

General Specifications

ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 400 mm (1 to 16 in.)]



GS 01E24A01-01EN

■ GENERAL DESCRIPTION

The ADMAG TI (Total Insight) series AXW magnetic flowmeter is a high-quality and highly reliable product developed based on years of experience and achievement, such as enhancement of application by our proprietary dual frequency excitation method.

The AXW magnetic flowmeter is ideal for general industrial process lines and water supply / sewage applications. With outstanding reliability and ease of operation and maintenance, developed on decades of field-proven experience, the AXW will increase user benefits while reducing total cost of ownership.

The sizes are available from 25 to 1800 mm (1 to 72 in.). Besides fluorocarbon PTFE, lining can be selected from various rubber linings. Process connection also supports various specifications such as ASME, EN, AS, and JIS.

Note: For sizes from 500 to 1800 mm (20 to 72 in.), read general specifications (GS 01E25D11-01EN).
For AXFA11G remote transmitter, read general specifications (GS 01E20C01-01E).



Integral Flowmeter

Remote Transmitter



Remote Sensor

■ FEATURES

●Stable Measurement

Our own dual frequency excitation method realizes stable flow measurement even under high flow noise in the fluid with or highly concentrated slurry.

●Multiple Inputs and Outputs

Maximum four inputs/outputs of current, pulse, and status signals can be selected.

●Improved Operation and Monitoring Function

Operation authority level setting for ensuring safety, process data trend display, display backlight flashing (Squawk) function, and data store / restore function with display unit internal memory or microSD card are available.

●Improved Maintainability

Diagnostic functions that contribute to preventive maintenance of the plant are installed. Diagnosis of the device (verification function) that can be executed without demounting from piping, electrode adhesion diagnosis, and wiring connection diagnosis are available.

●Communication Protocol

HART7, BRAIN, Modbus

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■ GENERAL

Measuring Principal:

By applying the occurrence of electromotive force proportional to the flow velocity when fluid moves in the magnetic field, the flowmeter can measure the flow velocity of conductive liquid. It calculates the instantaneous flow rate, integrated flow rate, etc. from the measured flow velocity.

System Configuration:

The flowmeter consists of a sensor that detects the flow velocity and a transmitter that amplifies, and converts the signal.

Structurally, there is an integral type (integrated structure of a sensor and a transmitter), and remote type (separated structure of a sensor and a transmitter).

In the remote type, the signal cable for the flow signal and the excitation cable for the coil excitation are added to the constituent elements.

Main Element of Sensor:

Wetted Part:

Lining, Electrodes, Grounding Devices (*1),
Adapters for hygienic.

*1: grounding ring plate

Note: Grounding devices are for taking the reference electric potential from the process fluid in measuring the electromotive force, and are fixed at two locations, upstream and downstream of the flow. They are unnecessary when the reference potential is taken from customer piping. For details of grounding, read "Cautions on Selection and Installation".

Non-wetted Part:

Flanges, Housing, Excitation coil, Measuring pipe

Main Element of Transmitter:

Display unit, Setting keys, Amplifier unit (including I/Os and power supply unit)

■ CONSTRUCTION

Use:

Use	Specification
General-purpose	Non explosion protection for the use in non-hazardous area. Applicable to Integral Flowmeter, Remote Sensor, or Remote Transmitter. IP Protection Grade: IP66/67, Type 4X (CSA)
Submersible	Temporary submersion is possible. Applicable to Remote Sensor only. Note: Urethane resin potting is applied in the terminal box of a remote sensor. Signal and excitation cables (when optional code L### is not selected, cable length is each 30 m) are pre-wired and waterproof glands with union joints are attached at factory. Performance: Conforms to continuous immersion under the following test condition. Test Condition: 50 m below the surface of the water, equivalent to 0.5 MPa hydraulic pressure, for one month. In case of bad condition such as sewage and seawater, this does not apply. Also, waterproof and protect the cable separately by conduit piping, etc.
Explosion Protection	Explosion protection for the use in hazardous area. Applicable to Integral Flowmeter, Remote Sensor, or Remote Transmitter. IP Protection Grade: Read "Explosion Protection".

Construction:

Integral Type:

A flowmeter in integrated structure of a sensor and a transmitter.

Remote Type:

A flowmeter in separated structure of a sensor and a transmitter, which are connected by a signal cable and an excitation cable. The excitation cable is to be supplied by customer except for submersible.

Combined Transmitter (*1) (*2) (*3):

Remote Sensor Size	Remote Transmitter
25 to 400 mm (1 to 16 in.)	AXW4A, AXFA11G

*1: When changing the combination transmitter, readjustment of the meter factor by actual flow calibration is necessary to ensure accuracy.

*2: For AXFA11G remote transmitter, read general specifications (GS 01E20C01-01E).

*3: When selecting the optional code /E21 with the AXW4A remote transmitter, select either general-purpose or explosion protection for both of the AXW remote sensor and the AXW4A remote transmitter.

Maximum Cable Length:

100 m (328 ft) for AXW4A remote transmitter

200 m (656 ft) for AXFA11G remote transmitter

Process Connection:

Available process connections are wafer and flange type. For the linings and size ranges that can be combined with these connections, read "MODEL AND SUFFIX CODE".

Wafer:

ASME Class 150, Class 300
EN PN10, PN16, PN40
JIS F12, 10K, 20K

Flange:

ASME Class 150, Class 300
EN PN10, PN16, PN40
JIS F12, 10K, 20K

Wetted Part:**Lining Material:**

Fluorocarbon PTFE
Polyurethane rubber
Natural hard rubber (with ethylene propylene diene rubber EPDM for sealing)
Natural soft rubber

Electrode Material:

Stainless steel 316L, Nickel alloy (*)

* : ASTM B574 UNS N10276 or ASME SB-574 UNS N10276

Electrode Construction:

PTFE Lining: Internal insertion type
Polyurethane Rubber Lining: External insertion type
Natural Hard Rubber Lining: Internal insertion type
Natural Soft Rubber Lining: Internal insertion type

Grounding Device Material:

Grounding Ring Plate:

Stainless steel 316L, Nickel alloy (*)

* : ASTM B575 UNS N10276 or ASME SB-575 UNS N10276

Grounding Device Construction:

Grounding Ring Plate:

Ring flat plate, with mounting bracket (*)

* : Grounding ring plates (type N, type J) for flange type sizes 150 to 400 mm (6 to 16 in.) with the lining code F (PTFE) and H (natural hard rubber) have a handle. Hook the pin attached to the handle on the outer circumference of the flange and install it between the flowmeter and piping.

Gasket Material:

The following is a description of the material of gaskets, which are supplied with flowmeter, to be used between the sensor pipe and grounding rings, or the installed pipe flanges. This includes if the gaskets are necessary or not, or if some gaskets should be supplied by customer.

For details of gaskets, read "Cautions on Selection and Installation" for recommended gaskets and "Optional Code".

PTFE Lining:

Standard:

Not necessary for sizes 125 mm (5 in.) or below or, should be supplied by customer. Necessary for sizes 150 mm (6 in.) and above and should be supplied by customer. For metal piping, PTFE-sheathed gasket is recommended.

Optional (for plastic piping):

GA: Fluororubber
GC: Acid-resistant fluororubber
GD: Alkali-resistant fluororubber

Natural Hard Rubber Lining:

Supplied by customer. PTFE-sheathed non-asbestos joint sheet or non-asbestos joint sheet is recommended.

Natural Soft Rubber Lining:

None (not necessary), or supplied by customer.

Polyurethane Rubber Lining:

None (not necessary), or supplied by customer.

Installed Pipe:

Standard:

None (supplied by customer)

Optional (for wafer type, with bolts, nuts, and gaskets):

BSC: Chloroprene rubber (CR)

BSF: PTFE-sheathed non-asbestos joint sheet

Non-wetted Part Material:

Sensor Terminal Box:

Low copper aluminum alloy EN AC-43400

Transmitter Housing:

Low copper aluminum alloy EN AC-43400

Sensor Housing:

Size	Material
25 to 125 mm (1 to 5 in.)	Stainless steel 304
150 to 400 mm (6 to 16 in.)	Carbon steel SPCC (*1) or its equivalent

*1: JIS standard or JIS standard-based material

Mini-flange (subject to pressure in wafer type):

Size	Material
150 to 200 mm (6 to 8 in.)	Carbon steel A105 (*2)

Note: In the wafer type other than the above, there is no mini flange because the measuring pipe and the connecting part have a one-piece casting structure.

Flange:

Process Connection Code	Material
B##	Stainless steel F304
C##	Carbon steel A105 (*2)

*2: ASTM standard forged material

Measuring Pipe:

Size	Material
25 to 125 mm (1 to 5 in.)	Stainless steel CF8 (*3)
150 to 400 mm (6 to 16 in.)	Stainless steel 304

*3: ASME standard casting material

Coating:General-purpose, and Explosion Protection (Integral Flowmeter, Remote Sensor and Transmitter):

Standard Coating:

Coated Part	Coating Specification
Sensor housing	Polyurethane resin solvent coating, or no coating (*1)
Sensor flanges (for flange type)	
Sensor terminal box (for remote type, incl. cover)	Urethane curing type polyester resin powder coating
Transmitter housing (incl. cover)	

Rugged Coating (*2):

Coated Part	Coating Specification
Sensor housing	Epoxy and polyurethane resin solvent coating, or no coating (*1)
Sensor flanges (for flange type)	
Sensor terminal box (for remote type, incl. cover)	Epoxy and polyurethane resin solvent coating
Transmitter housing (incl. cover)	

Submersible (Remote Sensor):

Standard Coating:

Coated Part	Coating Specification
Sensor housing	Non-tar epoxy resin solvent coating
Sensor flanges	
Sensor terminal box (incl. cover)	

- *1: No coating for General-purpose and Explosion Protection with stainless steel flanges in sizes 25 to 125 mm (1 to 5 in.). Coating is done for sizes 150 mm (6 in.) and more, or for carbon steel flanges.
- *2: Rugged coating is for applications which need salt tolerance resistance, alkali resistance, acid resistance, and/or weather resistance. Epoxy resin undercoating twice and polyurethane resin overcoating once are performed to the same area as standard coating.

Coating Color:

General-purpose, and Explosion Protection:

Mint green (Munsell 5.6BG3.3/2.9 equivalent)

Submersible:

Black

Cable Entry:

JIS G1/2 female

ASME 1/2 NPT female

ISO M20 x 1.5 female

Cable Entry Direction:

For Integral Flowmeter and Remote Sensor, the cable entry direction can be specified from +90, +180, or -90 degree rotation when optional code RH is ordering, and also can be changed by customer after delivery. However, it can not be changed after delivery when Submersible, or district heating and cooling / condensation-proof use (optional code DHC) is selected.

Wiring Terminal:

Intra-system Connection Part (*1): M4 Screw type

Extra-system Connection Part (*2):

M4 Screw or Clamp type

*1: Connections between Remote Sensor and Remote Transmitter for flow signal and excitation current.

*2: Connections at Integral Flowmeter and Remote Transmitter for input/output signals and power supply.

Mounting:

Remote Transmitter: 2-inch pipe mounting

Grounding:

Grounding Resistance: 10 Ω or less

Note: When the built-in lightning protector as standard is not required, grounding resistance 100 Ω or less can be applied.

For grounding of explosion protection, appropriate construction is required according to the regulations of each country.

■ FUNCTIONS

Note: For AXFA11G remote transmitter, read general specifications (GS 01E20C01-01E).

Display and Setting:

Parameter setting is possible through LCD with three infrared switches without opening the cover of the display.

Note: Parameter setting by setting tool such as HHT (handheld terminal) and FieldMate (device adjustment / management software) is also possible.

Display:

Full dot matrix LCD, 64 × 128 dots, with backlight, dot reversal display available

Display Language (*):

Display Code 1:

English, French, German, Italian, Spanish, Portuguese, Russian and Japanese. The display languages are selectable and can be changed by customer.

Display Code 2:

English and Chinese. The display languages are selectable and can be changed by customer.

*: The setting is English when shipped from factory.

Display Screen Configuration:

Display Screen Item:

Status display (icon), Time (necessary to set the time at power-on), Data display (max. four lines), Infrared switch operation status

Flow Rate Screen:

Measured Data Screen or Online Trend Screen is available. Update period selectable from 0.2, 0.4, 1, 2, 4, and 8 seconds.

Measured Data Screen:

Display up to 4 data points simultaneously with numbers, bar graphs, icons, or character strings. Specify up to 8 points of data and change display data with infrared switches or automatic scroll function (scroll period 2, 4, or 8 seconds).

Selectable Data in Measured Data Screen:

Flow rate (%), Flow velocity, Volume flow rate, Mass flow rate, Totalizer 1, Totalizer 2, Totalizer 3, Adhesion level, Current output 1, Tag number, Communication protocol

Online Trend Screen:

Display one data as a trend graph. The display data can be changed with infrared switches or automatic scroll function (scroll period 2, 4, or 8 seconds) selecting up to four data.

Selectable Data in Online Trend Screen:

Flow rate (%), Flow velocity, Volume flow rate, Mass flow rate, Totalizer 1, Totalizer 2, Totalizer 3, Current output 1

Alarm Screen:

When an alarm occurs, the flow rate screen and the alarm screen are alternately displayed in the cycle (2, 4, or 8 seconds) linked with the flow rate screen update cycle. Select simple screen (single line display) or detail screen (with alarm countermeasure display).

NAMUR NE 107 Alarm Display Function:

Based on NAMUR NE 107, alarms are classified and displayed as follows. It can also be set to hide.

F: Failure
C: Function Check
S: Out of Specification
M: Maintenance Required

Offline Trend Screen (when microSD card (optional code MC) is selected):

Data stored by the data logging function can be displayed on the trend screen. The selectable data is the same as that for the Online Trend Screen.

Display Backlight Flashing (Squawk) Function:

Display backlight can be set to flash once or continuously at 4-second cycle to identify the device.

Display Operation Authority:

Display operation authority level against the parameters can be controlled by selecting from operator, maintenance, or specialist by passcode.

Operator:

Only parameters related to display setting can be set.

Maintenance:

Only parameters related to display setting and zero adjustment can be set.

Specialist:

All parameters can be set.

Communication Function:

BRAIN Communication:

Communication Signal:

Superimposed on the Current Output 1

Communication Line Condition:

Load Resistance:

250 to 450 Ω (including cable resistance)

Load Capacitance: 0.22 μF or less

Load Inductance: 3.3 mH or less

Input Impedance of Communicating Device:

10 kΩ or more (at 2.4 kHz)

Communication Distance:

Up to 1.5 km (0.93 miles), when polyethylene insulated PVC-sheathed cables (CEV cables) are used. Communication distance varies depending on the type of cable and wiring used.

Distance from Power Line:

15 cm (6 in.) or more. (Parallel wiring should be avoided)

HART Communication:

Protocol Version: HART 7

Communication Signal:

Superimposed on the Current Output 1

Communication Line Condition:

Load Resistance:

230 to 600 Ω (including cable resistance)

Modbus Communication:

Communication protocol:

2-wire half duplex RS-485 Modbus

Flow control: None

Baud rate [bps]: 1200, 2400, 4800, 9600, 19200*, 38400, 57600, 115200

Start bit: 1 bit (Fixed)

Stop bit: 1 bit*, 2 bits

Parity bit: Odd, Even*, None

Transfer mode:

RTU (Remote Terminal Unit)

ASCII

Data length: 8 bits

LSB (Least Significant Bit sent first)

Slave address: 1* to 247

Support function: See IM 01E21A02-05EN (Modbus communication type).

Bus termination:

Standard RS-485 bus termination
ON (bus end), OFF* (not bus end)

*: Factory default setting

Modbus cable:

3-Wire cable (twisted pair (D0, D1) and Common) with shield should be used. Wire gauge should be AWG24 or wider.
The characteristic impedance of the cable higher than 100ohm may be preferred.

Line Termination:

Modbus cable requires Line Termination at each of the two ends of the bus to minimize the reflections. For details, please refer to "Modbus over serial line specification and implementation guide V1.02".

Input/Output Function:**Input/Output Signal:**

Input/Output up to four points can be selected from type A, E, G, 0, 6 in the table.

Input/Output (HART communication, BRAIN communication)

Type	Input/Output Signal				Communication and I/O Code	
	I/O1 Terminal	I/O2 Terminal	I/O3 Terminal	I/O4 Terminal	BRAIN	HART 7
Type A	Current Output 1 (Active)	Pulse/Status Output 1 (Passive)	None	None	DA	JA
Type E			Status Input (No-voltage)	Pulse/Status Output 2 (Passive)	DE	JE
Type G			Status Input (No-voltage)	Pulse/Status Output 2 (Active, without internal resistor)	DG	JG

Note: "Active" means no external power supply, "Passive" means external power supply is required.

Input/Output (Modbus communication)

Type	Input/Output Signal						Communication and I/O Code
	I/O1 Terminal	I/O2 Terminal	I/O3 Terminal		I/O4 Terminal		
			I/O3+	I/O3-	I/O4+	I/O4-	
Type 0	None	Pulse/Status Output (Passive)	—	Modbus C(Common)	Modbus B(D1)	Modbus A(D0)	M0
Type 6	Current Output 2 (Active)						M6

Note: "Active" means no external power supply, "Passive" means external power supply is required.

Input Signal

- **Status Input (Dry contact) (Type E, G)**

Load Resistance:

200 Ω or less (ON), 100 kΩ or more (OFF)

Output Signal

- **Current Output (Active) (Type A, E, G, 6)**

4 to 20 mA DC signal

Load Resistance:

750 Ω maximum, including cable resistance

- **Pulse/Status Output (Passive) (Type A, E, G, 0, 6)**

Transistor contact output (open collector)

Contact Capacity: 30 V DC (OFF), 200 mA (ON)

Pulse Rate:

0.0001 to 10000 pps (pulse per second)

Pulse Width:

0.05, 0.1, 0.5, 1, 20, 33, 50, 100, 200, 330, 500, 1000, or 2000 ms configurable

Frequency Output Range: 1 to 12500 Hz

- **Pulse/Status Output (Active)**

- **Without Internal Resistor (Type G)**

- Driving Electronic Counter

Load Resistance: 1 kΩ or more,

Internal Power Supply: 24 V DC ±20 %

Pulse Rate:

0.0001 to 10000 pps (pulse per second)

Pulse Width:

0.05, 0.1, 0.5, 1, 20, 33, 50, 100, 200, 330, 500, 1000, or 2000 ms configurable

Frequency Output Range: 1 to 12500 Hz

- Driving Electromechanical Counter

Maximum Current: 150 mA,

Internal Power Supply: 24 VDC ±20 %

Pulse Rate: 0.0001 to 2 pps (pulse per second)

Pulse Width: 20, 33, 50, or 100 ms configurable

- **Digital communication (RS485 Modbus protocol) (Type 0, 6)**

2-wire half duplex RS-485 Modbus

Flow Calculation Function:Excitation Method:

Dual Frequency Excitation

Span Setting:

Span flow can be set in units such as volume flow rate, mass flow rate, time, or flow rate value. The velocity unit can also be set.

Volume Flow Rate Unit:

kcf, cf, mcf, Mgal (US), kgal (US), gal (US), mgal (US), kbbbl (US)*, bbl (US)*, mbbl (US)*, μ bbl (US)*, MI (megaliter), m³, kl (kiloliter), l (liter), cm³

*: "US Oil" or "US Beer" can be selected.

Mass Flow Rate Unit:

klb (US), lb (US), t (ton), kg, g

Velocity Unit: ft, m (meter)Time Unit: s (sec), min, h (hour), d (day)Mass Flow Rate Processing:

The mass flow rate V_m is obtained in the following expression.

$$V_m = V_f \times \rho$$

V_m : Mass flow rate [kg/s]

V_f : Volume flow rate [m³/s]

ρ : Density [kg/m³]

Damping Function (63% response):

Can be set for each measurement value of flow velocity, volume flow rate, and mass flow rate.

Output Damping:

For each measured value, the time constant for instantaneous value output and the time constant for totalization / pulse output can be individually set. Time constant 0.1 to 200.0 seconds (shipped with 3.0 seconds). In the case of piston pump etc., it is possible to measure pulsatile flow up to 1 Hz with output damping 0.1 sec. However, note that decreasing damping time generally increases output fluctuation.

Display Damping:

A common time constant can be set for each screen display value of each measurement value. Time constant 0.0 to 200.0 seconds (shipped with 0.0 seconds).

Current Output:

Current signal (4 to 20 mA DC) proportional to instantaneous flow rate is outputted.

Pulse Output:

The totalized value of the flow rate is converted into the number of pulses converted by the pulse rate, and is outputted.

Frequency Output:

Frequency signal (Duty 50%) proportional to the instantaneous value of the flow rate is outputted. Output terminal is shared with pulse output.

Totalization Function:

Three independent totalizers can be allocated independently, including the start and stop of integration, for each measured value of volume flow rate, and mass flow rate.

Totalization Type:

Forward / reverse difference flow totalization, Absolute value totalization, Forward direction totalization, Reverse direction totalization

Totalization Display:

Select from actual flow rate display or count value display scaled by counter conversion rate.

Low-cut Function:

Cut below the set actual flow rate value for each flow rate of current output, pulse output, and frequency output (*). It is independent for current output, common for pulse output and frequency output. Low-cut function is not applied for display of process value on display.

*: When "Forward and Reverse Flow Measurement" or "Absolute Range" is used, cut below the set actual flow rate value against the absolute value of the measured value.

Output Processing Function:Multi-range:

Flow range can be switched to two ranges by status input or automatic switching. By status output, it is possible to identify in what range the measurement is being measured, and the status is also displayed on the display.

Forward and Reverse Flow Measurement:

Flow rate measurement in both forward and reverse directions is possible. By status output, it is possible to identify in which direction the measurement is being performed, and the status is also displayed on the display.

Absolute Range:

With 12 mA as flow rate zero, measurements in the forward (12 to 20 mA) and reverse (4 to 12 mA) directions are possible in a single range.

Totalization Switch:

Status signal is outputted when the totalized value becomes equal to or larger than the set value.

Preset Totalization:

By parameter setting or status input, the totalized value is preset to zero or a set value.

0% Signal Lock:

With status input, the current output is forcibly fixed to 0%. Instantaneous flow rate display, pulse output, and flow rate totalization continue.

Alarm Function:Alarm Configuration:

Alarms are classified into system alarm (device failure), process alarm, setting alarm, and warning. Alarm output availability can be selected for each item.

Current Output at Alarm Occurrence:

The current output at alarm occurrence is arbitrarily selected from 2.4 mA or less, 3.8 mA fixed, 4 mA fixed, 20.5 mA fixed, 21.6 mA or more, measured value, or HOLD.

Alarm Countermeasure Indication:

A specific countermeasure method can be displayed on the display when an alarm occurs.

Alarm Type:System Alarm:

CPU failure, A/D converter failure, Sensor coil circuit break (open), Sensor coil short circuit

Process Alarm:

Input signal error (signal overflow), Sensor empty pipe, Electrode adhesion (of insulator)

Setting Alarm:

Detect inconsistency in parameter setting

Warning:

Warning in a state where measurement can be continued

Alarm History: Keep history of up to four alarms.

Verification Function:

Function to diagnose the soundness of the device itself. Diagnose the magnetic circuit, excitation circuit, arithmetic processing circuit, etc. offline (i.e. flow measurement function stopped) and display the result without demounting the device from piping.

Data Management Function:Store / Restore Function of Parameters:

Main parameters can be stored and restored using nonvolatile memory of display unit or optional microSD card. The restore can also be used for copying parameters to another device (except for parameters under unmatched specification for the devices).

Data Logging Function (when microSD card (optional code MC) is selected):

It is possible to log up to four process data at the same time. In addition to displaying the logged results on the trend screen, it is also possible to connect the microSD card to a PC and retrieve the data.

Logging Cycle:

1 second, 10 seconds, 30 seconds, 1 minute, 5 minutes, 30 minutes, 1 hour

Logging Time:

10 minutes, 30 minutes, 1 hour, 3 hours, 12 hours, 24 hours, 72 hours, 240 hours

Logging Data:

Flow velocity, Volume flow rate, Mass flow rate, Adhesion resistance

Data Security During Power Failure:

Protection of data, such as parameters and integrated values, by nonvolatile memory at power failure.

Factory Default Parameter Restore:

It is possible to restore the parameters to the values that were set at the time of factory shipment.

Lightning Protection:

Built-in lightning protector for excitation(*), signal common(*), input / output terminals, and power supply terminal.

Test Standard: IEC61000-4-5

Test Method:

Series mode 1 kV / Common mode 2 kV
Surge waveform 8/20 μ S

*: Integral Flowmeter is excluded.

■ CONFORMITY STANDARDS**Safety Requirements:**

EN61010-1
EN61010-2-030
CAN/CSA-C22.2 No.61010-1-12
CAN/CSA-C22.2 No.61010-2-30-12
CAN/CSA-C22.2 No.94.2-07
UL 61010-1 (3rd Edition)
UL 61010-2-030 (1st Edition)
UL 50E
IEC 60529
Altitude at Installation Site:
Max. 2000 m above sea level
Installation Category (Overvoltage category): II
Micro Pollution Degree: 2
Macro Pollution Degree: 4
Protection Degree: IP66/67, Type 4X (CSA)

EMC:

EN61326-1 Class A, Table 2
EN61326-2-3
EN61000-3-2 Class A
EN61000-3-3

CE marking (optional code EC):

CE marking is attached to non-Explosion protected type and ATEX Explosion protected type.
The product which is attaching CE marking is in conformity with the statutory requirements of the applicable EU Directives.

EU RoHS Directive:

EN 50581

Note: Only applicable when CE marking (optional code EC) is selected.

PED (Pressure Equipment Directive):

Note: Applicable only when CE marking (optional code EC) is selected.

- **Technical Data**

Module: H

Type of Equipment: Piping

Type of Fluid: Liquid and Gas

Group of Fluid*4: 1 and 2

- **General-purpose, Submersible, and Explosion Protection**

MODEL	PROCESS CONNECTION	DN*1 (mm)	PS*1 (MPa)	PS•DN (MPa•mm)	CATEGORY*2, *4
AXW025	Wafer, Flange	25	4	100	Sound Engineering Practice (SEP)*3
AXW032	Wafer, Flange	32	4	128	II
AXW040	Wafer, Flange	40	4	160	II
AXW050	Wafer, Flange	50	4	200	II
AXW065	Wafer, Flange	65	4	260	II
AXW080	Wafer, Flange	80	4	320	II
AXW100	Wafer, Flange	100	4	400	III
AXW125	Wafer	125	2	250	II
	Flange	125	4	500	III
AXW150	Wafer	150	2	300	II
	Flange	150	4	600	III
AXW200	Wafer	200	2	400	III
	Flange	200	4	800	III
AXW250	Flange	250	2	500	III
AXW300	Flange	300	2	600	III
AXW350	Flange	350	1.8	630	III
AXW400	Flange	400	1.6	640	III

*1: PS: Maximum allowable pressure for Pipe

DN: Nominal size

*2: For details, refer to "Table 6 covered by ANNEX II of Directive 2014/68/EU".

*3: Article 4, paragraph 3 of Directive 2014/68/EU

*4: Models classified in categories I or II shall not be used for unstable gases of Group 1.

■ HAZARDOUS AREA CLASSIFICATION

ATEX

Applicable Standard:
EN 60079-0, EN 60079-1, EN 60079-7,
EN 60079-11, EN 60079-31
Certificate: FM 17ATEX0031X

(Integral Flowmeter)

Type of Gas Atmosphere Protection:

Group: II
Category: 2G
Type of Protection:
Ex db eb ia IIC T6...T3 Gb
(Transmitter Wiring Terminal: M4 screw type)
Ex db eb ia IIC T6...T3 Gb
Terminal Compartment: Ex db or Ex eb
(Transmitter Wiring Terminal: Clamp type)

Type of Dust Atmosphere Protection

Group: II
Category: 2D
Type of Protection: Ex tb IIIC T75°C...T130°C Db

Enclosure: IP66/IP67 in accordance with EN 60529

Maximum Surface Temperature:

See Table(a) and Table(b).

Ambient Temperature:

See Table(a) and Table(b).

Process Temperature:

See Table(a) and Table(b).

Power Supply:

100 to 240 Va.c. (50/60 Hz) / 100 to 120 Vd.c.

24 Va.c. (50/60 Hz) / 24 Vd.c.

Um: 250 V

Current I/O: 4 to 20 mA, 32 Vd.c. max.

Digital I/O: 30 Vd.c. max., 200 mA max.

(Remote Sensor)

Type of Gas Atmosphere Protection

Group: II
Category: 2G
Type of Protection: Ex db eb ia IIC T6...T3 Gb

Type of Dust Atmosphere Protection

Group: II
Category: 2D
Type of Protection: Ex tb IIIC T75°C...T150°C Db

Enclosure: IP66/IP67 in accordance with EN 60529

Maximum Surface Temperature:

See Table(a) and Table(b).

Ambient Temperature:

See Table(a) and Table(b).

Process Temperature:

See Table(a) and Table(b).

Um: 250 V

(Remote Transmitter)

Type of Gas Atmosphere Protection

Group: II
Category: 2G
Type of Protection:
Ex db IIC T6 Gb
(Transmitter Wiring Terminal: M4 screw type)
Ex db IIC T6 Gb or Ex db eb IIC T6 Gb
(Transmitter Wiring Terminal: Clamp type)

Type of Dust Atmosphere Protection

Group: II
Category: 2D
Type of Protection: Ex tb IIIC T75°C Db

Enclosure: IP66/IP67 in accordance with EN 60529

Maximum Surface Temperature: T75°C

Ambient Temperature: -40°C to +60°C

Power Supply:

100 to 240 Va.c. (50/60 Hz) / 100 to 120 Vd.c.

24 Va.c. (50/60 Hz) / 24 Vd.c.

Current I/O: 4 to 20 mA, 32 Vd.c. max.

Digital I/O: 30 Vd.c. max., 200 mA max.

Table (a): Temperature Table (ATEX)

Model	Size	Process Connection	Lining	Temperature Table*	
				Integral Flowmeter	Remote Sensor
AXW025, AXW032, AXW040, AXW050, AXW065, AXW080, AXW100, AXW125	25 to 125 mm (1 to 5 in.)	Flange	PTFE Lining	Table A	Table A
AXW150, AXW200, AXW250, AXW300, AXW350, AXW400	150 to 400 mm (6 to 16 in.)	Flange	PTFE Lining	Table B	Table B

*: For details, see Table No. on Table (b).

Table (b): Ambient Temperature and Process Temperature (ATEX)

Table No.	Ambient Temperature	Temperature Class	Maximum Surface Temperature	Process Temperature
A	-10°C to +60°C	T6	T75°C	-10°C to +50°C
		T5	T90°C	-10°C to +75°C
		T4	T120°C	-10°C to +120°C
		T3	T130°C	-10°C to +120°C
B	-10°C to +60°C	T6	T75°C	-10°C to +75°C
		T5	T90°C	-10°C to +90°C
		T4	T120°C	-10°C to +100°C
		T3	T150°C	-10°C to +100°C

IECEX

Applicable Standard:
IEC 60079-0, IEC 60079-1, IEC 60079-7,
IEC 60079-11, IEC 60079-31
Certificate:
IECEX FMG 17.0014X

(Integral Flowmeter)**Type of Gas Atmosphere Protection**

Ex db eb ia IIC T6...T3 Gb
(Transmitter Wiring Terminal: M4 screw type)
Ex db eb ia IIC T6...T3 Gb
Terminal Compartment: Ex db or Ex eb
(Transmitter Wiring Terminal: Clamp type)

Type of Dust Atmosphere Protection

Ex tb IIIC T75°C...T130°C Db

Enclosure: IP66/IP67 in accordance with IEC 60529

Maximum Surface Temperature:

See Table(c) and Table(d).

Ambient Temperature:

See Table(c) and Table(d).

Process Temperature:

See Table(c) and Table(d).

Power Supply:

100 to 240 Va.c. (50/60 Hz) / 100 to 120 Vd.c.

24 Va.c. (50/60 Hz) / 24 Vd.c.

Um: 250 V

Current I/O: 4 to 20 mA, 32 Vd.c. max.

Digital I/O: 30 Vd.c. max., 200 mA max.

(Remote Sensor)**Type of Gas Atmosphere Protection**

Ex db eb ia IIC T6...T3 Gb

Type of Dust Atmosphere Protection

Ex tb IIIC T75°C...T150°C Db

Enclosure: IP66/IP67 in accordance with IEC 60529

Maximum Surface Temperature:

See Table(c) and Table(d).

Ambient Temperature:

See Table(c) and Table(d).

Process Temperature:

See Table(c) and Table(d).

Um: 250 V

(Remote Transmitter)**Type of Gas Atmosphere Protection**

Ex db IIC T6 Gb

(Transmitter Wiring Terminal: M4 screw type)

Ex db IIC T6 Gb or Ex db eb IIC T6 Gb

(Transmitter Wiring Terminal: Clamp type)

Type of Dust Atmosphere Protection

Ex tb IIIC T75°C Db

Enclosure: IP66/IP67 in accordance with IEC 60529

Maximum Surface Temperature: T75°C

Ambient Temperature: -40°C to +60°C

Power Supply:

100 to 240 Va.c. (50/60 Hz) / 100 to 120 Vd.c.

24 Va.c. (50/60 Hz) / 24 Vd.c.

Current I/O: 4 to 20 mA, 32 Vd.c. max.

Digital I/O: 30 Vd.c. max., 200 mA max.

Table (c): Temperature Table (IECEX)

Model	Size	Process Connection	Lining	Temperature Table*	
				Integral Flowmeter	Remote Sensor
AXW025, AXW032, AXW040, AXW050, AXW065, AXW080, AXW100, AXW125	25 to 125 mm (1 to 5 in.)	Flange	PTFE Lining	Table A	Table A
AXW150, AXW200, AXW250, AXW300, AXW350, AXW400	150 to 400 mm (6 to 16 in.)	Flange	PTFE Lining	Table B	Table B

*: For details, see Table No. on Table (d).

Table (d): Ambient Temperature and Process Temperature (IECEX)

Table No.	Ambient Temperature	Temperature Class	Maximum Surface Temperature	Process Temperature
A	-10°C to +45°C	T6	T75°C	-10°C to +50°C
		T5	T90°C	-10°C to +75°C
	-10°C to +60°C	T4	T120°C	-10°C to +120°C
		T3	T130°C	-10°C to +120°C
B	-10°C to +60°C	T6	T75°C	-10°C to +75°C
		T5	T90°C	-10°C to +90°C
		T4	T120°C	-10°C to +100°C
		T3	T150°C	-10°C to +100°C

■ PERFORMANCE

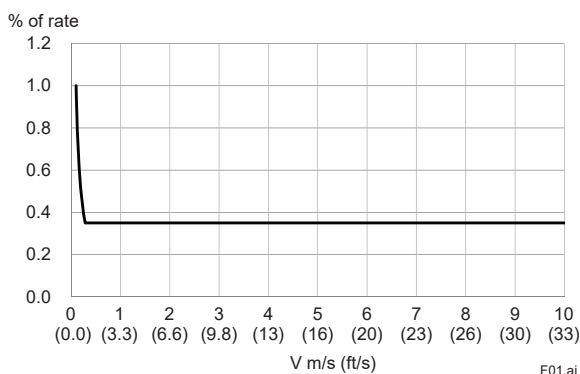
Accuracy:

- **AXW Integral Flowmeter, combination of AXW Remote Sensor and AXW4A Remote Transmitter, or combination of AXW Remote Sensor and AXFA11 Remote Transmitter**

Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy
25 to 400 (1) (16)	$V < 0.3$ (1)	± 1.0 mm/s
	$0.3 \leq V \leq 10$ (1) (33)	± 0.35 % of rate

Sizes 25 to 400 mm (1 to 16 in.)

Standard Accuracy



Note: The accuracy above is the result of calibration test at our water flow facility before shipment. It is defined by the integrated value of the pulse output. As for the current output accuracy, add $\pm 8 \mu\text{A}$ ($\pm 0.05\%$ of span) to the accuracy above.

Calibration takes place at reference conditions as below.

Medium: Water, Density: 0.9 to 1.1 kg/l

Medium temperature: 10 to 35°C (50 to 95°F)

(Average temperature 22.5°C (72.5°F))

Ambient temperature: 10 to 35°C (50 to 95°F)

Process pressure (absolute):

0.1 to 0.2 MPa (15 to 29 psi)

Reference Standards:

JIS B 7554, ISO 4185, ISO 5168, ISO 20456,

BS EN 29104

Repeatability:

$\pm 0.1\%$ of rate (Velocity 1 m/s (3.3 ft/s) or above)

$\pm 0.05\%$ of rate ± 0.5 mm/s (Velocity below 1 m/s (3.3 ft/s))

Measurement Range:

Minimum Span Velocity: 0.1 m/s (0.33 ft/s)

0.5 m/s (1.64 ft/s) when option E21 is applied

Maximum Span Velocity: 10 m/s (33 ft/s)

Note: For details of span flow rate, read "Sizing Data", and "Ordering Information".

Power Consumption:

Integral Type: 13 W

Remote Type: 13 W (with AXW4A Remote Transmitter)
20 W (with AXFA11 Remote Transmitter)

Note: The power consumption is the same as above regardless of the communication and I/O type.

Insulation Resistance:

Integral Flowmeter:

Between power supply terminals and ground terminal:

100 M Ω /500 V DC

Between power supply terminals and input/output terminals:

100 M Ω /500 V DC

Between ground terminal and input/output terminals:

20 M Ω /100 V DC or 125 V DC

Between input/output terminals*:

20 M Ω /100 V DC or 125 V DC

*: Not applicable for I/O3 and I/O4+ of Modbus

Remote Sensor:

Between signal terminals*:

100 M Ω /500 V DC

Between signal terminals and common terminal*:

100 M Ω /500 V DC

*: Not applicable for Explosion protection type

Between excitation current terminal and signal / common terminals:

100 M Ω /500 V DC

Remote Transmitter:

Between power supply terminals and ground terminal:

100 M Ω /500 V DC

Between power supply terminals and input/output or excitation current terminals:

100 M Ω /500 V DC

Between ground terminal and input/output or excitation current terminals:

20 M Ω /100 V DC or 125 V DC

Between input/output* and excitation current terminals:

20 M Ω /100 V DC or 125 V DC

*: Not applicable for I/O3 and I/O4+ of Modbus

Withstand Voltage:

Integral Flowmeter:

Between power supply terminals and ground terminal:

1400 V AC for 2 seconds

Between power supply terminals and input/output terminals:

1400 V AC for 2 seconds

Remote Sensor (Optional code WT1):

Between excitation current terminal and ground terminal:

1000 V AC for 1 minute

Remote Sensor (Optional code WT2):

Between excitation current terminal and ground terminal:

1500 V AC for 1 minute

Between signal terminals and excitation current terminal:

1500 V AC for 1 minute

Remote Sensor (Explosion protection type):

Between excitation current terminal and ground terminal:

1500 V AC for 1 minute, or 1800 V AC for 0.2 second

Between signal terminals and excitation current terminal:

1500 V AC for 1 minute, or 1800 V AC for 0.2 second

Remote Transmitter:

Between power supply terminals and ground terminal:

1400 V AC for 2 seconds

Between power supply terminals and input/output terminals:

1400 V AC for 2 seconds

Between excitation current terminal and ground terminal:

160 V AC for 2 seconds

Between excitation current terminal and input/output terminals:

350 V AC for 2 seconds

NORMAL OPERATING CONDITIONS

Ambient Temperature:

–10 to 60°C (14 to 140°F)

Note: Minimum temperature is limited according to minimum fluid temperature of sensor's specification. Read "Fluid Temperature and Pressure".
Refer to the HAZARDOUS AREA CLASSIFICATION for Explosion protection type.

Ambient Humidity:

0 to 100%

Note: Lengthy continuous operation at 95% or more is not recommended.

Power Supply:

Power Supply Code 1:

AC Type:

Rated Power Supply: 100 to 240 V AC, 50/60 Hz
Operating Voltage Range: 80 to 264 V AC

DC Type:

Rated Power Supply: 100 to 120 V DC
Operating Voltage Range: 90 to 130 V DC

Power Supply Code 2:

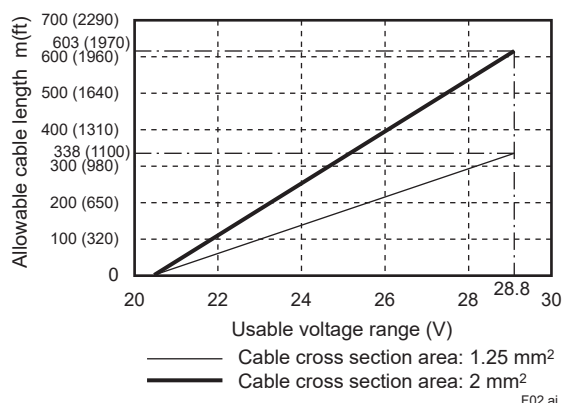
AC Type:

Rated Power Supply: 24 V AC, 50/60 Hz
Operating Voltage Range: 20.4 to 28.8 V AC

DC Type:

Rated Power Supply: 24 V DC
Operating Voltage Range: 20.4 to 28.8 V DC

Supply Voltage and Power Supply Cable Length for Power Supply Code 2:



Fluid Conductivity:

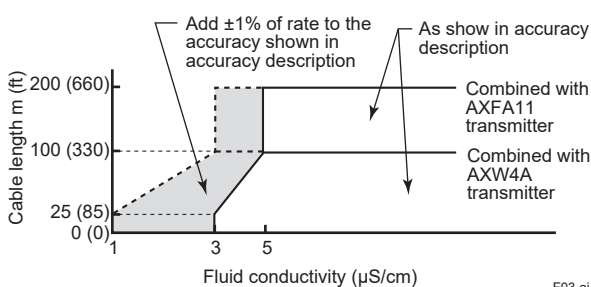
Size 25 to 125 mm (1 to 5 in.): 1 μS/cm or larger

Size 150 to 400 mm (6 to 16 in.): 3 μS/cm or larger

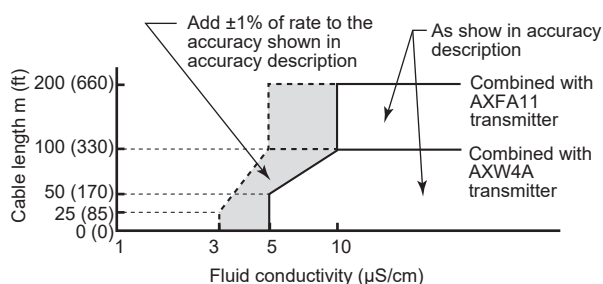
Note: For measuring low conductivity fluids, read "Cautions on Selection and Installation".

Signal Cable Length and Fluid Conductivity (Remote Sensor):

Sizes 25 to 125 mm (1 to 5 in.)



Sizes 150 to 400 mm (6 to 16 in.)



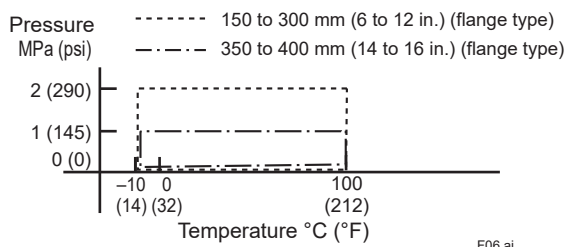
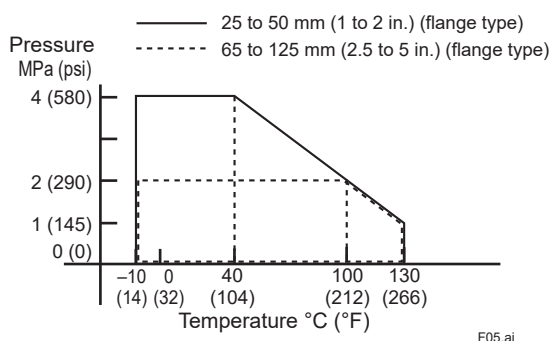
Fluid Temperature and Pressure:

The following figure shows the usable temperature and pressure range of the sensor in each specification. It is also limited by the flange pressure rating of the process connection.

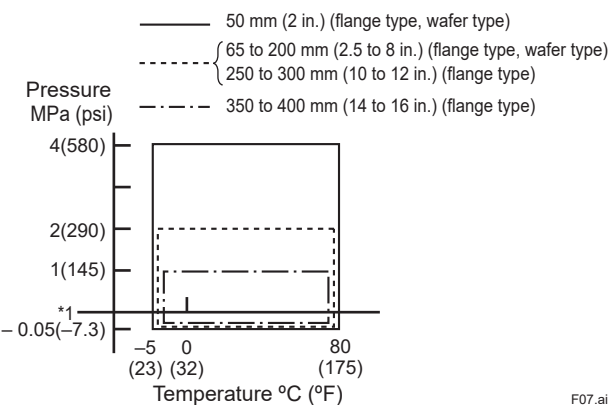
For fluid temperature of the Explosion Protection, read descriptions of "Explosion Protection".

PTFE Lining

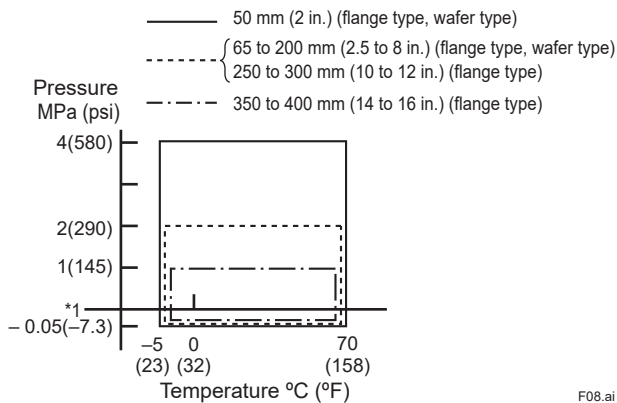
Note: In the case of PTFE lining, avoid the negative pressure inside the measuring pipe.



Natural Hard Rubber Lining

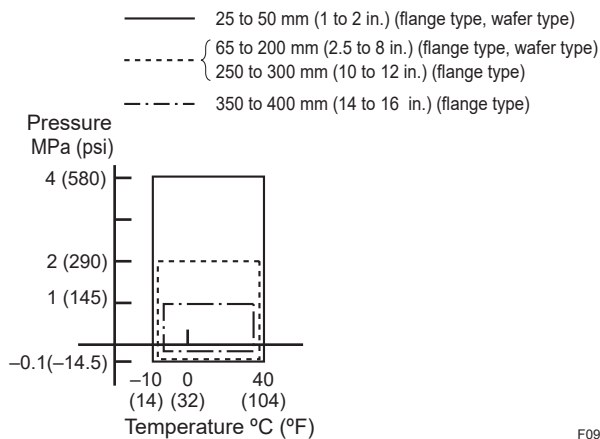


*1: For 350 to 400 mm (14 to 16 in.), the minimum pressure is -0.04 MPa (-5.7 psi).

Natural Soft Rubber Lining

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*1: For 350 to 400 mm (14 to 16 in.), the minimum pressure is -0.04 MPa (-5.7 psi).

Polyurethane Rubber Lining

F09.ai

Vibration Conditions:

Integral Flowmeter:

19.6 m/s² - rms (5 to 2000 Hz)

Remote Sensor:

34.3 m/s² - rms (5 to 2000 Hz)

Remote Transmitter:

19.6 m/s² - rms (5 to 2000 Hz)

Note: Vibration conditions are based on IEC 60068-2-64.
 Avoid installation in a place with much vibration
 (vibration frequency 2000 Hz or more). It may cause
 damage to the device.

■ CAUTIONS ON SELECTION AND INSTALLATION**Combined Transmitter:**

In the following cases, combine with AXFA11G remote transmitter. If it is considered that the flow noise in the fluid could be large because of low conductivity, or high concentration slurry, etc. and the size is 250 mm (10 in.) or more, it is recommended to combine with AXFA11G remote transmitter.

- When mounting remote transmitter to wall or panel
- When cable length exceeds 100 m
- When using 5 or more input/output terminals

Lining:**PTFE Lining:**

It is excellent in chemical resistance and suitable for general chemical fluids.

Note: For applications where permeable fluids, highly corrosive fluids, large temperature and pressure fluctuations are applied, we recommend PFA lining or ceramics tube type of the AXG magnetic flowmeter, or the capacitance magnetic flowmeter ADMAG CA.

Polyurethane Lining:

It has abrasion resistance and suitable for low slurry fluid of water, water-based solution, muddy water, or seawater.

Natural Hard Rubber Lining:

It has chemical resistance and suitable for acid / alkali fluid of low concentration, and also wastewater / sewage.

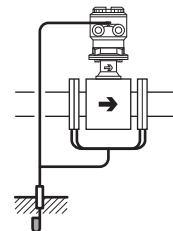
Natural Soft Rubber Lining:

It is a material that can reduce wear of the lining due to slurry mixed fluid. If the concentration of slurry is high, separate measures are required for the electrode part, so consult us.

Note: When the diameter is 200 mm (8 in.) or less, please also consider the ceramics tube type of AXG magnetic flowmeter.

Grounding Device:

The grounding device can be selected as an optional specification. It is unnecessary to use it for metal piping which has no lining. In that case, connect the piping and the sensor flange part (mini-flange or one-piece casting structured measuring pipe for wafer type) with grounding wire supplied by customer (see the figure below). Be sure to select the grounding device when installed at plastic or lining piping.



F10.ai

There are thin type (thickness 1 to 2 mm) and thick type (thickness 3 mm) for grounding rings. If the flange is ASME Class 300, EN PN 40 etc. for high fluid pressure and the tightening torque is high, the thick type is recommended.

Recommended Gasket (for installed piping flange):

Use compressed non-asbestos joint sheet gaskets, PTFE-sheathed non-asbestos joint sheet gaskets or gaskets which have equivalent elasticity. When selecting optional code GA, GC, or GD for plastic piping, use rubber gaskets or ones which have equivalent elasticity (such as PTFE-sheathed rubber gaskets).

When the customer's piping is a lining pipe, the following types of gasket are recommended depending on the lining material of the magnetic flowmeter.

- PTFE lining: PTFE-sheathed gasket
- Polyurethane rubber or natural soft rubber lining: No gasket required
- Natural hard rubber: Gasket with hardness equivalent to hard rubber

Dimensions of the gasket should be determined with reference to the following table (by process connection and lining) and figure. If the inner diameter of the gasket is too large or the outer diameter is too small, liquid leakage may occur.

Unit: mm

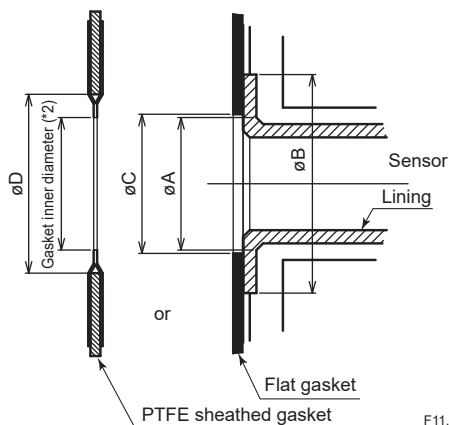
Size	Natural Hard Rubber/Natural Soft Rubber/Polyurethane Rubber Lining					PTFE/Natural Hard Rubber/Natural Soft Rubber/Polyurethane Rubber Lining				
	Inner Diameter for Effective Sealing [øA]	Outer Diameter for Effective Sealing [øB]	Wafer		Minimum Inner Diameter of Gasket *2	Inner Diameter for Effective Sealing [øA]	Flange			
			Recommended Inner Diameter of Gasket				Outer Diameter for Effective Sealing [øB]	Recommended Inner Diameter of Gasket		Minimum Inner Diameter of Gasket *2
			Flat Gasket [øC]	PTFE-sheathed Gasket [øD]				PTFE/Natural Hard Rubber/ Natural Soft Rubber Lining	Polyurethane Rubber Lining	
25	32	54	35		28	35	54		35	29
32	37	58	43		34	40	64		43	34
40	45	71	49		41	48	72		49	41
50	58	84	61		53	61	89		61	53
65	69	103	84		66	72	108		84	66
80	81	114	90		81	85	119		90	81
100	106	140	115		102	110	146		115	102
125	131	165	141		128	136	173		141	128
150	164	190	167		147	164	209 {216} *1	203 {209} *1	167	150
200	218	240	218		199	218	259 {272} *1	253 {259} *1	218	201
250	—	—	—		—	270	320 {332} *1	316 {320} *1	270	250
300	—	—	—		—	321	367 {392} *1	361 {367} *1	321	301
350	—	—	—		—	350	412	406	359	330
400	—	—	—		—	401	475	469	410	381

Unit: inch

Size	Natural Hard Rubber/Natural Soft Rubber/Polyurethane Rubber Lining					PTFE/Natural Hard Rubber/Natural Soft Rubber/Polyurethane Rubber Lining				
	Inner Diameter for Effective Sealing [øA]	Outer Diameter for Effective Sealing [øB]	Wafer		Minimum Inner Diameter of Gasket ^{*2}	Inner Diameter for Effective Sealing [øA]	Flange			Minimum Inner Diameter of Gasket ^{*2}
			Recommended Inner Diameter of Gasket				Outer Diameter for Effective Sealing [øB]	Recommended Inner Diameter of Gasket		
			Flat Gasket [øC]	PTFE-sheathed Gasket [øD]				PTFE/Natural Hard Rubber/ Natural Soft Rubber Lining	Polyurethane Rubber Lining	
25	1.26	2.13	1.38		1.10	1.39	2.13		1.38	1.14
32	1.46	2.28	1.69		1.34	1.59	2.53		1.69	1.34
40	1.76	2.80	1.93		1.61	1.89	2.83		1.93	1.61
50	2.26	3.31	2.40		2.09	2.39	3.50		2.40	2.09
65	2.73	4.06	3.31		2.60	2.84	4.25		3.31	2.60
80	3.19	4.49	3.54		3.19	3.33	4.69		3.54	3.19
100	4.19	5.51	4.53		4.02	4.34	5.75		4.53	4.02
125	5.14	6.50	5.55		5.04	5.34	6.81		5.55	5.04
150	6.46	7.48	6.57		5.79	6.46	8.23 {8.50} ^{*1}	7.99 {8.23} ^{*1}	6.57	5.91
200	8.58	9.45	8.58		7.83	8.58	10.20 {10.71} ^{*1}	9.96 {10.20} ^{*1}	8.58	7.91
250	—	—	—		—	10.61	12.60 {13.07} ^{*1}	12.44 {12.60} ^{*1}	10.63	9.84
300	—	—	—		—	12.64	14.44 {15.43} ^{*1}	14.21 {14.45} ^{*1}	12.64	11.85
350	—	—	—		—	13.76	16.22	15.98	14.13	12.99
400	—	—	—		—	15.78	18.70	18.46	16.14	15.00

*1: The value varies depending on the selection of process connection code.

BA2, BJ2, CA2, or CJ2: Value in { }.



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*2: To prevent the gasket from protruding into the flow path, make sure that this length is smaller than the minimum inner diameter of the gasket in the table.

Recommended Gasket (between sensor and grounding ring):

In case of natural hard rubber lining sizes 50 to 400 mm (2 to 16 in.) and PTFE lining sizes 150 to 400 mm (6 to 16 in.), prepare the gasket on the sensor side (between the sensor flange and the grounding ring). The recommended gasket inner diameter and material are the same as those for the installed piping flange side gasket in the previous section.

Installing PTFE Lining Sensor:

When installing PTFE lining sensor to the piping and tightening it, be careful not to apply uneven tension and torque to the PTFE. It is recommended to install the PTFE lining sensor with grounding rings or with short pipes at both upstream and downstream side fixed beforehand.

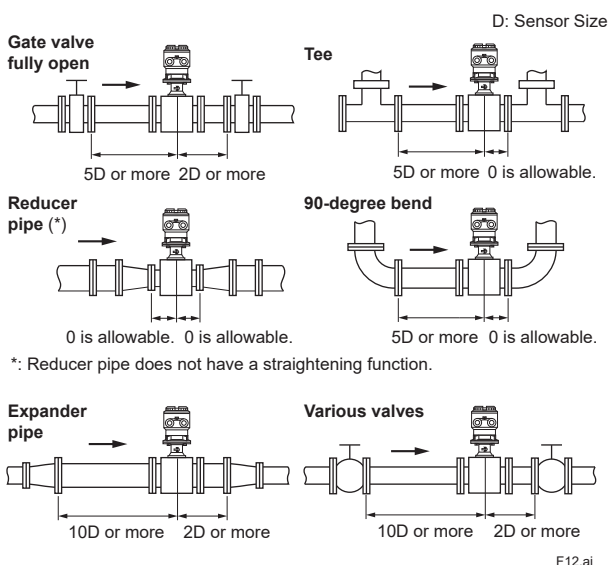
Noise Avoidance:

The flowmeter should be installed away from electrical motors, transformers, and other power sources in order to avoid interference with measurement.

When using multiple magnetic flowmeters, install the flowmeters setting the distance from each other by at least five times of the diameter of the larger one.

Mounting of Flowmeters and Required Lengths of Straight Runs:

Based on JIS B 7554 "Electromagnetic Flowmeters" and our piping condition test data, we recommend the piping conditions as shown in the following figures. This is not always enough when the piping line incorporates multiple conditions at the same time.



Required straight runs

- Do not install anything in the vicinity that may interfere with the magnetic field, induced signal voltages, or flow velocity distributions of the flowmeter.
- A straight run may not be required on the downstream side of the flowmeter. However, if a downstream valve or other fitting causes irregularity or deviation in flows, provide a distance run of 2D to 3D on the downstream side.
- The valves shall be mounted on the downstream side so that deviated flows do not occur in the sensor and to avoid startup from an empty condition.
- In case the piping conditions are compounded, install on the straight pipe section where the upstream part is sufficiently rectified.

Maintaining Stable Fluid Conductivity

Do not install the flowmeter where fluid conductivity tends to become uneven. If chemicals are fed near the upstream side of a magnetic flowmeter, they may affect the flow-rate's indications. To avoid this situation, it is recommended that the chemical feed ports be located on the downstream side of the flowmeter. If it is unavoidable that chemicals must be fed on the upstream side, provide a sufficient length of straight run (approximately 50D or more) to ensure the proper mixture of fluids.

Low Conductivity Fluid:

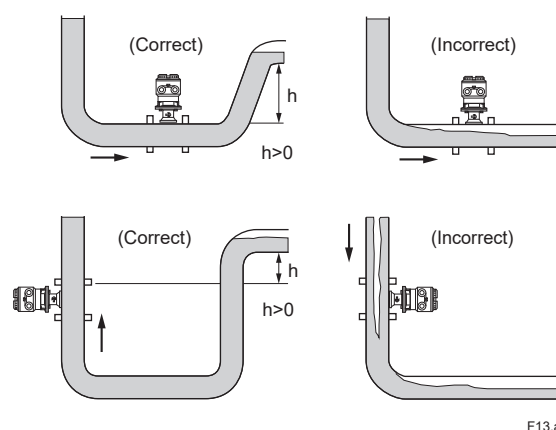
When used for fluids with high flow noise (pure water, low viscosity and low conductivity fluid such as alcohols), the output fluctuation increases and the measurement is affected. In that case, using the capacitance magnetic flowmeter ADMAG CA, vortex flowmeter, or coriolis flowmeter is recommended.

Abrasive Slurry Fluid:

For abrasive slurry fluids mixed with minerals, earth and sand etc., install on vertical piping. This reduces uneven wear of the lining. For sizes 200 mm (8 in.) or less, the AXG magnetic flowmeter with ceramics tube, the capacitance magnetic flowmeter ADMAG CA, or the AXW magnetic flowmeter with natural soft rubber lining is recommended.

Mounting Positions:

- Pipes must be fully filled with liquids. It is essential that pipes remain fully filled at all times, otherwise flow rate indications may be affected and measurement errors may be caused. Piping shall be designed so as to maintain the sensor filled with fluids. Vertical mounting is effective in such cases as when fluids tend to separate or solid matter may be precipitated. When employing vertical mounting, direct the fluids from the bottom to the top to ensure that the pipes remain fully filled.



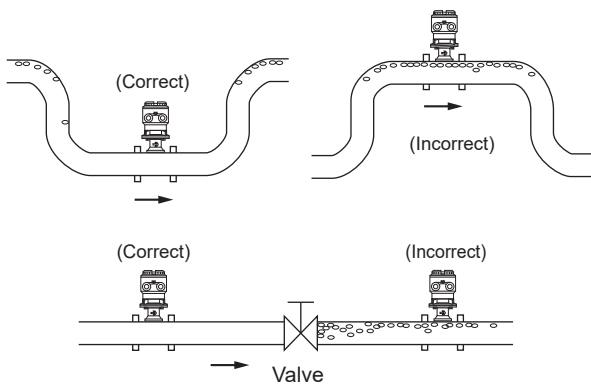
Mounting Positions

- **Avoiding Air Bubbles.**

If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.

In cases where fluids contain air bubbles, piping must be designed to prevent them from accumulating in the measurement pipe of a sensor.

If a valve exists near the sensor, try to mount the sensor on the valve's upstream side in order to prevent a possible reduction of pressure inside the pipe, thereby avoiding the possibility of air bubbles.



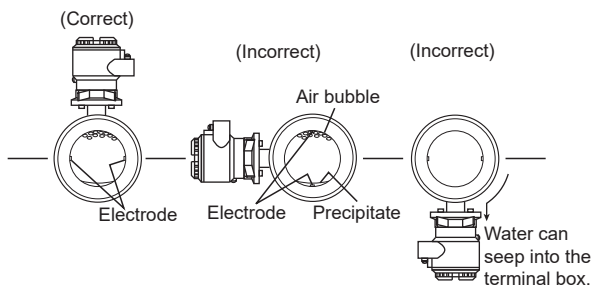
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Avoiding Air Bubbles

Mounting Orientation:

If electrodes are perpendicular to the ground, air bubbles near the top or precipitates at the bottom may cause measurement errors.

Ensure that the terminal box of a remote sensor and transmitter of an integral flowmeter are mounted above the piping to prevent water from entering them.



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Mounting Orientation

■ MODEL AND SUFFIX CODE

Note:

- 1: There are some limitations on the combination of specifications. Read specification code table when selecting specification code.
- 2: For EN standard wafer and flange type of sizes 25 to 50 mm (1 to 2 in.), select PN40 even for lower pressure rating because the dimensions of mating faces for PN10, 16, and 40 are the same.
For EN standard wafer and flange type of sizes 65 to 150 mm (2.5 to 6 in.), select PN16 even for lower pressure rating because the dimensions of mating faces for PN10 and 16 are the same.
- 3: The dimensions of mating faces are based on the following flange standards. The usable range is also limited by fluid temperature and pressure conditions.
JIS F12: JIS G 3443-2, JIS 10K, 20K: JIS B 2220 and JIS G 3443-2,
ASME: ASME B 16.5, EN: EN 1092-1
- 4: The grounding device is selectable from none or grounding ring. When selecting the grounding ring, it is also necessary to select its type (material etc.) from the optional codes.
- 5: The lay length (face to face) of the flange type of polyurethane rubber, natural hard rubber, and natural soft rubber lining conforms to ISO standard (ISO 20456). The lay length depends on the presence or absence of the optional grounding rings or gaskets, so see the Dimensional Drawings.
- 6:  Lining, electrode, and grounding device (grounding ring plate) are wetted parts.
Users must consider the characteristics of selected wetted parts material and influence of process fluids. The use of inappropriate materials can result in the leakage of corrosive process fluids and cause injury to personnel and/or damage to plant facilities. It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user's process fluids. Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hypochlorite, and high-temperature steam (150°C [302°F] or above). Contact Yokogawa for detailed information of the wetted parts material.
- 7: In the case of remote sensor, select "None (or Without)" for each specification code of "Power Supply", "Communication and I/O", "Transmitter Wiring Terminal" and "Display".

●General-purpose, Submersible, Explosionprotection, Wafer, Flange

Model	Suffix Code		Description	Limitation
AXW025			Magnetic Flowmeter (25 mm/1 in)	
AXW032			Magnetic Flowmeter (32 mm/1.25 in)	
AXW040			Magnetic Flowmeter (40 mm/1.5 in)	
AXW050			Magnetic Flowmeter (50 mm/2 in)	
AXW065			Magnetic Flowmeter (65 mm/2.5 in)	
AXW080			Magnetic Flowmeter (80 mm/3 in)	
AXW100			Magnetic Flowmeter (100 mm/4 in)	
AXW125			Magnetic Flowmeter (125 mm/5 in)	
AXW150			Magnetic Flowmeter (150 mm/6 in)	
AXW200			Magnetic Flowmeter (200 mm/8 in)	
AXW250			Magnetic Flowmeter (250 mm/10 in)	
AXW300			Magnetic Flowmeter (300 mm/12 in)	
AXW350			Magnetic Flowmeter (350 mm/14 in)	
AXW400			Magnetic Flowmeter (400 mm/16 in)	
Use	-G		General-purpose	
	-C		Explosion protection	
	-W		Submersible	Only for Remote Sensor
Construction	A		Integral Flowmeter	
	D		Remote Sensor (for AXFA11)	
	W		Remote Sensor (for AXW4A)	
Explosion Protection	000		Non Explosion Protection Approval	
	KF2		ATEX Flameproof	See Restriction for Explosion Protection type
	SF2		IECEx Flameproof	See Restriction for Explosion Protection type
Process Connection	Wafer	AA1	ASME Class 150 Wafer	25 to 200 mm (1 to 8 in.)
		AA2	ASME Class 300 Wafer	25 to 200 mm (1 to 8 in.)
		AE1	EN PN10 Wafer	200 mm (8 in.)
		AE2	EN PN16 Wafer	65 to 200 mm (2.5 to 8 in.)
		AE4	EN PN40 Wafer	25 to 50 mm (1 to 2 in.)
		AG1	JIS F12 Wafer	80 to 200 mm (3 to 8 in.)
		AJ1	JIS 10K Wafer	25 to 200 mm (1 to 8 in.)
		AJ2	JIS 20K Wafer	25 to 200 mm (1 to 8 in.)
	Stainless Steel Flange (F304)	BA1	ASME Class 150 Flange	
		BA2	ASME Class 300 Flange	25 to 300 mm (1 to 12 in.)
		BE1	EN PN10 Flange	200 to 400 mm (8 to 16 in.)
		BE2	EN PN16 Flange	65 to 300 mm (2.5 to 12 in.)
		BE4	EN PN40 Flange	25 to 50 mm (1 to 2 in.)
		BG1	JIS F12 Flange	80 to 400 mm (3 to 16 in.)
		BJ1	JIS 10K Flange	
		BJ2	JIS 20K Flange	25 to 300 mm (1 to 12 in.)
	Carbon Steel Flange	CA1	ASME Class 150 Flange	50 to 400 mm (2 to 16 in.)
		CA2	ASME Class 300 Flange	50 to 300 mm (2 to 12 in.)
		CE1	EN PN10 Flange	200 to 400 mm (8 to 16 in.)
		CE2	EN PN16 Flange	65 to 300 mm (2.5 to 12 in.)
		CE4	EN PN40 Flange	50 mm (2 in.)
		CG1	JIS F12 Flange	80 to 400 mm (3 to 16 in.)
		CJ1	JIS 10K Flange	50 to 400 mm (2 to 16 in.)
		CJ2	JIS 20K Flange	50 to 300 mm (2 to 12 in.)
Lining	F		PTFE Lining	Applicable for Flanges only
	U		Polyurethane Rubber Lining	
	H		Natural Hard Rubber Lining	50 to 400 mm (2 to 16 in.)
	D		Natural Soft Rubber Lining	50 to 400 mm (2 to 16 in.)
Electrode	L		Stainless Steel 316L	
	H		Nickel Alloy	
Grounding Device	1		None	
	2		Grounding Rings	Select an optional code

(Continued)

Housing and Coating	1	Standard Material with Standard Coating	
	2	Standard Material with Rugged Coating	Not applicable for Submersible
Cable Entry	0	JIS G1/2 Female	See Restriction for Explosion Protection type
	2	ASME 1/2 NPT Female	Not applicable for Submersible, See Restriction for Explosion Protection type
	4	ISO M20×1.5 Female	Not applicable for Submersible, See Restriction for Explosion Protection type
Accuracy	B	Standard	
Power Supply	-1	100-240 V AC / 100-120 V DC	Only for Integral Flowmeter
	-2	24 V AC / DC	Only for Integral Flowmeter
	-N	None (Remote Sensor)	Only for Remote Sensor
Communication and I/O	D#	#: A, E, G BRAIN and I/O (Type A, E, G, See separate table)	Only for Integral Flowmeter
	J#	#: A, E, G HART 7 and I/O (Type A, E, G, See separate table)	Only for Integral Flowmeter
	M#	#: 0, 6 Modbus and I/O (Type 0, 6, See separate table)	Only for Integral Flowmeter
	NN	None	Only for Remote Sensor
Transmitter Wiring Terminal	1	M4 Screw-type	
	2	Clamp Type	
	N	None	Only for Remote Sensor
Display	1	With Display (English, Multi-language)	Only for Integral Flowmeter
	2	With Display (English, Chinese)	Only for Integral Flowmeter
	N	Without Display/Remote Sensor	
Optional Specification		/# Refer to optional specification table.	

●General-purpose, ExplosionProtection, Remote Transmitter

Model	Suffix Code	Description	Limitation
AXW4A		Magnetic Flowmeter Remote Transmitter	
Use	-G	General-purpose	
	-C	Explosion protection	
Explosion Protection	000	Non Explosion Protection Approval	
	KF2	ATEX Flameproof	See Restriction for Explosion Protection type
	SF2	IECEx Flameproof	See Restriction for Explosion Protection type
Housing and Coating	1	Standard Material with Standard Coating	
	2	Standard Material with Rugged Coating	
Cable Entry	0	JIS G1/2 Female	See Restriction for Explosion Protection type
	2	ASME 1/2 NPT Female	See Restriction for Explosion Protection type
	4	ISO M20×1.5 Female	See Restriction for Explosion Protection type
Power Supply	1	100-240 V AC / 100-120 V DC	
	2	24 V AC / DC	
Communication and I/O	D#	#: A, E, G BRAIN and I/O (Type A, E, G, See separate table)	
	J#	#: A, E, G HART 7 and I/O (Type A, E, G, See separate table)	
	M#	#: 0, 6 Modbus and I/O (Type 0, 6 , See separate table)	
Transmitter Wiring Terminal	1	M4 Screw-type	
	2	Clamp Type	
Display	1	With Display (English, Multi-language)	
	2	With Display (English, Chinese)	
	N	Without Display/Remote Sensor	
Optional Specification		/# Refer to optional specification table.	

●Signal Cable

Model	Suffix Code	Optional Code	Description
AX01C			Magnetic Flowmeter Signal Cable
Cable Finish and Length	-A### (*1)		Unfinished, Cable length ### m, Set of Finishing Parts for M4 Screws
	-C### (*1)		Finished for AXW4A, Cable Length ### m
	-D### (*1)		Finished for AXFA11, Cable Length ### m
Finishing Parts		/C# (*2)	Finishing Parts (# sets)

*1: Specify the cable length in the "###" with the numerical value three digits (001 to 200) as multiple of 1 meter (e.g. 001, 002, or 005) for a length up to 5 m, as multiple of 5 meters up to 100 m (e.g. 010, 020, or 100), or as multiple of 10 meters up to 200 m (e.g. 110, 120, or 200).
The maximum cable length: -A###: 200 m, -C###: 100 m, -D###: 200 m

*2: Specify the finishing parts quantity in the "#" with the numerical value one digit (1 to 9).

●Details: Communication and I/O (HART type, BRAIN type)

Type	Communication and I/O Code		Number of Input and Output			
			Current Output (Active)	Pulse/Status Output (Passive)	Status Input (No-voltage)	Pulse/Status Output (Active, without internal resistor)
Type A	DA	JA	1	1	—	—
Type E	DE	JE	1	2	1	—
Type G	DG	JG	1	1	1	1

●Details: Communication and I/O (Modbus type)

Type	Communication and I/O Code	Number of Input and Output		
		Current Output (Active)	Pulse/ Status Output (Passive)	Current Input (Active)
Type 0	M0	—	1	—
Type 6	M6	1	1	—

●Details: Restriction for Explosion protection type

For Explosion protection type, following combinations of suffix code or optional code are restricted. For other optional codes, refer to optional code tables.

Item	Code	Restriction of Combination	
		Mandatory	Not Available
ATEX Flameproof	KF2	- Optional Code: EC - Lining: F (PTFE Lining)	- Cable Entry: 0 (JIS G1/2) - Process Connection: AG1, AJ#, BG1, BJ#, CG1, CJ#
IECEx Flameproof	SF2	Lining: F (PTFE Lining)	- Cable Entry: 0 (JIS G1/2) - Optional Code: EC

■ OPTIONAL CODE

●Application, Usage, and Operating Function

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model				Code
		General-purpose Explosion protection		Submersible	General-purpose Explosion protection	
		Integral Flowmeter	Remote Sensor	Remote Sensor	Remote Transmitter	
DC Noise Cut Circuit (for electrolytic bath)	Built-in DC noise cut circuit. It works effectively when the fluid conductivity is 50 μ S/cm or more. Empty pipe detection, electrode adhesion diagnosis, electrode potential measurement, and wetted resistance measurement function can not be used.	●	—	—	●	ELC
Potting Terminal Box with Cable (For district heating and cooling or condensation-proof)	Urethane resin potting is applied in the terminal box of a remote sensor. Signal and excitation cables (when optional code L### is not selected, cable length is each 30 m) are pre-wired and waterproof glands with union joints are attached at factory. For cable entry, selection of JIS G1/2 female thread is necessary. When optional code DHC is selected, the optional code of plastic and waterproof glands can not be selected.	—	○	—	—	DHC
Signal and Excitation Cable Length	Change the length of signal cable and excitation cable pre-wired for a remote sensor of Submersible or one with optional code DHC. Specify the cable length in the "####" with the numerical value three digits (001 to 200) as multiple of 1 meter (e.g. 001, 002, or 005) for a length up to 5 m, as multiple of 5 meters up to 100 m (e.g. 010, 020, or 100), or as multiple of 10 meters up to 200 m (e.g. 110, 120, or 200). The maximum cable length is 100 m in combination with the AXW4A transmitter, and 200 m in combination with the AXFA11 transmitter. When optional code L### is not selected, a 30-meter length cable as standard is pre-wired.	—	○	○	—	L###
Oil Prohibited Use	Electrodes, linings, grounding devices (grounding rings plate type), and gaskets are assembled and packed with polyethylene after being cleaned with water and acetone and dried with air. The label "OIL FREE" is affixed.	●	●	—	—	K1
Oil Prohibited Use with Dehydration	Electrodes, linings, and grounding devices (grounding rings plate type) are assembled and packed with polyethylene including desiccants after being cleaned with water and acetone and dried with air. The label "OIL & WATER FREE" is affixed.	●	●	—	—	K5
Mass Unit Setting	The flow rate calculation is performed in mass unit. In addition to fluid density, specify span flow rate, pulse weight, and totalization weight in mass unit. For specifying procedures, read "Ordering Information". For remote sensor, specified parameters are set in the transmitter that is ordered in combination.	●	●	●	—	MU
Signal Down on Failure	Set the current output signal as follows when shipped. Output signal at CPU failure or alarm occurrence: 2.4 mA (-10 %) or less (The standard setting is 21.6 mA (110%) or more at CPU failure or alarm occurrence.)	●	—	—	●	C1
Signal Down on Failure (NAMUR NE 43 Compliant)	Set the current output signal as follows when shipped. - Output signal limits: 3.8 to 20.5 mA - Output signal at CPU failure or alarm occurrence: 2.4 mA (-10%) or less	●	—	—	●	C2
Signal Up on Failure (NAMUR NE 43 Compliant)	Set the current output signal as follows when shipped. - Output signal limits: 3.8 to 20.5 mA - Output signal at CPU failure or alarm occurrence: 21.6 mA (110%) or more	●	—	—	●	C3

(Continued)

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model				Code
		General-purpose Explosion protection		Submersible	General-purpose Explosion protection	
		Integral Flowmeter	Remote Sensor	Remote Sensor	Remote Transmitter	
microSD Card	A microSD card slot is added to the display unit, and a microSD card (capacity 1 GB, format FAT 16) is inserted when shipped. When using parameter store / restore function, and/or data logging function, specify optional code MC.	●	—	—	●	MC
CE Marking	CE marking is indicated on the nameplate. When a flowmeter is used in the countries where CE marking is required, specify optional code EC. Optional code EC can be selected with the following process connection codes. AA#, AE#, BA#, BE#, CA#, CE#	●	●	●	●	EC
NAMUR NE21	Compliant to NAMUR NE21 under span setting of 0.5 m/s or more in terms of flow velocity. For specifiable span, read "Ordering Information". Combination with CE marking (optional code EC) is necessary.	●	—	—	●	E21

●Tag Plate and Mounting Bracket

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model				Code
		General-purpose Explosion protection		Submersible	General-purpose Explosion protection	
		Integral Flowmeter	Remote Sensor	Remote Sensor	Remote Transmitter	
Stainless Steel Tag Plate	The pendant type tag plate (stainless steel 304) is wired around the flowmeter neck. Select optional code SCT when necessary in addition to that on the nameplate, on which the Tag No. is inscribed. Plate size (Height x Width): Approx. 12.5 mm x 40 mm (4.92 in. x 15.7 in.)	●	●	●	●	SCT
Stainless Steel Mounting Bracket	Change the material of the remote transmitter mounting bracket, from carbon steel to stainless steel 304.	—	—	—	●	SB

●Piping Parts

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model			Code
		General-purpose Explosion protection		Submersible	
		Integral Flowmeter	Remote Sensor	Remote Sensor	
Bolts, Nuts and Gaskets (Type C)	The mounting bolts, nuts and gaskets of wafer type (process connection code: AJ1, AJ2, AA1) are supplied. Bolt: Stainless steel 304 Nut: Stainless steel 304 Gasket(*): Chloroprene rubber (CR), thickness: 3 mm (0.12 in.) *: The allowable temperature and pressure is equivalent to that of Valqua #2010 series.	●	●	●	BSC
Bolts, Nuts and Gaskets (Type F)	The mounting bolts, nuts and gaskets of wafer type (process connection code: AJ1, AJ2, AA1) are supplied. Bolt: Stainless steel 304 Nut: Stainless steel 304 Gasket(*): PTFE-sheathed non-asbestos joint sheet, thickness: 3 mm (0.12 in.) *: The allowable temperature and pressure is equivalent to that of Valqua #7030 (S) series.	●	●	●	BSF

●Grounding Device

Grounding devices are attached at factory.

For applicable condition of grounding devices and gaskets, see the separate table.

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model			Code
		General-purpose Explosion protection		Submersible	
		Integral Flowmeter	Remote Sensor	Remote Sensor	
Grounding Rings (Plate Type L)	Material: Stainless Steel 316L, Thin Type. Thickness: 1 mm (0.04 in.) for sizes 25 to 200 mm (1 to 8 in.) 2 mm (0.08 in.) for sizes 250 to 400 mm (10 to 16 in.)	●	●	●	GRL
Grounding Rings (Plate Type N)	Material: Stainless Steel 316L, Thick Type. Thickness: 3 mm (0.12 in.) for sizes 25 to 400 mm (1 to 16 in.)	●	●	●	GRN
Grounding Rings (Plate Type H)	Material: Nickel Alloy, Thin Type. Thickness: 1 mm (0.04 in.) for sizes 25 to 200 mm (1 to 8 in.) 2 mm (0.08 in.) for sizes 250 to 400 mm (10 to 16 in.)	●	●	●	GRH
Grounding Rings (Plate Type J)	Material: Nickel Alloy, Thick Type. Thickness: 3 mm (0.12 in.) for sizes 25 to 400 mm (1 to 16 in.)	●	●	●	GRJ

Size Range by Grounding Device

Grounding Ring Plate:

Stainless Steel 316L: 25 to 400 mm (1 to 16 in.)

Nickel Alloy: 25 to 400 mm (1 to 16 in.)

●Gasket

Grounding devices are attached at factory.

For applicable condition of grounding devices and gaskets, see the separate table.

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model			Code
		General-purpose Explosion protection		Submersible	
		Integral Flowmeter	Remote Sensor	Remote Sensor	
Plastic Pipe Gaskets	Fluororubber gasket (Viton) for plastic piping such as PVC. The allowable temperature and pressure range is the same as those of Valqua #4010 with no special formulation.	●	●	●	GA
Plastic Pipe Acid-resistant Gaskets	Fluororubber gasket (Viton) for plastic piping such as PVC. The allowable temperature and pressure range is the same as those of Valqua #4010 with special formulation D2470.	●	●	●	GC
Plastic Pipe Alkali-resistant Gaskets	Fluororubber gasket (Viton) for plastic piping such as PVC. The allowable temperature and pressure range is the same as those of Valqua #4010 with special formulation D0970.	●	●	●	GD

●Details: Applicable Condition for Grounding Devices and Gaskets

●: Applicable —: Not Applicable

Lining	PTFE Lining				Polyurethane Rubber Lining				Natural Hard Rubber Lining				Natural Soft Rubber Lining			
Process Connection	Flange				Flange		Wafer		Flange		Wafer		Flange		Wafer	
Size mm (inch)	25 to 125 (1 to 5)		150 to 400 (6 to 16)		25 to 400 (1 to 16)		25 to 200 (1 to 8)		50 to 400 (2 to 16)		50 to 200 (2 to 8)		50 to 400 (2 to 16)		50 to 200 (2 to 8)	
Code (Gasket) Code (Grounding Device)	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD	Not selected	GA GC GD
Not selected	●	—	●	—	●	—	●	—	●	—	●	—	●	—	●	—
GRL	—	—	—	—	●	—	●	—	—	—	—	—	●	—	●	—
GRN	●	●	●	—	●	—	—	—	●	—	●	—	●	—	—	—
GRH	—	—	—	—	●	—	●	—	—	—	—	—	●	—	●	—
GRJ	●	●	●	—	●	—	—	—	●	—	●	—	●	—	—	—

●Direction of Cable Entry, Cable Gland

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model				Code
		General-purpose Explosion protection		Submersible	General-purpose Explosion protection	
		Integral Flowmeter	Remote Sensor	Remote Sensor	Remote Transmitter	
Cable Entry Direction Change	Rotate the transmitter of integral flowmeter or the terminal box of remote sensor and change the direction of the cable entry (+90, +180, or -90 degree). For specifying procedures, read "Ordering Information".	●	●	●	—	RH
Waterproof Glands (Type G)	2 pcs. of waterproof gland For cable entry, selection of JIS G1/2 female thread is necessary.	—	○	—	—	EG
Waterproof Glands (Type G2)	2 pcs. of waterproof gland, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EG2
Waterproof Glands (Type G3)	3 pcs. of waterproof gland For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EG3
Waterproof Glands (Type G4)	4 pcs. of waterproof gland, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EG4
Waterproof Glands (Type G5)	5 pcs. of waterproof gland For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EG5
Waterproof Glands (Type U)	2 pcs. of waterproof gland with union joint For cable entry, selection of JIS G1/2 female thread is necessary.	—	○	—	—	EU
Waterproof Glands (Type U2)	2 pcs. of waterproof gland with union joint, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EU2
Waterproof Glands (Type U3)	3 pcs. of waterproof gland with union joint For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EU3
Waterproof Glands (Type U4)	4 pcs. of waterproof gland with union joint, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EU4
Waterproof Glands (Type U5)	5 pcs. of waterproof gland with union joint For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EU5
Plastic Glands (Type P)	2 pcs. of plastic gland For cable entry, selection of JIS G1/2 female thread is necessary.	—	○	—	—	EP
Plastic Glands (Type P2)	2 pcs. of plastic gland, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EP2
Plastic Glands (Type P3)	3 pcs. of plastic gland For cable entry, selection of JIS G1/2 female thread is necessary.	○	—	—	—	EP3
Plastic Glands (Type P4)	4 pcs. of plastic gland, and a blanking plug For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EP4
Plastic Glands (Type P5)	5 pcs. of plastic gland For cable entry, selection of JIS G1/2 female thread is necessary.	—	—	—	●	EP5
Waterproof Glands (Type W)	2 pcs. of waterproof gland for JIS G3/4 conduit or flexible tube For cable entry, selection of JIS G1/2 female thread is necessary.	—	○	—	—	EW

●Certificate, Calibration, and Various Test

●: Applicable ○: Applicable (except Explosion Protection) —: Not Applicable

Item	Specification and Applicable Condition	Applicable Model				Code
		General-purpose Explosion protection		Submersible	General-purpose Explosion protection	
		Integral Flowmeter	Remote Sensor	Remote Sensor	Remote Transmitter	
Material Certificate	Material certificate is issued. Target Parts: Measuring Pipe, Electrodes, Grounding Devices (Grounding Rings Plate Type), Flanges (for flange type), Mini-flanges (for wafer type)	●	●	●	—	M01
Material Certificate (EN 10204-3.1)	Material certificates according to EN 10204 Type 3.1 with a dedicated cover is issued. The target parts are the same as the above (Optional code M01).	●	●	●	—	E01
Calibration Certificate (Level 2)	The Declaration and the Calibration Equipment List are issued.	●	●	●	●	L2
Calibration Certificate (Level 3)	The Declaration and the Primary Standard List are issued.	●	●	●	●	L3
Calibration Certificate (Level 4)	The Declaration and the Yokogawa Measuring Instruments Control System are issued.	●	●	●	●	L4
Specified Span Five-point Calibration	With the customer's specified span, the actual flow inspection of 5 points around 0, 25, 50, 75, and 100% is performed. Instead of the flow inspection at the standard flow rate of 2 m/s (6.56 ft/s), the result of flow inspection with the customer specified span is described in a test certificate (QIC). For specifiable spans, read "Ordering Information".	●	●	●	—	SC
Hydrostatic Test	The water pressure depending on the process connection is applied to the lining (measuring pipe) for 10 minutes to check that there is no leakage, and the result is described in a test certificate (QIC). For the test water pressure on each process connection, see the separate table.	●	●	●	—	T01
Withstand Voltage Test (Type 1)	Withstand voltage test on remote sensor of PTFE lining or polyurethane lining is performed, and the result is described in a test certificate (QIC).	—	○	●	—	WT1
Withstand Voltage Test (Type 2)	WT1: Between excitation current terminal and ground terminal: 1000 V AC for 1 minute WT2: Between excitation current terminal and ground terminal: 1500 V AC for 1 minute Between signal terminals and excitation current terminal: 1500 V AC for 1 minute	—	○	●	—	WT2
PMI Test (Type 1)	Fluorescent X-ray analysis of nickel, chromium and molybdenum is performed on parts made of stainless steel or nickel alloy, and a test report is issued. For applicable condition, see the separate table. Target Parts: PM1: Grounding Rings (Plate Type) PM2: Flange (Stainless steel only) PM3: Measuring Pipe	●	●	●	—	PM1
PMI Test (Type 2)		●	●	●	—	PM2
PMI Test (Type 3)		●	●	●	—	PM3
Liquid Penetration Test	Liquid penetration test on welded parts of flanges (for flange type) or mini-flanges (for wafer type) is performed and a test report is issued. For applicable condition, see the separate table.	●	●	●	—	PT

●Details: Water Pressure of Hydrostatic Test (Optional Code T01):

Process connection code	Process connection	Size: mm (in.)	Water pressure (MPa)
#A1	ASME Class 150	25 to 300 (1 to 12)	3.0
		350 to 400 (14 to 16)	1.5
#A2	ASME Class 300	25 to 50 (1 to 2)	6.0
		65 to 300 (2.5 to 12)	3.0
#E1	EN PN10	200 to 400 (8 to 16)	1.5
#E2	EN PN16	65 to 300 (2.5 to 12)	2.4
#E4	EN PN40	25 to 50 (1 to 2)	6.0
#G1	JIS F12	80 to 300 (3 to 12)	1.8
		350 to 400 (14 to 16)	1.5
#J1	JIS 10K	25 to 300 (1 to 12)	2.1
		350 to 400 (14 to 16)	1.5
#J2	JIS 20K	25 to 50 (1 to 2)	6.0
		65 to 300 (2.5 to 12)	3.0

●Details: Applicable Condition for PMI Test
○Grounding Rings (Plate Type) (Optional Code PM1)

●: Applicable —: Not Applicable

Lining	PTFE Lining	Polyurethane Rubber Lining		Natural Hard Rubber Lining		Natural Soft Rubber Lining	
Process Connection	Flange	Flange	Wafer	Flange	Wafer	Flange	Wafer
Size mm (inch) Code (Grounding Device)	25 to 400 (1 to 16)	25 to 400 (1 to 16)	25 to 200 (1 to 8)	50 to 400 (2 to 16)	50 to 200 (2 to 8)	50 to 400 (2 to 16)	50 to 200 (2 to 8)
Not selected	—	—	—	—	—	—	—
GRL	—	●	●	—	—	●	●
GRN	●	●	—	●	●	●	—
GRH	—	●	●	—	—	●	●
GRJ	●	●	—	●	●	●	—

○Flange (Optional Code PM2)

●: Applicable —: Not Applicable

Lining	PTFE Lining		Polyurethane Rubber Lining			Natural Hard Rubber Lining			Natural Soft Rubber Lining		
Process Connection	Flange		Flange		Wafer	Flange		Wafer	Flange		Wafer
Code (Process Connection) Size mm (inch)	B##	C##	B##	C##	A##	B##	C##	A##	B##	C##	A##
25 (1)	●	—	●	—	—	—	—	—	—	—	—
32 (1.25)	●	—	●	—	—	—	—	—	—	—	—
40 (1.5)	●	—	●	—	—	—	—	—	—	—	—
50 (2)	●	—	●	—	—	●	—	—	●	—	—
65 (2.5)	●	—	●	—	—	●	—	—	●	—	—
80 (3)	●	—	●	—	—	●	—	—	●	—	—
100 (4)	●	—	●	—	—	●	—	—	●	—	—
125 (5)	●	—	●	—	—	●	—	—	●	—	—
150 (6)	●	—	●	—	—	●	—	—	●	—	—
200 (8)	●	—	●	—	—	●	—	—	●	—	—
250 (10)	●	—	●	—	—	●	—	—	●	—	—
300 (12)	●	—	●	—	—	●	—	—	●	—	—
350 (14)	●	—	●	—	—	●	—	—	●	—	—
400 (16)	●	—	●	—	—	●	—	—	●	—	—

○Measuring Pipe (Optional Code PM3)

●: Applicable —: Not Applicable

Lining	PTFE Lining	Polyurethane Rubber Lining		Natural Hard Rubber Lining		Natural Soft Rubber Lining	
Process Connection	Flange	Flange	Wafer	Flange	Wafer	Flange	Wafer
Code (Process Connection) Size mm (inch)							
25 (1)	●	●	●	—	—	—	—
32 (1.25)	●	●	●	—	—	—	—
40 (1.5)	●	●	●	—	—	—	—
50 (2)	●	●	●	●	●	●	●
65 (2.5)	●	●	●	●	●	●	●
80 (3)	●	●	●	●	●	●	●
100 (4)	●	●	●	●	●	●	●
125 (5)	●	●	●	●	●	●	●
150 (6)	●	●	●	●	●	●	●
200 (8)	●	●	●	●	●	●	●
250 (10)	●	●	—	●	—	●	—
300 (12)	●	●	—	●	—	●	—
350 (14)	●	●	—	●	—	●	—
400 (16)	●	●	—	●	—	●	—

●Details: Applicable Condition for Liquid Penetrat Test (Optional Code PT)

●: Applicable —: Not Applicable

Lining	PTFE Lining		Polyurethane Rubber Lining			Natural Hard Rubber Lining			Natural Soft Rubber Lining		
Process Connection	Flange		Flange		Wafer	Flange		Wafer	Flange		Wafer
Code (Process Connection) Size mm (inch)	B##	C##	B##	C##	A##	B##	C##	A##	B##	C##	A##
25 (1)	●	—	●	—	—	—	—	—	—	—	—
32 (1.25)	●	—	●	—	—	—	—	—	—	—	—
40 (1.5)	●	—	●	—	—	—	—	—	—	—	—
50 (2)	●	●	●	●	—	●	●	—	●	●	—
65 (2.5)	●	●	●	●	—	●	●	—	●	●	—
80 (3)	●	●	●	●	—	●	●	—	●	●	—
100 (4)	●	●	●	●	—	●	●	—	●	●	—
125 (5)	●	●	●	●	—	●	●	—	●	●	—
150 (6)	●	●	●	●	●	●	●	●	●	●	●
200 (8)	●	●	●	●	●	●	●	●	●	●	●
250 (10)	●	●	●	●	—	●	●	—	●	●	—
300 (12)	●	●	●	●	—	●	●	—	●	●	—
350 (14)	●	●	●	●	—	●	●	—	●	●	—
400 (16)	●	●	●	●	—	●	●	—	●	●	—

■ ACCESSORIES

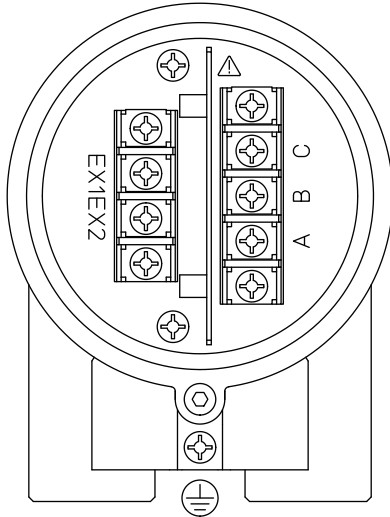
- Centering Device (wafer type only): 1 set
 - Blanking Plug: 1 to 2 pcs.
 - Mounting Bracket (transmitter only): 1 set
- Note: Accessories differ depending on specifications to be selected.

■ TERMINAL CONFIGURATION

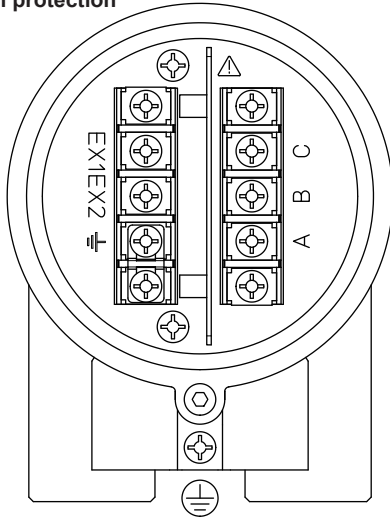
Remote Sensor:

<To be wired to Remote Transmitter>

Non Explosion Protection



Explosion protection



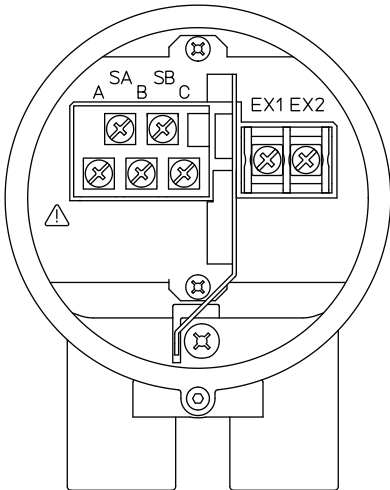
Terminal Symbol	Description
A B C	Flow Signal Output
EX1 EX2	Excitation Current Input
⏏	Protective Grounding (Outside of the terminal box)
⏏	Functional grounding (Only for explosion proof type)

F16.ai

Note: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached.

Remote Transmitter:

<To be wired to Remote Sensor>

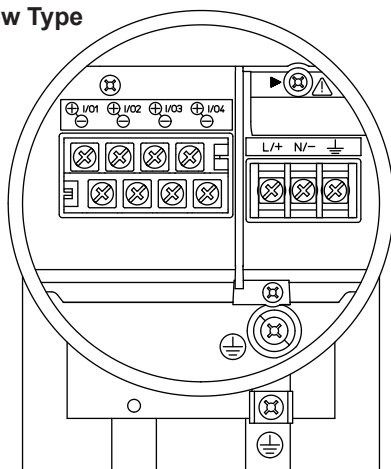


Terminal Symbol	Description
SA SB A B C	Flow Signal Input
EX1 EX2	Excitation Current Output

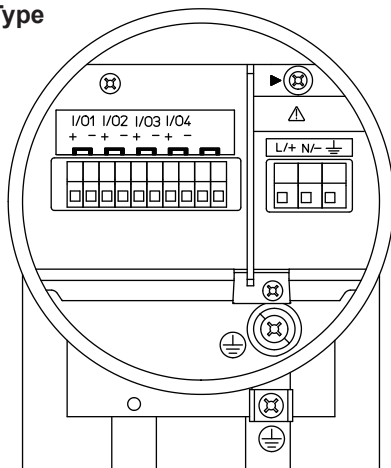
F17.ai

Integral Flowmeter and Remote Transmitter: **<To be wired to Power Supply and I/Os>**

M4 Screw Type



Clamp Type



Terminal Symbol	Description
	Shorting Screw (Need to be fixed for normal operation)
	Functional Grounding
N/- L/+	Power Supply
I/O4 - I/O4 + I/O3 - I/O3 + I/O2 - I/O2 + I/O1 - I/O1 +	Selected Input/Output (Note)
	Protective Grounding (Inside and outside of the terminal box)

F18.ai

Note: Read "Functions" for the input/output signal terminals.

Recommended Cable for Excitation, Power and Input / Output:

JIS C 3401 control cable equivalent

JIS C 3312 power cable equivalent

14 AWG Belden 8720 equivalent

Outer Diameter:

Without gland:

6.5 to 12 mm (0.26 to 0.47 in.)

With waterproof gland (optional code EG, EG#, EU, EU#, EW):

For excitation cable:

10.5 or 11.5 mm (0.41 or 0.45 in.)

For power and input/output cable:

7.5 to 12 mm (0.30 to 0.47 in.)

With plastic gland (optional code EP, EP#):

6 to 12 mm (0.24 to 0.47 in.)

Nominal Cross Section:

Single wire: 0.5 to 2.5 mm²

Stranded wire: 0.5 to 1.5 mm²

Excitation Cable for Submersible Use and Optional Code DHC:

Heat resistant vinyl resin sheath cable

Outer diameter ø10.5 mm (0.41 in.)

DIMENSIONAL DRAWINGS

(1) Integral Flowmeter, Remote Sensor

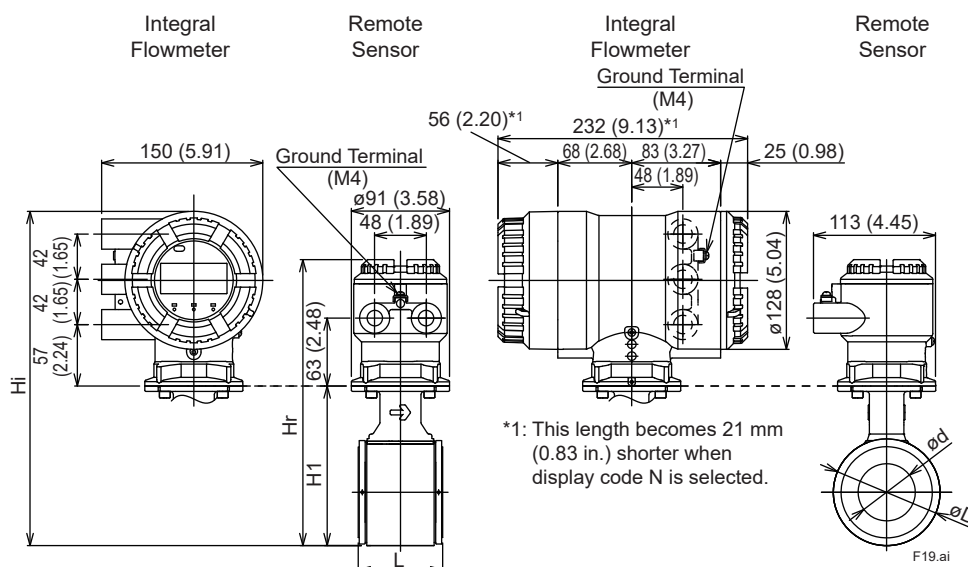
- Wafer (Polyurethane Rubber, Natural Hard Rubber, Natural Soft Rubber Lining)

Unit: mm (approx. in.)

Size 25 to 125 mm (1 to 5 in.)

AXW025
AXW032
AXW040
AXW050
AXW065
AXW080
AXW100
AXW125

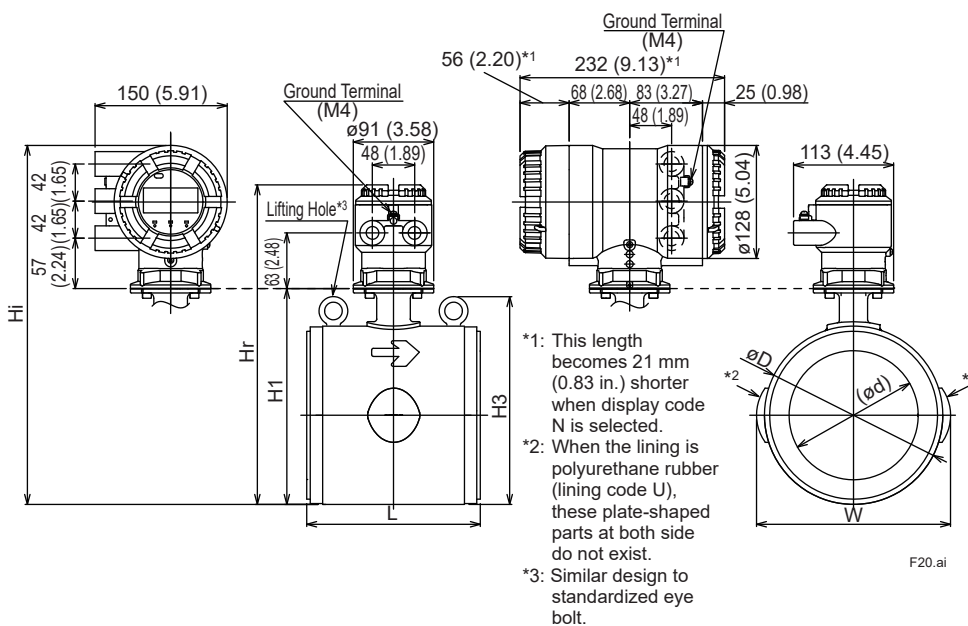
□□□□□A□□□□
Size Code Process Connection Code Lining Code



Size 150 to 200 mm (6 to 8 in.)

AXW150
AXW200

□□□□□A□□□□
Size Code Process Connection Code Lining Code



Unit: mm (approx. in.)

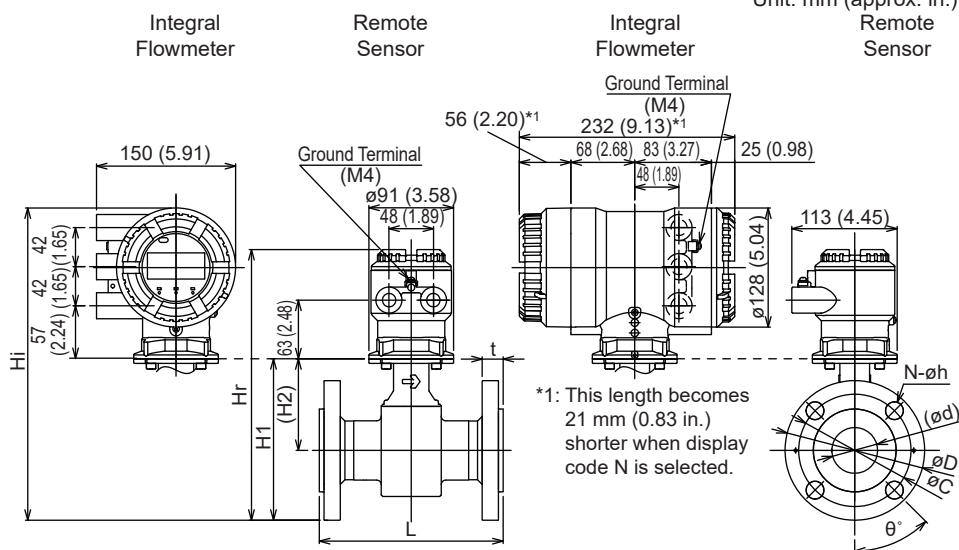
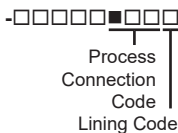
Model	Process Connection Code		AA1, AA2, AJ1, AJ2																
			AE4					AE2											
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AE1
	AG1																		
Size Code		025	032	040	050	050	065	065	080	100	100	100	125	125	150	150	200	200	
Size		25	32	40	50	50	65	65	80	100	100	100	125	125	150	150	200	200	
		(1)	(1.25)	(1.5)	(2)	(2)	(2.5)	(2.5)	(3)	(4)	(4)	(4)	(5)	(5)	(6)	(6)	(8)	(8)	
Lining Code		U	U	U	U	H,D	U	H,D	U,H,D	U	H	D	U,D	H	U	H,D	U	H,D	
Remote Sensor	Lay Length (*1)	L	58 (2.30)	68 (2.69)	68 (2.69)	78 (3.09)	78 (3.09)	98 (3.87)	98 (3.87)	118 (4.66)	148 (5.84)	148 (5.84)	148 (5.84)	198 (7.81)	198 (7.81)	197 (7.74)	247 (9.70)	247 (9.70)	
	Outer Diameter	øD	68 (2.66)	73 (2.87)	86 (3.39)	99 (3.90)	99 (3.90)	117 (4.61)	117 (4.61)	129 (5.08)	155 (6.10)	155 (6.10)	155 (6.10)	183 (7.20)	183 (7.20)	202 (7.94)	252 (9.91)	252 (9.91)	
	Lining Inner Diameter	ød	24 (0.93)	29 (1.13)	37 (1.44)	49 (1.94)	50 (1.95)	61 (2.40)	61 (2.41)	73 (2.87)	97 (3.82)	98 (3.87)	96 (3.79)	121 (4.76)	123 (4.84)	145 (5.71)	147 (5.80)	198 (7.63)	198 (7.81)
	Width	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220 (8.65)	-	270 (10.61)
	Height	H1	110 (4.33)	116 (4.57)	129 (5.08)	148 (5.83)	148 (5.83)	165 (6.50)	165 (6.50)	175 (6.89)	201 (7.91)	201 (7.91)	201 (7.91)	230 (9.06)	230 (9.06)	244 (9.62)	244 (9.62)	294 (11.59)	294 (11.59)
	Height	H3	-	-	-	-	-	-	-	-	-	-	-	-	-	235 (9.26)	235 (9.26)	285 (11.22)	285 (11.22)
Remote Sensor	Maximum Height	Hr	227 (8.94)	233 (9.17)	246 (9.69)	265 (10.43)	265 (10.43)	282 (11.10)	282 (11.10)	292 (11.50)	318 (12.52)	318 (12.52)	318 (12.52)	347 (13.66)	347 (13.66)	362 (14.24)	362 (14.24)	412 (16.21)	412 (16.21)
	Approx. Weight, Unit: kg (lb) (*2)		2.2 (4.9)	2.4 (5.3)	2.6 (5.7)	3.2 (7.1)	3.2 (7.1)	3.9 (8.6)	3.9 (8.6)	4.6 (10.1)	6.3 (13.9)	6.3 (13.9)	6.3 (13.9)	10.5 (23.2)	10.5 (23.2)	14 (30.9)	20 (44.2)	20 (44.2)	20 (44.2)
Integral Flowmeter	Maximum Height	Hi	272 (10.71)	278 (10.94)	291 (11.46)	310 (12.20)	310 (12.20)	327 (12.87)	327 (12.87)	337 (13.27)	363 (14.29)	363 (14.29)	363 (14.29)	392 (15.43)	392 (15.43)	406 (16.00)	406 (16.00)	456 (17.97)	456 (17.97)
	Approx. Weight, Unit: kg (lb)		4.8 (10.6)	4.9 (10.8)	5.1 (11.2)	5.7 (12.6)	5.7 (12.6)	6.4 (14.1)	6.4 (14.1)	7.2 (15.9)	8.8 (19.4)	8.8 (19.4)	8.8 (19.4)	13.1 (28.9)	13.1 (28.9)	16 (35.3)	16 (35.3)	23 (50.8)	22 (48.6)
Gaskets (BSC, BSF) (*1)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)
Grounding rings thin type (GRL, GRH) (*1) (*3)			+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)	+2 (+0.08)
Grounding rings thin type (GRL, GRH) and gaskets (BSC, BSF) (*1) (*3)			+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	-	+8 (+0.31)	+8 (+0.31)	-	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)	+8 (+0.31)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			-	-	-	-	+6 (+0.24)	-	+6 (+0.24)	+6 (+0.24)	-	+6 (+0.24)	-	-	+6 (+0.24)	-	+6 (+0.24)	-	+6 (+0.24)
Grounding rings thick type (GRN, GRJ) and gaskets (BSC, BSF) (*1) (*4) (*5)			-	-	-	-	+12 (+0.47)	-	+12 (+0.47)	+12 (+0.47)	-	+12 (+0.47)	-	-	+12 (+0.47)	-	+12 (+0.47)	-	+12 (+0.47)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code H but for U and D.
- *4: These grounding rings (GRN, GRJ) are applied only to lining code H.
- *5: When applying these grounding rings (GRN, GRJ), gaskets supplied by customer are necessary. For sizes up to 125 mm (5 in.), recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two, and for sizes 150 mm (6 in.) and above, it is 3 mm (0.12 in.) per one, bringing 6 mm (0.24 in.) per two, to be additionally added for getting the total lay length.

Unit: mm (approx. in.)
Remote
Sensor

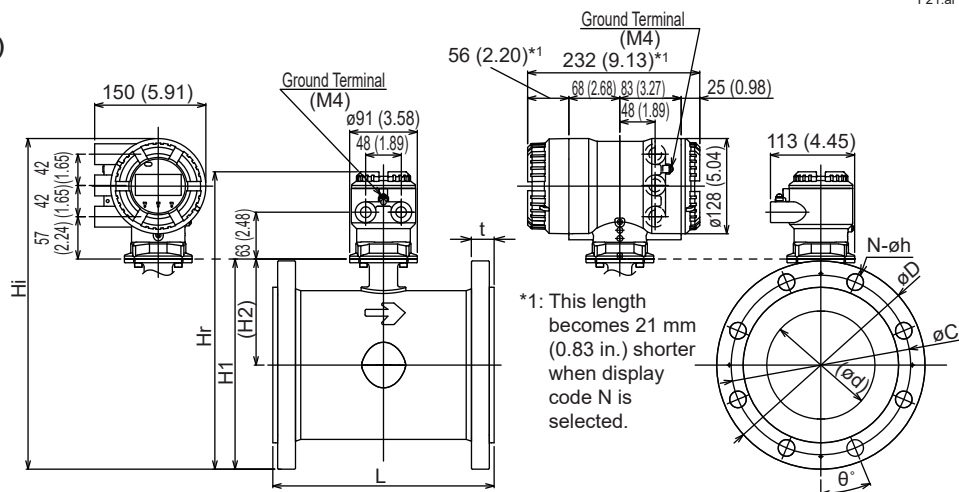
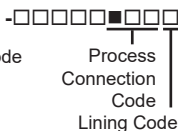
AXW025
AXW032
AXW040
AXW050
AXW065
AXW080
AXW100
AXW125

Size Code
■=B, C



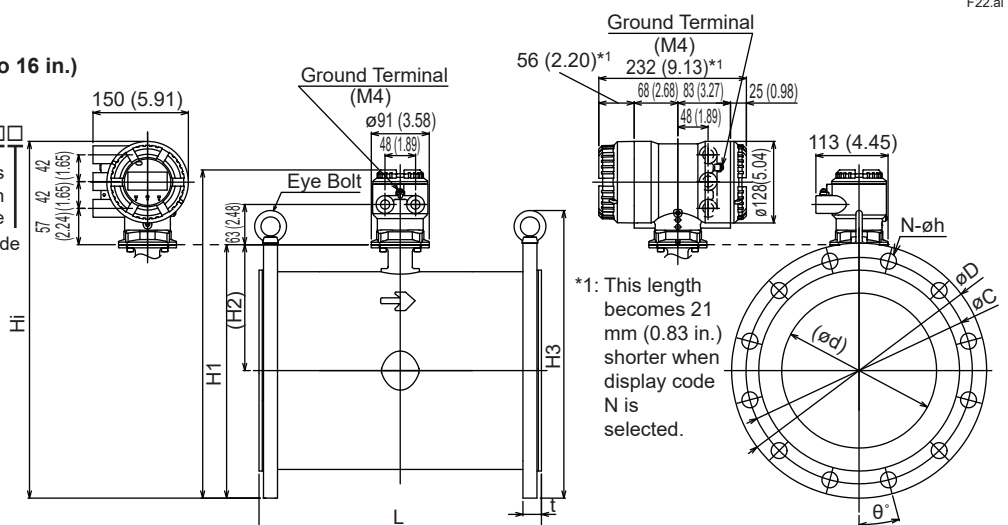
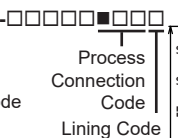
AXW150
AXW200

Size Code
■=B, C



AXW250
AXW300
AXW350
AXW400

Size Code
■=B, C



F23.ai

○ Flange, ASME Class 150

Unit: mm (approx. in.)

Model	Process		BA1																								
	Connection Code																										
		-	-	-	-	-	-	CA1																			
		025	025	032	032	040	040	050	050	050	065	065	080	080	100	100	100	100	125	125	125	125					
Size Code	25	25	32	32	40	40	50	50	50	65	65	80	80	100	100	100	100	125	125	125	125						
Size	(1)	(1)	(1.25)	(1.25)	(1.5)	(1.5)	(2)	(2)	(2)	(2.5)	(2.5)	(3)	(3)	(4)	(4)	(4)	(4)	(5)	(5)	(5)	(5)						
Lining Code	F	U	F	U	F	U	F	U	H,D	F	U,H,D	F	U,H,D	F	U	H	D	F	U	H	D						
Remote Sensor	Lay Length (*1) (*5)	L	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)						
	Flange Outer Diameter	øD	110 (4.33)	110 (4.33)	115 (4.53)	115 (4.53)	125 (4.92)	125 (4.92)	150 (5.91)	150 (5.91)	150 (5.91)	180 (7.09)	180 (7.09)	190 (7.48)	190 (7.48)	230 (9.06)	230 (9.06)	230 (9.06)	230 (9.06)	255 (10.04)	255 (10.04)						
	Flange Thickness (incl. lining flare)	t	20.2 (0.80)	18.7 (0.74)	20.8 (0.82)	19.3 (0.76)	22.4 (0.88)	20.9 (0.82)	24.0 (0.94)	22.5 (0.89)	22.5 (0.89)	27.2 (1.07)	25.7 (1.01)	28.8 (1.13)	27.3 (1.07)	28.8 (1.13)	27.3 (1.07)	27.3 (1.07)	27.3 (1.07)	28.8 (1.13)	27.3 (1.07)						
	Lining Inner Diameter	ød	26 (1.02)	24 (0.93)	31 (1.22)	29 (1.13)	39 (1.53)	37 (1.44)	52 (2.03)	49 (1.94)	50 (1.95)	63 (2.49)	61 (2.40)	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)						
	Bolt Circle Diameter	øC	79.4 (3.13)	79.4 (3.13)	88.9 (3.50)	88.9 (3.50)	98.4 (3.87)	98.4 (3.87)	120.7 (4.75)	120.7 (4.75)	120.7 (4.75)	139.7 (5.50)	139.7 (5.50)	152.4 (6.00)	152.4 (6.00)	190.5 (7.50)	190.5 (7.50)	190.5 (7.50)	190.5 (7.50)	215.9 (8.50)	215.9 (8.50)						
	Bolt Hole Interval	ø°	45	45	45	45	45	45	45	45	45	45	45	45	45	22.5	22.5	22.5	22.5	22.5	22.5						
	Bolt Hole Diameter	øh	15.9 (0.63)	15.9 (0.63)	15.9 (0.63)	15.9 (0.63)	15.9 (0.63)	15.9 (0.63)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	22.2 (0.87)	22.2 (0.87)						
	Number of Bolt Holes	N	4	4	4	4	4	4	4	4	4	4	4	4	4	8	8	8	8	8	8						
	Height	H1	135 (5.31)	135 (5.31)	144 (5.67)	144 (5.67)	149 (5.87)	149 (5.87)	174 (6.85)	174 (6.85)	174 (6.85)	198 (7.80)	198 (7.80)	209 (8.23)	209 (8.23)	239 (9.41)	239 (9.41)	239 (9.41)	239 (9.41)	266 (10.47)	266 (10.47)						
	Height	H2	80 (3.15)	80 (3.15)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)	99 (3.90)	99 (3.90)	99 (3.90)	108 (4.25)	108 (4.25)	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)						
	Remote Sensor	Maximum Height	Hr	252 (9.92)	252 (9.92)	261 (10.28)	261 (10.28)	266 (10.47)	266 (10.47)	291 (11.46)	291 (11.46)	291 (11.46)	315 (12.40)	315 (12.40)	326 (12.83)	326 (12.83)	356 (14.02)	356 (14.02)	356 (14.02)	356 (14.02)	383 (15.08)	383 (15.08)					
Approx. Weight, Unit: kg (lb) (*2)			4.2 (9.3)	4.2 (9.3)	4.8 (10.6)	4.8 (10.6)	5.5 (12.1)	5.5 (12.1)	7.4 (16.3)	7.4 (16.3)	7.4 (16.3)	10.8 (23.8)	10.8 (23.8)	13.0 (28.7)	13.0 (28.7)	18.2 (40.1)	18.2 (40.1)	18.2 (40.1)	18.2 (40.1)	22.8 (50.3)	22.8 (50.3)						
Integral Flowmeter	Maximum Height	Hi	297 (11.69)	297 (11.69)	306 (12.05)	306 (12.05)	311 (12.24)	311 (12.24)	336 (13.23)	336 (13.23)	336 (13.23)	360 (14.17)	360 (14.17)	371 (14.61)	371 (14.61)	401 (15.79)	401 (15.79)	401 (15.79)	401 (15.79)	428 (16.85)	428 (16.85)						
	Approx. Weight, Unit: kg (lb)		6.7 (14.8)	6.7 (14.8)	7.3 (16.1)	7.3 (16.1)	8.0 (17.6)	8.0 (17.6)	9.9 (21.8)	9.9 (21.8)	9.9 (21.8)	13.7 (30.2)	13.7 (30.2)	15.5 (34.2)	15.5 (34.2)	20.7 (45.6)	20.7 (45.6)	20.7 (45.6)	20.7 (45.6)	25.4 (56.0)	25.4 (56.0)						
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)						
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)						
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)			+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	-	-	+10 (+0.39)	-						

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm

○ Flange, ASME Class 150 (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BA1																	
			CA1																	
	Size Code		150	150	150	200	200	200	250	250	250	300	300	300	350	350	350	400	400	400
Remote Sensor	Size		150	150	150	200	200	200	250	250	250	300	300	300	350	350	350	400	400	400
	Lining Code		F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D
			(6)	(6)	(6)	(8)	(8)	(8)	(10)	(10)	(10)	(12)	(12)	(12)	(14)	(14)	(14)	(16)	(16)	(16)
Integral Flowmeter	Lay Length (*1) (*5)	L	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)	548 (21.56)	548 (21.56)	548 (21.56)	598 (23.52)	598 (23.52)	598 (23.52)
	Flange Outer Diameter	øD	280 (11.02)	280 (11.02)	280 (11.02)	345 (13.58)	345 (13.58)	345 (13.58)	405 (15.94)	405 (15.94)	405 (15.94)	485 (19.09)	485 (19.09)	485 (19.09)	535 (21.06)	535 (21.06)	535 (21.06)	595 (23.43)	595 (23.43)	595 (23.43)
	Flange Thickness (incl. lining flare)	t	30.9 (1.22)	30.9 (1.22)	30.9 (1.22)	34.0 (1.34)	34.0 (1.34)	34.0 (1.34)	36.6 (1.44)	36.6 (1.44)	36.6 (1.44)	38.2 (1.50)	38.2 (1.50)	38.2 (1.50)	41.9 (1.65)	41.9 (1.65)	41.9 (1.65)	43.5 (1.71)	43.5 (1.71)	43.5 (1.71)
	Lining Inner Diameter	ød	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)	330 (12.97)	323 (12.70)	330 (12.97)	381 (14.98)	373 (14.67)	381 (14.98)
	Bolt Circle Diameter	øC	241.3 (9.50)	241.3 (9.50)	241.3 (9.50)	298.5 (11.75)	298.5 (11.75)	298.5 (11.75)	362.0 (14.25)	362.0 (14.25)	362.0 (14.25)	431.8 (17.00)	431.8 (17.00)	431.8 (17.00)	476.3 (18.75)	476.3 (18.75)	476.3 (18.75)	539.8 (21.25)	539.8 (21.25)	539.8 (21.25)
	Bolt Hole Interval	ø°	22.5 (0.88)	22.5 (0.88)	22.5 (0.88)	22.5 (0.88)	22.5 (0.88)	22.5 (0.88)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)
	Bolt Hole Diameter	øh	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)
	Number of Bolt Holes	N	8	8	8	8	8	8	12	12	12	12	12	12	12	12	12	16	16	16
	Height	H1	283 (11.12)	283 (11.12)	283 (11.12)	340 (13.39)	340 (13.39)	340 (13.39)	401 (15.78)	401 (15.78)	401 (15.78)	465 (18.32)	465 (18.32)	465 (18.32)	512 (20.14)	512 (20.14)	512 (20.14)	569 (22.41)	569 (22.41)	569 (22.41)
	Height	H2	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)	244 (9.61)	244 (9.61)	244 (9.61)	272 (10.70)	272 (10.70)	272 (10.70)
	Height	H3	-	-	-	-	-	-	456 (17.95)	456 (17.95)	456 (17.95)	536 (21.10)	536 (21.10)	536 (21.10)	595 (23.43)	595 (23.43)	595 (23.43)	655 (25.79)	655 (25.79)	655 (25.79)
Remote Sensor	Maximum Height	Hr	400 (15.74)	400 (15.74)	400 (15.74)	457 (18.01)	457 (18.01)	457 (18.01)	518 (20.40)	518 (20.40)	518 (20.40)	583 (22.94)	583 (22.94)	583 (22.94)	629 (24.76)	629 (24.76)	629 (24.76)	687 (27.03)	687 (27.03)	687 (27.03)
	Approx. Weight, Unit: kg (lb) (*2)		30 (66.2)	29 (64.0)	29 (64.0)	46 (101.6)	46 (101.6)	46 (101.6)	74 (163.4)	73 (161.2)	73 (161.2)	102 (225.2)	101 (223.0)	100 (220.8)	128 (282.6)	126 (278.2)	125 (275.9)	161 (355.4)	160 (353.2)	158 (348.8)
Integral Flowmeter	Maximum Height	Hi	445 (17.50)	445 (17.50)	445 (17.50)	502 (19.77)	502 (19.77)	502 (19.77)	563 (22.16)	563 (22.16)	563 (22.16)	627 (24.69)	627 (24.69)	627 (24.69)	674 (26.52)	674 (26.52)	674 (26.52)	731 (28.79)	731 (28.79)	731 (28.79)
	Approx. Weight, Unit: kg (lb)		32 (70.6)	32 (70.6)	32 (70.6)	49 (108.2)	48 (106.0)	48 (106.0)	76 (167.8)	76 (167.8)	75 (165.6)	104 (229.6)	104 (229.6)	102 (225.2)	130 (287.0)	129 (284.8)	128 (282.6)	164 (362.0)	163 (359.8)	161 (355.4)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, ASME Class 300

Unit: mm (approx. in.)

Model	Process Connection Code		BA2																													
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	Size Code		025	025	032	032	040	040	050	050	050	065	065	080	080	CA2										100	100	100	125	125	125	125
	Size		(25)	(25)	(32)	(32)	(40)	(40)	(50)	(50)	(50)	(65)	(65)	(80)	(80)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(125)	(125)	(125)	(125)	(125)	(125)				
Remote Sensor	Lining Code		F	U	F	U	F	U	F	U	H,D	F	U,H,D	F	U,H,D	F	U,H,D	F	U	H	D	F	U	H	D	F	U	H	D			
	Lay Length (*1) (*5)	L	198 (7.80)	198 (7.78)	198 (7.80)	198 (7.78)	198 (7.80)	198 (7.78)	198 (7.80)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)				
	Flange Outer Diameter	øD	125 (4.92)	125 (4.92)	135 (5.31)	135 (5.31)	155 (6.10)	155 (6.10)	165 (6.50)	165 (6.50)	165 (6.50)	190 (7.48)	190 (7.48)	210 (8.27)	210 (8.27)	255 (10.04)	255 (10.04)	255 (10.04)	255 (10.04)	255 (10.04)	255 (10.04)	280 (11.02)	280 (11.02)	280 (11.02)	280 (11.02)	280 (11.02)	280 (11.02)	280 (11.02)				
	Flange Thickness (incl. lining flare)	t	23.4 (0.92)	21.9 (0.86)	24.0 (0.94)	22.5 (0.89)	25.6 (1.01)	24.1 (0.95)	27.2 (1.07)	25.7 (1.01)	25.7 (1.01)	30.4 (1.20)	28.9 (1.14)	33.5 (1.32)	32.0 (1.26)	36.7 (1.44)	35.2 (1.39)	35.2 (1.39)	35.2 (1.39)	35.2 (1.39)	35.2 (1.39)	39.9 (1.57)	38.4 (1.51)	38.4 (1.51)	38.4 (1.51)	38.4 (1.51)	38.4 (1.51)	38.4 (1.51)				
	Lining Inner Diameter	ød	26 (1.02)	24 (0.93)	31 (1.22)	29 (1.13)	39 (1.53)	37 (1.44)	52 (2.03)	49 (1.94)	50 (1.95)	63 (2.49)	61 (2.40)	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)	123 (4.83)	121 (4.75)	123 (4.83)	121 (4.75)	121 (4.75)	121 (4.75)	121 (4.75)				
	Bolt	øC	88.9 (3.50)	88.9 (3.50)	98.4 (3.87)	98.4 (3.87)	114.3 (4.50)	114.3 (4.50)	127.0 (5.00)	127.0 (5.00)	127.0 (5.00)	149.2 (5.87)	149.2 (5.87)	168.3 (6.63)	168.3 (6.63)	200.0 (7.87)	200.0 (7.87)	200.0 (7.87)	200.0 (7.87)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)	235.0 (9.25)				
	Bolt Hole Interval	θ°	45	45	45	45	45	45	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5				
	Bolt Hole Diameter	øh	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	22.2 (0.87)	22.2 (0.87)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)	22.2 (0.87)				
	Number of Bolt Holes	N	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8				
	Integral Flowmeter	Height	H1	143 (5.63)	143 (5.63)	154 (6.06)	154 (6.06)	164 (6.46)	164 (6.46)	182 (7.17)	182 (7.17)	182 (7.17)	203 (7.99)	203 (7.99)	219 (8.62)	219 (8.62)	252 (9.92)	252 (9.92)	252 (9.92)	252 (9.92)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)	278 (10.94)			
		Height	H2	80 (3.15)	80 (3.15)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)	99 (3.90)	99 (3.90)	99 (3.90)	108 (4.25)	108 (4.25)	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)			
Maximum Height		Hr	260 (10.24)	260 (10.24)	271 (10.67)	271 (10.67)	281 (11.06)	281 (11.06)	299 (11.77)	299 (11.77)	299 (11.77)	320 (12.60)	320 (12.60)	336 (13.23)	336 (13.23)	369 (14.53)	369 (14.53)	369 (14.53)	369 (14.53)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)	395 (15.55)				
Integral Flowmeter	Approx. Weight, Unit: kg (lb) (*2)		5.2 (11.5)	5.2 (11.5)	6.2 (13.7)	6.2 (13.7)	8.0 (17.6)	8.0 (17.6)	9.3 (20.5)	9.3 (20.5)	9.3 (20.5)	13.2 (29.1)	13.2 (29.1)	17.2 (37.9)	17.2 (37.9)	26.7 (58.9)	26.7 (58.9)	26.7 (58.9)	26.7 (58.9)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)	35.5 (78.3)				
	Maximum Height	Hi	305 (12.01)	305 (12.01)	316 (12.44)	316 (12.44)	326 (12.83)	326 (12.83)	344 (13.54)	344 (13.54)	344 (13.54)	365 (14.37)	365 (14.37)	381 (15.00)	381 (15.00)	414 (16.30)	414 (16.30)	414 (16.30)	414 (16.30)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)	440 (17.32)				
	Approx. Weight, Unit: kg (lb)		7.8 (17.2)	7.8 (17.2)	8.8 (19.4)	8.8 (19.4)	10.5 (23.2)	10.5 (23.2)	11.8 (26.0)	11.8 (26.0)	11.8 (26.0)	15.7 (34.6)	15.7 (34.6)	19.7 (43.4)	19.7 (43.4)	29.2 (64.4)	29.2 (64.4)	29.2 (64.4)	29.2 (64.4)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)	38.0 (83.8)				
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)			
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)			
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)			+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	-	-	+10 (+0.39)	-	-	-	+10 (+0.39)	-	-	-	-	-			

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm

○ Flange, ASME Class 300 (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BA2 CA2											
			150	150	150	200	200	200	250	250	250	300	300	300
	Size Code		150	150	150	200	200	200	250	250	250	300	300	300
	Size		(6)	(6)	(6)	(8)	(8)	(8)	(10)	(10)	(10)	(12)	(12)	(12)
Remote Sensor	Lining Code		F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D
	Lay Length (*1) (*5)	L	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)
	Flange Outer Diameter	øD	320 (12.60)	320 (12.60)	320 (12.60)	380 (14.96)	380 (14.96)	380 (14.96)	445 (17.52)	445 (17.52)	445 (17.52)	520 (20.47)	520 (20.47)	520 (20.47)
	Flange Thickness (incl. lining flare)	t	42.0 (1.65)	42.0 (1.65)	42.0 (1.65)	46.7 (1.84)	46.7 (1.84)	46.7 (1.84)	54.1 (2.13)	54.1 (2.13)	54.1 (2.13)	57.3 (2.26)	57.3 (2.26)	57.3 (2.26)
	Lining Inner Diameter	ød	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)
	Bolt	øC	269.9 (10.63)	269.9 (10.63)	269.9 (10.63)	330.2 (13.00)	330.2 (13.00)	330.2 (13.00)	387.4 (15.25)	387.4 (15.25)	387.4 (15.25)	450.8 (17.75)	450.8 (17.75)	450.8 (17.75)
	Circle Diameter	ø*	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)
	Bolt Hole Interval	øh	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)	31.8 (1.25)	31.8 (1.25)	31.8 (1.25)
	Bolt Hole Diameter	øh	22.3 (0.88)	22.3 (0.88)	22.3 (0.88)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)	28.6 (1.13)	28.6 (1.13)	28.6 (1.13)	31.8 (1.25)	31.8 (1.25)	31.8 (1.25)
	Number of Bolt Holes	N	12	12	12	12	12	12	16	16	16	16	16	16
	Height	H1	303 (11.91)	303 (11.91)	303 (11.91)	358 (14.08)	358 (14.08)	358 (14.08)	421 (16.57)	421 (16.57)	421 (16.57)	483 (19.01)	483 (19.01)	483 (19.01)
	Height	H2	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)
	Height	H3	-	-	-	-	-	-	496 (19.53)	496 (19.53)	496 (19.53)	571 (22.48)	571 (22.48)	571 (22.48)
Remote Sensor	Maximum Height	Hr	420 (16.53)	420 (16.53)	420 (16.53)	475 (18.70)	475 (18.70)	475 (18.70)	538 (21.19)	538 (21.19)	538 (21.19)	600 (23.62)	600 (23.62)	600 (23.62)
	Approx. Weight, Unit: kg (lb) (*2)		46 (101.6)	45 (99.3)	45 (99.3)	68 (150.1)	67 (147.9)	67 (147.9)	106 (234.0)	106 (234.0)	105 (231.8)	144 (317.9)	143 (315.7)	143 (315.7)
Integral Flowmeter	Maximum Height	Hi	465 (18.29)	465 (18.29)	465 (18.29)	520 (20.46)	520 (20.46)	520 (20.46)	583 (22.95)	583 (22.95)	583 (22.95)	645 (25.38)	645 (25.38)	645 (25.38)
	Approx. Weight, Unit: kg (lb)		48 (106.0)	48 (106.0)	48 (106.0)	70 (154.5)	69 (152.3)	69 (152.3)	109 (240.6)	108 (238.4)	108 (238.4)	147 (324.5)	146 (322.3)	145 (320.1)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, EN PN16, EN PN40

Unit: mm (approx. in.)

Model	Process Connection Code		BE4										BE2															
			CE4					CE2 (*5)																				
	Size Code		-	-	-	-	-	-	050	050	050	065	065	080	080	100	100	100	100	125	125	125	125					
	Size		(25)	(25)	(32)	(32)	(40)	(40)	(50)	(50)	(50)	(65)	(65)	(80)	(80)	(100)	(100)	(100)	(100)	(125)	(125)	(125)	(125)					
Lining Code		F	U	F	U	F	U	F	U	H,D	F	U,H,D	F	U,H,D	F	U	H	D	F	U	H	D						
Remote Sensor	Lay Length (*1) (*6)	L	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)					
	Flange Outer Diameter	øD	115 (4.53)	115 (4.53)	140 (5.51)	140 (5.51)	150 (5.91)	150 (5.91)	165 (6.50)	165 (6.50)	165 (6.50)	185 (7.28)	185 (7.28)	200 (7.87)	200 (7.87)	220 (8.66)	220 (8.66)	220 (8.66)	220 (8.66)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)					
	Flange Thickness (incl. lining flare)	t	23.5 (0.93)	22.0 (0.87)	22.5 (0.89)	21.0 (0.83)	22.5 (0.89)	21.0 (0.83)	24.5 (0.96)	23.0 (0.91)	23.0 (0.91)	22.5 (0.89)	21.0 (0.83)	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	23.0 (0.91)	23.0 (0.91)	26.5 (1.04)	25.0 (0.98)	25.0 (0.98)	25.0 (0.98)					
	Lining Inner Diameter	ød	26 (1.02)	24 (0.93)	31 (1.22)	29 (1.13)	39 (1.53)	37 (1.44)	52 (2.03)	49 (1.94)	50 (1.96)	63 (2.49)	61 (2.40)	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)	123 (4.83)	121 (4.75)					
Integral Flowmeter	Bolt	øC	85 (3.35)	85 (3.35)	100 (3.94)	100 (3.94)	110 (4.33)	110 (4.33)	125 (4.92)	125 (4.92)	125 (4.92)	145 (5.71)	145 (5.71)	160 (6.30)	160 (6.30)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	210 (8.27)	210 (8.27)	210 (8.27)	210 (8.27)					
	Bolt Hole Interval	θ°	45 (1.02)	45 (0.93)	45 (1.22)	45 (1.13)	45 (1.53)	45 (1.44)	45 (2.03)	45 (1.94)	45 (1.96)	22.5 (2.49)	22.5 (2.40)	22.5 (2.96)	22.5 (2.87)	22.5 (3.95)	22.5 (3.82)	22.5 (3.87)	22.5 (3.79)	22.5 (4.91)	22.5 (4.76)	22.5 (4.83)	22.5 (4.75)					
	Bolt Hole Diameter	øh	14 (0.55)	14 (0.55)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)					
	Number of Bolt Holes	N	4	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8					
Remote Sensor	Height	H1	138 (5.43)	138 (5.43)	156 (6.14)	156 (6.14)	161 (6.34)	161 (6.34)	182 (7.17)	182 (7.17)	182 (7.17)	201 (7.91)	201 (7.91)	214 (8.43)	214 (8.43)	234 (9.21)	234 (9.21)	234 (9.21)	234 (9.21)	263 (10.35)	263 (10.35)	263 (10.35)	263 (10.35)					
	Height	H2	80 (3.15)	80 (3.15)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)	99 (3.90)	99 (3.90)	99 (3.90)	108 (4.25)	108 (4.25)	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)					
	Maximum Height	Hr	255 (10.04)	255 (10.04)	273 (10.75)	273 (10.75)	278 (10.94)	278 (10.94)	299 (11.77)	299 (11.77)	299 (11.77)	318 (12.52)	318 (12.52)	331 (13.03)	331 (13.03)	351 (13.82)	351 (13.82)	351 (13.82)	351 (13.82)	380 (14.96)	380 (14.96)	380 (14.96)	380 (14.96)					
	Approx. Weight, Unit: kg (lb) (*2)		4.8 (10.6)	4.8 (10.6)	6.4 (14.1)	6.4 (14.1)	7.1 (15.7)	7.1 (15.7)	8.9 (19.6)	8.9 (19.6)	8.9 (19.6)	9.9 (21.8)	9.9 (21.8)	12.4 (27.3)	12.4 (27.3)	15.0 (33.1)	15.0 (33.1)	15.0 (33.1)	15.0 (33.1)	20.7 (45.6)	20.7 (45.6)	20.7 (45.6)	20.7 (45.6)					
Integral Flowmeter	Maximum Height	Hi	300 (11.81)	300 (11.81)	318 (12.52)	318 (12.52)	323 (12.72)	323 (12.72)	344 (13.54)	344 (13.54)	344 (13.54)	363 (14.29)	363 (14.29)	376 (14.80)	376 (14.80)	396 (15.59)	396 (15.59)	396 (15.59)	396 (15.59)	425 (16.73)	425 (16.73)	425 (16.73)	425 (16.73)					
	Approx. Weight, Unit: kg (lb)		7.4 (16.3)	7.4 (16.3)	9.0 (19.8)	9.0 (19.8)	9.6 (21.2)	9.6 (21.2)	11.4 (25.1)	11.4 (25.1)	11.4 (25.1)	12.4 (27.3)	12.4 (27.3)	15.0 (33.1)	15.0 (33.1)	17.6 (38.8)	17.6 (38.8)	17.6 (38.8)	17.6 (38.8)	23.3 (51.4)	23.3 (51.4)	23.3 (51.4)	23.3 (51.4)					
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)					
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)					
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)			+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)					

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two to be additionally added for getting the total lay length.
- *5: For process connection code CE2, lining code U (polyurethane rubber) is not available in sizes 65 to 125 mm (2.5 to 5 in.).
- *6: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/3 mm

○ Flange, EN PN16, EN PN40 (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BE2 CE2											
			150	150	150	200	200	200	250	250	250	300	300	300
	Size		150 (6)	150 (6)	150 (6)	200 (8)	200 (8)	200 (8)	250 (10)	250 (10)	250 (10)	300 (12)	300 (12)	300 (12)
	Lining Code		F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D
Remote Sensor	Lay Length (*1) (*5)	L	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)
	Flange Outer Diameter	øD	285 (11.22)	285 (11.22)	285 (11.22)	340 (13.39)	340 (13.39)	340 (13.39)	405 (15.94)	405 (15.94)	405 (15.94)	460 (18.11)	460 (18.11)	460 (18.11)
	Flange Thickness (incl. lining flare)	t	26.0 (1.02)	26.0 (1.02)	26.0 (1.02)	28.0 (1.10)	28.0 (1.10)	28.0 (1.10)	31.0 (1.22)	31.0 (1.22)	31.0 (1.22)	32.0 (1.26)	32.0 (1.26)	32.0 (1.26)
	Lining Inner Diameter	ød	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)
	Bolt	øC	240 (9.45)	240 (9.45)	240 (9.45)	295 (11.61)	295 (11.61)	295 (11.61)	355 (13.98)	355 (13.98)	355 (13.98)	410 (16.14)	410 (16.14)	410 (16.14)
	Circle Diameter	ø*	22.5 (0.87)	22.5 (0.87)	22.5 (0.87)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)
	Bolt Hole Interval	øh	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	26 (1.02)	26 (1.02)	26 (1.02)	26 (1.02)	26 (1.02)	26 (1.02)
	Bolt Hole Diameter	N	8 (0.31)	8 (0.31)	8 (0.31)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)
	Number of Bolt Holes	H1	285 (11.22)	285 (11.22)	285 (11.22)	338 (13.29)	338 (13.29)	338 (13.29)	401 (15.78)	401 (15.78)	401 (15.78)	453 (17.82)	453 (17.82)	453 (17.82)
	Height	H2	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)
	Height	H3	-	-	-	-	-	-	456 (17.95)	456 (17.95)	456 (17.95)	511 (20.12)	511 (20.12)	511 (20.12)
	Maximum Height	Hr	402 (15.84)	402 (15.84)	402 (15.84)	455 (17.91)	455 (17.91)	455 (17.91)	518 (20.40)	518 (20.40)	518 (20.40)	570 (22.44)	570 (22.44)	570 (22.44)
Remote Sensor	Approx. Weight, Unit: kg (lb) (*2)		27 (59.6)	27 (59.6)	27 (59.6)	41 (90.5)	40 (88.3)	40 (88.3)	68 (150.1)	67 (147.9)	66 (145.7)	84 (185.4)	83 (183.2)	82 (181.0)
Integral Flowmeter	Maximum Height	Hi	-	447 (17.60)	447 (17.60)	-	500 (19.67)	500 (19.67)	-	563 (22.16)	563 (22.16)	-	615 (24.20)	615 (24.20)
	Approx. Weight, Unit: kg (lb)		30 (66.2)	29 (64.0)	30 (66.2)	43 (94.9)	43 (94.9)	43 (94.9)	70 (154.5)	69 (152.3)	69 (152.3)	86 (189.9)	86 (189.9)	85 (187.6)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, EN PN10

Unit: mm (approx. in.)

Model	Process Connection Code		BE1															
			CE1															
	Size Code		200	200	200	250	250	250	300	300	300	350	350	350	400	400	400	
	Size		200 (8)	200 (8)	200 (8)	250 (10)	250 (10)	250 (10)	300 (12)	300 (12)	300 (12)	350 (14)	350 (14)	350 (14)	400 (16)	400 (16)	400 (16)	
Lining Code			F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	
Remote Sensor	Lay Length (*1) (*5)	L	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)	548 (21.56)	548 (21.56)	548 (21.56)	598 (23.52)	598 (23.52)	598 (23.52)	
	Flange Outer Diameter	øD	340 (13.39)	340 (13.39)	340 (13.39)	395 (15.55)	395 (15.55)	395 (15.55)	445 (17.52)	445 (17.52)	445 (17.52)	505 (19.88)	505 (19.88)	505 (19.88)	565 (22.24)	565 (22.24)	565 (22.24)	
	Flange Thickness (incl. lining flare)	t	28.0 (1.10)	28.0 (1.10)	28.0 (1.10)	31.0 (1.22)	31.0 (1.22)	31.0 (1.22)	30.0 (1.18)	30.0 (1.18)	30.0 (1.18)	30.5 (1.20)	30.5 (1.20)	30.5 (1.20)	30.5 (1.20)	30.5 (1.20)	30.5 (1.20)	
	Lining Inner Diameter	ød	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)	330 (12.97)	323 (12.70)	330 (12.97)	381 (14.98)	373 (14.67)	381 (14.98)	
	Bolt	øC	295 (11.61)	295 (11.61)	295 (11.61)	350 (13.78)	350 (13.78)	350 (13.78)	400 (15.75)	400 (15.75)	400 (15.75)	460 (18.11)	460 (18.11)	460 (18.11)	515 (20.28)	515 (20.28)	515 (20.28)	
	Circle Diameter	ø°	22.5 (0.87)	22.5 (0.87)	22.5 (0.87)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	
	Bolt Hole Interval	øh	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	22 (0.87)	26 (1.02)	26 (1.02)	26 (1.02)	
	Bolt Hole Diameter	N	8 (0.31)	8 (0.31)	8 (0.31)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	12 (0.47)	16 (0.63)	16 (0.63)	16 (0.63)	16 (0.63)	16 (0.63)	16 (0.63)	
	Number of Bolt Holes	H1	338 (13.29)	338 (13.29)	338 (13.29)	396 (15.58)	396 (15.58)	396 (15.58)	445 (17.53)	445 (17.53)	445 (17.53)	497 (19.55)	497 (19.55)	497 (19.55)	554 (21.82)	554 (21.82)	554 (21.82)	
	Height	H2	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)	244 (9.61)	244 (9.61)	244 (9.61)	272 (10.70)	272 (10.70)	272 (10.70)	
Integral Flowmeter	Height	H3	-	-	-	446 (17.56)	446 (17.56)	446 (17.56)	496 (19.53)	496 (19.53)	496 (19.53)	565 (22.24)	565 (22.24)	565 (22.24)	625 (24.61)	625 (24.61)	625 (24.61)	
	Maximum Height	Hr	455 (17.91)	455 (17.91)	455 (17.91)	513 (20.20)	513 (20.20)	513 (20.20)	563 (22.15)	563 (22.15)	563 (22.15)	614 (24.17)	614 (24.17)	614 (24.17)	672 (26.44)	672 (26.44)	672 (26.44)	
	Approx. Weight, Unit: kg (lb) (*2)		41 (90.5)	40 (88.3)	40 (88.3)	65 (143.5)	64 (141.3)	64 (141.3)	77 (170.0)	76 (167.8)	75 (165.6)	97 (214.1)	96 (211.9)	94 (207.5)	121 (267.1)	120 (264.9)	118 (260.5)	
Remote Sensor	Maximum Height	Hi	500 (19.67)	500 (19.67)	500 (19.67)	558 (21.96)	558 (21.96)	558 (21.96)	607 (23.91)	607 (23.91)	607 (23.91)	659 (25.93)	659 (25.93)	659 (25.93)	716 (28.20)	716 (28.20)	716 (28.20)	
	Approx. Weight, Unit: kg (lb)		43 (94.9)	43 (94.9)	43 (94.9)	67 (147.9)	67 (147.9)	66 (145.7)	79 (174.4)	79 (174.4)	78 (172.2)	99 (218.5)	98 (216.3)	97 (214.1)	123 (271.5)	122 (269.3)	120 (264.9)	
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, JIS F12

Unit: mm (approx. in.)

Model	Process Connection Code		BG1																			
	Size Code		CG1																			
	Size		080	080	100	100	100	100	125	125	125	125	150	150	150	200	200	200	250	250	250	
	Size		80	80	100	100	100	100	125	125	125	125	150	150	150	200	200	200	250	250	250	
Remote Sensor	Lining Code		F	U,H,D	F	U	H	D	F	U	H	D	F	U	H,D	F	U	H,D	F	U	H,D	
	Lay Length (*1) (*5)		L	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	
	Flange Outer Diameter		øD	211 (8.31)	211 (8.31)	238 (9.37)	238 (9.37)	238 (9.37)	263 (10.35)	263 (10.35)	263 (10.35)	263 (10.35)	290 (11.42)	290 (11.42)	290 (11.42)	342 (13.46)	342 (13.46)	342 (13.46)	410 (16.14)	410 (16.14)	410 (16.14)	
	Flange Thickness (incl. lining flare)		t	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	23.0 (0.91)	26.5 (1.04)	25.0 (0.98)	25.0 (0.98)	25.0 (0.98)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	30.0 (1.18)	30.0 (1.18)	30.0 (1.18)	
	Lining Inner Diameter		ød	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)	123 (4.83)	121 (4.75)	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)
	Bolt Circle Diameter		øC	168 (6.61)	168 (6.61)	195 (7.68)	195 (7.68)	195 (7.68)	195 (7.68)	220 (8.66)	220 (8.66)	220 (8.66)	220 (8.66)	247 (9.72)	247 (9.72)	247 (9.72)	299 (11.77)	299 (11.77)	299 (11.77)	360 (14.17)	360 (14.17)	360 (14.17)
	Bolt Hole Interval		θ°	45	45	45	45	45	45	30	30	30	30	30	30	30	22.5	22.5	22.5	22.5	22.5	22.5
	Bolt Hole Diameter		øh	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	23 (0.91)	23 (0.91)	23 (0.91)
	Number of Bolt Holes		N	4	4	4	4	4	4	6	6	6	6	6	6	6	8	8	8	8	8	8
	Height		H1	220 (8.66)	220 (8.66)	243 (9.57)	243 (9.57)	243 (9.57)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)	288 (11.32)	288 (11.32)	288 (11.32)	339 (13.33)	339 (13.33)	339 (13.33)	403 (15.88)	403 (15.88)	403 (15.88)	
Height		H2	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)		
Height		H3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	461 (18.15)	461 (18.15)	461 (18.15)		
Remote Sensor	Maximum Height		Hr	337 (13.27)	337 (13.27)	360 (14.17)	360 (14.17)	360 (14.17)	387 (15.24)	387 (15.24)	387 (15.24)	387 (15.24)	405 (15.94)	405 (15.94)	405 (15.94)	456 (17.95)	456 (17.95)	456 (17.95)	521 (20.50)	521 (20.50)	521 (20.50)	
	Approx. Weight, Unit: kg (lb) (*2)			12.8 (28.2)	12.8 (28.2)	16.1 (35.5)	16.1 (35.5)	16.1 (35.5)	21.2 (46.7)	21.2 (46.7)	21.2 (46.7)	21.2 (46.7)	29 (64.0)	28 (61.8)	28 (61.8)	40 (88.3)	40 (88.3)	40 (88.3)	67 (150.1)	67 (150.1)	67 (150.1)	
	Maximum Height		Hi	382 (15.04)	382 (15.04)	405 (15.94)	405 (15.94)	405 (15.94)	432 (17.01)	432 (17.01)	432 (17.01)	432 (17.01)	450 (17.70)	450 (17.70)	450 (17.70)	501 (19.71)	501 (19.71)	501 (19.71)	565 (22.26)	565 (22.26)	565 (22.26)	
Integral Flowmeter	Approx. Weight, Unit: kg (lb)			15.3 (33.7)	15.3 (33.7)	18.7 (41.2)	18.7 (41.2)	18.7 (41.2)	23.6 (52.0)	23.6 (52.0)	23.6 (52.0)	23.6 (52.0)	31 (68.4)	31 (68.4)	31 (68.4)	42 (92.7)	42 (92.7)	42 (92.7)	70 (154.5)	70 (154.5)	69 (152.3)	
	Grounding rings thin type (GRL, GRH) (*1) (*3)		-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	
Grounding rings thick type (GRN, GRJ) (*1) (*4)			-	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)			+10 (+0.39)	-	+10 (+0.39)	-	-	-	+10 (+0.39)	-	-	-	-	-	-	-	-	-	-	-	-	

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary, except for lining code F with sizes 125 mm (5 in.) or less. For sizes up to 125 mm (5 in.), recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two, and for sizes 150 mm (6 in.) and above, it is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two, to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, JIS F12 (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BG1							
			CG1							
	Size Code		300	300	300	350	350	350	400	400
	Size		300	300	300	350	350	350	400	400
			(12)	(12)	(12)	(14)	(14)	(14)	(16)	(16)
	Lining Code		F	U	H, D	F	U	H, D	F	U
			(12)	(12)	(12)	(14)	(14)	(14)	(16)	(16)
			(12)	(12)	(12)	(14)	(14)	(14)	(16)	(16)
Remote Sensor	Lay Length (*1) (*5)	L	498 (19.59)	498 (19.59)	498 (19.59)	548 (21.56)	548 (21.56)	548 (21.56)	598 (23.52)	598 (23.52)
	Flange Outer Diameter	øD	464 (18.27)	464 (18.27)	464 (18.27)	530 (20.87)	530 (20.87)	530 (20.87)	582 (22.91)	582 (22.91)
	Flange Thickness (incl. lining flare)	t	29.0 (1.14)	29.0 (1.14)	29.0 (1.14)	31.5 (1.24)	31.5 (1.24)	31.5 (1.24)	31.5 (1.24)	31.5 (1.24)
	Lining Inner Diameter	ød	300 (11.79)	292 (11.48)	299 (11.75)	330 (12.97)	323 (12.70)	330 (12.97)	381 (14.98)	373 (14.67)
	Bolt	øC	414 (16.30)	414 (16.30)	414 (16.30)	472 (18.58)	472 (18.58)	472 (18.58)	524 (20.63)	524 (20.63)
	Circle Diameter	ø°	18	18	18	18	18	18	15	15
	Bolt Hole Interval	øh	23 (0.91)	23 (0.91)	23 (0.91)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)
	Bolt Hole Diameter	N	10	10	10	10	10	10	12	12
	Height	H1	455 (17.90)	455 (17.90)	455 (17.90)	509 (20.04)	509 (20.04)	509 (20.04)	563 (22.16)	563 (22.16)
	Height	H2	223 (8.77)	223 (8.77)	223 (8.77)	244 (9.61)	244 (9.61)	244 (9.61)	272 (10.70)	272 (10.70)
Remote Sensor	Height	H3	515 (20.28)	515 (20.28)	515 (20.28)	591 (23.27)	591 (23.27)	591 (23.27)	643 (25.31)	643 (25.31)
	Maximum Height	Hr	572 (22.52)	572 (22.52)	572 (22.52)	626 (24.66)	626 (24.66)	626 (24.66)	680 (26.78)	680 (26.78)
	Approx. Weight, Unit: kg (lb) (*2)		81 (178.8)	80 (176.6)	79 (174.4)	106 (234.0)	105 (231.8)	103 (227.4)	129 (284.8)	128 (282.6)
Integral Flowmeter	Maximum Height	Hi	617 (24.28)	617 (24.28)	617 (24.28)	671 (26.42)	671 (26.42)	671 (26.42)	725 (28.54)	725 (28.54)
	Approx. Weight, Unit: kg (lb)		83 (183.2)	83 (183.2)	82 (181.0)	108 (238.4)	107 (236.2)	106 (234.0)	131 (289.2)	130 (287.0)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, JIS 10K

Unit: mm (approx. in.)

Model	Process Connection Code	BJ1																								
		-	-	-	-	-	-	CJ1																		
		Size Code						025	032	032	040	040	050	050	050	065	065	080	080	100	100	100	125	125	125	125
		(25)	(25)	(32)	(32)	(40)	(40)	(50)	(50)	(50)	(65)	(65)	(80)	(80)	(100)	(100)	(100)	(125)	(125)	(125)	(125)	(125)	(125)	(125)	(125)	(125)
Remote Sensor	Lining Code	F	U	F	U	F	U	F	U	H,D	F	U,H,D	F	U,H,D	F	U	H	D	F	U	H	D				
	Lay Length (*1) (*5)	L	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)				
	Flange Outer Diameter	øD	125 (4.92)	125 (4.92)	135 (5.31)	135 (5.31)	140 (5.51)	140 (5.51)	155 (6.10)	155 (6.10)	155 (6.10)	175 (6.89)	175 (6.89)	185 (7.28)	185 (7.28)	210 (8.27)	210 (8.27)	210 (8.27)	210 (8.27)	250 (9.84)	250 (9.84)	250 (9.84)				
	Flange Thickness (incl. lining flare)	t	21.5 (0.85)	20.0 (0.79)	22.5 (0.89)	21.0 (0.83)	22.5 (0.89)	21.0 (0.83)	22.5 (0.89)	21.0 (0.83)	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	26.5 (1.04)	25.0 (0.98)	25.0 (0.98)	25.0 (0.98)				
	Lining Inner Diameter	ød	26 (1.02)	24 (0.93)	31 (1.22)	29 (1.13)	39 (1.53)	37 (1.44)	52 (2.03)	49 (1.94)	50 (1.95)	63 (2.49)	61 (2.40)	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)	123 (4.83)				
	Bolt	øC	90 (3.54)	90 (3.54)	100 (3.94)	100 (3.94)	105 (4.13)	105 (4.13)	120 (4.72)	120 (4.72)	140 (5.51)	140 (5.51)	150 (5.91)	150 (5.91)	175 (6.89)	175 (6.89)	175 (6.89)	175 (6.89)	210 (8.27)	210 (8.27)	210 (8.27)	210 (8.27)				
	Circle Diameter	øC	90 (3.54)	90 (3.54)	100 (3.94)	100 (3.94)	105 (4.13)	105 (4.13)	120 (4.72)	120 (4.72)	140 (5.51)	140 (5.51)	150 (5.91)	150 (5.91)	175 (6.89)	175 (6.89)	175 (6.89)	175 (6.89)	210 (8.27)	210 (8.27)	210 (8.27)	210 (8.27)				
	Bolt Hole Interval	θ°	45 (1.02)	45 (0.93)	45 (1.22)	45 (1.13)	45 (1.53)	45 (1.44)	45 (2.03)	45 (1.94)	45 (1.95)	45 (2.49)	45 (2.40)	45 (2.96)	45 (2.87)	22.5 (3.95)	22.5 (3.82)	22.5 (3.87)	22.5 (3.79)	22.5 (4.91)	22.5 (4.76)	22.5 (4.83)				
	Bolt Hole Diameter	øh	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)			
	Number of Bolt Holes	N	4	4	4	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8				
	Integral Flowmeter	Height	H1	143 (5.63)	143 (5.63)	154 (6.06)	154 (6.06)	156 (6.14)	156 (6.14)	177 (6.97)	177 (6.97)	196 (7.72)	196 (7.72)	207 (8.15)	207 (8.15)	229 (9.02)	229 (9.02)	229 (9.02)	229 (9.02)	263 (10.35)	263 (10.35)	263 (10.35)	263 (10.35)			
		Height	H2	80 (3.15)	80 (3.15)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)	99 (3.90)	99 (3.90)	99 (3.90)	108 (4.25)	108 (4.25)	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)	138 (5.43)			
Maximum Height		Hr	260 (10.24)	260 (10.24)	271 (10.67)	271 (10.67)	273 (10.75)	273 (10.75)	294 (11.57)	294 (11.57)	294 (11.57)	313 (12.32)	313 (12.32)	324 (12.76)	324 (12.76)	346 (13.62)	346 (13.62)	346 (13.62)	346 (13.62)	380 (14.96)	380 (14.96)	380 (14.96)				
Approx. Weight, Unit: kg (lb) (*2)			4.8 (10.6)	4.8 (10.6)	5.9 (13.0)	5.9 (13.0)	6.1 (13.5)	6.1 (13.5)	7.3 (16.1)	7.3 (16.1)	7.3 (16.1)	9.6 (21.2)	9.6 (21.2)	10.2 (22.5)	10.2 (22.5)	13.0 (28.7)	13.0 (28.7)	13.0 (28.7)	13.0 (28.7)	19.1 (42.1)	19.1 (42.1)	19.1 (42.1)				
Integral Flowmeter	Maximum Height	Hi	305 (12.01)	305 (12.01)	316 (12.44)	316 (12.44)	318 (12.52)	318 (12.52)	339 (13.35)	339 (13.35)	339 (13.35)	358 (14.09)	358 (14.09)	369 (14.53)	369 (14.53)	391 (15.39)	391 (15.39)	391 (15.39)	391 (15.39)	425 (16.73)	425 (16.73)	425 (16.73)				
	Approx. Weight, Unit: kg (lb)		7.3 (16.1)	7.3 (16.1)	8.4 (18.5)	8.4 (18.5)	8.7 (19.2)	8.7 (19.2)	9.8 (21.6)	9.8 (21.6)	9.8 (21.6)	12.1 (26.7)	12.1 (26.7)	12.7 (28.0)	12.7 (28.0)	15.6 (34.4)	15.6 (34.4)	15.6 (34.4)	15.6 (34.4)	21.6 (47.6)	21.6 (47.6)	21.6 (47.6)				
Grounding rings thin type (GRL, GRH) (*1) (*3)		-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)				
Grounding rings thick type (GRN, GRJ) (*1) (*4)		+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)					
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)		+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-					

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm

○ Flange, JIS 10K (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BJ1																	
			CJ1																	
	Size Code		150	150	150	200	200	200	250	250	250	300	300	300	350	350	350	400	400	400
	Size		150	150	150	200	200	200	250	250	250	300	300	300	350	350	350	400	400	400
	Lining Code		F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D
			(6)	(6)	(6)	(8)	(8)	(8)	(10)	(10)	(10)	(12)	(12)	(12)	(14)	(14)	(14)	(16)	(16)	(16)
Remote Sensor	Lay Length (*1) (*5)	L	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)	548 (21.56)	548 (21.56)	548 (21.56)	598 (23.52)	598 (23.52)	598 (23.52)
	Flange Outer Diameter	øD	280 (11.02)	280 (11.02)	280 (11.02)	330 (12.99)	330 (12.99)	330 (12.99)	400 (15.75)	400 (15.75)	400 (15.75)	445 (17.52)	445 (17.52)	445 (17.52)	490 (19.29)	490 (19.29)	490 (19.29)	560 (22.05)	560 (22.05)	560 (22.05)
	Flange Thickness (incl. lining flare)	t	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	30.0 (1.18)	30.0 (1.18)	30.0 (1.18)	29.0 (1.14)	29.0 (1.14)	29.0 (1.14)	31.5 (1.24)	31.5 (1.24)	31.5 (1.24)	33.5 (1.32)	33.5 (1.32)	33.5 (1.32)
	Lining Inner Diameter	ød	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)	330 (12.97)	323 (12.70)	330 (12.97)	381 (14.98)	373 (14.67)	381 (14.98)
	Bolt	øC	240 (9.45)	240 (9.45)	240 (9.45)	290 (11.42)	290 (11.42)	290 (11.42)	355 (13.98)	355 (13.98)	355 (13.98)	400 (15.75)	400 (15.75)	400 (15.75)	445 (17.52)	445 (17.52)	445 (17.52)	510 (20.08)	510 (20.08)	510 (20.08)
	Circle Diameter	øC	240 (9.45)	240 (9.45)	240 (9.45)	290 (11.42)	290 (11.42)	290 (11.42)	355 (13.98)	355 (13.98)	355 (13.98)	400 (15.75)	400 (15.75)	400 (15.75)	445 (17.52)	445 (17.52)	445 (17.52)	510 (20.08)	510 (20.08)	510 (20.08)
	Bolt Hole Interval	θ°	22.5 (0.91)	22.5 (0.91)	22.5 (0.91)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	15 (0.60)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)	11.25 (0.44)
	Bolt Hole Diameter	øh	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	27 (1.06)	27 (1.06)	27 (1.06)
	Number of Bolt Holes	N	8	8	8	12	12	12	12	12	12	16	16	16	16	16	16	16	16	16
	Height	H1	283 (11.12)	283 (11.12)	283 (11.12)	333 (13.10)	333 (13.10)	333 (13.10)	398 (15.68)	398 (15.68)	398 (15.68)	445 (17.53)	445 (17.53)	445 (17.53)	489 (19.25)	489 (19.25)	489 (19.25)	552 (21.72)	552 (21.72)	552 (21.72)
	Height	H2	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)	244 (9.61)	244 (9.61)	244 (9.61)	272 (10.70)	272 (10.70)	272 (10.70)
	Height	H3	-	-	-	-	-	-	451 (17.76)	451 (17.76)	451 (17.76)	496 (19.53)	496 (19.53)	496 (19.53)	550 (21.65)	550 (21.65)	550 (21.65)	620 (24.41)	620 (24.41)	620 (24.41)
Remote Sensor	Maximum Height	Hr	400 (15.74)	400 (15.74)	400 (15.74)	450 (17.71)	450 (17.71)	450 (17.71)	516 (20.30)	516 (20.30)	516 (20.30)	563 (22.15)	563 (22.15)	563 (22.15)	606 (23.87)	606 (23.87)	606 (23.87)	669 (26.34)	669 (26.34)	669 (26.34)
	Approx. Weight, Unit: kg (lb) (*2)		26 (57.4)	25 (55.2)	26 (57.4)	36 (79.5)	35 (77.3)	35 (77.3)	61 (134.7)	61 (134.7)	61 (134.7)	71 (156.7)	70 (154.5)	69 (152.3)	87 (192.1)	85 (187.6)	84 (185.4)	115 (253.9)	114 (251.7)	112 (247.2)
Integral Flowmeter	Maximum Height	Hi	445 (17.50)	445 (17.50)	445 (17.50)	495 (19.47)	495 (19.47)	495 (19.47)	560 (22.06)	560 (22.06)	560 (22.06)	607 (23.91)	607 (23.91)	607 (23.91)	651 (25.63)	651 (25.63)	651 (25.63)	714 (28.10)	714 (28.10)	714 (28.10)
	Approx. Weight, Unit: kg (lb)		28 (61.8)	28 (61.8)	28 (61.8)	38 (83.9)	38 (83.9)	38 (83.9)	64 (141.3)	63 (139.1)	63 (139.1)	73 (161.2)	73 (161.2)	72 (158.9)	89 (196.5)	88 (194.3)	86 (189.9)	117 (258.3)	116 (256.1)	114 (251.7)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

○ Flange, JIS 20K

Unit: mm (approx. in.)

Model	Process Connection Code	BJ2																					
		-	-	-	-	-	-	CJ2															
		Size Code	025	025	032	032	040	040	050	050	050	065	065	080	080	100	100	100	100	125	125	125	125
		Size	(25)	(25)	(32)	(32)	(40)	(40)	(50)	(50)	(50)	(65)	(65)	(80)	(80)	(100)	(100)	(100)	(100)	(125)	(125)	(125)	(125)
Lining Code		F	U	F	U	F	U	F	U	H,D	F	U,H,D	F	U,H,D	F	U	H	D	F	U	H	D	
Remote Sensor	Lay Length (*1) (*5)	L	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	198 (7.78)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	248 (9.74)	
	Flange Outer Diameter	øD	125 (4.92)	125 (4.92)	135 (5.31)	135 (5.31)	140 (5.51)	140 (5.51)	155 (6.10)	155 (6.10)	155 (6.10)	175 (6.89)	175 (6.89)	200 (7.87)	200 (7.87)	225 (8.86)	225 (8.86)	225 (8.86)	225 (8.86)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)
	Flange Thickness (incl. lining flare)	t	23.5 (0.93)	22.0 (0.87)	24.5 (0.96)	23.0 (0.91)	24.5 (0.96)	23.0 (0.91)	26.5 (0.96)	23.0 (0.91)	26.5 (0.91)	25.0 (1.04)	28.5 (0.98)	28.5 (1.12)	27.0 (1.06)	30.5 (1.20)	29.0 (1.14)	29.0 (1.14)	29.0 (1.14)	32.5 (1.28)	31.0 (1.22)	31.0 (1.22)	31.0 (1.22)
	Lining Inner Diameter	ød	26 (1.02)	24 (0.93)	31 (1.22)	29 (1.13)	39 (1.53)	37 (1.44)	52 (2.03)	49 (1.94)	50 (1.95)	63 (2.49)	61 (2.40)	75 (2.96)	73 (2.87)	100 (3.95)	97 (3.82)	98 (3.87)	96 (3.79)	125 (4.91)	121 (4.76)	123 (4.83)	121 (4.75)
	Bolt	øC	90 (3.54)	90 (3.54)	100 (3.94)	100 (3.94)	105 (4.13)	105 (4.13)	120 (4.72)	120 (4.72)	120 (4.72)	140 (5.51)	140 (5.51)	160 (6.30)	160 (6.30)	185 (7.28)	185 (7.28)	185 (7.28)	185 (7.28)	225 (8.86)	225 (8.86)	225 (8.86)	225 (8.86)
Integral Flowmeter	Bolt Hole Interval	θ°	45 (1.77)	45 (1.77)	45 (1.77)	45 (1.77)	45 (1.77)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	
	Bolt Hole Diameter	øh	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)
	Number of Bolt Holes	N	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Height	H1	143 (5.63)	143 (5.63)	154 (6.06)	154 (6.06)	156 (6.14)	156 (6.14)	177 (6.97)	177 (6.97)	177 (6.97)	196 (7.72)	196 (7.72)	214 (8.43)	214 (8.43)	237 (9.33)	237 (9.33)	237 (9.33)	237 (9.33)	273 (10.75)	273 (10.75)	273 (10.75)	273 (10.75)
	Height	H2	80 (3.15)	80 (3.15)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)	99 (3.90)	99 (3.90)	99 (3.90)	108 (4.25)	108 (4.25)	114 (4.49)	114 (4.49)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)	138 (5.43)	138 (5.43)	138 (5.43)	138 (5.43)
Remote Sensor	Maximum Height	Hr	260 (10.24)	260 (10.24)	271 (10.67)	271 (10.67)	273 (10.75)	273 (10.75)	294 (11.57)	294 (11.57)	294 (11.57)	313 (12.32)	313 (12.32)	331 (13.03)	331 (13.03)	354 (13.94)	354 (13.94)	354 (13.94)	354 (13.94)	390 (15.35)	390 (15.35)	390 (15.35)	390 (15.35)
	Approx. Weight, Unit: kg (lb) (*2)		5.2 (11.5)	5.2 (11.5)	6.3 (13.9)	6.3 (13.9)	6.6 (14.6)	6.6 (14.6)	7.5 (16.5)	7.5 (16.5)	7.5 (16.5)	9.9 (21.8)	9.9 (21.8)	13.1 (28.9)	13.1 (28.9)	17.7 (39.0)	17.7 (39.0)	17.7 (39.0)	17.7 (39.0)	26.5 (58.4)	26.5 (58.4)	26.5 (58.4)	26.5 (58.4)
Integral Flowmeter	Maximum Height	Hi	305 (12.01)	305 (12.01)	316 (12.44)	316 (12.44)	318 (12.52)	318 (12.52)	339 (13.35)	339 (13.35)	339 (13.35)	358 (14.09)	358 (14.09)	376 (14.80)	376 (14.80)	399 (15.71)	399 (15.71)	399 (15.71)	399 (15.71)	435 (17.13)	435 (17.13)	435 (17.13)	435 (17.13)
	Approx. Weight, Unit: kg (lb)		7.7 (17.0)	7.7 (17.0)	8.8 (19.4)	8.8 (19.4)	9.2 (20.3)	9.2 (20.3)	10.0 (22.1)	10.0 (22.1)	10.0 (22.1)	12.5 (27.6)	12.5 (27.6)	15.6 (34.4)	15.6 (34.4)	20.2 (44.5)	20.2 (44.5)	20.2 (44.5)	20.2 (44.5)	29.1 (64.2)	29.1 (64.2)	29.1 (64.2)	29.1 (64.2)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)	-	+2 (+0.08)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)
Grounding rings thick type (GRN, GRJ) with gaskets (GA, GC, GD) (*1)			+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)	-	+10 (+0.39)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 2 mm (0.08 in.) per one, bringing 4 mm (0.16 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm

○ Flange, JIS 20K (continued)

Unit: mm (approx. in.)

Model	Process Connection Code		BJ2 CJ2											
			150	150	150	200	200	200	250	250	250	300	300	300
	Size Code		150	150	150	200	200	200	250	250	250	300	300	300
	Size		(6)	(6)	(6)	(8)	(8)	(8)	(10)	(10)	(10)	(12)	(12)	(12)
	Lining Code		F	U	H, D	F	U	H, D	F	U	H, D	F	U	H, D
Remote Sensor	Lay Length (*1) (*5)	L	299 (11.75)	299 (11.75)	299 (11.75)	349 (13.72)	349 (13.72)	349 (13.72)	448 (17.62)	448 (17.62)	448 (17.62)	498 (19.59)	498 (19.59)	498 (19.59)
	Flange Outer Diameter	øD	305 (12.01)	305 (12.01)	305 (12.01)	350 (13.78)	350 (13.78)	350 (13.78)	430 (16.93)	430 (16.93)	430 (16.93)	480 (18.90)	480 (18.90)	480 (18.90)
	Flange Thickness (incl. lining flare)	t	33.0 (1.30)	33.0 (1.30)	33.0 (1.30)	35.0 (1.38)	35.0 (1.38)	35.0 (1.38)	40.0 (1.57)	40.0 (1.57)	40.0 (1.57)	41.0 (1.61)	41.0 (1.61)	41.0 (1.61)
	Lining Inner Diameter	ød	149 (5.87)	145 (5.71)	147 (5.80)	200 (7.89)	194 (7.63)	198 (7.81)	248 (9.78)	242 (9.53)	247 (9.74)	300 (11.79)	292 (11.48)	299 (11.75)
	Bolt	øC	260 (10.24)	260 (10.24)	260 (10.24)	305 (12.01)	305 (12.01)	305 (12.01)	380 (14.96)	380 (14.96)	380 (14.96)	430 (16.93)	430 (16.93)	430 (16.93)
	Circle Diameter	ø°	15 (0.98)	15 (0.98)	15 (0.98)	15 (0.98)	15 (0.98)	15 (0.98)	15 (1.06)	15 (1.06)	15 (1.06)	11.25 (1.06)	11.25 (1.06)	11.25 (1.06)
	Bolt Hole Interval	øh	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)
	Number of Bolt Holes	N	12	12	12	12	12	12	12	12	12	16	16	16
	Height	H1	295 (11.61)	295 (11.61)	295 (11.61)	343 (13.49)	343 (13.49)	343 (13.49)	413 (16.27)	413 (16.27)	413 (16.27)	463 (18.22)	463 (18.22)	463 (18.22)
	Height	H2	143 (5.61)	143 (5.61)	143 (5.61)	168 (6.60)	168 (6.60)	168 (6.60)	198 (7.81)	198 (7.81)	198 (7.81)	223 (8.77)	223 (8.77)	223 (8.77)
	Height	H3	-	-	-	-	-	-	481 (18.94)	481 (18.94)	481 (18.94)	531 (20.91)	531 (20.91)	531 (20.91)
	Maximum Height	Hr	412 (16.23)	412 (16.23)	412 (16.23)	460 (18.11)	460 (18.11)	460 (18.11)	531 (20.89)	531 (20.89)	531 (20.89)	580 (22.84)	580 (22.84)	580 (22.84)
Remote Sensor	Approx. Weight, Unit: kg (lb) (*2)		35 (77.3)	35 (77.3)	35 (77.3)	48 (106.0)	47 (103.8)	47 (103.8)	85 (187.6)	84 (185.4)	83 (183.2)	101 (223.0)	100 (220.8)	100 (220.8)
Integral Flowmeter	Maximum Height	Hi	457 (17.99)	457 (17.99)	457 (17.99)	505 (19.87)	505 (19.87)	505 (19.87)	575 (22.65)	575 (22.65)	575 (22.65)	625 (24.60)	625 (24.60)	625 (24.60)
	Approx. Weight, Unit: kg (lb)		37 (81.7)	37 (81.7)	37 (81.7)	50 (110.4)	50 (110.4)	50 (110.4)	87 (192.1)	86 (189.9)	86 (189.9)	104 (229.6)	102 (225.2)	102 (225.2)
Grounding rings thin type (GRL, GRH) (*1) (*3)			-	+2 (+0.08)	+2 (+0.08)	-	+2 (+0.08)	+2 (+0.08)	-	+4 (+0.16)	+4 (+0.16)	-	+4 (+0.16)	+4 (+0.16)
Grounding rings thick type (GRN, GRJ) (*1) (*4)			+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)	+6 (+0.24)

- *1: Add the value above (which is the total of both ends) to the lay length "L" when selecting optional grounding rings with/without gaskets. Also, the thickness of customer supplied gaskets should be added for getting the total lay length.
- *2: When submersible use or optional code DHC is selected, waterproof glands with union joints and cables are attached. When the cable length is 30-meters, add 9.5 kg (20.9 lb) to the weight in the table.
- *3: These grounding rings (GRL, GRH) are not applied to lining code F nor H but for U and D.
- *4: When applying these grounding rings (GRN, GRJ) to lining code F or H, gaskets supplied by customer are necessary. For the sizes in this table, recommended thickness of the gasket is 3 to 5 mm (0.12 to 0.20 in.) per one, bringing 6 to 10 mm (0.24 to 0.39 in.) per two to be additionally added for getting the total lay length.
- *5: The tolerance of the lay length "L" is as follows.
- Size 25 to 200 mm (1 to 8 in.): 0/-3 mm
 - Size 250 to 400 mm (10 to 16 in.): 0/-5 mm

- Grounding Ring (Handle Bracket Type)

Size 150 to 400 mm (6 to 16 in.)

AXW150

AXW200

AXW250

AXW300

AXW350

AXW400

Size Code

Process
Connection
Code

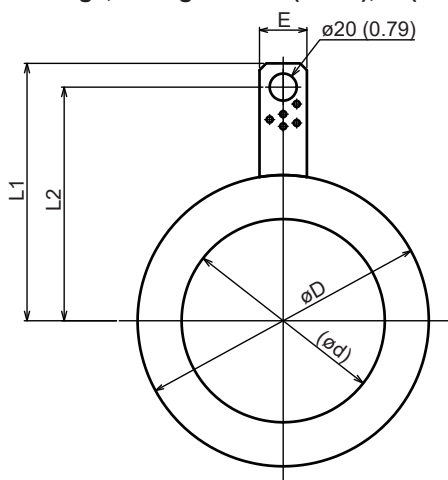
Lining Code

■=B, C

- Grounding Ring (Optional Code GRN, GRJ) for size 150 to 200 mm (6 to 8 in.)

Flange, Lining Code F (PTFE), H (Natural Hard Rubber)

Unit: mm (approx. in.)



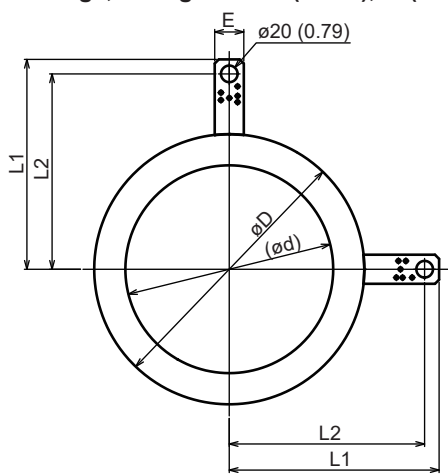
F24.ai

Process Connection Code	BA1, BE2, BG1, BJ1 CA1, CE2, CG1, CJ1	BA2, BJ2 CA2, CJ2	BA1, BE1, BE2, BG1, BJ1 CA1, CE1, CE2, CG1, CJ1	BA2, BJ2 CA2, CJ2
Size Code	150	150	200	200
Size	(6)	(6)	(8)	(8)
Lining Code	F, H			
Ring Outer Diameter	øD 215 (8.46)	222 (8.74)	265 (10.43)	278 (10.94)
Ring Inner Diameter	ød 150 (5.91)	150 (5.91)	201 (7.91)	201 (7.91)
Length	L1 197.5 (7.78)	201.0 (7.91)	222.5 (8.76)	229.0 (9.02)
Length	L2 180.0 (7.09)	183.5 (7.22)	205.0 (8.07)	211.5 (8.33)
Bracket Width	E 35 (1.38)	35 (1.38)	35 (1.38)	35 (1.38)
Ring Thickness	3	3	3	3
Grounding rings thick type (GRN) Approx. Weight, Unit: kg (lb)	0.5 (1.1)	0.6 (1.3)	0.6 (1.3)	0.8 (1.8)
Grounding rings thick type (GRJ) Approx. Weight, Unit: kg (lb)	0.6 (1.3)	0.6 (1.3)	0.7 (1.5)	0.8 (1.8)

- Grounding Ring (Optional Code GRN, GRJ) for size 250 to 400 mm (10 to 16 in.)

Flange, Lining Code F (PTFE), H (Natural Hard Rubber)

Unit: mm (approx. in.)



F25.ai

Process Connection Code	BA1, BE1, BE2, BG1, BJ1 CA1, CE1, CE2, CG1, CJ1	BA2, BJ2 CA2, CJ2	BA1, BE1, BE2, BG1, BJ1 CA1, CE1, CE2, CG1, CJ1	BA2, BJ2 CA2, CJ2	BA1, BE1, BE2, BG1, BJ1 CA1, CE1, CE2, CG1, CJ1	BA2, BJ2 CA2, CJ2
Size Code	250	250	300	300	350	400
Size	(10)	(10)	(12)	(12)	(14)	(16)
Lining Code	F, H					
Ring Outer Diameter	øD 325 (12.80)	337 (13.27)	370 (14.57)	395 (15.55)	415 (16.34)	478 (18.82)
Ring Inner Diameter	ød 250 (9.84)	250 (9.84)	301 (11.85)	301 (11.85)	330 (12.99)	381 (15.00)
Length	L1 252.5 (9.94)	258.5 (10.18)	292.0 (11.50)	304.5 (11.99)	314.5 (12.38)	346.0 (13.62)
Length	L2 235.0 (9.25)	241.0 (9.49)	274.5 (10.81)	287.0 (11.30)	297.0 (11.69)	328.5 (12.93)
Bracket Width	E 35 (1.38)	35 (1.38)	35 (1.38)	35 (1.38)	35 (1.38)	35 (1.38)
Ring Thickness	3	3	3	3	3	3
Grounding rings thick type (GRN) Approx. Weight, Unit: kg (lb)	0.8 (1.8)	1.0 (2.2)	0.9 (2.0)	1.2 (2.7)	1.2 (2.7)	1.6 (3.5)
Grounding rings thick type (GRJ) Approx. Weight, Unit: kg (lb)	0.9 (2.0)	1.1 (2.4)	1.0 (2.2)	1.4 (3.1)	1.3 (2.9)	1.8 (4.0)

(4) Dimensional Tolerance

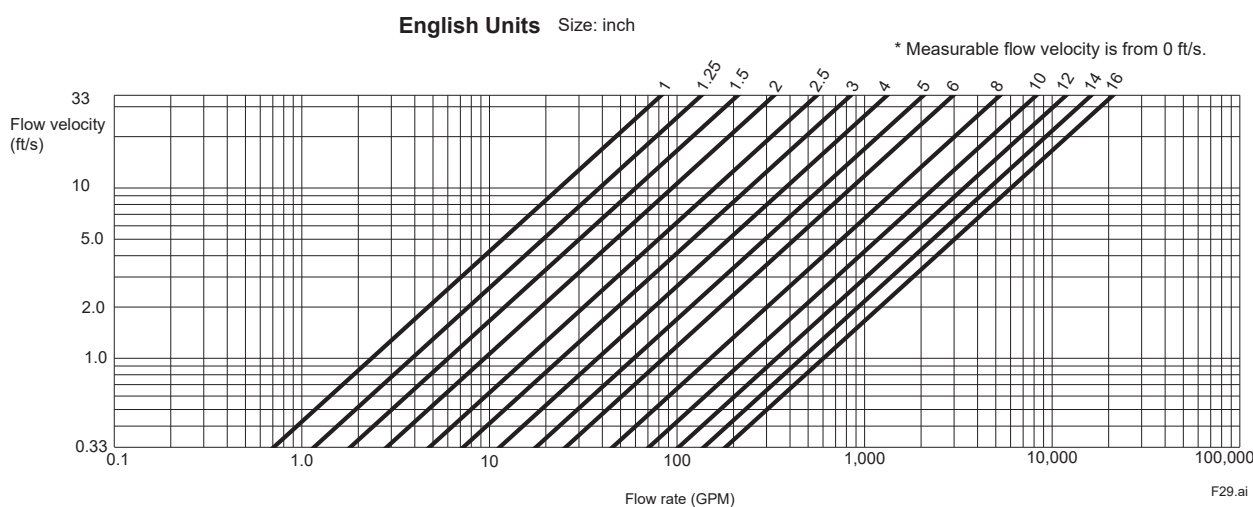
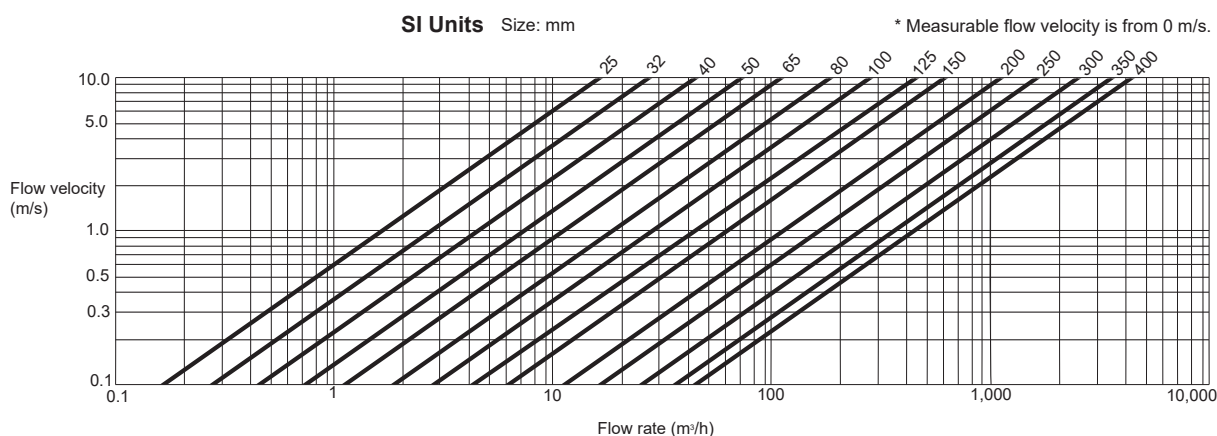
Unless otherwise specified, dimensional tolerances on the drawings are as shown in the following table.

General tolerance in the dimensional outline drawing.

Unit: mm (approx. in.)

Category of basic dimension		Tolerance	Category of basic dimension		Tolerance
Above	Equal or below		Above	Equal or below	
	3 (0.12)	±0.7 (±0.03)	500 (19.69)	630 (24.80)	±5.5 (±0.22)
3 (0.12)	6 (0.24)	±0.9 (±0.04)	630 (24.80)	800 (31.50)	±6.25 (±0.25)
6 (0.24)	10 (0.39)	±1.1 (±0.04)	800 (31.50)	1000 (39.37)	±7.0 (±0.28)
10 (0.39)	18 (0.71)	±1.35 (±0.05)	1000 (39.37)	1250 (49.21)	±8.25 (±0.32)
18 (0.71)	30 (1.18)	±1.65 (±0.06)	1250 (49.21)	1600 (62.99)	±9.75 (±0.38)
30 (1.18)	50 (1.97)	±1.95 (±0.08)	1600 (62.99)	2000 (78.74)	±11.5 (±0.45)
50 (1.97)	80 (3.15)	±2.3 (±0.09)	2000 (78.74)	2500 (98.43)	±14.0 (±0.55)
80 (3.15)	120 (4.72)	±2.7 (±0.11)	2500 (98.43)	3150 (124.02)	±16.5 (±0.65)
120 (4.72)	180 (7.09)	±3.15 (±0.12)			
180 (7.09)	250 (9.84)	±3.6 (±0.14)			
250 (9.84)	315 (12.40)	±4.05 (±0.16)			
315 (12.40)	400 (15.75)	±4.45 (±0.18)			
400 (15.75)	500 (19.69)	±4.85 (±0.19)			

Remarks: The numeric is based on criteria of tolerance class IT18 in JIS B 0401-1.

■ SIZING DATA

■ ORDERING INFORMATION

- Note 1:** When ordering, the span flow rate, unit, output pulse weight, and totalizer display pulse weight can be specified. These parameters will then be set before shipment.
In the case of remote type, specify combination information of sensor and transmitter.
These parameters will be set in the combined transmitter.
When ordering of a remote sensor alone or a remote transmitter alone, these parameters cannot be specified. Custom configuration request is necessary for setting these parameters out of regular setting range.
- Note 2:** Some options, if ordered, require the relevant specifications to be input when ordering.
- Note 3:** For AXFA11G remote transmitter, read general specifications (GS 01E20C01-01E). The contents and conditions of ordering informations are different.

1. Model, Suffix Code and Optional Code
2. Combination

This is necessary when ordering combination of remote sensor and transmitter. Specify the combination of a sensor and a transmitter one by one by their model name, specification code, or Tag No. etc. On the nameplate of each sensor and transmitter, the serial number of the specified combination partner is described when shipped.

3. Tag No.

The Tag No. can be specified by a combination of uppercase letters, lowercase letters (for HART communication excludes lower case letters), numbers, "-" (hyphen), "." (period), and " " (space)". See the table below for specifying procedure.

Items to be Specified	Described / Setting Destination	Maximum Number of Characters
TAG NO	• Nameplate • Stainless steel tag plate (with optional code SCT)	30 (*1)
	• Memory in transmitter	
SOFTWARE TAG	• Memory in transmitter (Overrides TAG NO designation)	See below

In the case of integral flowmeter and remote transmitter, the characters specified by "TAG NO" are also written to the memory (parameter) in the transmitter. If it is necessary to specify a different tag number only for the transmitter memory, specify "SOFTWARE TAG". It is also possible to specify only SOFTWARE TAG. Names of the parameter to be written and the maximum number of characters are as shown in the table below. If the number of specified characters exceed the maximum number, the characters from the beginning up to the maximum number is written.

Items to be Specified	Transmitter Memory		Maximum Number of Characters
	Communication	Parameter Name	
TAG NO and SOFTWARE TAG	BRAIN	TAG NO	16
	HART 7	Long Tag	32 (*1)
		Tag	8
	Modbus	Long Tag	32
		Tag	16

*1: For AXFA11G transmitter, the "TAG NO" is maximum 16 characters. And as its HART protocol is HART 5, the "Long Tag" is not available.

4. Span Flow Rate and Unit

Specify the range of span flow rate in the range of 0.0001 to 999999000000.0000 (the number of significant digits in operation is the upper six digits). Up to four digits below the decimal point that can be specified (by 0.001 unit). However, if the transmitter is BRAIN communication type, specify so that it is within the range of 0.0001 to 32000, it is up to four digits below the decimal point when it is included, and the numerical value excluding the decimal point is within 32000.

Specify units in the unit described in "Flow Calculation Function". This span flow rate is set to the positive first range. Be sure to specify the span flow rate and unit when selecting the Mass Unit Setting (optional code MU), or Specified Span Five-point Calibration (optional code SC). When selecting the NAMUR NE21 (optional code E21), specify the span flow rate of 0.5 m/s or more in terms of flow velocity.

Unless specified, it is set as the following when shipped.

- Integral Flowmeter, or combined with AXW4A Remote Transmitter span flow rate (unit m³/h) equivalent to flow velocity 1 m/s
- Combined with AXFA11 Remote Transmitter flow velocity 1 m/s

The measurement flow range (minimum and maximum of span flow rate) is shown below (in the case of flow rate unit m³/h and GPM). Specify the span flow within this range. The range specifying different unit must also fall into the same flow rate (flow velocity) range after conversion.

Measurable Flow Rate Range

- (1) Integral Flowmeter, or combined with AXW4A Remote Transmitter

SI Units (Size: mm, Flow rate: m³/h)

Size (mm)	0 to Min. Span Flow Rate m ³ /h (0.1 m/s)	0 to Min. Span Flow Rate m ³ /h (0.5 m/s)	0 to Max. Span Flow Rate m ³ /h (10 m/s)
25	0 to 0.1768	0 to 0.8836	0 to 17.6714
32	0 to 0.2896	0 to 1.4477	0 to 28.9529
40	0 to 0.4524	0 to 2.2620	0 to 45.2389
50	0 to 0.7069	0 to 3.5343	0 to 70.6858
65	0 to 1.1946	0 to 5.9730	0 to 119.459
80	0 to 1.8096	0 to 9.0478	0 to 180.955
100	0 to 2.8275	0 to 14.1372	0 to 282.743
125	0 to 4.4179	0 to 22.0894	0 to 441.786
150	0 to 6.3618	0 to 31.8087	0 to 636.172
200	0 to 11.3098	0 to 56.5487	0 to 1130.97
250	0 to 17.6715	0 to 88.3573	0 to 1767.14
300	0 to 25.4470	0 to 127.235	0 to 2544.69
350	0 to 34.6361	0 to 173.181	0 to 3463.60
400	0 to 45.2390	0 to 226.195	0 to 4523.89

English Units (Size: in., Flow rate: GPM)

Size (in.)	0 to Min. Span Flow Rate GPM (0.33 ft/s)	0 to Min. Span Flow Rate GPM (1.64 ft/s)	0 to Max. Span Flow Rate GPM (33 ft/s)
1	0 to 0.7781	0 to 3.8903	0 to 77.8050
1.25	0 to 1.2748	0 to 6.3738	0 to 127.475
1.5	0 to 1.9919	0 to 9.9591	0 to 199.181
2	0 to 3.1123	0 to 15.5611	0 to 311.220
2.5	0 to 5.2597	0 to 26.2982	0 to 525.962
3	0 to 7.9673	0 to 39.8363	0 to 796.724
4	0 to 12.4489	0 to 62.2441	0 to 1244.88
5	0 to 19.4513	0 to 97.2564	0 to 1945.12
6	0 to 28.0099	0 to 140.049	0 to 2800.98
8	0 to 49.7953	0 to 248.977	0 to 4979.52
10	0 to 77.8051	0 to 389.026	0 to 7780.5
12	0 to 112.040	0 to 560.197	0 to 11203.9
14	0 to 152.498	0 to 762.490	0 to 15249.7
16	0 to 199.182	0 to 995.906	0 to 19918.1

(2) Combined with AXFA11 Remote Transmitter

SI Units (Size: mm, Flow rate: m³/h)

Size (mm)	0 to Min. Span Flow Rate m ³ /h (0.1 m/s)	0 to Max. Span Flow Rate m ³ /h (10 m/s)
25	0 to 0.1768	0 to 17.671
32	0 to 0.2896	0 to 28.952
40	0 to 0.4524	0 to 45.23
50	0 to 0.7069	0 to 70.68
65	0 to 1.1946	0 to 119.45
80	0 to 1.8096	0 to 180.95
100	0 to 2.8275	0 to 282.74
125	0 to 4.418	0 to 441.7
150	0 to 6.362	0 to 636.1
200	0 to 11.310	0 to 1130.9
250	0 to 17.672	0 to 1767.1
300	0 to 25.447	0 to 2544.6
350	0 to 34.64	0 to 3463
400	0 to 45.24	0 to 4523

English Units (Size: in., Flow rate: GPM)

Size (in.)	0 to Min. Span Flow Rate GPM (0.33 ft/s)	0 to Max. Span Flow Rate GPM (33 ft/s)
1	0 to 0.7781	0 to 77.80
1.25	0 to 1.216	0 to 121.5
1.5	0 to 1.751	0 to 175.0
2	0 to 3.113	0 to 311.2
2.5	0 to 4.863	0 to 486.2
3	0 to 7.003	0 to 700.2
4	0 to 12.45	0 to 1244
5	0 to 19.46	0 to 1945
6	0 to 28.01	0 to 2800
8	0 to 49.80	0 to 4979
10	0 to 77.81	0 to 7780
12	0 to 112.1	0 to 11203
14	0 to 152.5	0 to 15249
16	0 to 199.2	0 to 19918

5. Output Pulse Weight (Pulse Status Output 1)

Specify the volume flow per pulse, after specifying the span flow rate. This output pulse weight is set to the Pulse Status Output 1. Specify it in the same unit as the span flow rate.

(Example: When "m³" is selected as "Span Flow Rate", specify "10 m³/p" as pulse weight unit.)

The specifiable numerical digit and range is the same as that for "4. Span Flow Rate and Unit".

Unless specified, it is set as the following when shipped.

- Integral Flowmeter, or combined with AXW4A Remote Transmitter 0 [span unit/p]
- Combined with AXFA11 Remote Transmitter 0 pulse/s

6. Totalizer Display Pulse Weight (Totalizer 1)

Specify the volume flow per pulse, after specifying the span flow rate. This totalizer display pulse weight is set to the Totalizer 1. The set value can be output only in communication as the integrated count of the integral flowmeter and the remote transmitter. Specify it in the same unit as the span flow rate.

(Example: When "m³" is selected as "Span Flow Rate", specify "10 m³/p" as totalizer display pulse weight unit.)

The specifiable numerical digit and range is the same as that for "4. Span Flow Rate and Unit".

Unless specified, it is set as the following when shipped.

- Integral Flowmeter, or combined with AXW4A Remote Transmitter 1 [span unit/p]
- Combined with AXFA11 Remote Transmitter 0 pulse/s

7. Mass Unit (optional code MU)

The flow rate calculation is performed in mass unit. In addition to fluid density, specify span flow rate, output pulse weight, and totalizer display pulse weight in mass unit.

The specifiable numerical digit and range is the same as that for "4. Span Flow Rate and Unit".

(1) Density

Numerical Value:

Specify within six digits (up to three digits below the decimal point) in the range of 500 to 2000 kg/m³ (4.2 to 16.7 lb/gal, 31.2 to 124.8 lb/cf). If BRAIN communication type is selected, specify so that the numerical value excluding the decimal point is within 32000.

Unit:

kg/m³, lb/gal, lb/cf

The density of water is about 1000 kg/m³. Then specify "1000 kg/m³" in this case.

However, as the density varies with temperature, specify the density at the time of flow measurement.

(2) Span Flow Rate

Numerical Value:

When setting the mass span flow rate, calculate the volume span flow rate from the "density" and it must be within the measurable flow rate range. The settable numerical range for the mass span flow rate is the same as that for the volume span flow rate.

Unit:

Mass Unit: t, kg, g, klb, lb

Time Unit: /d, /h, /min, /s

(3) Output Pulse Weight, Totalizer Display Pulse Weight

Set the value with the same unit as that for the mass span flow rate.

8. Specified Span Five-point Calibration (optional code SC)

A flow test at the five points around 0, 25, 50, 75, 100% of the customer specified span is performed. In the test certificate (QIC), the result for the customer specified span is recorded instead of that for the standard flow rate of 2 m/s (6.56 ft/s). Corresponding flow velocity of the selectable span lies between 0.5 to 10 m/s (1.64 to 33 ft/s) or 0.8 to 10 m/s (2.62 to 33 ft/s). The latter is applied when the size is 32, 65, or 125 mm (1.25, 2.5, or 5 in.). It is also limited by the capacity of our flow test facility. Specify it within the following range. The specifiable numerical digit and range is the same as that for "4. Span Flow Rate and Unit".

Selectable Range of Span Flow Rate

SI Units (Size: mm, Flow rate: m³/h)

Size (mm)	Min. Span Flow Rate m ³ /h (m/s)	Max. Span Flow Rate m ³ /h (m/s)
25	0.89 (0.5)	11.0 (6.22)
32	2.32 (0.8)	28.9 (9.98)
40	2.27 (0.5)	28.0 (6.19)
50	3.54 (0.5)	56.0 (7.92)
65	9.56 (0.8)	80.0 (6.70)
80	9.05 (0.5)	126 (6.96)
100	14.2 (0.5)	190 (6.72)
125	35.4 (0.8)	300 (6.79)
150	31.9 (0.5)	380 (5.97)
200	56.6 (0.5)	670 (5.92)
250	88.4 (0.5)	1000 (5.66)
300	128 (0.5)	1200 (4.72)
350	174 (0.5)	1200 (3.46)
400	227 (0.5)	1350 (2.98)

English Units (Size: in., Flow rate: GPM)

Size (in.)	Min. Span Flow Rate GPM (ft/s)	Max. Span Flow Rate GPM (ft/s)
1	3.8903 (1.64)	48.4315 (20.4)
1.25	10.1981 (2.62)	127.242 (32.7)
1.5	9.9591 (1.64)	123.280 (20.3)
2	15.5611 (1.64)	246.560 (25.9)
2.5	42.0770 (2.62)	352.229 (21.9)
3	39.8363 (1.64)	554.761 (22.8)
4	62.2441 (1.64)	836.544 (22.0)
5	156.052 (2.62)	1320.86 (22.2)
6	140.050 (1.64)	1673.08 (19.5)
8	248.977 (1.64)	2949.92 (19.4)
10	389.026 (1.64)	4402.86 (18.5)
12	560.197 (1.64)	5283.44 (15.4)
14	762.490 (1.64)	5283.44 (11.3)
16	995.906 (1.64)	5943.87 (9.78)

9. Direction of Cable Entry (optional code RH)

Rotate the transmitter of integral flowmeter or the terminal box of remote sensor and change the direction of the cable entry. See the table below and specify either +90, +180, or -90 degree. When the direction of cable entry is not changed, optional code RH is not necessary.

	Direction of Cable Entry			
	Standard (0 degree)	+90 degree rotation	+180 degree rotation	-90 degree rotation
Integral Flowmeter				
Remote Sensor				

10. Direction of Display

When the specification "With Display" is selected for the integral flowmeter or the remote transmitter, specify direction of the display. For the integral flowmeter, specify according to the horizontal or vertical direction of the installation piping. For the remote transmitter, specify according to the positional relation of mounting bracket or mounting pipe.

	Direction of Display		Without Display
	Horizontal	Vertical	
Integral Flowmeter			
Remote Transmitter			

11. Fluid Name

12. Modbus Protocol parameters

Specify the following parameters for Modbus communication.

Parameter to be specified	Selectable value
Baud rate [bps]	1200, 2400, 4800, 9600, 19200*, 38400, 57600, 115200
Stop bit	1 bit*, 2 bits
Parity bit	Odd, Even*, None
Slave address	1* to 247 (decimal value.)

*: Factory default setting. If the parameter is not specified at ordering, these settings are applied to the parameter for Modbus communication.

■ RELATED INSTRUMENTS

Product	Document Number
AM012 Calibrator for Magnetic Flowmeter	GS 1E6K2-E
BT200 BRAIN TERMINAL	GS 01C00A11-00EN
AXFA11G Magnetic Flowmeter Remote Converter	GS 01E20C01-01E
ADMAG CA Capacitance Magnetic Flowmeter	GS 01E08B01-00E
FieldMate Versatile Device Management Wizard	GS 01R01A01-01E
ADMAG TI Series AXG Magnetic Flowmeter	GS 01E22A01-01EN
ADMAG TI Series AXW Magnetic Flowmeter [Size: 500 to 1800 mm (20 to 72 in.)]	GS 01E25D11-01EN
FSA130 ADMAG TI Verification Tool	GS 01E21A04-01EN

■ REFERENCE STANDARD

Design and Test on Magnetic Flowmeters:

JIS B 7554(1997), ISO 20456(2017),
NAMUR NE70(2006), ASME MFC-16-2014

■ TRADEMARKS

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are not marked with TM or [®].

Note: The terms “transmitter” and “sensor” in this document are
used in the same manner as “converter” and “flowtube”
respectively which are used for our previous magnetic
flowmeter models.

<Information on EU WEEE Directive>

EU WEEE (Waste Electrical and Electronic Equipment)

Directive is only valid in the EU.

This instrument is intended to be sold and used only as
a part of equipment which is excluded from WEEE

Directive, such as large-scale stationary industrial
tools, a large-scale fixed installation and so on, and,
therefore, subjected to the exclusion from the scope
of the WEEE Directive. The instrument should be
disposed of in accordance with local and national
legislation/regulations.