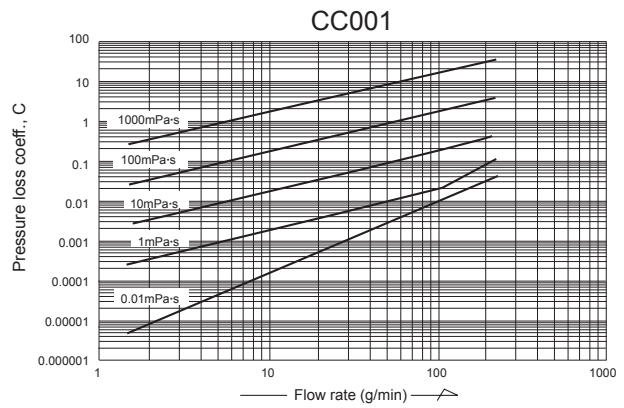
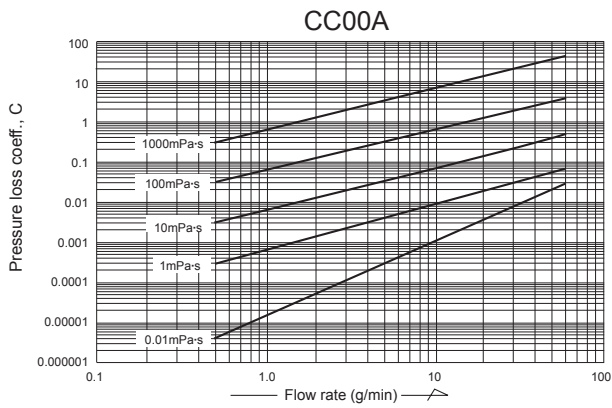


- LCD backlight available in white and orange. Color changes according to the status of flow meter.
- In most cases, the backlight shuts off automatically if the optical sensor does not respond within a user-defined duration.

To select the mode, touch the infrared optical sensor panel through the front glass.

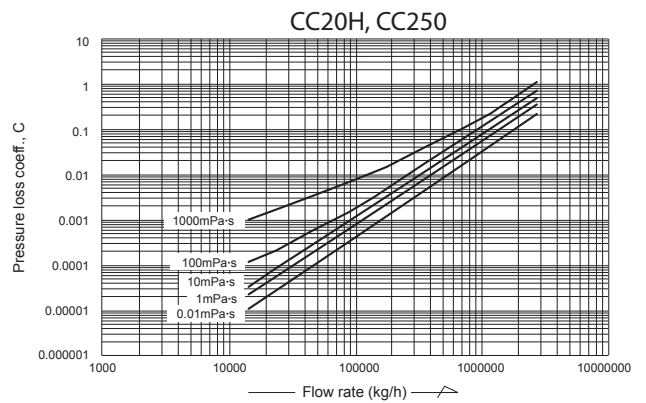
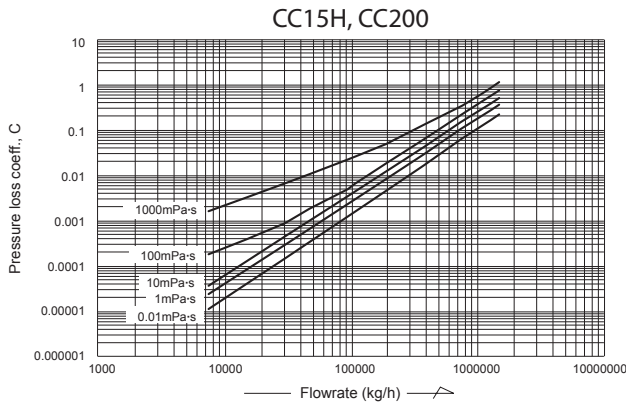
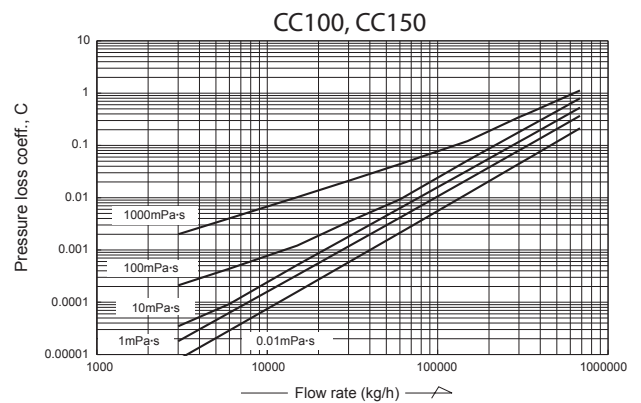
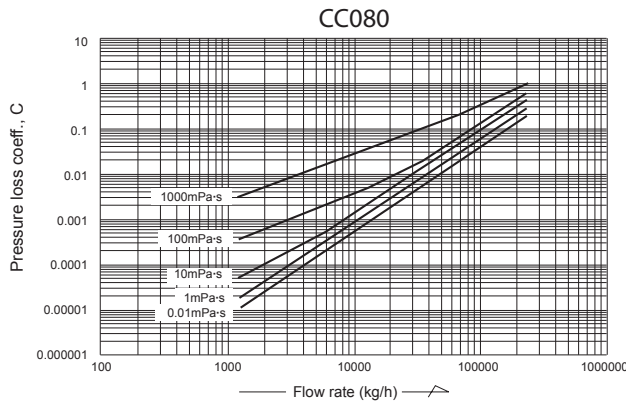


**PRESSURE LOSSES**





**PRESSURE LOSSES**



**How to Determine Pressure Loss**

1. Find the pressure loss factor “C” for a given parameter from its flow rate (kg/h or g/min) and viscosity (mPa·s), then divide “C” by specific gravity “d” (“1” for water) as shown in the following formula:

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

\*For high viscosity liquids not shown in these graphs, calculate the pressure loss using the following formula:

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

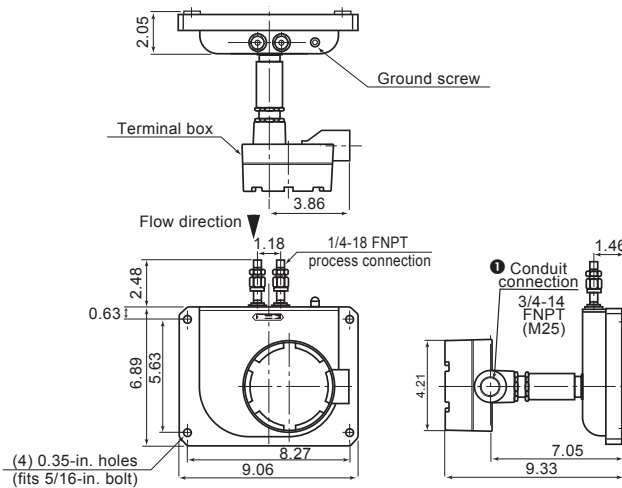
- where
- $\Delta P_2$  = Pressure loss of high viscosity liquid (MPa)
  - $\mu_1$  = Maximum viscosity shown in the graph (mPa·s)
  - $\mu_2$  = Viscosity of high-viscosity liquid (mPa·s)
  - d = Specific gravity of high-viscosity liquid (“1” for water)
  - C = Pressure loss factor

**DIMENSIONS [UNITS IN INCHES]**

Sensor unit: CC00A and CC001

Transmitter: Separately-mounted/threaded connection type

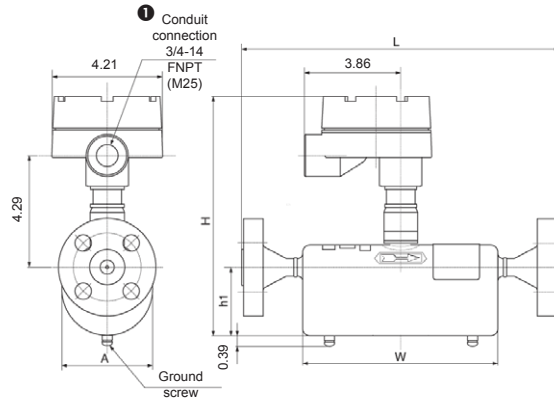
(Approximate weight: 20 lb)



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Sensor unit: CC003

Transmitter: Separately-mounted/flange connection type

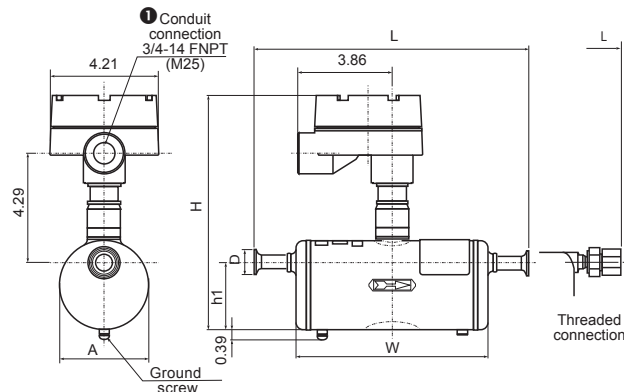


Model	ASME				Nominal size (DN)	DIN		H	h1	A	W	Approx. Weight (lb)
	Nominal size (in.)	150	300	600		900 ②	PN 10, 16					
CC003	1/2	L	L	L	15	L	11.1	9.06	2.64	3.51	7.56	11

- 1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
- 2. ASME 900 flanges are only available in Alloy C22 material.
- \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
- \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC003

Transmitter: Separately-mounted/ferrule or threaded connection type



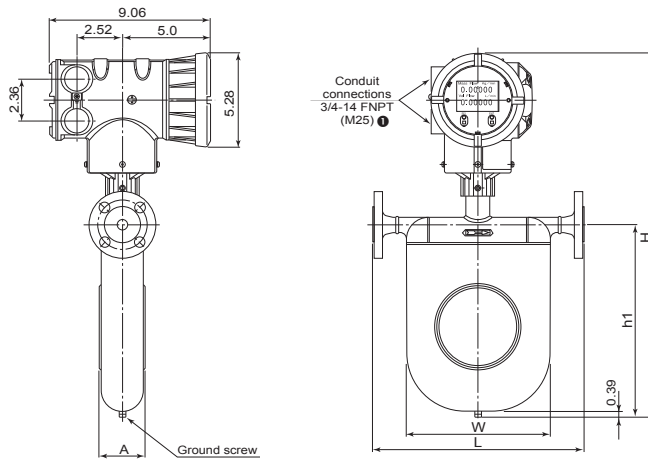
Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (lb)
	Nominal size	Connection ②							
CC003	10	Ferrule 10A	10.49	9.06	2.64	3.51	7.56	1.34	9.92

Model	Threaded Connection	L	Approx. Weight (lb)
CC003	1/2-14 FNPT	13.1	9.92

2. Process connection: A = mm

**DIMENSIONS [UNITS IN INCHES]**

Sensor unit: CC006 through CC080  
 Transmitter: Integrally-mounted/flange connection type

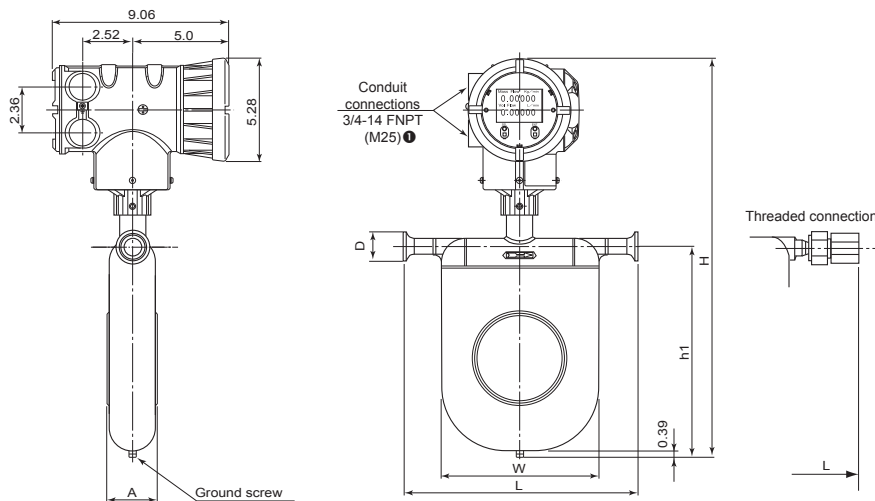


● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	ASME					DIN			H	h1	A	W	Approx. Weight (lb)
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)	PN 10, 16	PN 25, 40					
		L					L						
CC006	1/2	10.6	10.9	11.4	12.1	15	9.49	9.72	16.7	7.09	2.09	5.83	15.4
CC010	1/2	11.1	11.5	11.9	12.6	15	10.1	10.3	18.2	8.58	2.09	6.42	17.2
CC015	1/2	12.8	13.1	13.7	14.3	15	11.8	12	20.2	10.6	2.56	8.07	19.4
CC025	1	16.2	16.7	17.2	18.1	25	14.8	15	22.8	13	3.27	10.3	29.3
CC040	1-1/2	21.5	22	22.6	23.7	40	20	20.2	28	17.8	4.76	15.2	50.7
CC050	2	21.7	22.2	22.9	25.2	50	20.2	20.4					50.7
CC080	3	27.5	28.2	29	30.6	80	25.9	26.6	34.6	23.7	6.85	20.1	125.7

- Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
- ASME 900 flanges are only available in Alloy C22 material.
  - \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
  - \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC006 through CC080  
 Transmitter: Integrally-mounted/ferrule or threaded connection type



● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (lb)
	Nominal size	Connection ②							
CC006	10	Ferrule 10A	9.11	17.1	7.09	2.09	5.83	1.34	12.6
CC010	15	Ferrule 15A	10.1	18.2	8.58	2.09	6.42	1.34	13.9
CC015	15	Ferrule 15A	11.4	20.2	10.6	2.56	8.07	1.34	15.7
CC025	25	Ferrule 25 (ISO), IDF 1S	14.6	22.8	13	3.27	10.3	1.99	23.6
CC040	40	Ferrule 38 (ISO), IDF 1.5S	19.4	28	17.8	4.76	15.2	1.99	41.9
CC050	50	Ferrule 51 (ISO), IDF 2S						2.52	
CC080	80	Ferrule 76.1 (ISO), IDF 3S	25.9	34.6	23.7	6.85	20.1	3.58	112.4

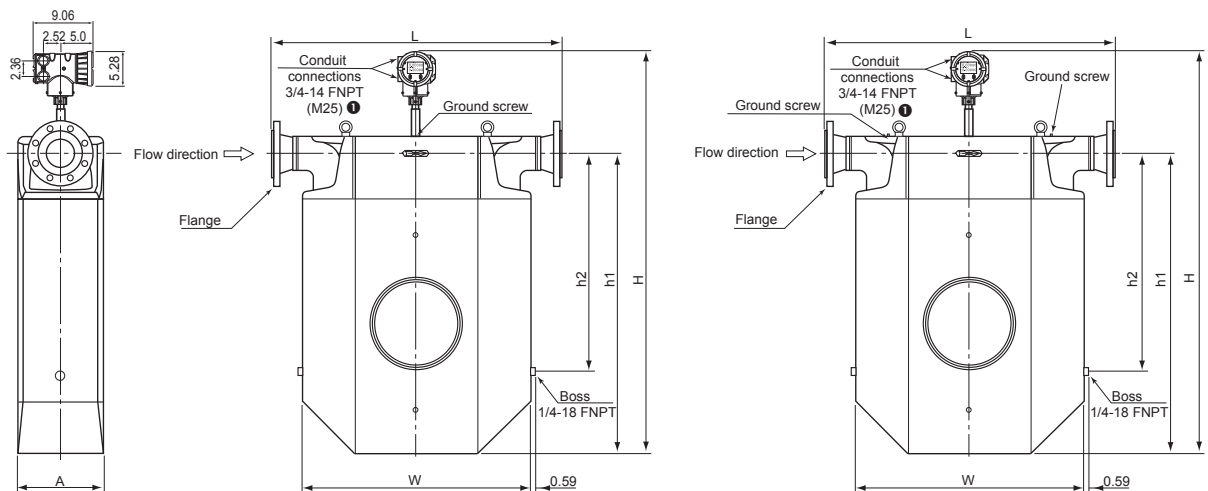
Model	Threaded Connection	L	Approx. Weight (lb)
CC006	1/2-14 FNPT	11.7	12.6
CC010	1/2-14 FNPT	12.3	13.9
CC015	3/4-14 FNPT	15	15.7

2. Process connection: A = mm, S (sanitary) = in.

**DIMENSIONS [UNITS IN INCHES]**

Sensor unit: CC100 through CC250

Transmitter: Integrally-mounted/flange connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

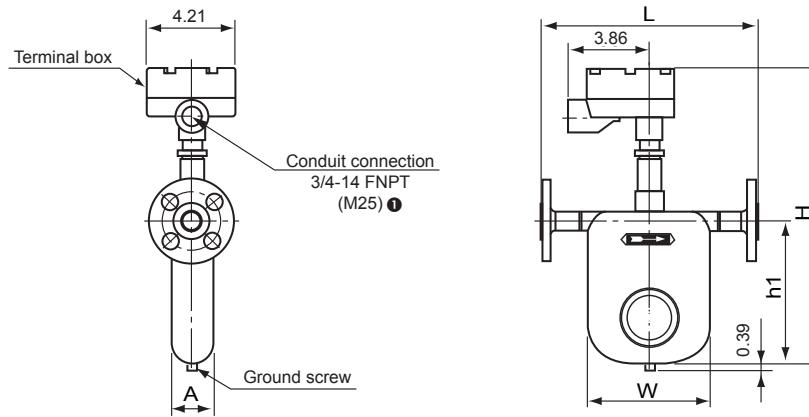
**CC100, CC150**

**CC15H through CC250**

Model	Flange		L	H	h1	h2	A	W	Approx. Weight (lb)
	Nominal size	Flange rating							
CC100	4"	ASME 150	40.1	55.2	40	26	11.8	31.9	509
		ASME 300	40.8						
		ASME 600	42.6						
	DN100	PN 10, 16	38.1						
		PN 25, 40	39.1						
CC150	6"	ASME 150	51.9	55.2	40	26	11.8	31.9	542
		ASME 300	52.7						
		ASME 600	54.6						
	DN150	PN 10, 16	49.2						
		PN 25, 40	50.8						
CC15H	6"	ASME 150	42.8	63.1	46.9	33.5	12.6	31.9	683
		ASME 300	43.6						
		ASME 600	45.6						
	DN150	PN 10, 16	40.1						
		PN 25, 40	41.7						
CC200	8"	ASME 150	55.8	63.1	46.9	33.5	12.6	31.9	750
		ASME 300	56.6						
		ASME 600	58.8						
	DN200	PN 10, 16	52.7						
		PN 25	54.1						
		PN 40	54.7						
CC20H	8"	ASME 150	55.8	72	54.7	37.8	16.5	43.7	1345
		ASME 300	56.6						
		PN 10, 16	52.7						
	DN200	PN 25	54.1						
		PN 40	54.7						
CC250	10"	ASME 150	69.8	72	54.7	37.5	16.5	43.7	1433
		ASME 300	71.1						
	DN250	PN 10	67.1						
		PN 16	67.3						
		PN 25	68.7						
		PN 40	70						

**DIMENSIONS [UNITS IN INCHES]**

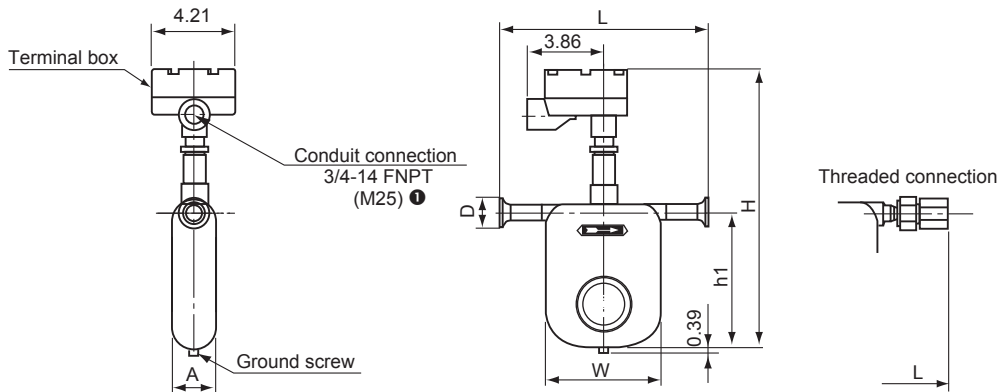
Sensor unit: CC006 through CC080  
 Transmitter: Separately-mounted/flange connection type



Model	Nominal size (in.)	ASME				DIN		H	h1	A	W	Approx. Weight (lb)	
		150	300	600	900 ②	Nominal size (DN)	PN 10, 16						PN 25, 40
CC006	1/2	10.6	10.9	11.4	12.1	15	9.49	9.72	14.5	7.09	2.09	5.83	8.8
CC010	1/2	11.1	11.5	11.9	12.6	15	10	10.3	16	8.58	2.09	6.42	10.4
CC015	1/2	12.8	13.1	13.7	14.3	15	11.8	12	18	10.6	2.56	8.07	12.3
CC025	1	16.2	16.7	17.2	18.1	25	14.8	15	21	13	3.27	10.3	23
CC040	1-1/2	21.5	22	22.6	23.7	40	20	20.2	25.7	17.8	4.76	15.2	44.1
CC050	2	21.7	22.2	22.9	25.2	50	20.2	20.4					
CC080	3	27.5	28.2	29	30.6	80	26	26.6	32.4	23.7	6.85	20.1	119

- Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
- ASME 900 flanges are only available in Alloy C22 material.
  - \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
  - \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC006 through CC080  
 Transmitter separately-mounted/ferrule or threaded connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (lb)
	Nominal size	Connection ②							
CC006	10	Ferrule 10A	9.11	14.5	7.09	2.09	5.83	1.34	6.2
CC010	15	Ferrule 15A	10.1	16	8.58	2.09	6.42	1.34	7.5
CC015	15	Ferrule 15A	11.4	18	10.6	2.56	8.07	1.34	9.3
CC025	25	Ferrule 25 (ISO), IDF 1S	14.6	20.6	13	3.27	10.3	1.99	17.2
CC040	40	Ferrule 38 (ISO), IDF 1.5S	19.4	25.7	17.8	4.76	15.2	1.99	35.3
CC050	50	Ferrule 51 (ISO), IDF 2S						2.52	
CC080	80	Ferrule 76.1 (ISO), IDF 3S	25.9	32.4	23.7	6.85	20.1	3.58	105.8

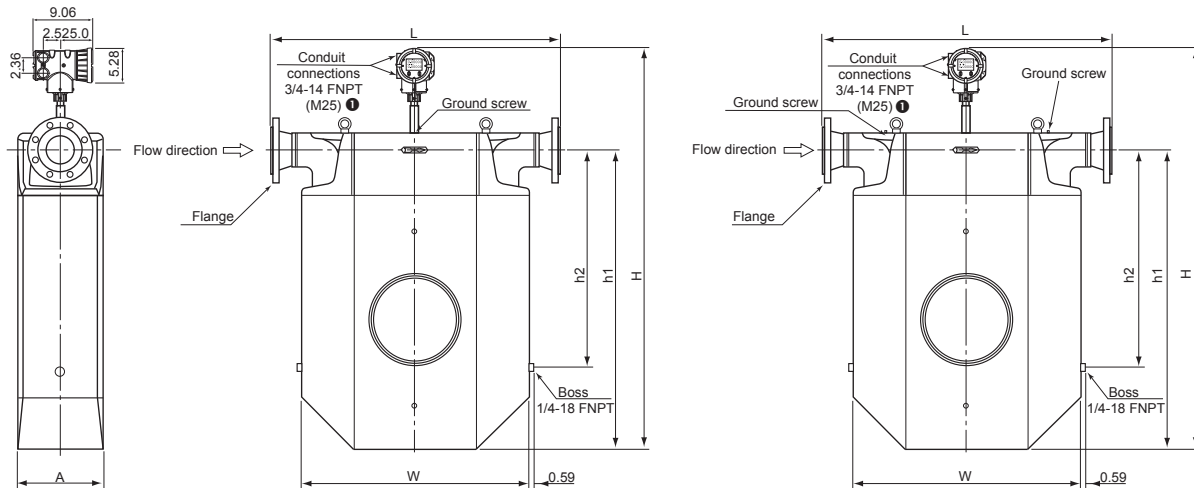
② Process connection: A = mm, S (sanitary) = in.

Model	Threaded Connection	L	Approx. Weight (lb)
CC006	1/2-14 FNPT	11.7	6.2
CC010	1/2-14 FNPT	12.3	7.5
CC015	3/4-14 FNPT	15	9.3

**DIMENSIONS [UNITS IN INCHES]**

Sensor unit: CC100 through CC250

Transmitter: Separately-mounted/flange connection type



● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

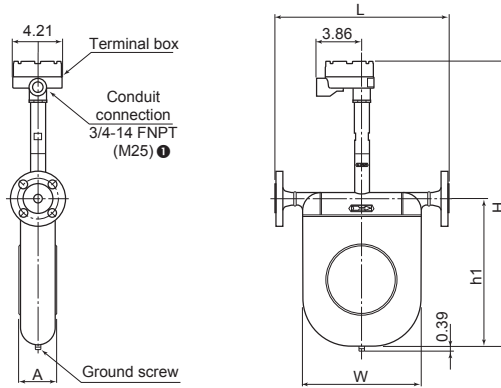
**CC100, CC150**

**CC15H through CC250**

Model	Flange		L	H	h1	h2	A	W	Approx. Weight (lb)
	Nominal size	Flange rating							
CC100	4"	ASME 150	40.1	53.3	40	26	11.8	31.9	509
		ASME 300	40.8						
		ASME 600	42.6						
	DN100	PN 10, 16	38.1						
PN 25, 40		39.1							
CC150	6"	ASME 150	51.2	53.3	40	26	11.8	31.9	542
		ASME 300	52.7						
		ASME 600	54.6						
	DN150	PN 10, 16	49.2						
PN 25, 40		50.8							
CC15H	6"	ASME 150	42.8	61.2	46.9	33.5	12.6	31.9	683
		ASME 300	43.6						
		ASME 600	45.6						
	DN150	PN 10, 16	40.1						
PN 25, 40		41.7							
CC200	8"	ASME 150	55.8	61.2	46.9	33.5	12.6	31.9	750
		ASME 300	56.6						
		ASME 600	58.8						
	DN200	PN 10, 16	52.7						
		PN 25	54.1						
PN 40	54.7								
CC20H	8"	ASME 150	55.8	70.1	54.7	37.8	16.5	43.7	1345
		ASME 300	56.6						
	DN200	PN 10, 16	52.7						
		PN 25	54.1						
CC250	10"	ASME 150	69.8	70.1	54.7	37.8	16.5	43.7	1433
		ASME 300	71.1						
	DN250	PN 10	67.1						
		PN 16	67.3						
		PN 25	68.7						
PN 40	70								

**DIMENSIONS [UNITS IN INCHES]**

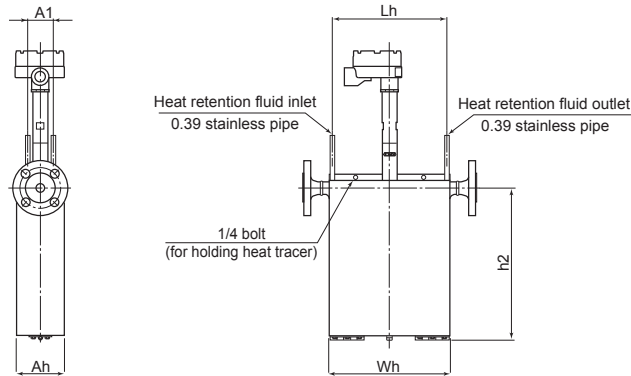
Sensor unit: CC025 through CC080 (High-temperature models)  
 Transmitter: Separately-mounted/flange connection type



Model	ASME					DIN			H	h1	A	W	Approx. Weight (lb)
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)	PN 10, 16	PN 25, 40					
CC025	1	16.2	16.7	17.2	—	25	14.8	15	25.1	12.3	3.27	10.3	24
CC040	1-1/2	21.5	22	22.6	—	40	20	20.2	30.2	17.8	4.76	15.2	44.8
CC050	2	21.7	22.2	22.9	—	50	20.2	20.4					45.6
CC080	3	27.5	28.2	29	30.6	80	25.9	26.6	37.8	23.7	6.85	20.1	119

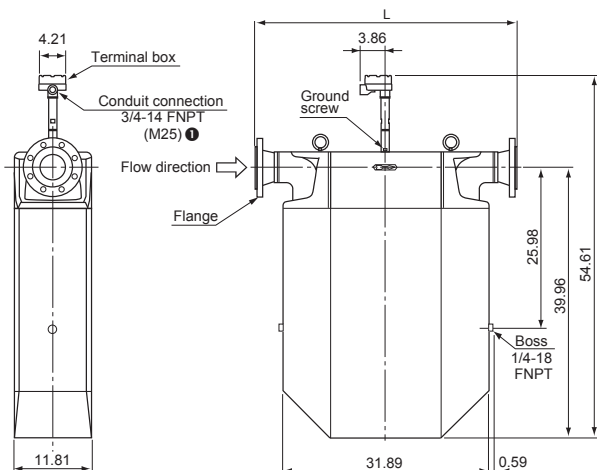
- Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
  - ASME 900 flanges are only available in Alloy C22 material.
- \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC025 through CC080 (with heat tracer)  
 Transmitter: Separately-mounted/flange connection type



Model	Nominal size (in.)	Heat Tracer Model Compatibility	Lh	h2	Ah	A1	Wh	Approx. Weight (lb)
CC025	1	HT1-025A	10	13.4	4.17	2.2	10.6	37.3
CC040	1-1/2	HT1-040A	14.8	18.3	5.67	2.76	15.4	70.1
CC050	2							71
CC080	3	HT1-080A	19.7	24.1	7.8	4.33	21.5	166

Sensor unit: CC100 and CC150 (High-temperature models)  
 Transmitter: Separately-mounted/flange connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Flange		L	Approx. Weight (lb)
	Nominal size	Flange rating ②		
CC100	4"	ASME 150	40.1	522
		ASME 300	40.8	540
		ASME 600	42.6	562
	DN100	PN 10, 16	38.1	509
		PN 25, 40	39.1	531
CC150	6"	ASME 150	51.9	547
		ASME 300	52.7	584
		ASME 600	54.6	644
	DN150	PN 10, 16	49.2	542
		PN 25, 40	50.8	584

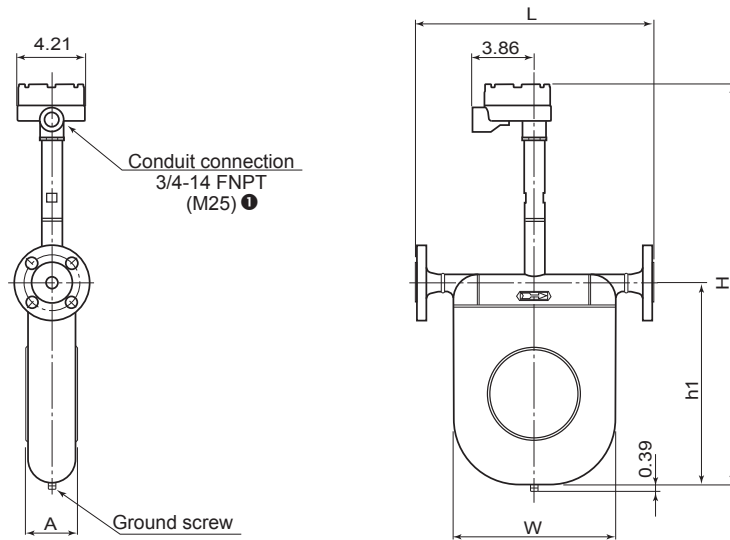
② For specifications of other flange ratings, see the approval drawing (or delivery specification).



**DIMENSIONS [UNITS IN INCHES]**

Sensor unit: CC025 through CC080 (Low-temperature models)

Transmitter: Separately-mounted/flange connection type

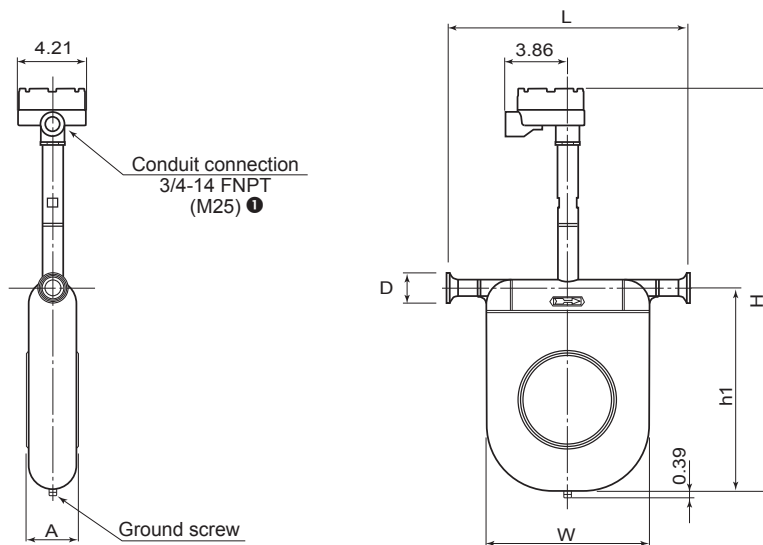


Model	ASME					DIN			H	h1	A	W	Approx. Weight (lb)
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)	PN 10, 16	PN 25, 40					
		L					L						
CC025	1	16.2	9.53	17.2	18.1	25	14.8	15	26	13	3.27	10.3	24
CC040	1-1/2	21.5	22	22.6	23.7	40	20	20.2	31.1	17.8	4.76	15.2	44.8
CC050	2	21.7	22.2	22.9	25.2	50	20.2	20.4					46.3
CC080	3	27.5	28.2	29	30.6	80	25.9	26.6	37.8	23.7	6.85	20.1	119

1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
2. Alloy C22 and ASME 900 is only available with the high-temperature CC080 model.
- \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
- \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC025 through CC080 (Low-temperature models)

Transmitter: Separately-mounted/ferrule connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

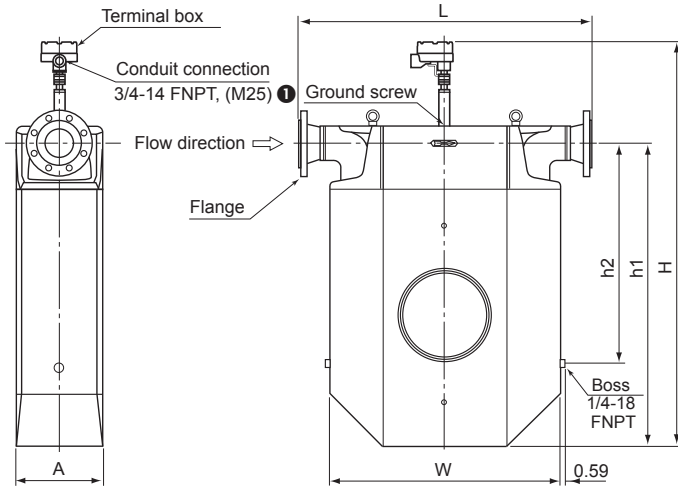
Model	Ferrule		L	H	h1	A	W	D	Approx. weight (lb)
	Nominal size	Connection ②							
CC025	25	Ferrule 25 (ISO), IDF 1S	14.6	26	13	3.27	10.3	1.99	18.3
CC040	40	Ferrule 38 (ISO), IDF 1.5S	19.4	31.1	17.8	4.76	15.2	1.99	37.5
CC050	50	Ferrule 51 (ISO), IDF 2S						2.52	
CC080	80	Ferrule 76.1 (ISO), IDF 3S	25.9	37.8	23.7	6.85	20.1	3.58	

2. Process connection: S = in.

**DIMENSIONS [UNITS IN INCHES]**

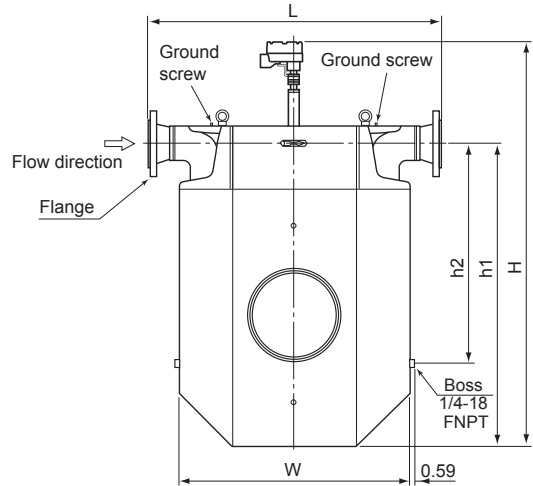
Sensor unit: CC100 through CC250 (Low-temperature models)

Transmitter: Separately-mounted/flange connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

**CC100, CC150**



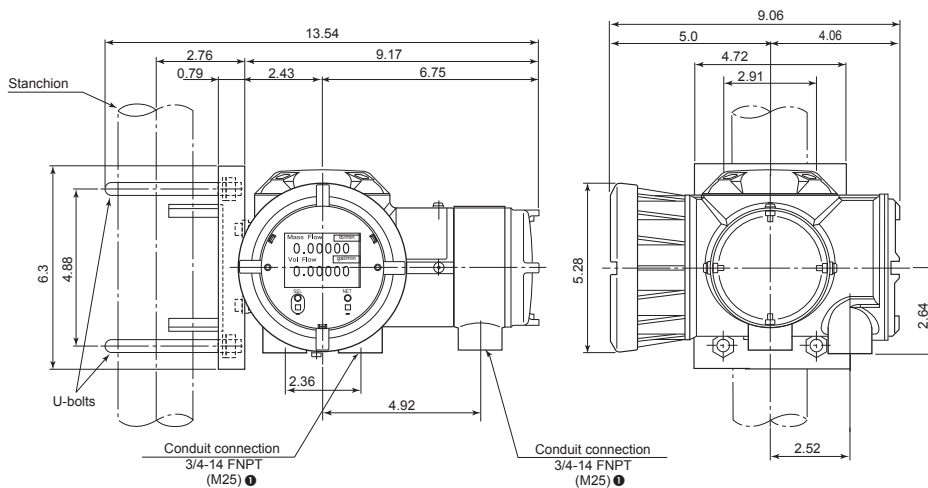
**CC15H through CC250**

Model	Flange		L	H	h1	h2	A	W	Approx. Weight (lb)
	Nominal size	Flange rating ②							
CC100	4"	ASME 150	40.1	54.6	40	26	11.8	31.9	509
		ASME 300	40.8						
		ASME 600	42.6						
	DN100	PN 10, 16	38.1						
		PN 25, 40	39.1						
CC150	6"	ASME 150	51.2	54.6	40	26	11.8	31.9	542
		ASME 300	52.7						
		ASME 600	54.6						
	DN150	PN 10, 16	49.2						
		PN 25, 40	50.8						
CC15H	6"	ASME 150	42.8	62.5	46.9	33.5	12.6	31.9	683
		ASME 300	43.6						
		ASME 600	45.6						
	DN150	PN 10, 16	40.1						
		PN 25, 40	41.7						
CC200	8"	ASME 150	55.8	62.5	46.9	33.5	12.6	31.9	750
		ASME 300	56.6						
		ASME 600	58.8						
	DN200	PN 10, 16	52.7						
		PN 25	54.1						
		PN 40	54.7						
CC20H	8"	ASME 150	55.8	71.4	54.7	37.8	16.5	43.7	1345
		ASME 300	56.6						
		PN 10, 16	52.7						
	DN200	PN 25	54.1						
		PN 40	54.7						
CC250	10"	ASME 150	69.8	71.4	54.7	37.8	16.5	43.7	1433
		ASME 300	71.1						
	DN250	PN 10	67.1						
		PN 16	67.3						
		PN 25	68.7						
		PN 40	70						

2. For specifications of other flange ratings, see the approval drawing (or delivery specification).

**DIMENSIONS [UNITS IN INCHES]**

**Separately-mounted Transmitter**

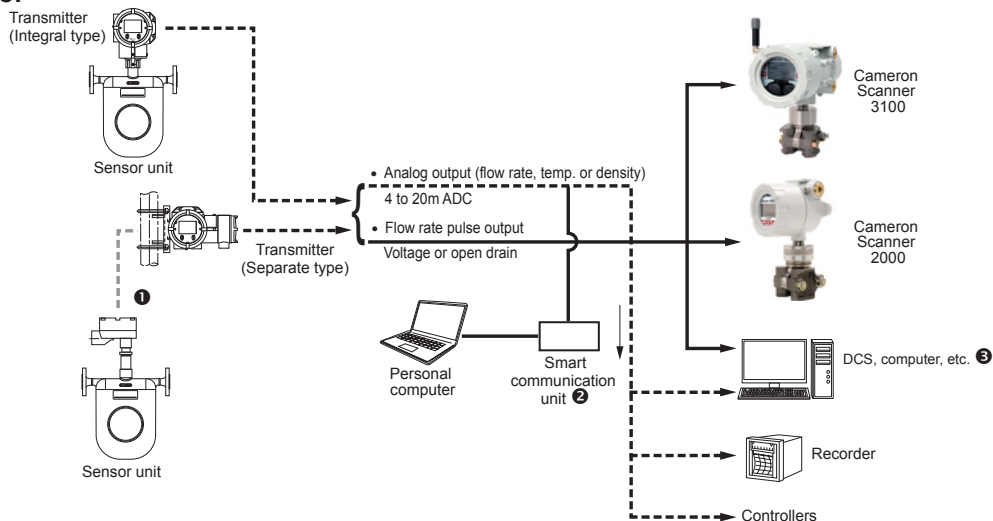


● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Pipe mounting hardware (U-bolts) are furnished as standard accessories. The pipe must be provided by the customer.

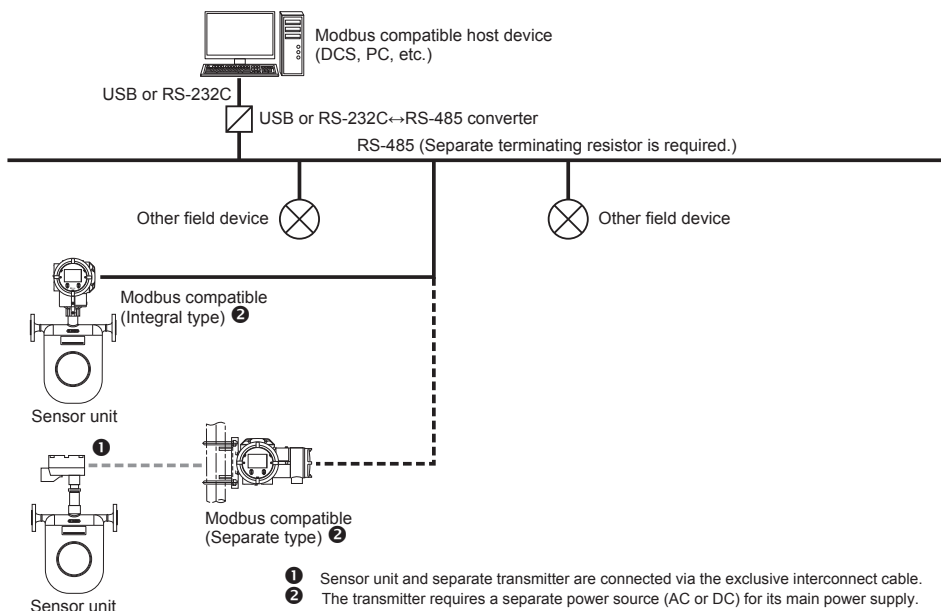
**REMOTE MEASURING SYSTEM**

**HART Protocol**



- ① In case of the separate type, the sensor unit and transmitter are connected with exclusive cable.
- ② Communication between the device and PC shall comply with HART protocol revision 7.
- ③ For detailed information about companion instruments, see respective product catalogs and General Specification sheets.

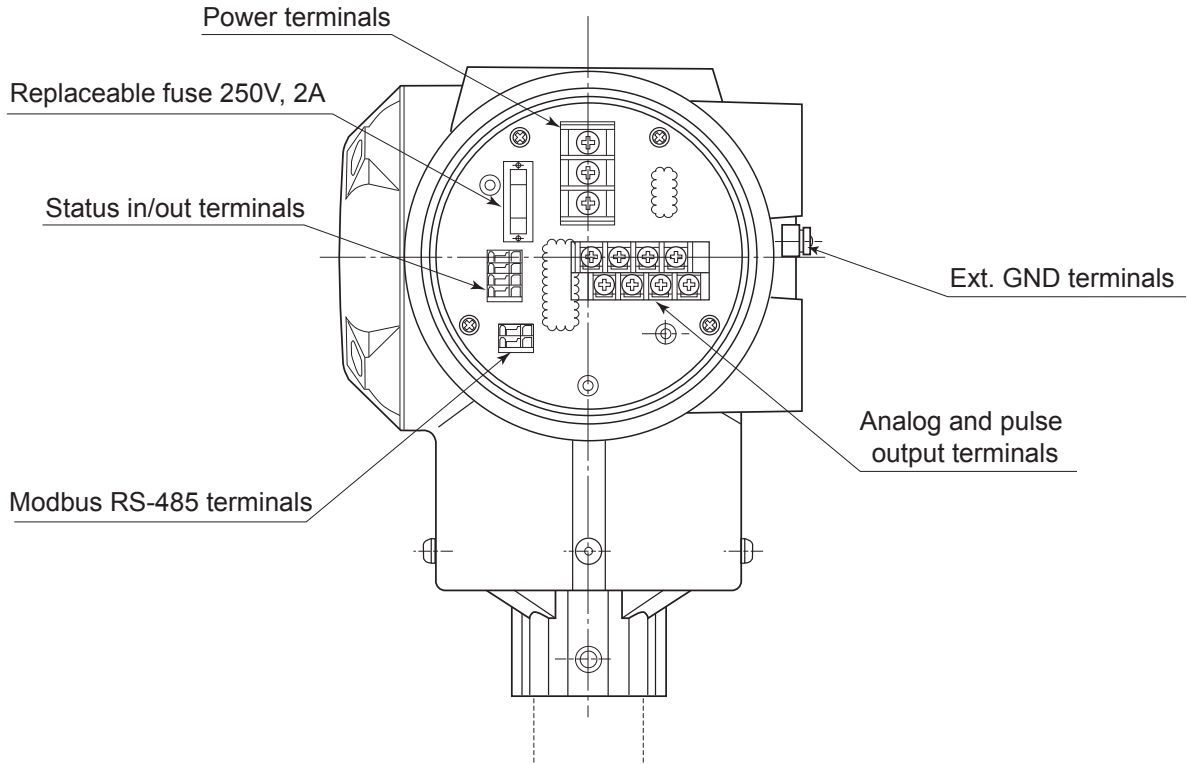
**Modbus Protocol**



- ① Sensor unit and separate transmitter are connected via the exclusive 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**

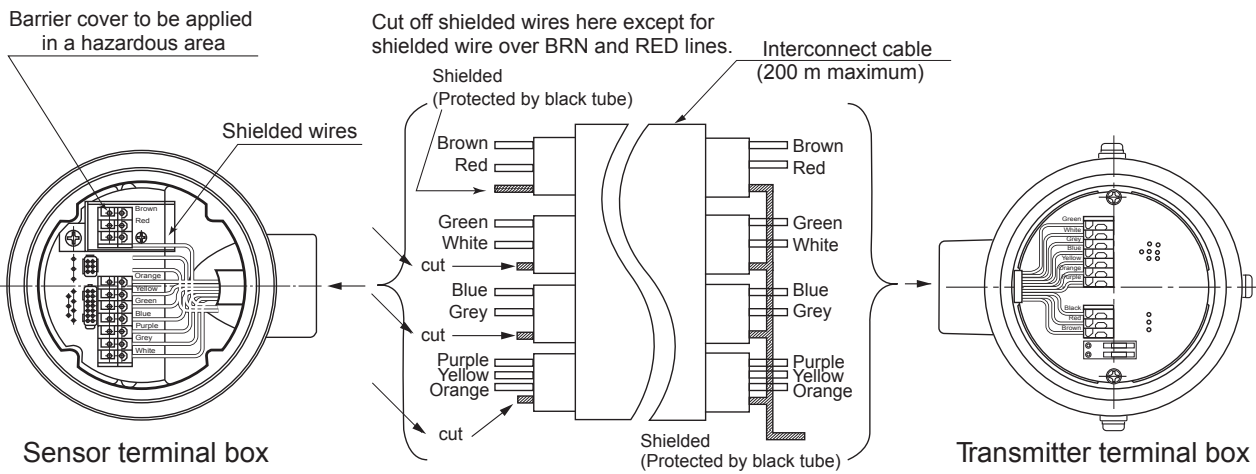
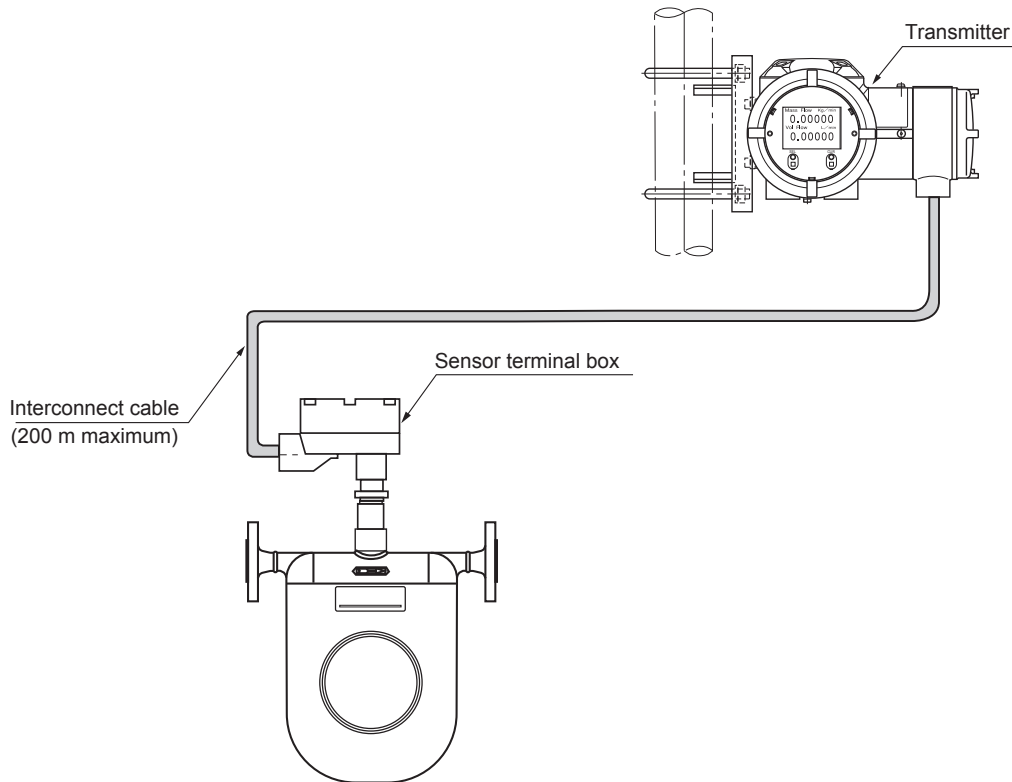


**Transmitter Identification and Description**

Item	Label	Description	Remarks
Signal	A1 (+)	Analog Output 1 (4 to 20 mA)	Maximum load resistance is 600Ω for Analog Outputs 1 and 2.
	A1 (-)		
	A2 (+)	Analog Output 2 (4 to 20 mA)	
	A2 (-)		
	P1 (+)	Pulse Output 1 (voltage/open drain)	Maximum pulse output (voltage/open drain) transmission length: • 10 m @ 10 kHz • 100 m @ 1 kHz • 1 m @ 100 Hz Minimum conductor size: 18 AWG
	P1 (-)		
	P2 (+)	Pulse Output 2 (voltage/open drain)	
	P2 (-)		
	SI (+)	Status Input (contact)	
	SI (-)		
SO (+)	Status Output (open drain)		
SO (-)			
I/O (+)	Expanded Input/Output (Modbus communication, etc.)	For Modbus communications: • Maximum transmission length: 1200 m • Minimum conductor size: 18 AWG	
I/O (-)			
Power	L (+)	Power (with DC power: +)	—
	GND	Earth Ground	
	N (-)	Power (with DC power: -)	

**WIRING DIAGRAM**

**Wiring between Sensor Unit and Separately-mounted Transmitter**



Use dedicated interconnect cable and prepare shielded wire as follows.

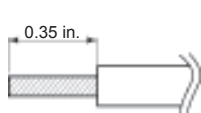
**Transmitter End**

1. Bundle shielded wires colored in brown/red, green/white, blue/grey and purple/yellow/orange and cover the wires with a black tube.
2. Connect only one wire to the terminal box (black), taking care to avoid potential contact with the housing or conductive parts.

**Sensor End**

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

**Recommended Cable End Treatment**

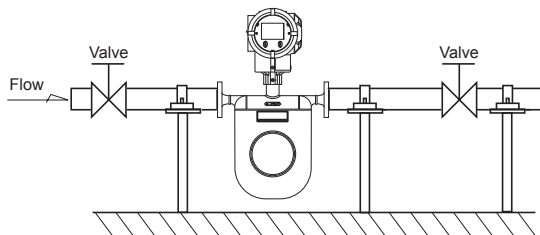


Use of a crimp pin terminal is not necessary.

## INSTALLATION

### Typical Installation

1. Avoid pipeline stresses on the meter.
2. The meter should be supported near each process connection, as shown in the illustration on the right.
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 low point in the piping where slurries may build up.
5. Provide a valve downstream of the meter to allow zeroing by obtaining a true zero flow. We recommend providing another valve upstream of the meter for servicing or maintenance.



### Precautions at Installation

1. Locate the meter at least 3.28 feet from large transformers, motors, or other sources of electromagnetic induction. Also avoid installation near 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 392°F. Explosion-proof models require the temperature to be held below their maximum allowable levels.
3. To ensure consistent volume flow and density measurements, heat retention is suggested.
4. The sensor unit is of gas-tight construction. To prevent dew condensation inside in a low-temperature application, it is filled with argon gas. To avoid damaging the sensor, do not drop the sensor unit or otherwise subject it to impact shocks.
5. In a horizontal run, install the sensor unit with the transmitter up as shown in the typical installation 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 16.4 feet away.
7. To ensure consistent and accurate measurement, the Coriolis flow meter should be placed in an environment where pipeline oscillation is held below 0.3G.
8. Sudden temperature change may damage the performance of the flow meter. Keep the temperature change of the fluid within ±55°F/min. for both heating and cooling.

### Prevention of Cavitation (Gas Flash Off)

Cavitation can cause a loss in Coriolis meter measurement accuracy. To prevent cavitation, maintain line pressure upstream and downstream of the meter. Avoid piping arrangements that open the line to the atmosphere immediately downstream of the meter. Particular care must be taken in low pressure applications and with high vapor pressure liquids, such as NGLs (natural gas liquids). It is recommended the back pressure immediately downstream of the meter be kept above the value calculated by the formula below:

$$P_d = 2\Delta P + 1.25P_v$$

where  $P_d$ : Downstream pressure (psia)

$\Delta P$ : Pressure drop across meter (psid)

$P_v$ : Vapor pressure of the process fluid (psia)

Calculation based on API Manual of Petroleum Measurement Standards, Chapter 5.6, Section 6.3.2.

### Physical Orientation

#### CC003 through CC250

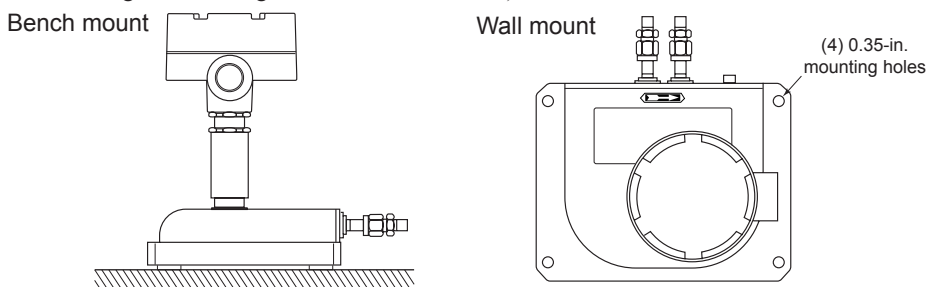
Recommended physical orientation varies with the type of process fluid. (No. 2 in the figure below shows basic orientation for liquid service.) Physical orientation must be specified at the time of order.

	Horizontal run		Vertical run
	No.1	No.2	No.3
Orientation	 Flow direction ← ①	 Flow direction → ②	 Flow direction ↑ ③
Fluids	<ul style="list-style-type: none"> <li>•Gases</li> <li>•Slurries</li> </ul>	<ul style="list-style-type: none"> <li>•Liquids</li> </ul>	<ul style="list-style-type: none"> <li>•Slurries (requiring cleaning)</li> <li>•Liquids</li> <li>•Gases</li> </ul>

1. For installation orientation in No. 1, Cameron recommends the separately-mounted transmitter. If the integrally-mounted transmitter is preferred, contact Cameron.
2. The measuring tube of the CC003 is in double-loop configuration without self-draining feature.

#### CC00A and CC001

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



## EXPLOSION-PROOF SPECIFICATIONS

### CSA

#### Integral Type

- Transmitter ratings: Class I, Zone 1, Ex d ib IIB T4 Gb  
Class I, Zone 1, AEx d ib IIB T4 Gb
- Transmitter and sensor ambient temperature: -40°F to 131°F
- Fluid temperature: -40°F to 176°F
- Sensor ratings: Class I, Zone 1, Ex ib IIB T4 Gb  
Class I, Zone 1, AEx ib IIB T4 Gb
- Sensor to be connected: CC006 through CC250
- Communication: HART, Modbus

#### Separate Type

- Transmitter ratings: Class I, Zone 1, Ex d [ib] IIB T6 Gb  
Class I, Zone 1, AEx d [ib] IIB T6 Gb
- Transmitter ambient temperature: -40°F to 131°F
- Sensor ratings: 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, Modbus

#### Meter Combinations

Model	Meter Temperature Category			Transmitter		Hazardous Location Temperature Class			
	Model Code 7	Description	Nominal Media Temp (°F)	Model Code 12	Mounting Type	Model Code 18	Description	Media Temp (°F)	Ambient Temp (°F)
CC00A and CC001	2	Standard B	266° to 392°	2	Separate	3	Class T3	-40° to 302°	-40° to 140°
CC003	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
CC006 through CC015	1	Standard A	-40° to 266°	1	Integral	4	Class T4	-40° to 176°	-40° to 140°
	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
CC025 through CC080	1	Standard A	-40° to 266°	1	Integral	4	Class T4	-40° to 176°	-40° to 140°
	1	Standard A	-40° to 266°	2	Separate	3	Class T3	-40° to 302°	-40° to 140°
	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	3	High Temp	392° to 662°	2	Separate	1	Class T1	-4° to 662°	-4° to 122°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°
CC100 through CC150	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	3	High Temp	392° to 662°	2	Separate	1	Class T1	-4° to 662°	-4° to 122°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°
CC15H through CC250	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°

Temperature Category describes the nominal temperature rating of the meter, with no consideration for hazardous area certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

Temperature Class describes "T" codes, which define temperature limitations that apply if the meter is installed in a hazardous area, per the CSA certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

If a meter will be used in a process with temperature lower than -22°F, Charpy impact testing is required.

### ATEX/IECEX

#### Integral type

- Transmitter ratings: Zones 1 and 2  
II 2G Ex d ib IIC T4 Gb
- Transmitter and sensor ambient temperature: -40°F to 131°F
- Fluid temperature: -40°F to 176°F
- Sensor ratings: Zones 1 and 2  
II 2G Ex ib IIC T4 Gb
- Sensor to be connected: CC006 through CC250
- Communication: HART, Modbus

#### Separate type

- Transmitter rating: II 2G Ex d [ib] II C T6 Gb
- Transmitter ambient temperature: -40°F to 131°F
- Sensor ratings: II 2G Ex ib II C T1, T2, T3, T4, T5
- Communication: HART, Modbus

#### Meter combinations

Model	Meter Temperature Category			Transmitter		Hazardous Location Temperature Class			
	Model Code 7	Description	Nominal Media Temp (°F)	Model Code 12	Mounting Type	Model Code 18	Description	Media Temp (°F)	Ambient Temp (°F)
CC00A and CC001	2	Standard B	266° to 392°	2	Separate	3	Class T3	-40° to 302°	-40° to 140°
CC003	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
CC006 through CC015	1	Standard A	-40° to 266°	1	Integral	4	Class T4	-40° to 176°	-40° to 140°
	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
CC025 through CC080	1	Standard A	-40° to 266°	1	Integral	4	Class T4	-40° to 176°	-40° to 140°
	1	Standard A	-40° to 266°	2	Separate	3	Class T3	-40° to 302°	-40° to 140°
	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	3	High Temp	392° to 662°	2	Separate	1	Class T1	-4° to 662°	-4° to 122°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°
CC100 through CC150	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	3	High Temp	392° to 662°	2	Separate	1	Class T1	-4° to 662°	-4° to 122°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°
CC15H through CC250	2	Standard B	266° to 392°	2	Separate	2	Class T2	-40° to 392°	-40° to 140°
	4	Low Temp	-328° to 122°	2	Separate	5	Class T5	-328° to 122°	-4° to 122°

Temperature Category describes the nominal temperature rating of the meter, with no consideration for hazardous area certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

Temperature Class describes "T" codes, which define temperature limitations that apply if the meter is installed in a hazardous area, per the CSA certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

If a meter will be used in a process with temperature lower than -22°F, Charpy impact testing is required.



# Appendix A: Metric Units

## GENERAL PERFORMANCE

### Flow Rate

Meter type	Model	Size (in.)	Guaranteed minimum rate (kg/h)	Minimum setting rate (kg/h)	Maximum service rate (kg/h)	Maximum allowable rate (kg/h)	Uncertainty ⑤		Repeatability ⑤		Zero stability (kg/h)	Analog output uncertainty		
							Liquids	Gases	Liquids	Gases				
Low-flow	CC00A	1/4	0.024	0.12	2.4	3.6	±0.2% of reading (±ZS) ⑤	±0.5% of reading (±ZS)	±0.05% of reading (±1/2 ZS)	±0.25% of reading (±1/2 ZS)	0.00036	±0.1% of full scale		
	CC001		0.09	0.45	9	13.5					0.00135			
	CC003	1/2	0.72 (0.9) ①	3.6	72	144 (180) ①					0.0018			
	CC006	1/2	3.6	18	360	720					0.018			
	CC010	1/2	12	60	1200	2400					0.06			
	CC015	1/2	36	180	3600	7200					0.18			
Standard and Low-temperature	CC025	1	108	540	10800	21600	±0.1% of reading ②	±0.05% of reading ③	±0.25% of reading (±1/2 ZS)	0.54				
	CC040	1-1/2	390	1950	39000	78000				1.95				
	CC050	2	3420	17100	342000	684000				±0.1% of reading (±ZS) ④	±0.05% of reading (±1/2 ZS)		—	6
	CC080	3												17.1
	CC100	4												35
	CC150	6												70
	CC15H	6	7000	35000	700000	1400000				±0.1% of reading (±ZS) ④	±0.05% of reading (±1/2 ZS)	—	17.1	
	CC200	8											35	
	CC20H	8											70	
	CC250	10	14000	70000	1400000	2800000				70				
High-pressure	CC010	3/8	24	120	840	1680	±0.2% of reading (±ZS) ⑤	±0.5% of reading (±ZS)	±0.1% of reading (±1/2 ZS)	±0.25% of reading (±1/2 ZS)	0.21			
	CC015	3/4	78	390	2550	5100					0.636			
High-temperature	CC025	1	108	540	10800	21600	±0.1% of reading (±ZS)	—	±0.05% of reading (±1/2 ZS)	—	1.08			
	CC040	1-1/2	390	1950	39000	78000					3.9			
	CC050	2	3420	17100	342000	684000					±0.1% of reading (±ZS)	±0.05% of reading (±1/2 ZS)	—	12
	CC080	3												34.2
	CC100	4												
CC150	6													

- When a maximum allowable range 180 kg/h is adopted, the minimum flow rate is 0.9 kg/h.
- ±ZS is applied for flow rates below 5% ( 2.5% for Model CC003) of the maximum service rate (within the guaranteed flow range).
- ±1/2 ZS is applied for flow rates below 5% (2.5% for Model CC003) of the maximum service rate (within the guaranteed flow range).
- If an uncertainty of ±0.1% of reading is required, consult Cameron.
- Above maximum service flow rate, the uncertainty is ±0.3% of reading (±ZS).

- \* If you request volume flow measurement for the purpose of fiscal transactions or weights and measurements transactions, contact Cameron.
- \* In gas measurement, the maximum permissible flow velocity varies with the type of gas and some may be beyond the bounds of measurement. If so, contact Cameron.
- \* ZS = Zero stability error (During testing, zero stability and current flow rate should be read in the same measurement unit.)

$$\text{Zero stability error} = \frac{\text{Zero stability}}{\text{Current flow rate}} \times 100\%$$

### Volumetric Flow Rate ①

Model	Units	Guaranteed minimum rate	Minimum setting rate	Maximum service rate	Maximum allowable
CC00A	l/hr	0.024	0.12	2.4	3.6
CC001	l/hr	0.09	0.45	9.01	13.5
CC003	l/hr	0.721	3.6	72.1	144
CC006	l/min	0.06	0.3	6.01	12
CC010	l/min	0.2	1	20	40
CC015	l/min	0.601	3	60	120
CC025	l/min	1.8	9.01	180	360
CC040	l/min	6.51	32.5	651	1301
CC050	m³/hr				
CC080	m³/hr	1.2	6.01	120	240
CC100	m³/hr	3.42	17.1	342	685
CC150	m³/hr				
CC15H	m³/hr	7.01	35	701	1401
CC200	m³/hr				
CC20H	m³/hr				
CC250	m³/hr	14	70	1401	2802
CC010*	l/min	0.4	2	14	28
CC015*	l/min	1.3	6.51	42.5	85.1

\* High-pressure models

- Calculations based on water (specific gravity of 1) at 15°C (mass = 999.13 kg/m³). Actual flow ranges vary with media density. To determine the flow range for your fluid, divide the values above by the fluid's specific gravity.

### Density (Liquids)

Meter type	Model	Size (in.)	Metering range	Uncertainty	Analog output uncertainty	
Low-flow	CC00A	1/4	0.3 to 2g/mL	±0.0005 g/mL	±0.1% of full scale	
	CC001					
	CC003	1/2				
	CC006	1/2				
	CC010	1/2				
	CC015	1/2				
	Standard and Low-temperature	CC025				1
		CC040				1-1/2
		CC050				2
		CC080				3
CC100		4				
CC150		6				
CC15H		6				
CC200		8				
CC20H		8				
CC250		10				
High-pressure	CC010	3/8	0.3 to 2 g/mL	±0.004 g/mL	±0.1% of full scale	
	CC015	3/4				
High-temperature	CC025	1	0.3 to 2g/mL	±0.003g/mL	±0.1% of full scale	
	CC040	1-1/2				
	CC050	2				
	CC080	3				
	CC100	4				
	CC150	6				

**GENERAL SPECIFICATIONS**

**Sensor Unit Specifications**

**Low-Flow Models (CC00A, CC001 and CC003)**

Item		Description		
<b>Model</b>		CC00A	CC001	CC003
<b>Nominal size</b>		1/4"		10mm, 1/2", DN15
<b>Materials</b>	<b>Wetted parts ①</b>	SUS316L		SUS316L, Alloy C22
	<b>Housing</b>	SUS304		
	<b>O-rings</b>	Fluoro-elastomer (standard Viton®), PTFE (option)		—
<b>Process connection</b>		1/4-18 FNPT		ASME 100, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 RF ③; IDF Ferrule ④, Threaded
<b>Applicable fluid</b>		Liquid and gas		
<b>Density range</b>		0 to 2.0 g/mL		
<b>Temperature range</b>		-200°C to 200°C ⑤		
<b>Tube withstand @ 37.8°C</b>		—		Wetted parts materials: SUS316L maximum 10 MPa; Alloy C22 maximum 15 MPa (depending on flange rating)
<b>Maximum operating pressure @ 37.8°C</b>	<b>Liquid</b>	15 MPa		
	<b>Gas</b>	0.98 MPa		
<b>Sensor housing withstand ⑥</b>		—		7.2 MPa
<b>Flow direction</b>		Bi-directional		
<b>Explosion-proof configuration</b>		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.		
<b>Dust-tight, waterproof configuration</b>		IP66/67		

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - DIN flanges are only available for meter material SUS316L.
  - For application with foods, this product does not comply with CE marking.
  - This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
  - Refer to [Explosion-proof Specifications, page A-22](#) for details. In case of non-explosion-proof type, the maximum measurement temperature is 130°C. However, the product must be used within the maximum ambient temperature of 45°C. Higher temperature limits can be achieved with the high-temperature models.
- \* Only available with separately-mounted transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).  
\* For products conforming to the high pressure gas safety regulations and CE marking, consult Cameron.

**Standard Models (CC006 through CC080)**

Item		Description						
<b>Model</b>		CC006	CC010	CC015	CC025	CC040	CC050	CC080
<b>Nominal size</b>		10 mm, 1/2", DN15	15 mm, 1/2", DN15		25 mm, 1", DN25	40 mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80
<b>Materials</b>	<b>Wetted parts ①</b>	SUS316L, Alloy C22						
	<b>Housing</b>	SUS304						
<b>Process connection</b>		ASME 150, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 RF ③; IDF Ferrule ④; Threaded						
<b>Applicable fluids</b>		Liquid and gas						
<b>Density range</b>		0 to 2.0 g/mL						
<b>Temperature range</b>		-200°C to 200°C ⑤						
<b>Tube withstand @ 37.8°C</b>		10.5 MPa						
<b>Maximum operating pressure</b>		Depends on flange rating						
<b>Sensor housing withstand ⑥</b>		3.8 MPa	3.0 MPa	2.2 MPa	1.6 MPa	1.8 MPa		1.4 MPa
<b>Flow direction</b>		Bi-directional						
<b>Explosion-proof configuration</b>		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.						
<b>Dust-tight, waterproof configuration</b>		IP66/67						

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - DIN flanges are only available for meter material SUS316L.
  - For application with foods, this product does not comply with CE marking.
  - This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
  - Refer to [Explosion-proof Specifications, page A-22](#) for details. In case of non-explosion-proof type, the maximum measurement temperature is 130°C. However, the product must be used within the maximum ambient temperature of 45°C. Higher temperature limits can be achieved with the high-temperature models.
- \* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

## GENERAL SPECIFICATIONS

## High-Flow Models (CC100 through CC250)

Item		Description					
Model		CC100	CC150	CC15H	CC200	CC20H	CC250
Nominal size		100 mm, 4", DN100	150 mm, 6", DN150		200 mm, 8", DN200		250 mm, 10", DN250
Materials	Wetted parts <sup>1</sup>	SUS316L					
	Housing	SUS304					
Process connection		ASME 150, 300, 600 RF; DIN PN 10, 16, 25, 40 RF <sup>2</sup>					
Applicable fluids		Liquid					
Density range		0.3 to 2.0 g/mL					
Viscosity range		Maximum 10000 mPa·s					
Temperature range		-200°C to 200°C <sup>3</sup>					
Tube withstand @ 37.8°C		13.3 MPa	10.7 MPa		9.0 MPa		
Maximum operating pressure		Dependent on flange rating					
Flow direction		Bi-directional					
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.					
Dust-tight, waterproof configuration		IP66/67					

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
- ASME flanged process connections for Models CC20H and CC250 are limited to ASME classes 150 and 300.
- Refer to [Explosion-proof Specifications, page A-22](#) for details. In case of non-explosion-proof type, the maximum measurement temperature is 130°C. However, the product must be used within the maximum ambient temperature of 45°C. Higher temperature limits can be achieved with the high-temperature models.

## High-Pressure Models (CC010 and CC015)

Item		Description	
Model		CC010	CC015
Materials	Wetted parts	Flow tube: Alloy C22; Manifold: Alloy C22 equivalent (CX2MW)	
	Housing	SUS304	
Process connection		3/8-18 FNPT	3/4-14 FNPT
Applicable fluid		Liquid and gas	
Density range		0.3 to 2.0 g/mL	
Temperature range		Integrally-mounted: -20°C to 90°C; Separately-mounted: -200°C to 200°C	
Maximum operating pressure (at room temperature)		36 MPa	43 MPa
Sensor housing withstand <sup>1</sup>		3.0 MPa	2.2 MPa
Flow direction		Bi-directional	
Explosion-proof configuration		CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.	
Dust-tight, waterproof configuration		IP66/67	

- This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.

\* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

**GENERAL SPECIFICATIONS**

**High-Temperature Models (CC025 to CC150)**

Item		Description						
Model		CC025	CC040	CC050	CC080	CC100	CC150	
Nominal size		25 mm, 1", DN25	40mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80	100 mm, 4", DN100	150 mm, 6", DN150	
Materials	Wetted parts ①	SUS316L			SUS316L, Alloy C22	SUS316L		
	Housing	SUS304						
Process connection		1" to 3": ASME 150, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 RF 4" and 6": ASME 150, 300, 600 RF; DIN PN10, 16, 25, 40 RF						
Applicable fluids		Liquid						
Density range		0.3 to 2.0 g/mL						
Temperature range ③		-40°C to 350°C						
Tube withstand @ 37.8°C		10.5 MPa			13.3 MPa			
Maximum operating pressure		Dependent on flange rating						
Sensor housing withstand ④		1.6 MPa	1.8 MPa		1.4 MPa	—		
Flow direction		Bi-directional						
Explosion-proof configuration		CSA, ATEX and IECEx pending; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.						
Dust-tight, waterproof configuration		IP66/67						

**Optional Heat Tracer Specifications (Available for Models CC025 through CC080) ⑤**

Applicable fluids	Hot water, saturated steam, overheated steam
Heat retention fluid maximum output pressure	0.98 MPa
Joint port for heat retention fluid	10 mm stainless tubing
Recommended joint	Standard stainless steel ferrule-type compression fitting for 10mm tubing

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - Allowable ambient temperature permitted for the sensor unit is up to 50°C.
  - This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
  - Heat trace should only be used for heating the meter. Do not use for cooling of flowing media.
- \* For products conforming to the high-pressure gas safety regulations, consult Cameron.  
 \* Only available with separately-mounted transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).

**Low-Temperature Models (CC025 through CC250)**

Item		Description									
Model		CC025	CC040	CC050	CC080	CC100	CC150	CC15H	CC200	CC20H	CC250
Nominal size		25 mm, 1", DN25	40 mm, 1-1/2", DN40	50 mm, 2", DN50	80 mm, 3", DN80	100 mm, 4", DN100	150 mm, 6", DN150		200 mm, 8", DN200		250 mm, 10", DN250
Materials	Wetted parts ①	SUS316L, Alloy C22					SUS316L				
	Housing	SUS304									
Process connection		ASME 150, 300, 600, 900 ② RF; DIN PN 10, 16, 25, 40 RF ③; IDF Ferrule ④			ASME 150, 300, 600 RF; DIN PN 10, 16, 25, 40 RF ③			ASME 150, 300 RF; DIN PN 10, 16, 25, 40 RF ③			
Applicable fluids		Liquid and gas				Liquid					
Density range		0.3 to 2.0 g/mL									
Temperature range		-200°C to 50°C (separately-mounted only)									
Tube withstand @ 37.8°C		10.5 MPa			13.3 MPa		10.7 MPa		9.0 MPa		
Maximum operating pressure		Dependent on flange rating									
Sensor housing withstand ⑤		1.6 MPa	1.8 MPa		1.4 MPa		—				
Flow direction		Bi-directional									
Explosion-proof configuration		CSA (ATEX and IECEx pending) Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.									
Dust-tight, waterproof configuration		IP66/67									

- When SUS316L is selected as the wetted parts material, the flange material will be dual-rated SUS316/SUS316L.
  - ASME 900 flanges are only available in Alloy C22 material.
  - DIN flanges are only available for meter material SUS316L.
  - For application with foods, this product does not comply with CE marking.
  - This pressure does not represent the rated test pressure of a pressure vessel, but 1/4 of the factory-tested breakdown pressure or the data obtained from FEA analysis, whichever is lower. Distorted enclosures do not constitute a failure of the test.
- \* Only available with separately-mounted transmitter and interconnect cable (ordered separately; 10-meter minimum, available in 5-meter increments thereafter).  
 \* For products conforming to the high-pressure gas safety regulations and CE marking, consult Cameron.

## GENERAL SPECIFICATIONS








## Transmitter Specifications

Item	Description	
Model	PA0K	
Power supply	85 to 264 VAC, 50/60 Hz or 20 to 30 VDC (Safety rated 100 to 240 VAC, 50/60 Hz)	
Power consumption	Maximum 15W	
Ambient temperature	-40°C to 55°C <sup>1</sup>	
Transmission length (separately-mounted)	Maximum 200 m (interconnect cable used) <sup>2</sup>	
Applicable EU directive	EMC Directive: 2004/108/EC; ATEX Directive: 94/9/EC	
Applicable EN standards	EMC—EN55011: 1998/A1, 1999/A2, 2002 Group 1, Class B; EN61000-6-2: 2001; EN061326-1: 2006 ATEX—EN60079-0: 2012; EN60079-1: 2007; EN60079-11: 2012 IECEX—IEC60079-0: 2011; IEC60079-1: 2007-04; IEC60079-11: 2011	
Explosion-proof configuration	CSA, ATEX and IECEx; Refer to <a href="#">Explosion-proof Specifications, page A-22</a> for details.	
Dust-tight, waterproof configuration	IP66/67	
Transmitter configuration	Integral or separately-mounted	
Finish	Paint type: Baked enamel; Paint color: Light gray (RAL7035)	
Display	LCD display provided (128×64 dots), backlit (white, orange); Two infrared light sensors; Two LEDs (green and red)	
Weight (approximate)	Integrally-mounted model, 3.6 kg; Separately-mounted model, 5.0 kg	
Communication interface <sup>5</sup>	HART (Standard)	Protocol Version 7, Bell 202 <sup>3</sup>
	Modbus (Optional)	RS-485 Modbus protocol; Baud rate: 9600 bps, 19200 bps, 38400 bps; RTU or ASCII; Response time: 25 to 50 ms
Damping (default)	Flow rate, 0.8 sec.; Density, 4.0 sec.; Temperature, 2.5 sec.	
Low-flow cutoff (default)	Less than 0.6% of maximum service flow rate	
Pulse output	Select one: Open drain (equivalent to open collector)—10V to 30V, 50 mA DC, ON resistance ≤0.6 Ω or Voltage—1.5V maximum (low level) to 13V minimum (high level), Output impedance: 2.2 kΩ; Setting range—0.1 to 10000 Hz (Maximum: 11000 Hz)	
Analog output	4 to 20 mA DC (maximum load: 600 Ω); Select two outputs from instant flowrate (mass or volume) temperature, and density.	
Status output	Open drain (equivalent to open collector)—30V maximum, 50 mA DC, ON resistance ≤0.6 Ω; Select one from error (default) <sup>4</sup> , flow direction, or high/low alarm	
Status input	Contact-closure (Form "a" contact)—Short: 200 Ω maximum, Open: 100 kΩ minimum; Select one output from remote zero, total reset, 0% signal lock, or function off (default)	

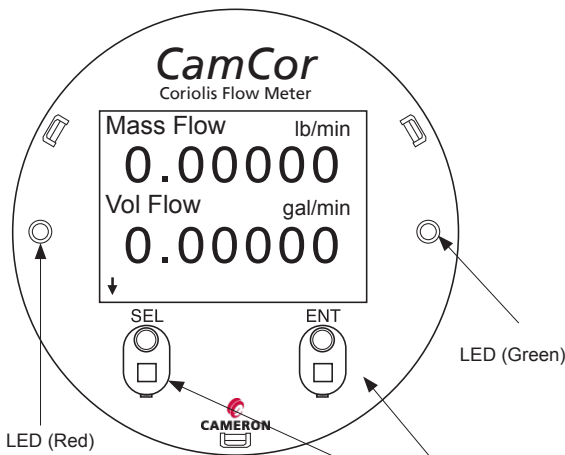
- Below -20°C, the display loses its visibility due to weakened contrast. Both the display and infrared sensor may exhibit slow responses below -20°C.
- If the signal transmission length for a separately-mounted transmitter exceeds 200 m, consult Cameron.
- HART communications are available only across the Analog Output 1.
- The status output can also be configured to activate when meter zeroing is in process.
- Electrical noise filtering components are installed in connections between power source, output, communications and chassis.

EXTERNAL APPEARANCE

CT Series Models

Low-flow and Standard Models				High-pressure Model	High-temperature Model	Low-temperature/ Explosion-proof Model
CC00A, CC001	CC003	CC006 to CC080	CC100 to CC250	CC010, CC015	CC025 to CC150	CC025 to CC250
1/4"	1/2"	1/2" to 3"	4" to 10"	3/8" and 3/4"	1" to 6"	1" to 10"
						

Display



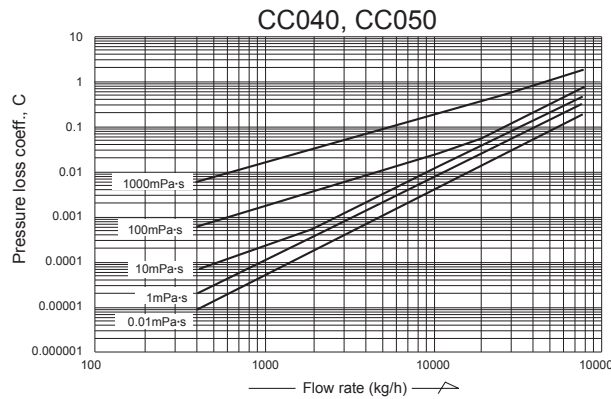
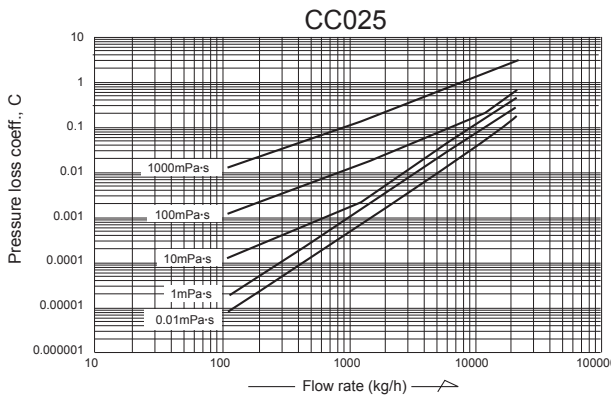
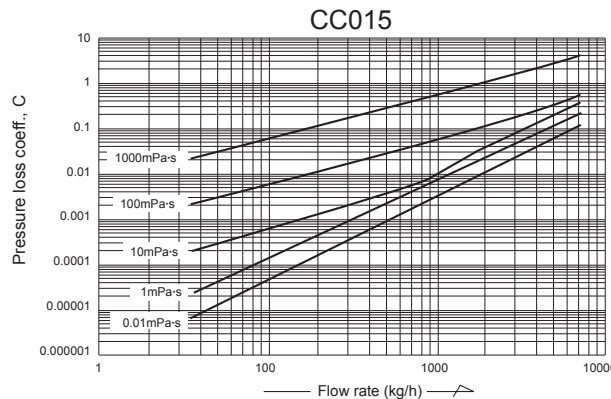
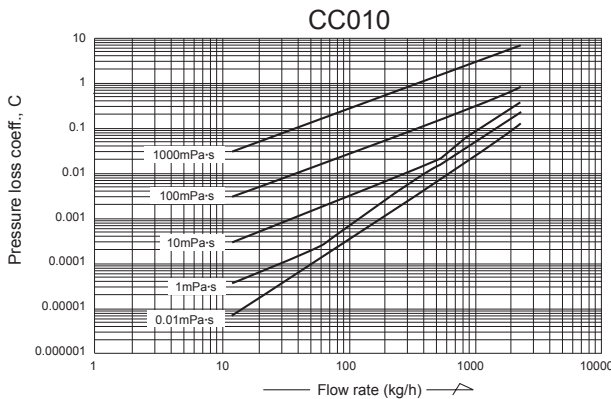
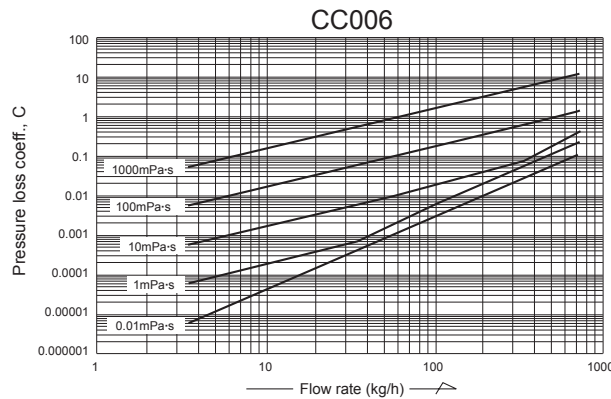
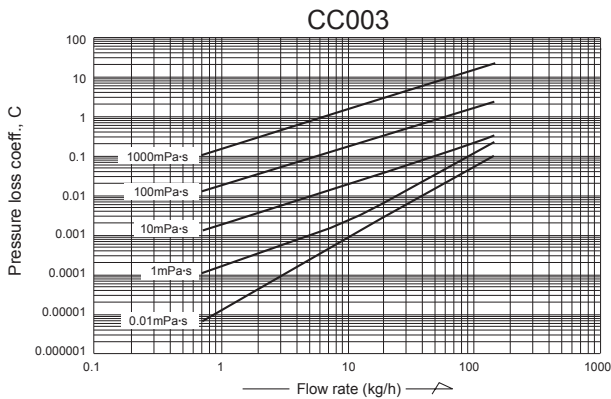
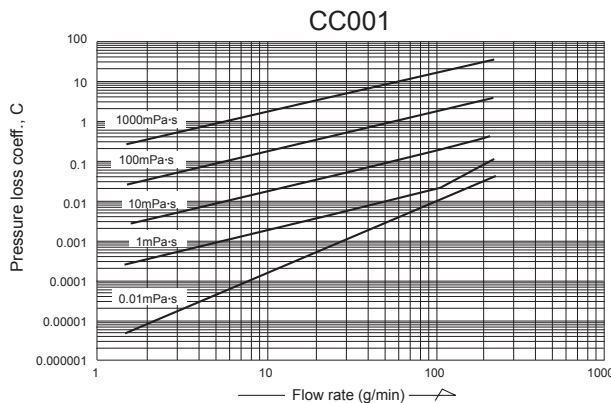
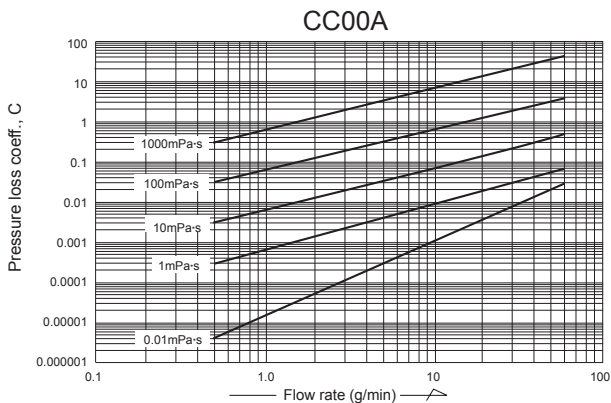
Display modes

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

- LCD backlight available in white and orange. Color changes according to the status of flow meter.
- In most cases, the backlight shuts off automatically if the optical sensor does not respond within a user-defined duration.

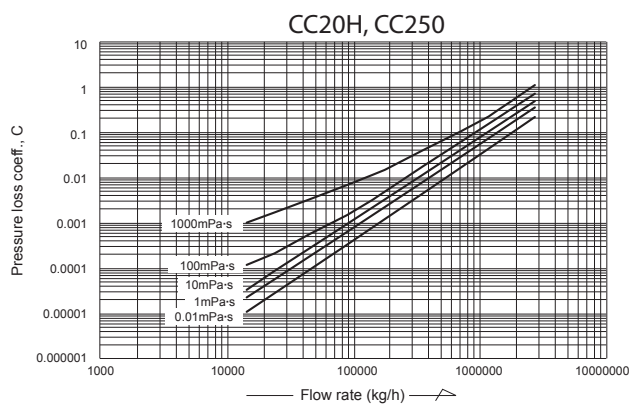
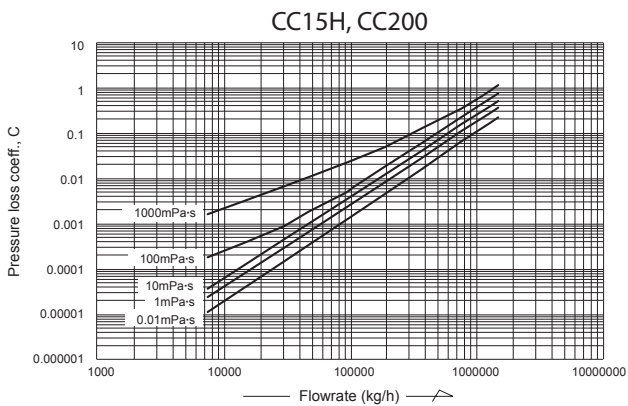
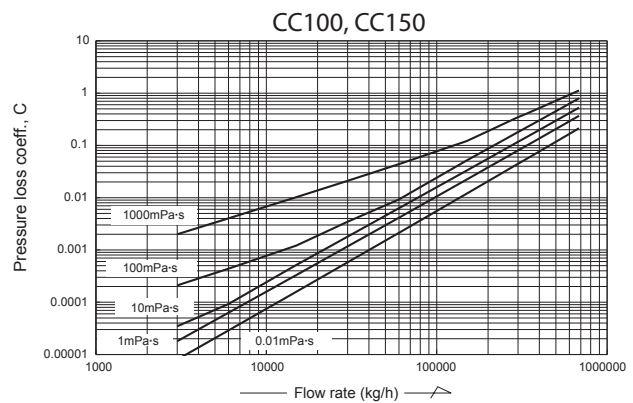
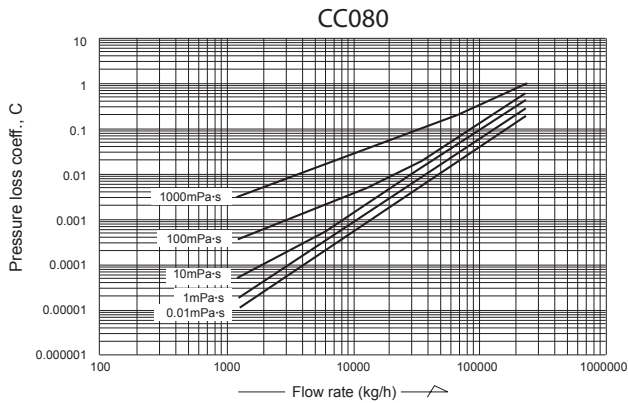
To select the mode, touch the infrared optical sensor panel through the front glass.

**PRESSURE LOSSES**





**PRESSURE LOSSES**



**How to Determine Pressure Loss**

1. Find the pressure loss factor “C” for a given parameter from its flow rate (kg/h or g/min) and viscosity (mPa·s), then divide “C” by specific gravity “d” (“1” for water) as shown in the following formula:

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

\*For high viscosity liquids not shown in these graphs, calculate the pressure loss using the following formula:

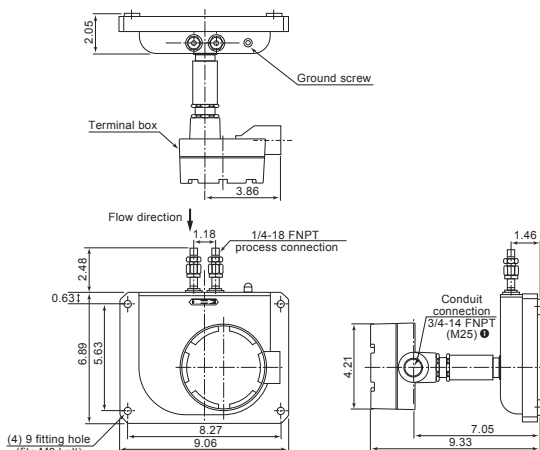
$$\Delta P_2 = C \times \frac{\mu_2}{\mu_1} \times \frac{1}{d}$$

- where  $\Delta P_2$  = Pressure loss of high-viscosity liquid (MPa)
- $\mu_1$  = Maximum viscosity shown in the graph (mPa·s)
- $\mu_2$  = Viscosity of high-viscosity liquid (mPa·s)
- d = Specific gravity of high-viscosity liquid (“1” for water)
- C = Pressure loss factor

**DIMENSIONS [UNITS IN MILLIMETERS]**

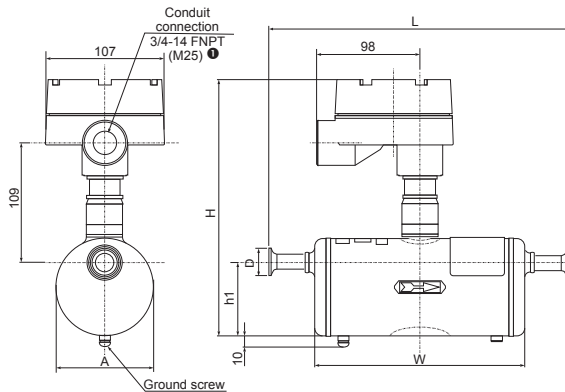
**Sensor unit: CC00A and CC001**  
**Transmitter: Separately-mounted/threaded connection type**

(Approximate weight: 9 kg)



● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

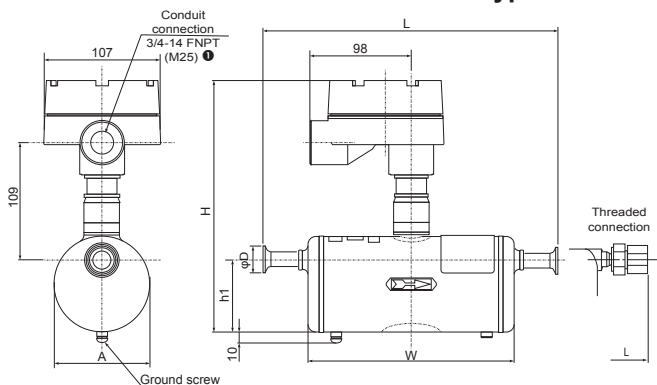
**Sensor unit: CC003**  
**Transmitter: Separately-mounted/flange connection type**



Model	ASME					DIN			H	h1	A	W	Approx. Weight (kg)
	Nominal size (mm)	150	300	600	900 ②	Nominal size (DN)	PN10, 16	PN25, 40					
CC003	10	301	310	322	338	15	275	281	230	67	89.1	192	5.0

- 1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
- 2. ASME 900 flanges are only available in Alloy C22 material.
  - \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
  - \* DIN flanges are only available for meter material SUS316L.

**Sensor unit: CC003**  
**Transmitter: Separately mounted/ferrule or threaded connection type**



● Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Ferrule ②		L	H	h1	A	W	D	Approx. Weight (kg)
	Nominal size	Connection							
CC003	10	Ferrule 10A	265	230	67	89.1	192	34	4.5

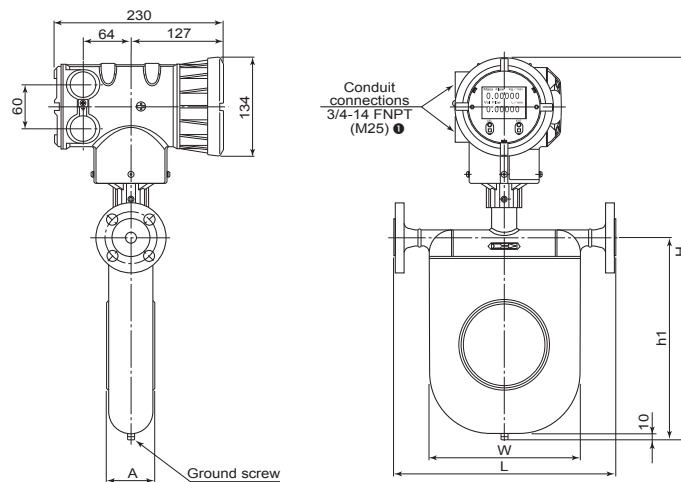
Model	Threaded Connection	L	Approx. Weight (kg)
CC003	1/2-14 FNPT	332	4.5

2. Process connection: A = mm

**DIMENSIONS [UNITS IN MILLIMETERS]**

Sensor unit: CC006 through CC080

Transmitter integrally-mounted/flange connection type

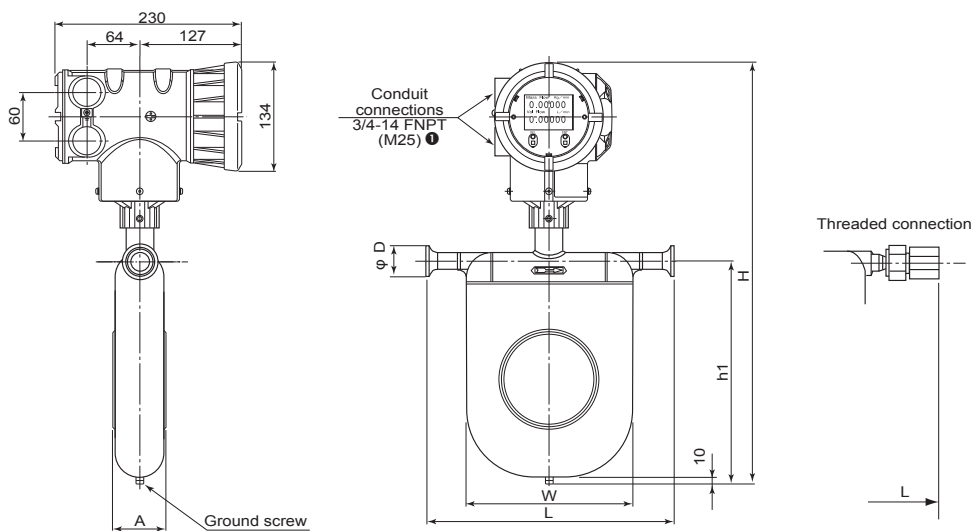


Model	ASME					DIN			H	h1	A	W	Approx. Weight (kg)
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)	PN 10, 16	PN 25, 40					
		L					L						
CC006	1/2	268	277	289	306	15	241	247	424	180	53	148	7
CC010	1/2	282	291	303	320	15	256	261	462	218	53	163	7.8
CC015	1/2	325	334	347	363	15	299	305	512	268	65	205	8.8
CC025	1	411	424	437	460	25	376	380	580	329	83	262	13.3
CC040	1-1/2	547	560	575	603	40	507	513	710	452	121	385	23
CC050	2	550	563	582	641	50	513	519					
CC080	3	699	717	737	777	80	659	675	880	602	174	510	57

1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
  2. ASME 900 flanges are only available in Alloy C22 material.
- \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.  
 \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC006 through CC080

Transmitter: Integrally-mounted/ferrule or threaded connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (kg)
	Nominal size	Connection ②							
CC006	10	Ferrule 10A	231.5	434	180	53	148	34	5.7
CC010	15	Ferrule 15A	256	462	218	53	163	34	6.3
CC015	15	Ferrule 15A	289	512	268	65	205	34	7.1
CC025	25	Ferrule 25 (ISO), IDF 1S	370	580	329	83	262	50.5	10.7
CC040	40	Ferrule 38 (ISO), IDF 1.5S	493	710	452	121	385	50.5	19
CC050	50	Ferrule 51 (ISO), IDF 2S						64	
CC080	80	Ferrule 76.1 (ISO), IDF 3S						658.5	

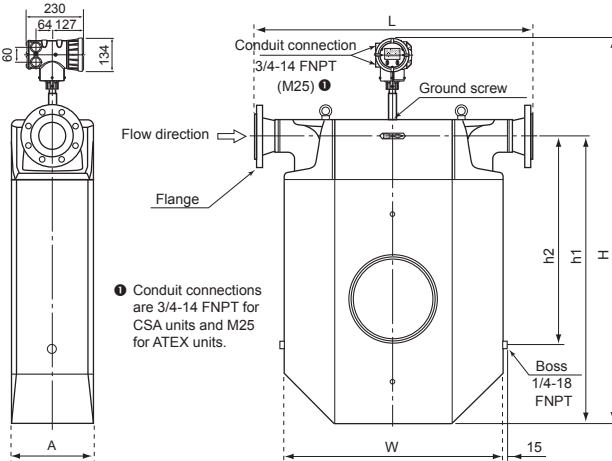
Model	Threaded Connection	L	Approx. Weight (kg)
CC006	1/2-14 FNPT	296	5.7
CC010	1/2-14 FNPT	312	6.3
CC015	3/4-14 FNPT	382	7.1

② Process connection: A = mm, S (sanitary) = in.

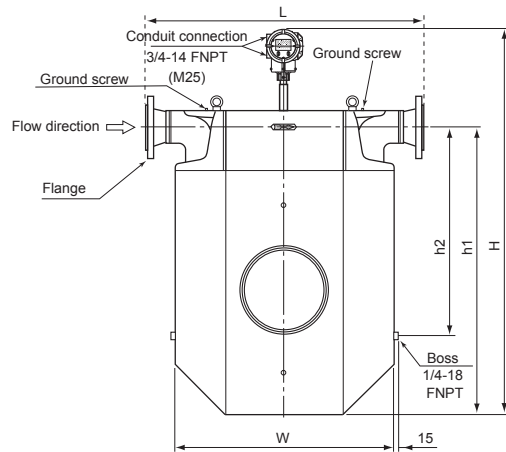
**DIMENSIONS [UNITS IN MILLIMETERS]**

Sensor unit: CC100 through CC250

Transmitter: Integrally-mounted/flange connection type



**CC100, CC150**



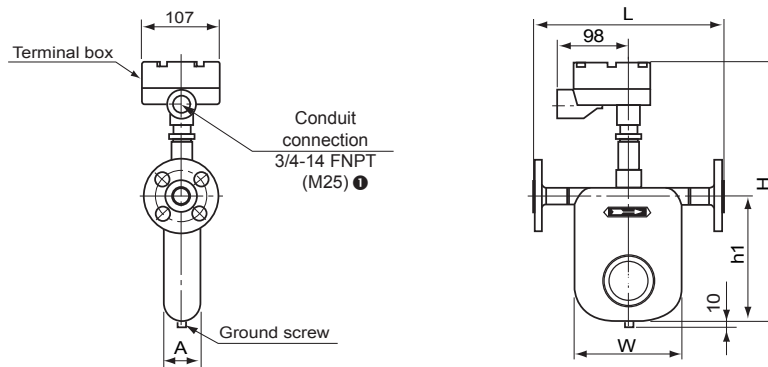
**CC15H through CC250**

Model	Flange		L	H	h1	h2	A	W	Approx. Weight (kg)
	Nominal size	Flange rating							
CC100	4"	ASME 150	1018	1403	1015	660	300	810	231
		ASME 300	1036						
		ASME 600	1082						
	DN100	PN 10, 16	968						
PN 25, 40		994							
CC150	6"	ASME 150	1318	1403	1015	660	300	810	246
		ASME 300	1338						
		ASME 600	1388						
	DN150	PN 10, 16	1250						
PN 25, 40		1290							
CC15H	6"	ASME 150	1087	1604	1190	851	320	810	310
		ASME 300	1107						
		ASME 600	1157						
	DN150	PN 10, 16	1019						
PN 25, 40		1059							
CC200	8"	ASME 150	1418	1604	1190	851	320	810	340
		ASME 300	1438						
		ASME 600	1494						
	DN200	PN 10, 16	1338						
PN 25		1374							
		PN 40	1390						
CC20H	8"	ASME 150	1418	1830	1390	960	420	1110	610
		ASME 300	1438						
		ASME 600	1494						
	DN200	PN 10, 16	1338						
PN 25		1374							
		PN 40	1390						
CC250	10"	ASME 150	1773	1830	1390	960	420	1110	650
		ASME 300	1805						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
		PN 40	1779						

**DIMENSIONS [UNITS IN MILLIMETERS]**

Sensor unit: CC006 through CC080

Transmitter: Separately-mounted/flange connection type

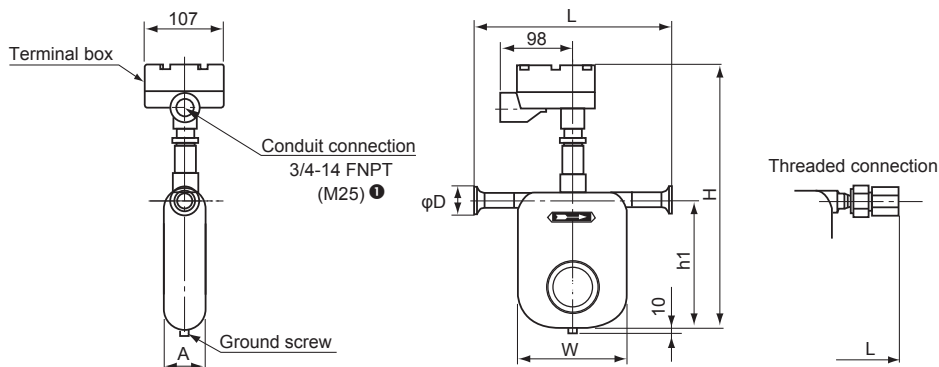


Model	ASME					DIN			H	h1	A	W	Approx. Weight (kg)
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)	PN 10, 16	PN 25, 40					
		L					L						
CC006	1/2	268	277	289	306	15	241	247	368	180	53	148	4.0
CC010	1/2	282	291	303	320	15	256	261	406	218	53	163	4.7
CC015	1/2	325	334	347	363	15	299	305	456	268	65	205	5.6
CC025	1	411	424	437	460	25	376	380	524	329	83	262	10.4
CC040	1-1/2	547	560	575	603	40	507	513	654	452	121	385	20
CC050	2	550	563	582	641	50	513	519					
CC080	3	699	717	737	777	80	659	675	824	602	174	510	54

1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
2. ASME 900 flanges are only available in Alloy C22 material.
  - \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
  - \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC006 through CC080

Transmitter separately-mounted/ferrule or threaded connection type



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (kg)
	Nominal size	Connection ②							
CC006	10	Ferrule 10A	231.5	368	180	53	148	34	2.8
CC010	15	Ferrule 15A	256	406	218	53	163	34	3.4
CC015	15	Ferrule 15A	289	456	268	65	205	34	4.2
CC025	25	Ferrule 25 (ISO), IDF 1S	370	524	329	83	262	50.5	7.8
CC040	40	Ferrule 38 (ISO), IDF 1.5S	493	654	452	121	385	50.5	16
CC050	50	Ferrule 51 (ISO), IDF 2S						64	
CC080	80	Ferrule 76.1 (ISO), IDF 3S	658.5	824	602	174	510	91	48

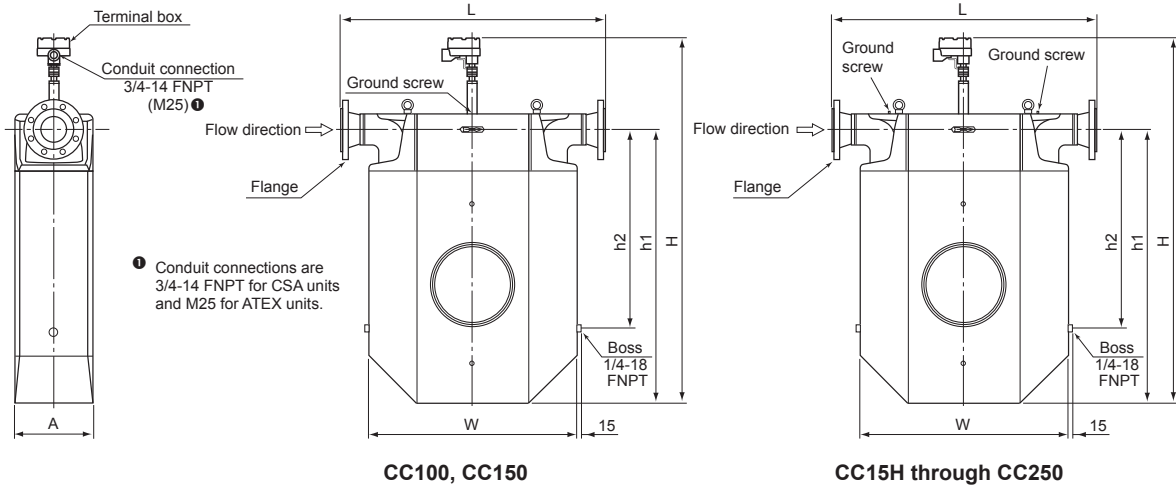
2. Process connection: A = mm, S (sanitary) = in.

Model	Threaded Connection	L	Approx. Weight (kg)
CC006	1/2-14 FNPT	296	2.8
CC010	1/2-14 FNPT	312	3.4
CC015	3/4-14 FNPT	382	4.2

**DIMENSIONS [UNITS IN MILLIMETERS]**

Sensor unit: CC100 through CC250

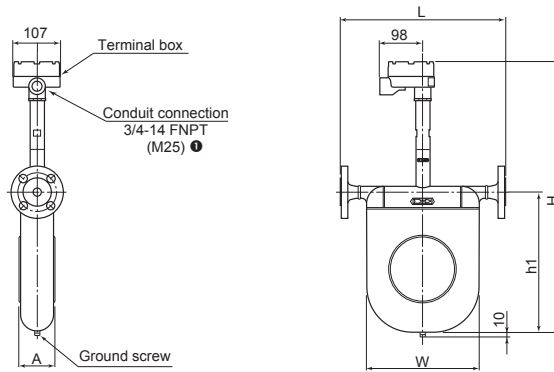
Transmitter: Separately-mounted/flange connection type



Model	Flange		L	H	h1	h2	A	W	Approx. weight (kg)
	Nominal size	Flange rating							
CC100	4"	ASME 150	1018	1353	1015	660	300	810	231
		ASME 300	1036						
		ASME 600	1082						
	DN100	PN 10, 16	968						
		PN 25, 40	994						
CC150	6"	ASME 150	1318	1353	1015	660	300	810	246
		ASME 300	1338						
		ASME 600	1388						
	DN150	PN 10, 16	1250						
		PN 25, 40	1290						
CC15H	6"	ASME 150	1087	1554	1190	851	320	810	310
		ASME 300	1107						
		ASME 600	1157						
	DN150	PN 10, 16	1019						
		PN 25, 40	1059						
CC200	8"	ASME 150	1418	1554	1190	851	320	810	340
		ASME 300	1438						
		ASME 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
	PN 40	1390							
CC20H	8"	ASME 150	1418	1780	1390	960	420	1110	610
		ASME 300	1438						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CC250	10"	ASME 150	1773	1780	1390	960	420	1110	650
		ASME 300	1805						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
	PN 40	1779							

**DIMENSIONS [UNITS IN MILLIMETERS]**

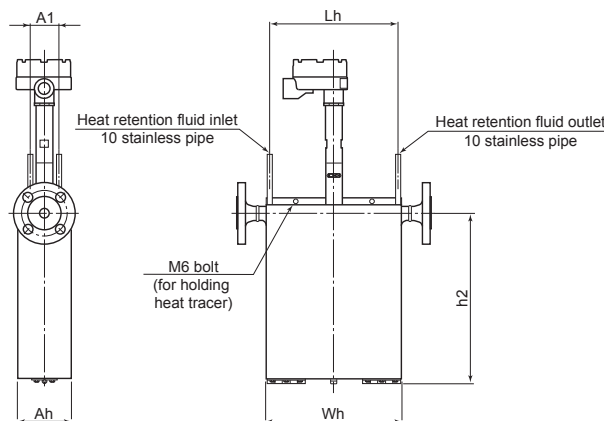
Sensor unit: CC025 through CC080 (High-temperature models)  
 Transmitter: Separately-mounted/flange connection type



Model	ASME				DIN		H	h1	A	W	Approx. weight kg		
	Nominal size (in.)	150	300	600	900 ②	Nominal size DN						PN10, 16	PN25, 40
CC025	1	411	424	437	—	25	376	380	638	329	83	262	10.9
CC040	1-1/2	547	560	575	—	40	507	513	768	452	121	385	20.3
CC050	2	550	563	582	—	50	513	519	768	452	121	385	20.7
CC080	3	699	717	737	777	80	659	675	960	602	174	510	54.1

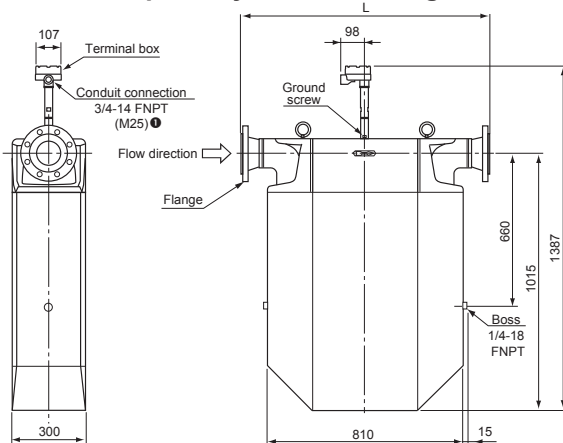
- Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
  - ASME 900 flanges are only available in Alloy C22 material.
- \* DIN flanges are only available for meter material SUS316L.

Sensor unit: CC025 through CC080 (with heat tracer)  
 Transmitter: Separately-mounted/flange connection type



Model	Nominal size (in.)	Heat Tracer Model Compatibility	Lh	h2	Ah	A1	Wh	Approx. weight (kg)
CC025	1	HT1-025A	254	340	106	56	268	16.9
CC040	1-1/2	HT1-040A	376	464	144	70	390	31.8
CC050	2							32.2
CC080	3	HT1-080A	501	612	198	110	545	75.1

Sensor unit: CC100 and CC150 (High-temperature models)  
 Transmitter: Separately-mounted/flange connection type



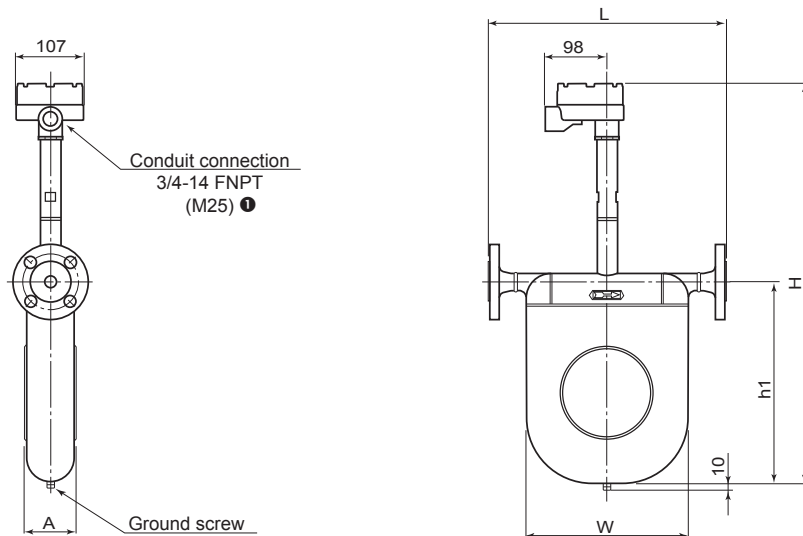
① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Model	Nominal size	Flange		L	Approx. Weight (kg)
		Flange rating ②			
CC100	4"	ASME 150	1018	237	
		ASME 300	1036	245	
		ASME 600	1082	255	
	DN100	PN 10, 16	968	231	
		PN 25, 40	994	241	
CC150	6"	ASME 150	1318	248	
		ASME 300	1338	265	
		ASME 600	1388	292	
	DN150	PN 10, 16	1250	246	
		PN 25, 40	1290	265	

- For specifications of other flange ratings, see the approval drawing (or delivery specification).

**DIMENSIONS [UNITS IN MILLIMETERS]**

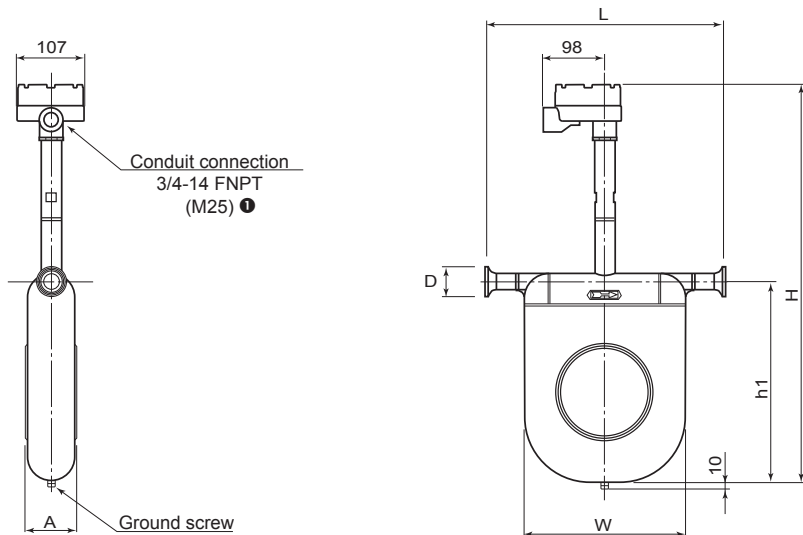
**Sensor unit: CC025 through CC080 (Low-temperature models)**  
**Transmitter: Separately-mounted/flange connection type**



Model	ASME				DIN		H	h1	A	W	Approx. Weight (kg)		
	Nominal size (in.)	150	300	600	900 ②	Nominal size (DN)						PN10, 16	PN25, 40
		L										L	
CC025	1	411	424	437	460	25	376	380	660	329	83	262	10.9
CC040	1-1/2	547	560	575	603	40	507	513	790	452	121	385	20.3
CC050	2	550	563	582	641	50	513	519					21
CC080	3	699	717	727	777	80	659	675	960	602	174	510	54

1. Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.
2. ASME 900 flanges are only available in Alloy C22 material.
  - \* This table only applies to meter material SUS316L. For information about material Alloy C22, please consult Cameron.
  - \* DIN flanges are only available for meter material SUS316L.

**Sensor unit: CC025 and CC080 (Low-temperature models)**  
**Transmitter: Separately-mounted/ferrule connection type**



① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

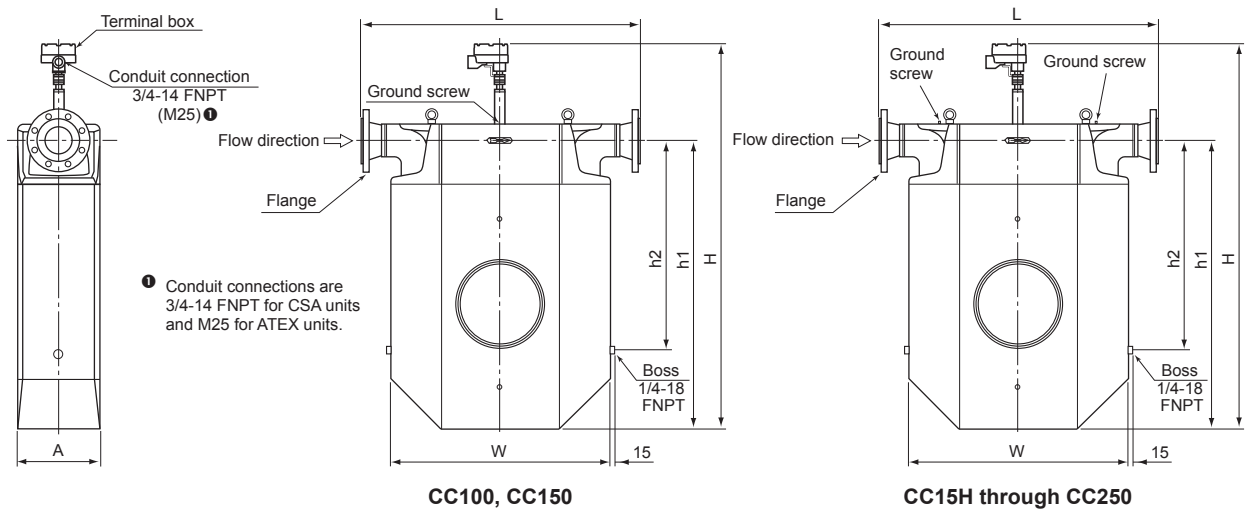
Model	Ferrule		L	H	h1	A	W	D	Approx. Weight (kg)
	Nominal size	Connection ②							
CC025	25	Ferrule 25 (ISO), IDF 1S	370	660	329	83	262	50.5	8.3
CC040	40	Ferrule 38 (ISO), IDF 1.5S	493	790	452	121	385	50.5	17
CC050	50	Ferrule 51 (ISO), IDF 2S						64	
CC080	80	Ferrule 76.1 (ISO), IDF 3S	658.5	960	602	174	510	91	48

2. Process connection: A = mm, S (sanitary) = in.



**DIMENSIONS [UNITS IN MILLIMETERS]**

Sensor unit: CC100 and CC250 (Low-temperature models)  
 Transmitter: Separately-mounted/flange connection type

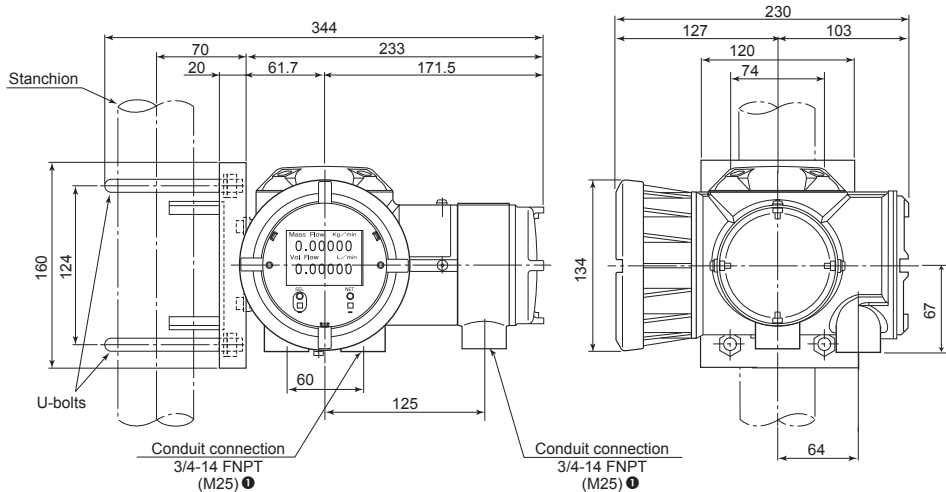


Model	Flange		L	H	h1	h2	A	W	Approx. Weight (kg)
	Nominal size	Flange rating ❷							
CC100	4"	ASME 150	1018	1387	1015	660	300	810	231
		ASME 300	1036						
		ASME 600	1082						
	DN100	PN 10, 16	968						
		PN 25, 40	994						
CC150	6"	ASME 150	1318	1387	1015	660	300	810	246
		ASME 300	1338						
		ASME 600	1388						
	DN150	PN 10, 16	1250						
		PN 25, 40	1290						
CC15H	6"	ASME 150	1087	1588	1190	851	320	810	310
		ASME 300	1107						
		ASME 600	1157						
	DN150	PN 10, 16	1019						
		PN 25, 40	1059						
CC200	8"	ASME 150	1418	1588	1190	851	320	810	340
		ASME 300	1438						
		ASME 600	1494						
	DN200	PN 10, 16	1338						
		PN 25	1374						
		PN 40	1390						
CC20H	8"	ASME 150	1418	1814	1390	960	420	1110	610
		ASME 300	1438						
		PN 10, 16	1338						
	DN200	PN 25	1374						
		PN 40	1390						
CC250	10"	ASME 150	1773	1814	1390	960	420	1110	650
		ASME 300	1805						
	DN250	PN 10	1705						
		PN 16	1709						
		PN 25	1745						
		PN 40	1779						

2. For specifications of other flange ratings, see the approval drawing (or delivery specification).

**DIMENSIONS [UNITS IN MILLIMETERS]**

**Separately-mounted Transmitter**

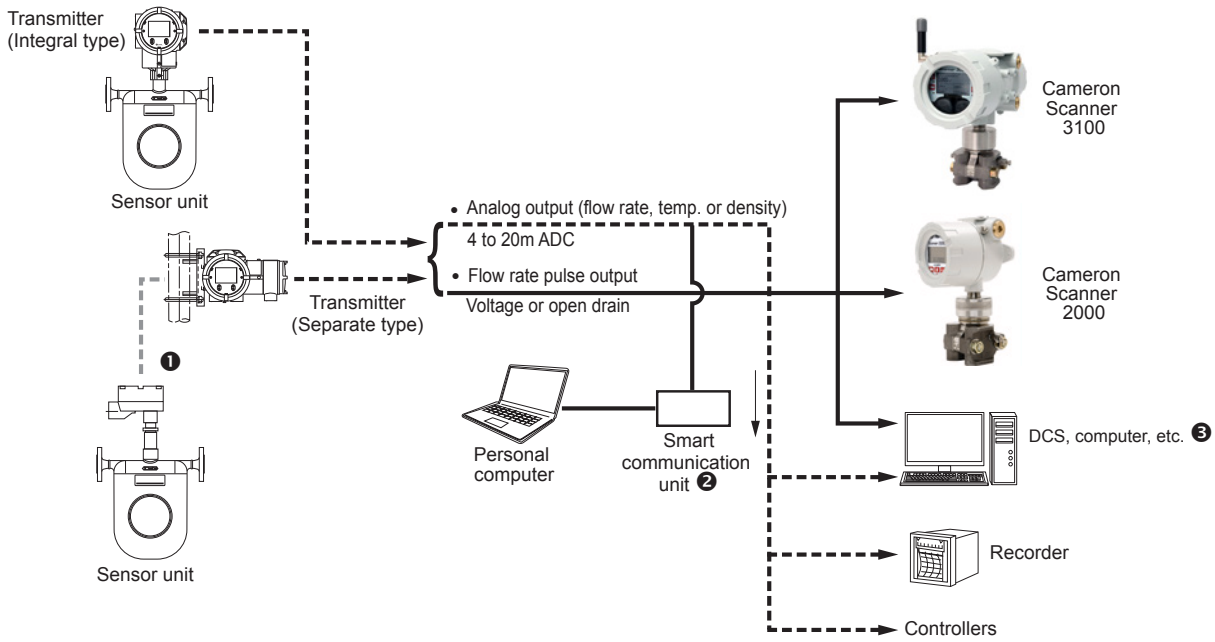


① Conduit connections are 3/4-14 FNPT for CSA units and M25 for ATEX units.

Pipe mounting hardware (U-bolts) are furnished as standard accessories. The pipe must be provided by the customer.

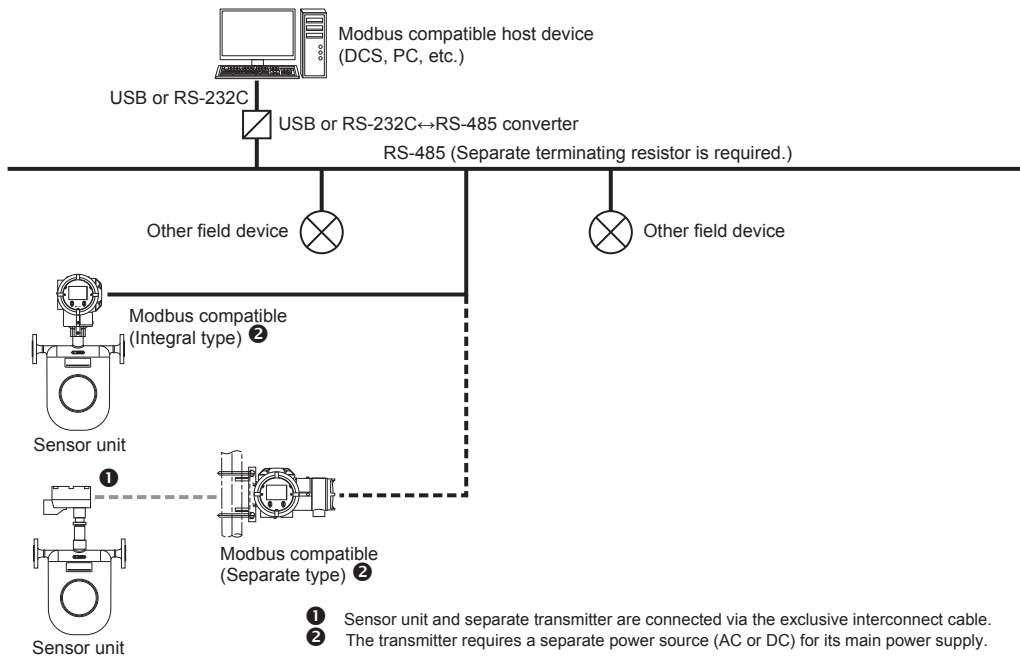
REMOTE MEASURING SYSTEM

HART Protocol



- 1 In case of the separate type, the sensor unit and transmitter are connected with exclusive cable.
- 2 Communication between the device and PC shall comply with HART protocol revision 7.
- 3 For detailed information about companion instruments, see respective product catalogs and General Specification sheets.

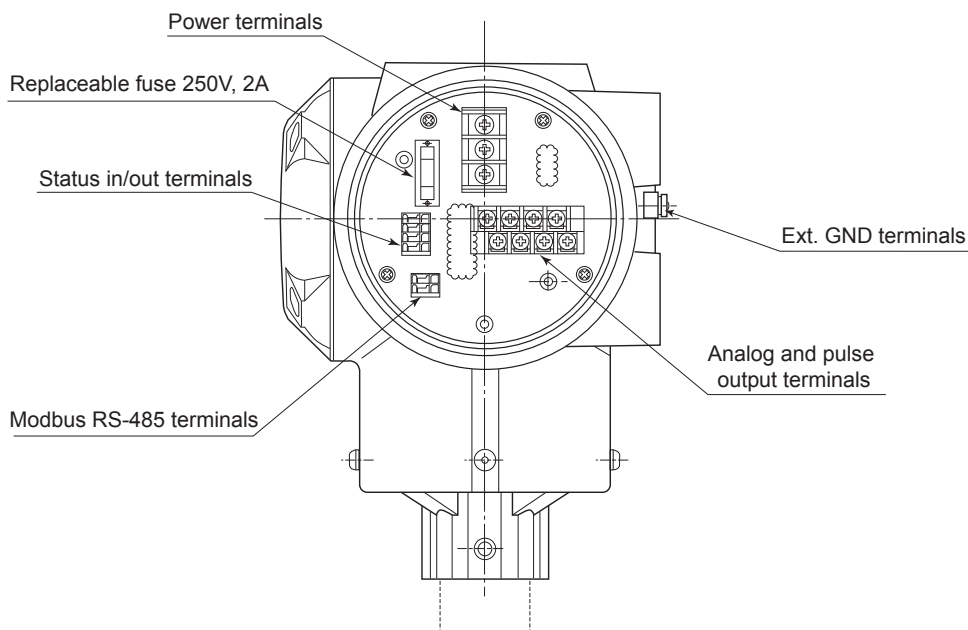
Modbus



- 1 Sensor unit and separate transmitter are connected via the exclusive 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**

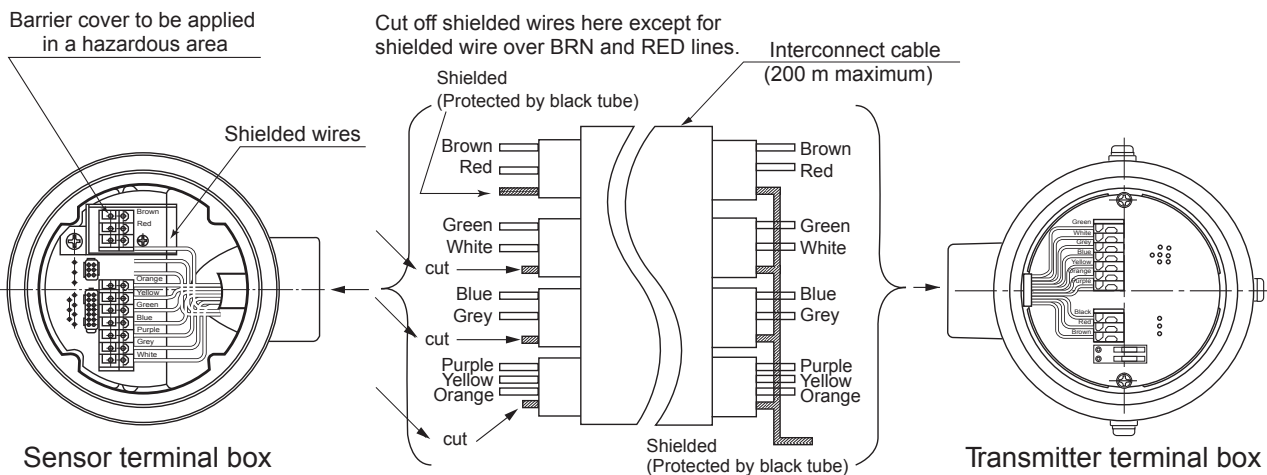
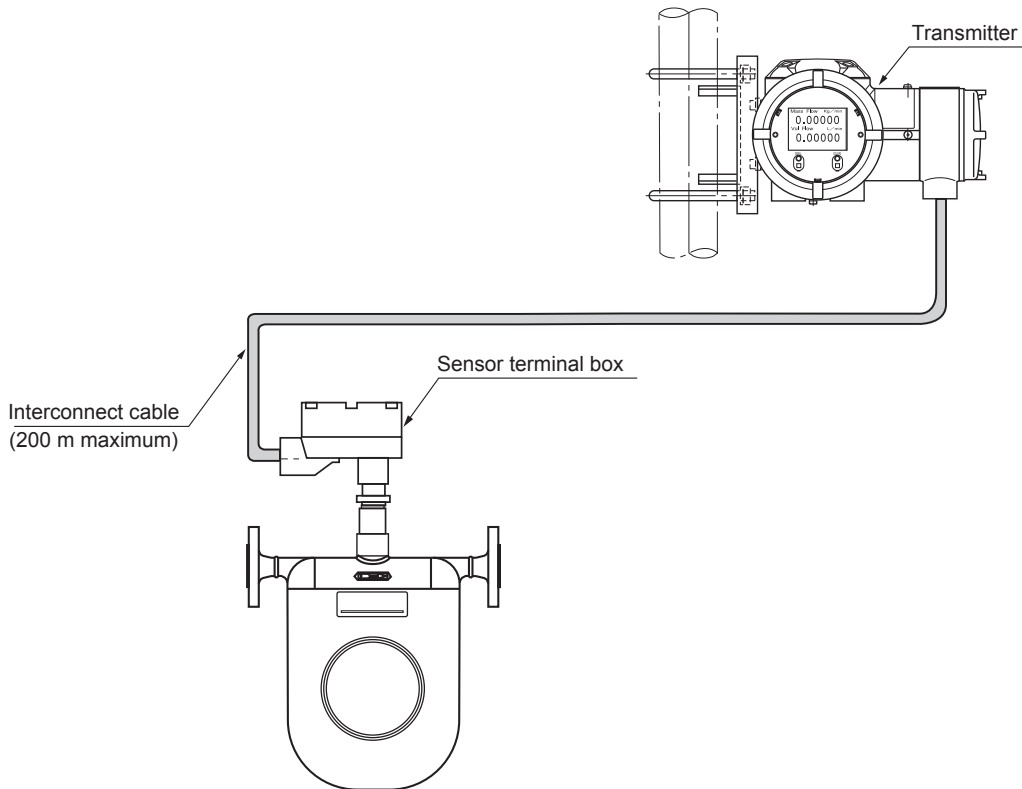


**Transmitter Identification and Description**

Item	Label	Description	Remarks	
Signal	A1 (+)	Analog Output 1 (4 to 20 mA)	Maximum load resistance is 600Ω for Analog Outputs 1 and 2.	
	A1 (-)			
	A2 (+)	Analog Output 2 (4 to 20 mA)		
	A2 (-)			
	P1 (+)	Pulse Output 1 (voltage/open drain)	Maximum pulse output (voltage/open drain) transmission length: • 10 m @ 10 kHz • 100 m @ 1 kHz • 1 m @ 100 Hz Minimum conductor size: 0.75 mm <sup>2</sup>	
	P1 (-)			
	P2 (+)	Pulse Output 2 (voltage/open drain)		
	P2 (-)			
	SI (+)	Status Input (contact)		—
	SI (-)			
	SO (+)	Status Output (open drain)	—	
SO (-)				
I/O (+)	Expanded Input/Output (Modbus communication, etc.)	For Modbus communications: • Maximum transmission length: 1200 m • Minimum conductor size: 0.75 mm <sup>2</sup>		
I/O (-)				
Power	L (+)	Power (with DC power: +)	—	
	GND	Earth Ground		
	N (-)	Power (with DC power: -)		

**WIRING DIAGRAM**

**Wiring between Sensor Unit and Separately-mounted Transmitter**



Use dedicated interconnect cable and prepare shielded wire as follows.

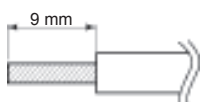
**Transmitter End**

1. Bundle shielded wires colored in brown/red, green/white, blue/grey and purple/yellow/orange and cover the wires with a black tube.
2. Connect only one wire to the terminal box (black), taking care to avoid potential contact with the housing or conductive parts.

**Sensor End**

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

**Recommended Cable End Treatment**

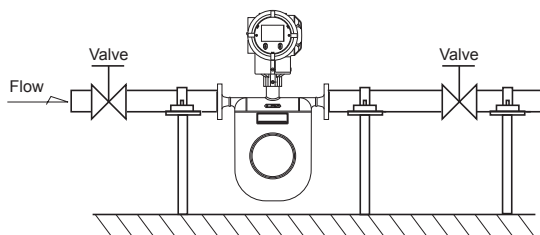


Use of a crimp pin terminal is not necessary.

## INSTALLATION

### Typical Installation

1. Avoid pipeline stresses on the meter.
2. The meter should be supported near each process connection, as shown in the illustration on the right.
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 low point in the piping where slurries may build up.
5. Provide a valve downstream of the meter to allow zeroing by obtaining a true zero flow. We recommend providing another valve upstream of the meter for servicing or maintenance.



### Precautions at Installation

1. Locate the meter at least 1 meter from large transformers, motors, or other sources of electromagnetic induction. Also avoid installation near 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. Explosion-proof models require the temperature to be held below their maximum allowable levels.
3. To ensure consistent volume flow and density measurements, heat retention is suggested.
4. The sensor unit is of gas-tight construction. To prevent dew condensation inside in a low-temperature application, it is filled with argon gas. To avoid damaging the sensor, do not drop the sensor unit or otherwise subject it to impact shocks.
5. In a horizontal run, install the sensor unit with the transmitter up as shown in the typical installation 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 flow meter should be placed in an environment where pipeline oscillation is held below 0.3G.
8. Sudden temperature change may damage the performance of the flow meter. Keep the temperature change of the fluid within ±12°C/minimum for both heating and cooling.

### Prevention of Cavitation (Gas Flash Off)

Cavitation can cause a loss in Coriolis meter measurement accuracy. To prevent cavitation, maintain line pressure upstream and downstream of the meter. Avoid piping arrangements that open the line to the atmosphere immediately downstream of the meter. Particular care must be taken in low pressure applications and with high vapor pressure liquids, such as NGLs (natural gas liquids). It is recommended the back pressure immediately downstream of the meter be kept above the value calculated by the formula below:

$$P_d = 2\Delta P + 1.25P_v$$

where  $P_d$ : Downstream pressure (psia)

$\Delta P$ : Pressure drop across meter (psid)

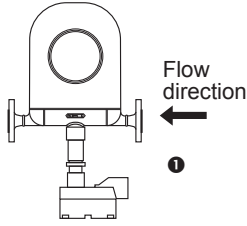
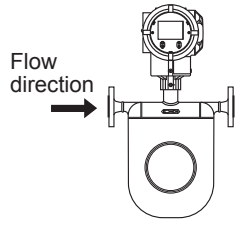
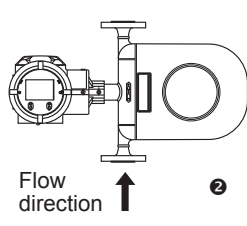
$P_v$ : Vapor pressure of the process fluid (psia)

Calculation based on API Manual of Petroleum Measurement Standards, Chapter 5.6, Section 6.3.2.

### Physical Orientation

#### CC003 through CC250

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

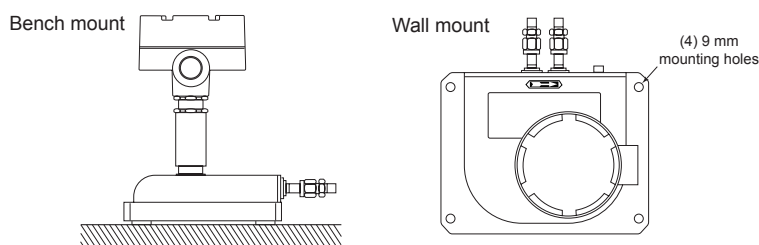
	Horizontal run		Vertical run
	No.1	No.2	No.3
Orientation			
Fluids	<ul style="list-style-type: none"> <li>•Gases</li> <li>•Slurries</li> </ul>	<ul style="list-style-type: none"> <li>•Liquids</li> </ul>	<ul style="list-style-type: none"> <li>•Slurries (requiring cleaning)</li> <li>•Liquids</li> <li>•Gases</li> </ul>

1. For installation orientation in No. 1, Cameron recommends the separately-mounted transmitter. If the integrally-mounted transmitter is preferred, contact Cameron.
2. The measuring tube of the CC003 is in double-loop configuration without self-draining feature.

\* Do not forget to specify the physical orientation when you order.

#### CC00A and CC001

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.)



## EXPLOSION-PROOF SPECIFICATIONS

### CSA

#### Integral Type

- Transmitter symbol: Class I, Zone 1, Ex d ib IIB T4 Gb  
Class I, Zone 1, AEx d ib IIB T4 Gb
- 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 IIB T4 Gb  
Class I, Zone 1, AEx ib IIB T4 Gb
- Sensor to be connected: CC006 through CC250
- Communication: HART, Modbus

#### Separate Type

- Transmitter symbol: Class I, Zone 1, Ex d [ib] IIB T6 Gb  
Class I, Zone 1, AEx d [ib] IIB T6 Gb
- Transmitter ambient temperature: -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, Modbus

#### Meter Combinations

Model	Meter Temperature Category			Transmitter		Hazardous Location Temperature Class			
	Model Code 7	Description	Nominal Media Temp (°C)	Model Code 12	Mounting Type	Model Code 18	Description	Media Temp (°C)	Ambient Temp (°C)
CC00A and CC001	2	Standard B	130° to 200°	2	Separate	3	Class T3	-40° to 150°	-40° to 60°
CC003	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
CC006 through CC015	1	Standard A	-40° to 130°	1	Integral	4	Class T4	-40° to 80°	-40° to 60°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
CC025 through CC080	1	Standard A	-40° to 130°	1	Integral	4	Class T4	-40° to 80°	-40° to 60°
	1	Standard A	-40° to 130°	2	Separate	3	Class T3	-40° to 150°	-40° to 60°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	3	High Temp	200° to 350°	2	Separate	1	Class T1	-20° to 350°	-20° to +50°
CC100 through CC150	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	3	High Temp	Under 350°	2	Separate	1	Class T1	-20° to 350°	-20° to +50°
CC15H through CC250	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°

Temperature Category describes the nominal temperature rating of the meter with no consideration for hazardous area certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

Temperature Class describes "T" codes or temperature limitations that apply if the meter is installed in a hazardous area, per the CSA certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

If a meter will be used in a process with temperature lower than -30°C, Charpy impact testing is required.

### ATEX/IECEx

#### Integral type

- Transmitter ratings: Zones 1 and 2  
II 2G Ex d ib IIC T4 Gb
- Transmitter and sensor ambient temperature: -40°C to 55°C
- Fluid temperature: -40°C to 80°C
- Sensor ratings: Zones 1 and 2  
II 2G Ex ib IIC T4 Gb
- Sensor to be connected: CC006 through CC250
- Communication: HART, Modbus

#### Separate type

- Transmitter rating: II 2G Ex d [ib] IIC T6 Gb
- Transmitter ambient temperature: -40°C to 55°C
- Sensor ratings: II 2G Ex ib IIC T1, T2, T3, T4, T5
- Communication: HART, Modbus

#### Meter combinations

Model	Meter Temperature Category			Transmitter		Hazardous Location Temperature Class			
	Model Code 7	Description	Nominal Media Temp (°C)	Model Code 12	Mounting Type	Model Code 18	Description	Media Temp (°C)	Ambient Temp (°C)
CC00A and CC001	2	Standard B	130° to 200°	2	Separate	3	Class T3	-40° to 150°	-40° to 60°
CC003	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
CC006 through CC015	1	Standard A	-40° to 130°	1	Integral	4	Class T4	-40° to 80°	-40° to 60°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
CC025 through CC080	1	Standard A	-40° to 130°	1	Integral	4	Class T4	-40° to 80°	-40° to 60°
	1	Standard A	-40° to 130°	2	Separate	3	Class T3	-40° to 150°	-40° to 60°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	3	High Temp	200° to 350°	2	Separate	1	Class T1	-20° to 350°	-20° to +50°
CC100 through CC150	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	3	High Temp	Under 350°	2	Separate	1	Class T1	-20° to 350°	-20° to +50°
CC15H through CC250	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°
	2	Standard B	130° to 200°	2	Separate	2	Class T2	-40° to 200°	-40° to 60°
	4	Low Temp	-200° to 50°	2	Separate	5	Class T5	-200° to 50°	-20° to +50°

Temperature Category describes the nominal temperature rating of the meter with no consideration for hazardous area certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

Temperature Class describes "T" codes or temperature limitations that apply if the meter is installed in a hazardous area, per the CSA certification. See [Appendix B: Product Codes and Inquiry Form, page B-1](#) for product code selections.

If a meter will be used in a process with temperature lower than -30°C, Charpy impact testing is required.

# Appendix B: Product Codes and Inquiry Form

## PRODUCT CODE (STANDARD AND LOW-FLOW METERS)

Item	Product Code																		Description	Availability (Y/N)							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		CC00A, CC001	CC003	CC006	CC010, CC015	CC025, CC040, CC050, CC080	CC025, CC040, CC050 (Hi-temp, <662°F)	CC080 (Hi-temp, <662°F)	CC025, CC040, CC050, CC080 (Lo-temp)
Model	C	C																	CamCor CT Series Coriolis Flow Meter								
Connection nominal size (mm) ①	0	0	A																								
	0	0	1																								
	0	0	3																								
	0	0	6																								
	0	1	0																								
	0	1	5																								
	0	2	5																								
	0	4	0																								
	0	5	0																								
0	8	0																									
Fluid category	L																										
	G																										
Temperature category ②	1																										
	2																										
	3																										
	4																										
Pressure category	1																										
	3																										
Wetted materials ⑤	S																										
	H																										
	Z																										
Process connection	A																										
	B																										
	H																										
	J																										
	K																										
	T																										
	P																										
	Q																										
	R																										
	S																										
	Z																										
Transmitter mounting ⑦	1																										
	2																										
Power source	1																										
	2																										
Analog output ⑧ ⑨	A																										
	B																										
	C																										
	D																										
	E																										
	F																										
	G																										
	H																										
	J																										
	K																										
	Pulse output ⑧ ⑨	A																									
B																											
C																											
D																											
E																											
F																											
G																											
H																											
J																											
K																											
Pulse output type	1																										
	2																										
Communication interface	1																										
	4																										
Explosion-proof rating	2																										
	4																										
Explosion-proof temperature class ②	1																										
	2																										
	3																										
	4																										
	5																										

- Other connections available for Models CC003 through CC080
- Explosion-proof specification has restrictions on temperature class. Refer to [Explosion-proof Specifications, page 22](#) and [page A-22](#) for details.
- If "High-pressure Service" is selected, "Threaded" is the only valid process connection.
- If wetted material "H" is selected for Model CC006, the unit will be provided with a "floating" flange connection.
- Material code H (Alloy C22) available only on models C003 thru CC080.
- ASME Class 900 flanges require Alloy C22 sensor material; therefore, wetted material "H" must be selected.
- If fluid temperature exceeds 176°F (80°C), a separately-mounted transmitter must be selected. Sensor-to-transmitter cable is ordered separately – see page B3.
- If "Volume flow (fixed density)" is selected for analog outputs and/or pulse outputs, the volume rate calculation will be based on the fixed (not live) density value.
- "Volume flow (fixed density)" and "Volume flow (live density)" cannot be used simultaneously for analog outputs and/or pulse outputs. User must choose one or the other.



**PRODUCT CODE (HIGH-FLOW METERS)**

Item	Sensor Product Code																		Description	Availability (Y/N)		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		CC100, CC150, CC200, CC250	CC100, CC150 (High-temperature, <662°F)	CC150, CC15H, CC200, CC250 (Low-temperature)
<b>Model</b>	C C																		CamCor CT Series Coriolis Flow Meter			
<b>Connection nominal size (mm)</b>	1	0	0																100 mm sensor; 4" flange	CC100, CC150, CC200, CC250	CC100, CC150 (High-temperature, <662°F)	CC150, CC15H, CC200, CC250 (Low-temperature)
	1	5	0																150 mm sensor; 6" flange			
	1	5	H																200 mm sensor; 6" flange			
	2	0	0																200 mm sensor; 8" flange			
	2	0	H																250 mm sensor; 8" flange			
	2	5	0																250 mm sensor; 10" flange			
<b>Fluid category</b>	L																	Liquid service	Y	Y	Y	
<b>Temperature category ①</b>	2																	Standard B (media under 392°F/200°C)	Y	N	N	
	3																	High-temperature (media under 662°F/350°C)	N	Y	N	
	4																	Low-temperature (media -328°F/-200°C to 50°C)	N	N	Y	
<b>Pressure category</b>	1																	Standard	Y	Y	Y	
<b>Wetted materials</b>	S																	SUS316L	Y	Y	Y	
<b>Process connection</b>	H																	ASME 150	Y	Y	Y	
	J																	ASME 300	Y	Y	Y	
	K																	ASME 600 ②	Y	Y	Y	
	P																	DIN PN10	Y	Y	Y	
	Q																	DIN PN16	Y	Y	Y	
	R																	DIN PN25	Y	Y	Y	
	S																	DIN PN40	Y	Y	Y	
	Z																	Other than above	Y	Y	Y	
<b>Transmitter mount ③</b>	1																	Integrally-mounted	Y	N	N	
	2																	Separately-mounted	Y	Y	Y	
<b>Power source</b>	1																	20 to 30 VDC				
	2																	85 to 264 VAC, 50/60 Hz (Safety rated 100 to 240 VAC)				
<b>Analog output ④ ⑤</b>	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 (live density)			
	E																	Output 1: Mass flow	Output 2: Volume flow (fixed density)			
	F																	Output 1: Density	Output 2: Temperature			
	G																	Output 1: Volume flow (live density)	Output 2: Density (live density)			
	H																	Output 1: Volume flow (fixed density)	Output 2: Density			
	J																	Output 1: Volume flow (live density)	Output 2: Temperature			
	K																	Output 1: Volume flow (fixed density)	Output 2: Temperature			
	<b>Pulse output ④ ⑤</b>	A																	Output 1: Mass flow	None		Single pulse
B																	Output 1: Volume flow (live density)	None				
C																	Output 1: Volume flow (fixed density)	None				
D																	Output 1: Mass flow	Output 2: Mass flow		Dual pulse		
E																	Output 1: Mass flow	Output 2: Volume flow (live density)				
F																	Output 1: Mass flow	Output 2: Volume flow (fixed density)				
G																	Output 1: Volume flow (live density)	Output 2: Volume flow (live density)				
H																	Output 1: Volume flow (fixed density)	Output 2: Volume flow (fixed density)				
J																	Output 1: Volume flow (live density)	Output 2: Mass flow				
K																	Output 1: Volume flow (fixed density)	Output 2: Mass flow				
<b>Pulse output type</b>	1																	Open collector pulse				
	2																	Voltage pulse				
<b>Communication interface</b>	1																	HART communication (Hybrid Bell 202)				
	4																	Modbus communication (RS-485) and HART communication (Hybrid Bell 202)				
<b>Explosion-proof rating</b>	2																	ATEX, IECEx				
	4																	CSA				
<b>Explosion-proof temperature class ①</b>	1			Sensor: T1 (separate transmitter only, high-temperature models CC025 through CC150 only)																		
	2			Sensor: T2 (separate transmitter only, models CC003 through CC250 only)																		
	3			Sensor: T3 (separate transmitter only, Models CC00A through CC080)																		
	4			Sensor: T4 (integral transmitter, not available for models CC006 through CC080)																		
	5			Sensor: T5 (separate transmitter only, low-temperature models CC025 through CC250 only)																		

1. Explosion-proof specification has restrictions on temperature class. Refer to [Explosion-proof Specifications, page 22](#) and [page A-22](#) for details.
2. ASME class 600 is not available on models CC20H or CC250.
3. If fluid temperature exceeds 176°F (80°C), a separately-mounted transmitter must be selected. Sensor-to-transmitter cable is ordered separately – see [page B-3](#).
4. If "Volume flow (fixed density)" is selected for analog outputs and/or pulse outputs, the volume rate calculation will be based on the fixed (not live) density value.
5. "Volume flow (fixed density)" and "Volume flow (live density)" cannot be used simultaneously for analog outputs and/or pulse outputs. User must choose one or the other.

**PRODUCT CODE (TRANSMITTER)**

Item		Transmitter Product Code					
		1	2	3	4	5	6
<b>Model</b>	PA0K						Transmitter
<b>Mounting</b>		1					Integral
		2					Separate
<b>Input power</b>		1					20 to 30 VDC
		2					100 to 240 VAC
<b>Pulse output</b>		1					Open Collector Pulse
		2					Voltage Pulse
<b>Communication interface</b>					1		HART
					4		HART/Modbus
<b>Hazardous location</b>						2	CSA
						4	ATEX, IECEx

**Interconnect Cable**  
(for separately -mounted transmitter)

The interconnect cable (9-core with PVC coating) is sold as a separate line item:  
Part No. CBP2-XXX where XXX is meter length\*

Minimum meter length: 10 meters  
Available in 5 meter increments thereafter; maximum 200 m

\* For example, product code CBP2-010 is for an interconnect cable 10 meters long.

**PRODUCT INQUIRY FORM**

**PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE**

Complete the following form (to the extent possible) by filling in the blanks and checking the applicable boxes. Additional information will be provided during your personal consultation.

<b>1. Model code</b>	CC _____	
<b>2. Process fluid ①</b>	Name: _____ Density: _____ Viscosity: _____	
<b>3. Flow range</b>	Maximum _____ Normal _____ Minimum _____	Unit _____ (lbm/hr, bbl/hr, etc.)
<b>4. Fluid temperature</b>	Maximum _____ Normal _____ Minimum _____	Unit _____ (*F or °C)
<b>5. Operating pressure</b>	Maximum _____ Normal _____ Minimum _____	Unit _____ (psi, barg, kPa, kg/cm2)
<b>6. Ambient temperature</b>	Maximum _____ Normal _____ Minimum _____	Unit _____ (*F or °C)
<b>7. Fluid flow direction</b>	<input type="checkbox"/> Left to Right <input type="checkbox"/> Right to Left <input type="checkbox"/> Bottom to Top <input type="checkbox"/> Top to Bottom (Orientation: See <a href="#">page 21</a> )	
<b>8. Nominal size</b>	_____ in. or _____ mm	
<b>9. Required accuracy</b>	± _____% of reading    ± _____% of full scale	
<b>10. Process connection</b>	<input type="checkbox"/> Flange type/rating _____ <input type="checkbox"/> Threaded <input type="checkbox"/> Ferrule	
<b>11. Explosion-proof</b>	<input type="checkbox"/> CSA <input type="checkbox"/> ATEX <input type="checkbox"/> IECEx <input type="checkbox"/> Not required	
<b>12. Power supply</b>	<input type="checkbox"/> AC <input type="checkbox"/> DC                    _____ Volts	
<b>13. Output specifications</b>	Pulse output	Output Form: <input type="checkbox"/> Active voltage <input type="checkbox"/> Open collector
		Output 1: <input type="checkbox"/> Mass rate <input type="checkbox"/> Volume rate
		Output 2: <input type="checkbox"/> Mass rate <input type="checkbox"/> Volume rate
	Analog output	Output 1: _____ Pulses per _____
		Output 2: _____ Pulses per _____
Flow damping	_____ seconds (selectable from 0 to 200 seconds; default is 0.8 seconds)	
Slug flow alarm output	Low = _____ (g/ml, SG, lbm/ft3, etc.) Default is 0.3 g/ml. High = _____ (g/ml, SG, lbm/ft3, etc.) Default is 2.0 g/ml.	
<b>14. Communication protocol</b>	<input type="checkbox"/> HART <input type="checkbox"/> Modbus (Slave Address: _____)	
<b>15. Transmission length</b>	Distance from sensor to transmitter (if remote mounted) _____ Unit _____ (ft or m)	
	Distance from transmitter to receiving device _____ Unit _____ (ft or m)	
<b>16. Receiving device</b>	<input type="checkbox"/> Totalizer <input type="checkbox"/> Indicator <input type="checkbox"/> Recorder <input type="checkbox"/> Flow controller <input type="checkbox"/> Batch controller <input type="checkbox"/> Density computer <input type="checkbox"/> Computer <input type="checkbox"/> Other _____	
<b>17. Interconnect cable length</b>	For separately-mounted transmitter: CBP2- _____ m (Minimum: 10 m; Maximum 200 m)	
<b>18. Remote mount bracket</b>	<input type="checkbox"/> Remote mount bracket for wall mount or 2" pipe mount (for remote mount transmitters only)	
<b>19. Number of units required</b>		
<b>20. Application</b>		
<b>21. Other considerations</b>		

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

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