General Specifications

Vortex Flowmeter
VY Series

GS 01F07A00-01EN

Integral Flowmeter (General Type)

Remote Transmitter

Remote Sensor (Reduced Bore Type)

Dual-Sensor (Welded) General Type

■ Overview

The VY Series features highly versatile vortex flowmeters. It measures the flow rate of liquid, gas, and steam by measuring the Karman vortex street that occurs behind the shedder bar.

■ Features

- **Support for efficient and planned plant operations**
  With a health diagnosis function that monitors the status of the entire instrument, the user can accurately assess the current measurement status of the instrument on the PC monitor in the control room. In addition, the status information is recorded in the instrument, making it easier to identify when maintenance is required. By performing maintenance activities such as flowmeter cleaning or shedder bar replacement based on the condition of the instrument, these features contribute to more efficient and planned plant operations.

- **Stable measurement by Yokogawa's unique detection structure with a proven track record**
  Yokogawa's original integral detection structure provides excellent reliability and durability through: (1) a signal sensing element inside the shedder bar and (2) a simple structure without moving parts. The VY series inherits this structure, which is well-established in the YEWFLO series. In addition, by optimizing our proven SSP (*) filtering function, measurements are more stable and stronger against vibration. The VY Series provides a measurement accuracy of ±0.75% of the reading for liquid, or ±1% of the reading for gas and steam, under a wide range of fluid conditions.

  *: SSP is YOKOGAWA's original technology for digital signal processing.

- **Wide range of supported applications**
  The VY Series has succeeded the YEWFLO Series' lineup and expanded lineup with a greater variety of specifications.
  - Standardize the Dual-Sensor (Welded) General Type
  - Additional standards such as SIL 2, NAMUR, etc.
  - Fluid temperature range of -196 to 450°C (Including integral flowmeter)
  - Flange pressure rating up to ASME Class 1500
  - Additional size for the built-in temperature sensor
  - Additional process connections, etc.

- **Enhanced input/output functions**
  Analog input (4 to 20 mA) is supported, resulting in enhanced flow rate calculation functions such as for mass flow rate and heat flow rate.

  Analog output (4 to 20 mA) which is isolated, and pulse/alarm/status contact output are supported.

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■ Standard Specifications

● Performance Specifications

Fluid to be Measured	Liquid, gas, saturated steam, superheated steam (Avoid multiphase flow and sticky or corrosive fluids)
Measuring Flow Rates	Read "■Sizing".
Accuracy	±0.75% of reading (liquid) ±1% of reading (gas, steam) Read "■Accuracy Details".
Repeatability	±0.2% of reading
Calibration	For general type: Flow calibration using water For type with built-in temperature sensor: Temperature and flow calibration using water
Vibration Resistance	[Integral Flowmeter / Remote Sensor] General type: 19.6 m/s^2 (10 to 500 Hz), IEC 60068-2-6 compliant Long Neck type, High temperature type, cryogenic type: 9.8 m/s^2 (10 to 500 Hz), IEC 60068-2-6 compliant [Remote Transmitter] 9.8 m/s^2 (10 to 500 Hz), IEC 60068-2-6 compliant

● Normal Operating Conditions

Process Temperature Range	-29 to 250°C:	Shedder bar type: General type, Long Neck type (including built-in temperature sensor) Shedder bar material: Duplex stainless steel 1.4517/S31803 Body material: Stainless steel CF8M
	-40(-50*) to 250°C:	Shedder bar type: General type, Long Neck type (including built-in temperature sensor) Shedder bar material: Stainless steel CF8M or nickel alloy CW-12MW/N10276 Body material: Stainless steel CF8M or nickel alloy CW-12MW/N10276
	-40(-50*) to 450°C:	Shedder bar type: High temperature type Shedder bar material: Stainless steel CF8M or nickel alloy CW-12MW/N10276 Body material: Stainless steel CF8M or nickel alloy CW-12MW/N10276
	-40(-50*) to 400°C:	Shedder bar type: High temperature type with built-in temperature sensor Shedder bar material: Stainless steel CF8M or nickel alloy CW-12MW/N10276 Body material: Stainless steel CF8M or nickel alloy CW-12MW/N10276
	-196 to 250°C:	Shedder bar type: Cryogenic type Shedder bar material: Nickel alloy CW-12MW/N10276 Body material: Stainless steel CF8M

*: For Option code: /LAT, the minimum temperature specification is extended to -50°C.

Process Pressure Limit	From -0.1 MPa to the process connection pressure rating. In the case of connection size 25 mm for ASME Class 1500 nickel alloy shedder bar, the upper limit is 80% of the process connection pressure rating.

Ambient Temperature Range

-29 to 85°C: Integral Flowmeter / Remote Sensor, Shedder bar material: Duplex stainless steel 1.4517/S31803

-40(-50 *4) to 85°C: Integral Flowmeter / Remote Sensor, Shedder bar material: Stainless steel CF8M or Nickel alloy CW-12MW/N10276 (*1)

-40(-50 *4) to 85°C: Remote Transmitter (*1)

*1: The range is -30 to 85°C when the display is installed.

*4: For Option code: /LAT, the minimum temperature specification is extended to -50°C.

For integral flowmeter and remote sensor, read the figures below.

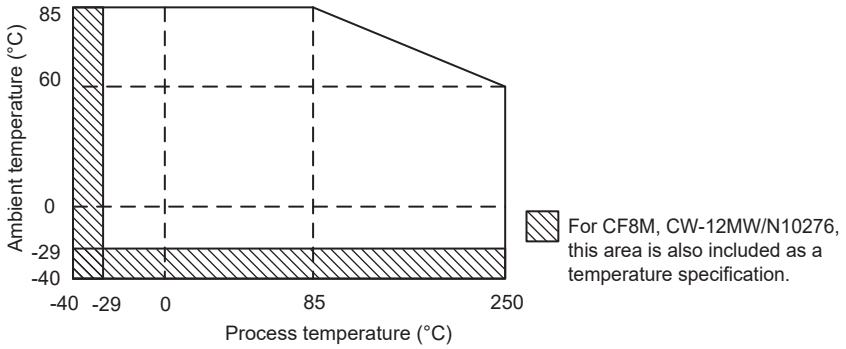


Figure 1 Operating temperature range (General type)

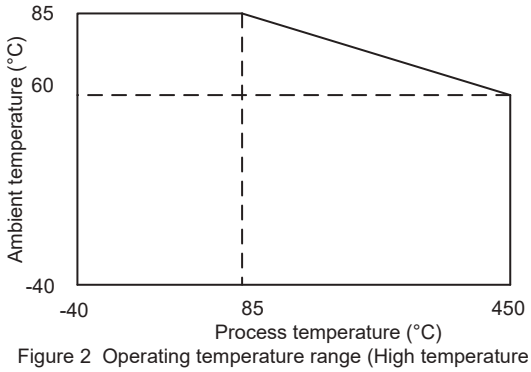


Figure 2 Operating temperature range (High temperature type)

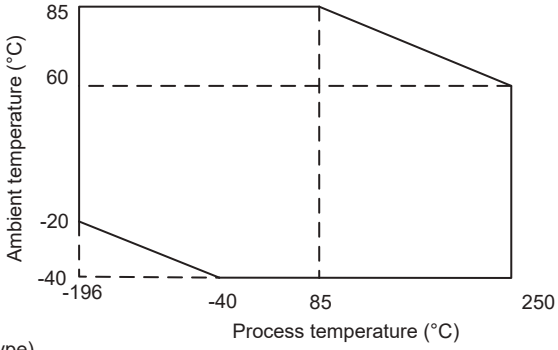


Figure 3 Operating temperature range (Cryogenic type)

Note: The description here shows the normal operating ambient temperature range of the device (including Option code: /LAT). See the Explosion Protection Specifications section for the temperature range of explosion protection performance. Please use within the temperature range that satisfies both ranges.

Ambient Humidity

0 to 100%, operation with no condensation (IEC 60068-2-38)

Storage Conditions (*2)

-40(-50 *4) to 85°C, 0 to 100% RH (no condensation)

*2: When stored in a packaged state

*4: For Option code: /LAT, the minimum temperature specification is extended to -50 ° C.

Supply Voltage

10.5 to 42 V DC (*3)

*3: 10.5 to 30 V DC in the case of lightning protector (option code /A) and intrinsically safe approval.

Read the figure below for the relationship between the power supply voltage and the load resistance.

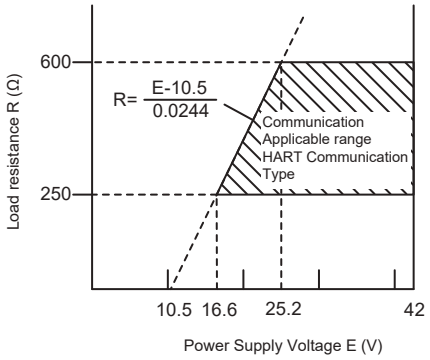


Figure 4 Relationship between power supply and load resistance

● Mechanical Specifications

Type of body	General type, Reduced bore type (1 or 2 size reduction), High pressure reduced bore type (1 size reduction), Dual-Sensor (Welded) General Type	
	Read "■Model and Suffix Codes" for details on materials.	
Wetted Parts	Body (including bottom plug)	• Stainless steel CF8M (*2). The flange material for VY250 to VY400 is F304 (*2). Bottom plug: Duplex stainless steel S31803 (*2) Stainless steel SUS316 (*1) (or SUS F316 (*1)) Nickel alloy N10276 (*2) • Stainless steel F316 (*2) (ASME Class 1500) Bottom plug: Duplex stainless steel S31803 (*2) Nickel alloy N10276 (*2) • Nickel alloy CW-12MW (*2) Bottom plug: N10276 (*2)
	Shedder Bar	• Duplex stainless steel S31803 (*2) (15 mm), 1.4517 (*3) (25 to 300 mm) • Stainless steel CF8M (*2) (150 to 400 mm) • Nickel alloy N10276 (*2) (15 mm), CW-12MW (*2) (25 to 200 mm)
	Gasket	SUS F316 (*1) PTFE coating. (General type, cryogenic type) SUS F316 (*1) plated with silver (For high temperature type or general type with stainless steel gasket plated with silver (option code: /SPG)) N10276 (*2) PTFE coating (When nickel alloy is selected for body material)
Non-wetted Parts	Housing	Low copper aluminum alloy ADC3 (*1) (with 0.6% or less copper content)
	Name Plate (Main and Secondary)	SUS304 (*1)
	Mounting Bracket for Housing	CF8 (*2)
	O-ring	Silicone
	Plate for Shedder Bar Fixing	CF8 (*2) 304 (*2) (VY015 ASME Class 900, VY015 to VY150 ASME Class 1500)
	Bolts for Shedder Bar Fixing	Grade 660 Class B (*2) 630 H1150 (*2)
	Mounting Bracket for Remote Transmitter	SCS14A (*1)
Coating (Housing)	Coating Specifications	Polyester resin powder coating / Epoxy and polyurethane resin solvent coating
	Coating Color	Mint green (Munsell 5.6BG 3.3/2.9 equivalent)
Degree of Protection	IP66/IP67 (IEC 60529, JIS C 920) Type 4X (CSA C22.2 No.94.2-15, UL50E)	
Cable Entry	JIS G1/2 female ASME 1/2 NPT female (*4) ISO M20×1.5 female	
Vortex Flowmeter Signal Cable	Structure: 6-wire double shielded cable	
	Cable length: Up to 50 m	
	Outer sheath material: Polyvinyl chloride (PVC)	
	Flame resistance: IEC 60332-1-2 equivalent	
	Oil resistance: IEC 60811-2-1 equivalent	
	Operating temperature range: -50 to 105°C (fixed installation) -40 to 105°C (non-fixed installation)	
Weight	Read "■External Dimensions".	
Mounting	Integral Flowmeter, Remote Sensor: Flange mounting or wafer mounting between flanges of adjacent pipes. Remote Transmitter: 50 mm (2 inch) pipe mounting.	

*1: JIS standard material
*2: ASME or ASTM standard material
*3: EN standard material
*4: In the case of flameproof approval, only the transmitter housing has a screw length that is deeper than the ASME standard for 0.5 to 2 threads.

● Electrical Specifications

For details on how to connect the wiring, read " ●Wiring examples".

Output Signal: Current and transistor contact (simultaneous output possible)

Analog Output: 4 to 20 mA DC, two-wire system

Accuracy	±0.1% of span
Maximum voltage	42 V DC

Transistor Contact Output: Open drain (N ch).
Pulse, alarm, or status output can be selected by parameter settings (*1).

Contact rating	10.5 to 30 V DC, 80 mA
Low level	0 to 2 V DC

*1: Pulse output, alarm output, and status output share the same terminal. Select any one of these functions.

Communication Requirements

HART Communication:
Protocol version: HART 7
Communication signal: Superimposed on analog output
Communication line conditions:
Load resistance: 250 to 600 Ω, including cable resistance

Input Signal

Analog Input (Passive):
Accuracy: ±0.1% of span (4 to 20 mA)
Analog input range: 3.6 to 21.6 mA
Voltage drop: 3.3 to 3.8 V typ
Maximum input voltage: 42 V DC (Maximum input current must not be exceeded)
Maximum input current: 100 mA

■ Functional Specifications

Analog Output	Flow rate output (Volumetric flow rate, mass flow rate, volumetric flow rate at normal/standard condition, energy) Temperature output (In case of built-in temperature sensor type)
Damping Time Constant	0 to 200 sec (63% response time) Delay time: 0.5 sec Analog output circuit time constant: 0.3 sec
Burn-out function	If CPU or EEPROM failure occurs, analog output is up-scale (21.6 mA or more). Up-scale or down-scale (3.6 mA or less) can be selected with a switch. Output that is compliant with NAMUR NE43 can be specified as an option.
Pulse Output function (*1)	Pulse output: Scaled pulse, unscaled pulse, frequency (number of pulses output per second at 100% flow rate or temperature) Pulse frequency: Max. 10 kHz, Max. 1 kHz (-40°C to -50°C, For Option code: /LAT) Duty cycles: Approx. 50% (1:2 to 2:1)
Self-diagnostics and Alarm Output (*1)	If an alarm (over range output signal, EEPROM error, vibration noise, abnormal flow due to clogging, bubbles, etc.) occurs, an alarm signal is output. If the instrument is equipped with the display the NE107 category is displayed along with a short message. When the alarm occurs, the alarm signal output goes from open (OFF) to closed (ON), or from closed (ON) to open (OFF). The alarm signal output mode can be selected by the parameter settings.
Status Output function (*1)	Flow switch: Depending on the flow rate, temperature, and total flow rate settings, the status output goes from open (OFF) to closed (ON), or from closed (ON) to open (OFF). The status output mode can be selected by the parameter setting.

*1: Select any one of these functions.

Analog Input

Analog input	4 to 20 mA (passive)
Available input (*2)	Temperature, pressure, density

*2: To ensure accurate temperature/pressure compensation, read "Remarks on Installation" and pay careful attention to the pressure and temperature tap positions.

Flow Rate Calculation

The flow rate calculations described below can be performed by using the built-in temperature sensor and analog input.

• Mass flow rate

Measured fluid	Calculation method	Standard	Remarks
Steam	Saturated steam (Temperature)	Density calculation: IAPWS - IF97	Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Set the dryness parameter to 100%.
	Saturated steam (Pressure)		Fixed value or analog input can be selected for pressure. Set the dryness parameter to 100%.
	Superheated steam		Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Fixed value or analog input can be selected for pressure. (Analog input can be selected for either temperature or pressure, but not both.)
	Fixed density compensation	-	Use the fixed fluid density parameter setting.
General gas	Temperature/ pressure compensation	Temperature/pressure compensation formula: Equation of state for gas (Combined Gas Law) (*1)	Temperature/pressure compensation calculation is performed using specified fluid parameters. Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Fixed value or analog input can be selected for pressure. (Analog input can be selected for either temperature or pressure, but not both.)
	Density compensation using analog input	-	Use analog input for density.
	Fixed density compensation	-	Use the fixed fluid density parameter setting.
Water (Liquid)	Temperature compensation	Density calculation: IAPWS-IF97	Fixed value, built-in temperature sensor, or analog input can be selected for temperature.
	Fixed density compensation	-	Use the fixed fluid density parameter setting.
General liquid	Temperature compensation	Temperature compensation formula: API, JIS K 2249 (*2)	Temperature compensation calculation is performed using specified fluid parameters. Fixed value, built-in temperature sensor, or analog input can be selected for temperature.
	Density compensation using analog input	-	Use analog input for density.
	Fixed density compensation	-	Use the fixed fluid density parameter setting.

• Flow rate at normal/standard condition

Measured fluid	Calculation method	Standard	Remarks
General gas	Temperature/ pressure compensation	Temperature/ pressure compensation formula: Equation of state for gas (Combined Gas Law) (*3)	Temperature/pressure compensation calculation is performed using specified fluid parameters. Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Fixed value or analog input can be selected for pressure. (Analog input can be selected for either temperature or pressure, but not both.)
	Compensation based on the density ratio of the density at analog input relative to a fixed density	-	Use the analog input for the density, then use it to calculate the density ratio relative to the fixed fluid density parameter setting value.

• Energy flow rate

Measured fluid	Calculation method	Standard	Remarks
Steam	Saturated steam (Temperature)	Density and specific enthalpy calculation: IAPWS-IF97	Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Set the dryness parameter to 100%.
	Saturated steam (Pressure)		Fixed value or analog input can be selected for pressure. Set the dryness parameter to 100%.
	Superheated steam		Fixed value, built-in temperature sensor, or analog input can be selected for temperature. Fixed value or analog input can be selected for pressure. (Analog input can be selected for either temperature or pressure, but not both.)
	Fixed density/ fixed specific enthalpy compensation	-	Use the fixed fluid density parameter setting value and fixed specific enthalpy setting value.
Water (Liquid)	Temperature compensation	Density and specific enthalpy calculation: IAPWS-IF97	Fixed value, built-in temperature sensor, or analog input can be selected for temperature.
	Fixed density/ fixed specific enthalpy compensation	-	Use the fluid density parameter setting value and fixed specific enthalpy setting value.

• Heat difference calculation

Measured fluid	Calculation method	Standard	Remarks
Steam	Temperature compensation	Density and specific enthalpy calculation: IAPWS-IF97	Use the measurement value of the built-in temperature sensor for the temperature, and use the difference between the built-in temperature sensor and the analog input for the temperature difference. Set the dryness parameter to 100%.
Water (Liquid)	Temperature compensation		Use the measurement value of the built-in temperature sensor for the temperature, and use the difference between the built-in temperature sensor and the analog input for the temperature difference.
General liquid	Temperature compensation	Temperature compensation formula: API, JIS K 2249 (*4)	For the temperature, use the measurement value of the built-in temperature sensor. For the temperature difference, use the difference between the built-in temperature sensor and the analog input, or use the analog input. In addition, for general liquid, perform the calculation using the heat conversion coefficient parameter setting value. If this parameter is a mass-based coefficient, use the density value with the built-in temperature compensation for the density.

*1: The calculation formula is as follows.

$$M = Q_f \times \rho_n \times \{P_f / P_n\} \times \{(T_n + 273.15)/(T_f + 273.15)\} \times 1/K$$

$$K = Z_f / Z_n$$

M : Mass flow rate
Q_f : Volume flow rate in use
ρ_n : Density in the standard state (kg/m^3)
T_f : Measured temperature (°C)
T_n : Temperature in the standard state (°C)
P_f : Measured pressure (kPa)
P_n : Pressure in the standard state (kPa)
K : Deviation coefficient
Z_f : Compressibility factor in use
Z_n : Compressibility factor in the standard state

*2: The calculation formula is as follows.

$M=Q_f \times \rho_n \times \{1+a_1 \times (T_f-T_n) \times 10^{-2}+a_2 \times (T_f-T_n)^2 \times 10^{-6}\}$

M : Mass flow rate

Q_f : Volume flow rate in use

ρ_n : Density in the standard state (kg/m^3)

T_f : Measured temperature (°C)

T_n : Temperature in the standard state (°C)

a_1 : Primary correction factor of liquid

a_2 : Secondary correction factor of liquid

(Tips)

To obtain the compensation coefficients a_1 and a_2, the maximum temperature T_{max} and its density ρ_{Tmax} and the minimum temperature T_{min} and its density ρ_{Tmin} in the compensation temperature range and the reference temperature T_n and its density ρ_{Tn} in between are required. From the correction formula, the following equation can be obtained.

$\rho_f = M / Q_f$

$\rho_f = \rho_n \times \{1+a_1 \times (T_f-T_n) \times 10^{-2}+a_2 \times (T_f-T_n)^2 \times 10^{-6}\}$

The density of the maximum temperature and the density of the reference temperature and the density of the minimum temperature and the density of the reference temperature are applied to the above equations to solve the simultaneous equations to obtain a_1 and a_2.

$\rho_{Tmax} = \rho_{Tn} \times \{1+a_1 \times (T_{max}-T_n) \times 10^{-2}+a_2 \times (T_{max}-T_n)^2 \times 10^{-6}\}$

$\rho_{Tmin} = \rho_{Tn} \times \{1+a_1 \times (T_{min}-T_n) \times 10^{-2}+a_2 \times (T_{min}-T_n)^2 \times 10^{-6}\}$

*3: The calculation formula is as follows.

$Q_n = Q_f \times \{P_f/P_n\} \times \{(T_n+273.15)/(T_f+273.15)\} \times 1/K$

$K = Z_f/Z_n$

Q_n : Volume flow rate in the standard state

Q_f : Volume flow rate in use

T_f : Measured temperature (°C)

T_n : Temperature in the standard state (°C)

P_f : Pressure in use (kPa)

P_n : Pressure in the standard state (kPa)

K : Deviation coefficient

Z_f : Compressibility factor in use

Z_n : Compressibility factor in the standard state

*4: The calculation formula is as follows.

$Q_e = Q_f \times C \times \Delta T$

Q_e : Heat difference value

Q_f : Volume flow rate in use

C : Heat conversion coefficient (MJ/m^3·K)

ΔT: Measured temperature difference (K)

Display	The upper and lower parts of the display can simultaneously display the flow rate (% or engineering units) along with the totalized value or process value (temperature/pressure/density) based on the temperature or analog input. In addition, parameters can be changed by using setting switches. Alarm numbers for self-diagnostics are displayed. The mounting direction can be rotated 90 degrees to the left or right.	
Self-diagnostics	Diagnose the health of the entire instrument from the sensor to the output circuit, and classify hardware errors, process abnormalities, instrument setting problems, and the instrument status. Alarm classifications (4 types): System alarm, Process alarm, Setting alarm, Warning NE107 category indications: F (Failure), S (Out of Specification), C (Function Check), M (Maintenance Required)	
Adjustment Functions	Instrument error adjustment: Output errors associated with vortex frequency can be adjusted by segment approximations (5 coefficient settings).	
	Reynolds number adjustment: Output errors associated with Reynolds number can be adjusted by segment approximations (5 coefficient settings).	
	Compressible fluid expansion adjustment: This expansion coefficient can adjust the error that occurs when measuring a compressible fluid (gas or steam) at high flow velocity (35 m/s or more).	
Data Management	Data security during power failure	Parameters, totalized values, and other data are stored in EEPROM for protection in case of power failure. This function can also be disabled when performing operations in combination with the Yokogawa FN310 Field Wireless Multi-Protocol Module.
	Flowmeter profile data save/restore function	Sensor-specific information (diameter, K-Factor, etc.) can be stored in the backup memory in the instrument. These parameter settings can be restored at any time.
	Event log auto retrieve function	This function automatically acquires the alarm information and records it in the log. In addition, when an alarm related to flow rate measurement occurs, the waveform of the vortex signal at that time, as well as the signal strength data of each frequency band, are acquired automatically. The acquired data can be checked by using the FSA130 Magnetic Flowmeter/Vortex Flowmeter Verification Tool.

FSA130 Magnetic Flowmeter/ Vortex Flowmeter Verification Tool	The verification tool can diagnose the health of the vortex flowmeter and create a results reports. The vortex flowmeter may not operate normally due to problems such as a failure in the sensor circuit or signal processing circuit, the effect of fluid deposits on the shedder bar, or age deterioration of the sensor element. The verification tool makes it easy to diagnose the health of the instrument to check for abnormalities and monitor the measuring condition from a remote location, without having to remove the vortex flowmeter from the piping.

■ Conformity Standards

Safety Requirements	Conformity standards	EN 61010-1 EN 61010-2-030 CAN/CSA-C22.2 No. 61010-1 CAN/CSA-C22.2 No. 61010-2-030 UL 61010-1 UL 61010-2-030 IEC 60529 Installation altitude: 2,000 m or less Installation category (Overvoltage category): I Pollution degree: 2 Indoor or outdoor use
EMC	Conformity standards	EN 61326-1 Class A, Table 2 (For use in industrial locations) EN 61326-2-3 EN IEC 61326-3-2 Compliance with EMC standards in other countries: South Korea (KC), Oceania (RCM), Morocco
PED	Conformity standards	Pressure Equipment Directive: 2014/68/EU ASME B31.3, Process Piping Certification body: TÜV-Rheinland Certification body number: 0035
	Compatibility evaluation	Type of equipment: piping Type of fluid: liquid and gas Group of fluid: 1 and 2 Module H

MODEL	DN (*1) (mm)	PS (*1) (bar)	PS (*1) (MPa)	PS•DN (*1) (bar•mm)	PS•DN (*1) (MPa•mm)	CATEGORY (*2)
VY015	15	414	41.4	6210	621	Sound Engineering Practice (SEP) (*3)
VY025	25	414	41.4	10350	1035	
VY040	40	414	41.4	16560	1656	II (*4)
VY050	50	414	41.4	20700	2070	II (*4)
VY080	80	414	41.4	33120	3312	II (*4)
VY100	100	414	41.4	41400	4140	II (*4)
VY150	150	414	41.4	62100	6210	III
VY200	200	414	41.4	82800	8280	III
VY250	250	414	41.4	103500	10350	III
VY300	300	414	41.4	124200	12420	III
VY400	400	250	25	100000	10000	III

*1: PS: Maximum allowable pressure for flow tube, DN: Nominal diameter
*2: Table 6 covered by ANNEX II of Directive 2014/68/EU
*3: Article 4, paragraph 3 of Directive 2014/68/EU
*4: Models classified as Category II cannot be used for unstable gases in Group 1.

EU RoHS	Conformity standards	EN IEC 63000
CE marking	Suffix code - Certification: -001, -KF2, -KS2 CE marking is displayed on the nameplate for non-explosion protected models and ATEX explosion protected models. Products with CE marking are in compliance with the statutory requirements of the applicable EU directives.	
CRN (Canadian Registration Number)	Suffix code - Certification: -002, -CF1, -CS1 Integral Flowmeters and Remote sensors (15 to 400 mm diameter) have obtained CRN approval in all provinces and territories of Canada.	
Morocco Conformity Mark	This conformity mark indicates that the product complies with Moroccan requirements.	

NACE	Conformity standards	NACE MR0103 (ISO 17945) NACE MR0175 (ISO 15156)
	Applicable parts	Body (including bottom plug) Shedder bar Gasket
	Applicable materials	Austenitic stainless steel: CF8M, 316, F316, F304 Nickel alloy: CW-12MW, N10276
Functional Safety (SIL Certification)	Option code: /SL * Compliant with conformity standard IEC 61508 (Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems). Compliant with SIL 2. Compliant with SIL 3 if two instruments are used in a redundant configuration. When using this instrument for Safety Instrumented System (SIS) application, use it under the condition that the accuracy is within ±2%. Read "■Accuracy Details". The safety data varies depending on the hardware/software revision. Read the Safety Manual for details. (Document No.: IM 01F07A21-02EN) The Functional Safety Manual can be downloaded from our website. URL: https://www.yokogawa.com/solutions/products-platforms/field-instruments/ *: This cannot be combined with the analog input (Communication and input/output code: JB) or Dual-Sensor (Welded) General Type (Type of Body: -6)	
NAMUR	Conformity standards	NE21, NE107
Marine Certificate	ABS (Option code: /WCA)	American Bureau of Shipping For Open deck, Machinery spaces (not on machinery such as internal combustion engines, compressors, pumps), Pump room, Etc.
	DNV (Option code: /WCD)	Det Norske Veritas -Temperature D -Humidity B -Vibration A -EMC B -Enclosure C

■ Explosion Protection Specifications

When selecting an explosion protection type, specify the explosion protection standard recognized by the certification body in the country where the instrument is to be used.

The remote transmitter can be connected only with a remote sensor authorized by Yokogawa Electric Corporation.

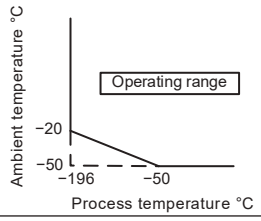
For flameproof or explosionproof type, make sure to use a power supply such as a distributor that is certified for general safety. In addition, wiring cables have heat resistance requirements, so refer to IM for the each explosion protection type in selection.

For intrinsically safe type, use a barrier certified by a testing laboratory.

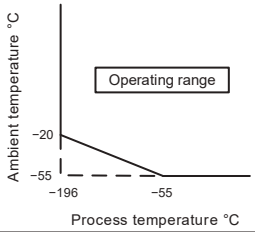
● IECEx explosion protection

In the case that final destination is Taiwan or UAE and the explosion type is required, select IECEx explosion protection type.

Applicable Standard:	IEC 60079-0 IEC 60079-1 IEC 60079-11 IEC 60079-31
Certificate:	IECEx FMG 21.0008X
Flameproof (Certification Code: SF2)	
	• Type of Gas Atmosphere Protection: (Integral Flowmeter) Ex db ia IIC T6...T1 Gb (Remote Sensor) Ex ia IIC T6...T1 Ga (Remote Transmitter) Ex db ia [ia Ga] IIC T6 Gb • Type of Dust Atmosphere Protection: (Integral Flowmeter) Ex ia tb IIIC T80°C...T440°C Db (Remote Sensor) Ex ia IIIC T80°C...T440°C Db (Remote Transmitter) Ex ia tb [ia Db] IIIC T70°C Db • Ambient Temperature(*1): (Integral Flowmeter, Remote Transmitter) -50°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80 °C: -50°C ≤ Ta ≤ +40°C T5, T95 °C to T1, T440 °C: -50°C ≤ Ta ≤ +60°C • Maximum Surface Temperature and Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6, T80°C: -196°C to +80°C / [+78°C] T5, T95°C: -196°C to +95°C / [+93°C] T4, T130°C: -196°C to +130°C / [+128°C] T3, T195°C: -196°C to +195°C / [+193°C] T2, T290°C: -196°C to +290°C / [+288°C] T1, T440°C: -196°C to +440°C / [+438°C] [ ]: Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: IP66/IP67 in accordance with only IEC 60529 IP66 in accordance with IEC 60079-0 (for transmitter assembly) • Electrical Connection: 1/2 NPT female, M20×1.5 female • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 42 V DC (Communication and I/O Code: JA, JB or JJ) • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 42 V DC, ≤ 120 mA

Flameproof (Certification Code: SF2)	
	• Dielectric Strength: (Remote Transmitter) 1500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE 500 V AC r.m.s., 1 min, 5 mA Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal • Um: (Integral Flowmeter and Remote Transmitter) 60 V DC *1: The ambient temperature for the process temperature under -50°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

Intrinsically Safe (Certification Code: SS2, Communication and I/O Code: JA, JB or JJ)	
	• Type of Gas Atmosphere Protection (Integral Flowmeter) Ex ia IIC T4...T1 Ga (Remote Sensor) Ex ia IIC T6...T1 Ga (Remote Transmitter) Ex ia IIC T4 Ga • Ambient Temperature(*1): (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -55°C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -55°C ≤ Ta ≤ +60°C (Remote Transmitter) -55°C ≤ Ta ≤ +80°C • Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6: -196°C to +80°C / [+78°C] T5: -196°C to +95°C / [+93°C] T4: -196°C to +130°C / [+128°C] T3: -196°C to +195°C / [+193°C] T2: -196°C to +290°C / [+288°C] T1: -196°C to +440°C / [+438°C] [ ] : Built-in Temperature Sensor • Atmospheric Pressure: 80kPa to 110 kPa • Enclosure: IP66/IP67 in accordance with only IEC 60529 • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 30 V DC • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 30 V DC, ≤ 80 mA • Dielectric Strength: (Integral Flowmeter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- (Remote Transmitter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE • Electrical Parameter: [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH *1: The ambient temperature for the process temperature under -55°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

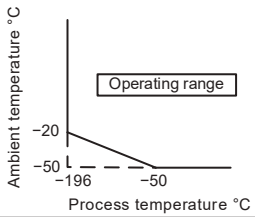
● ATEX explosion protection

Applicable Standard:	EN IEC 60079-0 EN 60079-1 EN 60079-11 EN 60079-31 EN 60529 + A1 + A2
Certificate:	FM21ATEX0010X

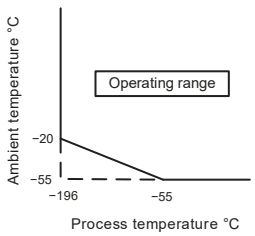
Flameproof (Certification Code: KF2)

- Type of Gas Atmosphere Protection:
  (Integral Flowmeter) II 2 G Ex db ia IIC T6...T1 Gb
  (Remote Sensor) II 1 G Ex ia IIC T6...T1 Ga
  (Remote Transmitter) II 2 (1) G Ex db ia [ia Ga] IIC T6 Gb
- Type of Dust Atmosphere Protection:
  (Integral Flowmeter) II 2 D Ex ia tb IIIC T80°C...T440°C Db
  (Remote Sensor) II 2 D Ex ia IIIC T80°C...T440°C Db
  (Remote Transmitter) II 2 D Ex ia tb [ia Db] IIIC T70°C Db
- Ambient Temperature(*1):
  (Integral Flowmeter and Remote Transmitter) -50°C ≤ Ta ≤ +60°C
  (Remote Sensor) T6, T80 °C: -50°C ≤ Ta ≤ +40°C
  T5, T95 °C to T1, T440 °C: -50°C ≤ Ta ≤ +60°C
- Maximum Surface Temperature and Process Temperature(*1):
  (Integral Flowmeter and Remote Sensor)
  T6, T80°C: -196°C to +80°C / [+78°C]
  T5, T95°C: -196°C to +95°C / [+93°C]
  T4, T130°C: -196°C to +130°C / [+128°C]
  T3, T195°C: -196°C to +195°C / [+193°C]
  T2, T290°C: -196°C to +290°C / [+288°C]
  T1, T440°C: -196°C to +440°C / [+438°C]
  [ ]: Built-in temperature sensor
- Atmospheric Pressure: 80 kPa to 110 kPa
- Enclosure:
  IP66/IP67 in accordance with only EN 60529
  IP66 in accordance with EN IEC 60079-0 (for transmitter assembly)
- Electrical Connection: 1/2 NPT female, M20×1.5 female
- Pollution Degree: 2
- Overvoltage Category: I
- Power Supply:
  (Integral Flowmeter and Remote Transmitter)
  10.5 to 42 V DC (Communication and I/O Code: JA, JB or JJ)
- Current I/O:
  (Integral Flowmeter and Remote Transmitter)
  Output: 3.6 to 21.6 mA
  Input: ≤ 21.6 mA
- Pulse Output:
  (Integral Flowmeter and Remote Transmitter)
  Output: ≤ 42 V DC, ≤ 120 mA
- Dielectric Strength:
  (Remote Transmitter)
  1500 V AC r.m.s., 1 min, 5 mA
  Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE
  500 V AC r.m.s., 1 min, 5 mA
  Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal
- Um:
  (Integral Flowmeter and Remote Transmitter) 60 V DC

*1: The ambient temperature for the process temperature under -50°C is shown as below



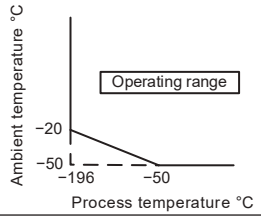
Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

Intrinsically Safe (Certification Code: KS2, Communication and I/O Code: JA, JB or JJ)	
	• Type of Gas Atmosphere Protection (Integral Flowmeter) II 1 G Ex ia IIC T4...T1 Ga (Remote Sensor) II 1 G Ex ia IIC T6...T1 Ga (Remote Transmitter) II 1 G Ex ia IIC T4 Ga • Ambient Temperature(*1): (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -55°C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -55°C ≤ Ta ≤ +60°C (Remote Transmitter) -55°C ≤ Ta ≤ +80°C • Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6: -196°C to +80°C / [+78°C] T5: -196°C to +95°C / [+93°C] T4: -196°C to +130°C / [+128°C] T3: -196°C to +195°C / [+193°C] T2: -196°C to +290°C / [+288°C] T1: -196°C to +440°C / [+438°C] [ ] : Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: IP66/IP67 in accordance with only EN 60529 • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 30 V DC • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 30 V DC, ≤ 80 mA • Dielectric Strength: (Integral Flowmeter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- (Remote Transmitter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE • Electrical Parameter: [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH *1: The ambient temperature for the process temperature under -55°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

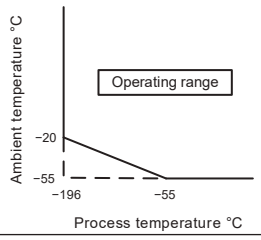
● FM explosion protection (USA)

Applicable Standard:	FM 3600 FM 3610 FM 3611 FM 3615 FM 3616 FM 3810 ANSI/UL 50E ANSI/UL 60079-0 ANSI/UL 60079-1 ANSI/UL 60079-11 ANSI/UL 60079-31 ANSI/UL 121201 ANSI/UL 61010-1 ANSI/UL 61010-2-030 ANSI/UL 122701 ANSI/IEC 60529
Certificate:	FM21US0025X
Explosionproof (Certification Code: FF1)	
	• Type of Protection: (Integral Flowmeter) CL I/II/III DIV 1 GP ABCDEFG IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 CL 1 ZN 1 AEx db ia IIC T6...T1 Gb ZN 21 AEx ia tb IIIC T80°C...T440°C Db (Remote Sensor) IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 CL I ZN 0 AEx ia IIC T6...T1 Ga ZN 21 AEx ia IIIC T80°C…T440°C Db (Remote Transmitter) CL I/II/III DIV 1 GP ABCDEFG T6 AIS CL I/II/III DIV 1 GP ABCDEFG CL 1 ZN 1 AEx db ia [ia Ga] IIC T6 Gb ZN 21 AEx ia tb [ia Db] IIIC T70°C Db • Ambient Temperature(*1): (Integral Flowmeter and Remote Transmitter) -50°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -50°C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -50°C ≤ Ta ≤ +60°C • Maximum Surface Temperature and Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6, T80°C: -196°C to +80°C / [+78°C] T5, T95°C: -196°C to +95°C / [+93°C] T4, T130°C: -196°C to +130°C / [+128°C] T3, T195°C: -196°C to +195°C / [+193°C] T2, T290°C: -196°C to +290°C / [+288°C] T1, T440°C: -196°C to +440°C / [+438°C] [ ]: Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: Type 4X IP66/IP67 in accordance with only ANSI/IEC 60529 IP66 in accordance with ANSI/UL 60079-0 (for transmitter assembly) • Electrical Connection: 1/2 NPT female, M20×1.5 female • Process Seal: Dual Seal • Pollution Degree: 2 • Overvoltage Category: I

Explosionproof (Certification Code: FF1)	
	• Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 42 V DC(Communication and I/O Code: JA, JB or JJ) • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 42 V DC, ≤ 120 mA • Dielectric Strength: (Remote Transmitter) 1500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE 500 V AC r.m.s., 1 min, 5 mA Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal • Um: (Integral Flowmeter and Remote Transmitter) 60 V DC *1: The ambient temperature for the process temperature under -50°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

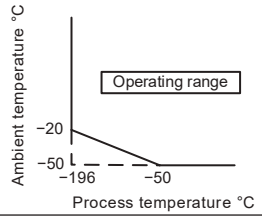
Intrinsically Safe (Certification Code: FS1, Communication and I/O Code: JA, JB or JJ)	
	• Type of Protection (Integral Flowmeter) IS CL I/II/III DIV 1 GP ABCDEFG T4...T1 CL I ZN 0 AEx ia IIC T4...T1 Ga NI CL I/II DIV 2 GP ABCDFG T4...T1; CL III DIV 1 CL I ZN 2 GP IIC T4...T1 (Remote Sensor) IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 CL I ZN 0 AEx ia IIC T6...T1 Ga NI CL I/II DIV 2 GP ABCDFG T6...T1; CL III DIV 1 CL I ZN 2 GP IIC T6...T1 (Remote Transmitter) IS CL I/II/III DIV 1 GP ABCDEFG T4 CL I ZN 0 AEx ia IIC T4 Ga NI CL I/II DIV 2 GP ABCDFG T4; CL III DIV 1 CL I ZN 2 GP IIC T4 • Ambient Temperature(*1): (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -55°C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -55°C ≤ Ta ≤ +60°C (Remote Transmitter) -55°C ≤ Ta ≤ +80°C • Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6: -196°C to +80°C / [+78°C] T5: -196°C to +95°C / [+93°C] T4: -196°C to +130°C / [+128°C] T3: -196°C to +195°C / [+193°C] T2: -196°C to +290°C / [+288°C] T1: -196°C to +440°C / [+438°C] [ ] : Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: Type 4X IP66/IP67 in accordance with only ANSI/IEC 60529 • Process Seal: Dual Seal • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 30 V DC

Intrinsically Safe (Certification Code: FS1, Communication and I/O Code: JA, JB or JJ)	
	• Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 30 V DC, ≤ 80 mA • Dielectric Strength: (Integral Flowmeter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- (Remote Transmitter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE • Electrical Parameter (intrinsic safety): [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH • Electrical Parameters (NIFW): [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ci: 14.4nF, Li: 1.9uH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ii: 200mA, Ci: 14.4nF, Li: 1.9µH *1: The ambient temperature for the process temperature under -55°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

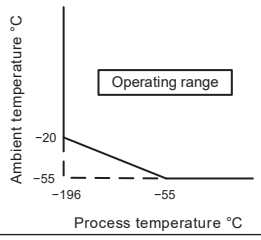
● FMc explosion protection (Canada)

Applicable Standard:	C22.2 No. 25 C22.2 No. 30 C22.2 No. 94.2 C22.2 No. 213 C22.2 No. 60079-0 CAN/CSA-C22.2 No. 60079-1 CAN/CSA C22.2 No. 60079-11 CAN/CSA-C22.2 No. 60079-31 CAN/CSA-C22.2 No. 60529 CAN/CSA-C22.2 No. 61010-1 CAN/CSA-C22.2 No. 61010-1A CAN/CSA-C22.2 No. 61010-2-030 ANSI/UL 122701
Certificate:	FM21CA0017X
Explosionproof (Certification Code: CF1)	
	• Type of Protection: (Integral Flowmeter) Ex db ia IIC T6...T1 Gb Ex ia tb IIIC T80°C...T440°C Db CL I/II/III DIV 1 GP ABCDEFG IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 (Remote Sensor) Ex ia IIC T6...T1 Ga Ex ia IIIC T80°C…T440°C Db IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 (Remote Transmitter) Ex db ia [ia Ga] IIC T6 Gb Ex ia tb [ia Db] IIIC T70°C Db CL I/II/III DIV 1 GP ABCDEFG T6 AIS CL I/II/III DIV 1 GP ABCDEFG • Ambient Temperature(*1): (Integral Flowmeter and Remote Transmitter) -50°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80 °C: -50°C ≤ Ta ≤ +40°C T5, T95 °C to T1, T440 °C: -50°C ≤ Ta ≤ +60°C • Maximum Surface Temperature and Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6, T80°C: -196°C to +80°C / [+78°C] T5, T95°C: -196°C to +95°C / [+93°C] T4, T130°C: -196°C to +130°C / [+128°C] T3, T195°C: -196°C to +195°C / [+193°C] T2, T290°C: -196°C to +290°C / [+288°C] T1, T440°C: -196°C to +440°C / [+438°C] [ ]: Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110kPa • Enclosure: Type 4X IP66/IP67 in accordance with only CAN/CSA-C22.2No. 60529 IP66 in accordance with CSA C22.2 No.60079-0 (for transmitter assembly) • Electrical Connection: 1/2 NPT female, M20×1.5 female • Process Seal: Dual Seal • Pollution Degree: 2 • Overvoltage Category: I

Explosionproof (Certification Code: CF1)	
	• Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 42 V DC(Communication and I/O Code: JA, JB or JJ) • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 42 V DC, ≤ 120 mA • Dielectric Strength: (Remote Transmitter) 1500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE 500 V AC r.m.s., 1 min, 5 mA Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal • Um: (Integral Flowmeter and Remote Transmitter) 60 V DC *1: The ambient temperature for the process temperature under -50°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

Intrinsically Safe (Certification Code: CS1, Communication and I/O Code: JA, JB or JJ)	
	• Type of Protection (Integral Flowmeter) Ex ia IIC T4...T1 Ga IS CL I/II/III DIV 1 GP ABCDEFG T4...T1 NI CL I/II DIV 2 GP ABCDFG T4...T1; CL III DIV 1 (Remote Sensor) Ex ia IIC T6...T1 Ga IS CL I/II/III DIV 1 GP ABCDEFG T6...T1 NI CL I/II DIV 2 GP ABCDFG T6...T1; CL III DIV 1 (Remote Transmitter) Ex ia IIC T4 Ga IS CL I/II/III DIV 1 GP ABCDEFG T4 NI CL I/II DIV 2 GP ABCDFG T4; CL III DIV 1 • Ambient Temperature(*1): (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -55°C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -55°C ≤ Ta ≤ +60°C (Remote Transmitter) -55°C ≤ Ta ≤ +80°C • Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6: -196°C to +80°C / [+78°C]T5: -196°C to +95°C / [+93°C] T4: -196°C to +130°C / [+128°C] T3: -196°C to +195°C / [+193°C] T2: -196°C to +290°C / [+288°C] T1: -196°C to +440°C / [+438°C] [ ] : Built-in Temperature Sensor • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: Type 4X IP66/IP67 in accordance with only CAN/CSA-C22.2 No. 60529 • Process Seal: Dual Seal • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 30 V DC

Intrinsically Safe (Certification Code: CS1, Communication and I/O Code: JA, JB or JJ)	
	• Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 30 V DC, ≤ 80 mA • Dielectric Strength: (Integral Flowmeter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- (Remote Transmitter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE • Electrical Parameter (intrinsic safety): [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH • Electrical Parameters (NIFW): [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ii: 200mA, Ci: 14.4nF, Li: 1.9µH *1: The ambient temperature for the process temperature under -55°C is shown as below 

Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

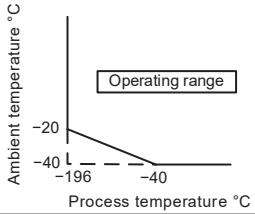
● **Japan explosion protection**

For Japan explosion protection (Certification: JF5, Cable entry: J, K), be sure to use the Ex-gland and Ex-plug supplied with the product.

Combinations of remote sensor and remote transmitter for Japan Explosionproof are available only for the VY series.

Cable entry of Remote Sensor and Remote Transmitter terminal box is JIS G1/2 female.

Explosionproof (Certification Code: JF5)	
Applicable Standard:	JNIOSH-TR-46-1 JNIOSH-TR-46-2 JNIOSH-TR-46-6
Certificate & Type of Protection:	(Integral Flowmeter) Ex db ia IIC T1 Gb DEK22.0005 X Ex db ia IIC T2 Gb DEK22.0006 X Ex db ia IIC T3 Gb DEK22.0007 X Ex db ia IIC T4 Gb DEK22.0008 X Ex db ia IIC T5 Gb DEK22.0009 X Ex db ia IIC T6 Gb DEK22.0010 X (Remote Sensor) Ex ia IIC T1 Ga DEK22.0011 X Ex ia IIC T2 Ga DEK22.0012 X Ex ia IIC T3 Ga DEK22.0013 X Ex ia IIC T4 Ga DEK22.0014 X Ex ia IIC T5 Ga DEK22.0015 X Ex ia IIC T6 Ga DEK22.0016 X (Remote transmitter) Ex db ia [ia Ga] IIC T6 Gb DEK22.0004 X
	• Ambient Temperature(*1): (Integral Flowmeter) T6 to T2: -40°C ≤ Ta ≤ +60°C T1: -40°C ≤ Ta ≤ +55°C (Remote Sensor) T6: -40°C ≤ Ta ≤ +40°C T5 to T1: -40°C ≤ Ta ≤ +60°C (Remote Transmitter) -40°C ≤ Ta ≤ +60°C • Process Temperature(*1): (Integral Flowmeter, Remote Sensor) T6: -196°C to +78°C T5: -196°C to +93°C T4: -196°C to +128°C T3: -196°C to +193°C T2: -196°C to +288°C T1: -196°C to +438°C • Atmospheric Pressure: 80 kPa to 110 kPa • Enclosure: IP66/IP67 • Electrical Connection: M20×1.5 female • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 42 V DC / 3.6 to 21.6 mA (Remote Sensor) Only connectable with remote transmitter of certification number: DEK22.0004X • Current I/O: (Integral Flowmeter and Remote Transmitter) Input: ≤ 21.6 mA or None • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 42 V DC, ≤ 120 mA or None

Explosionproof (Certification Code: JF5)	
	• Dielectric Strength: (Remote Transmitter) 1500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE 500 V AC r.m.s., 1 min, 5 mA Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal • Um: (Integral Flowmeter and Remote Transmitter) 60 V DC *1: The ambient temperature for the process temperature under -40°C is shown as below 

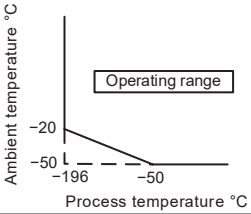
Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

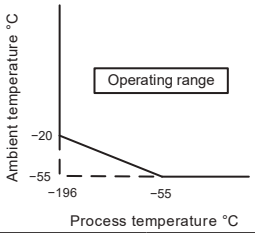
● Korea explosion protection

Applicable Standard:	Notice of Ministry of Labor No. 2021-22 Harmonized with IEC 60079-0 IEC 60079-1 IEC 60079-11 IEC 60079-31
Certificate:	• Flameproof (Certification Code: PF2): (Integral Flowmeter) Ex db ia IIC T6...T1 Gb 22-KA4B0-0377X Ex ia tb IIIC T80°C...T440°C Db 22-KA4B0-0378X (Remote Sensor) Ex ia IIC T6...T1 Ga 22-KA4B0-0381X Ex ia IIIC T80°C...T440°C Db 22-KA4B0-0382X (Remote transmitter) Ex db ia [ia Ga] IIC T6 Gb 22-KA4B0-0384X Ex ia tb [ia Db] IIIC T70°C Db 22-KA4B0-0385X • Intrinsically Safe (Certification Code: PS2, Communication and I/O Code: JA, JB or JJ)): (Integral Flowmeter) Ex ia IIC T4...T1 Ga 22-KA4B0-0379X (Remote Sensor) Ex ia IIC T6...T1 Ga 22-KA4B0-0383X (Remote transmitter) Ex ia IIC T4 Ga 22-KA4B0-0386X

Flameproof (Certification Code: PF2)

• Type of Gas Atmosphere Protection:
(Integral Flowmeter) Ex db ia IIC T6...T1 Gb
(Remote Sensor) Ex ia IIC T6...T1 Ga
(Remote Transmitter) Ex db ia [ia Ga] IIC T6 Gb
• Type of Dust Atmosphere Protection:
(Integral Flowmeter) Ex ia tb IIIC T80°C...T440°C Db
(Remote Sensor) Ex ia IIIC T80°C...T440°C Db
(Remote Transmitter) Ex ia tb [ia Db] IIIC T70°C Db
• Ambient Temperature(*1):
(Integral Flowmeter, Remote Transmitter) -50° C ≤ Ta ≤ +60°C
(Remote Sensor) T6, T80 °C: -50°C ≤ Ta ≤ +40°C
T5, T95 °C to T1, T440 °C: -50°C ≤ Ta ≤ +60°C
• Maximum Surface Temperature and Process Temperature(*1):
(Integral Flowmeter and Remote Sensor)
T6, T80°C: -196°C to +80°C / [+78°C]
T5, T95°C: -196° C to +95°C / [+93°C]
T4, T130°C: -196°C to +130°C / [+128°C]
T3, T195°C: -196°C to +195°C / [+193°C]
T2, T290°C: -196°C to +290°C / [+288°C]
T1, T440°C: -196°C to +440°C / [+438°C]
[ ]: Built-in Temperature Sensor
• Atmospheric Pressure: 80 kPa to 110 kPa
• Enclosure:
IP66/IP67 in accordance with only IEC 60529
IP66 in accordance with IEC 60079-0 (for transmitter assembly)
• Electrical Connection: 1/2 NPT female, M20 × 1.5 female
• Pollution Degree: 2
• Overvoltage Category: I
• Power Supply:
(Integral Flowmeter and Remote Transmitter)
10.5 to 42 V DC (Communication and I/O Code: JA, JB or JJ)
• Current I/O:
(Integral Flowmeter and Remote Transmitter)
Output: 3.6 to 21.6 mA
Input: ≤ 21.6 mA
• Pulse Output:
(Integral Flowmeter and Remote Transmitter)
Output: ≤ 42 V DC, ≤ 120 mA

Flameproof (Certification Code: PF2)	
	• Dielectric Strength: (Remote Transmitter) 1500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE 500 V AC r.m.s., 1 min, 5 mA Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal • Um: (Integral Flowmeter and Remote Transmitter) 60 V DC *1: The ambient temperature for the process temperature under -50°C is shown as below 

Intrinsically Safe (Certification Code: PS2, Communication and I/O Code: JA, JB or JJ)	
	• Type of Gas Atmosphere Protection: (Integral Flowmeter) Ex ia IIC T4...T1 Ga (Remote Sensor) Ex ia IIC T6...T1 Ga (Remote Transmitter) Ex ia IIC T4 Ga • Ambient Temperature(*1): (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C (Remote Sensor) T6, T80°C: -55° C ≤ Ta ≤ +40°C T5, T95°C to T1, T440°C: -55° C ≤ Ta ≤ +60°C (Remote Transmitter) -55°C ≤ Ta ≤ +80°C • Process Temperature(*1): (Integral Flowmeter and Remote Sensor) T6: -196°C to +80°C / [+78°C] T5: -196°C to +95° C / [+93°C] T4: -196°C to +130° C / [+128°C] T3: -196°C to +195° C / [+193°C] T2: -196°C to +290° C / [+288°C] T1: -196°C to +440° C / [+438°C] [ ] : Built-in Temperature Sensor • Atmospheric Pressure: 80kPa to 110 kPa • Enclosure: IP66/IP67 in accordance with only IEC 60529 • Pollution Degree: 2 • Overvoltage Category: I • Power Supply: (Integral Flowmeter and Remote Transmitter) 10.5 to 30 V DC • Current I/O: (Integral Flowmeter and Remote Transmitter) Output: 3.6 to 21.6 mA Input: ≤ 21.6 mA • Pulse Output: (Integral Flowmeter and Remote Transmitter) Output: ≤ 30 V DC, ≤ 80 mA • Dielectric Strength: (Integral Flowmeter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- (Remote Transmitter) 500 V AC r.m.s., 1 min, 5 mA Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}- Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE • Electrical Parameter: [4-20mA Output: SUPPLY+, SUPPLY-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Pulse Output: D_{OUT}+, D_{OUT}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH [Current Input: A_{IN}+, A_{IN}-] Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH *1: The ambient temperature for the process temperature under -55° C is shown as below 

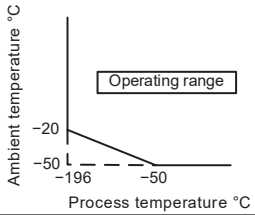
Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

● INMETRO explosion protection (Brazil)

Applicable Standard:	ABNT NBR IEC 60079-0 ABNT NBR IEC 60079-1 ABNT NBR IEC 60079-11 ABNT NBR IEC 60079-31
Certificate:	DNV 22.0151 X
Explosionproof (Certification Code: UF2)	

- Type of Gas Atmosphere Protection:
  (Integral Flowmeter) Ex db ia IIC T6...T1 Gb
  (Remote Sensor) Ex ia IIC T6...T1 Ga
  (Remote Transmitter) Ex db ia [ia Ga] IIC T6 Gb
- Type of Dust Atmosphere Protection:
  (Integral Flowmeter) Ex ia tb IIIC T80°C...T440°C Db
  (Remote Sensor) Ex ia IIIC T80°C...T440°C Db
  (Remote Transmitter) Ex ia tb [ia Db] IIIC T70°C Db
- Ambient Temperature(*1):
  (Integral Flowmeter, Remote Transmitter) -50°C ≤ Ta ≤ +60°C
  (Remote Sensor) T6, T80 °C: -50°C ≤ Ta ≤ +40°C
  T5, T95 °C to T1, T440 °C: -50°C ≤ Ta ≤ +60°C
- Maximum Surface Temperature and Process Temperature(*1):
  (Integral Flowmeter and Remote Sensor)
  T6, T80°C: -196°C to +80°C / [+78°C]
  T5, T95°C: -196°C to +95°C / [+93°C]
  T4, T130°C: -196°C to +130°C / [+128°C]
  T3, T195°C: -196°C to +195°C / [+193°C]
  T2, T290°C: -196°C to +290°C / [+288°C]
  T1, T440°C: -196°C to +440°C / [+438°C]
  [ ]: Built-in Temperature Sensor
- Atmospheric Pressure: 80 kPa to 110 kPa
- Enclosure:
  IP66/IP67 in accordance with only ABNT NBR IEC 60529
  IP66 in accordance with ABNT NBR IEC 60079-0(for transmitter assembly)
- Electrical Connection: 1/2 NPT female, M20×1.5 female
- Pollution Degree: 2
- Overvoltage Category: I
- Power Supply:
  (Integral Flowmeter and Remote Transmitter)
  10.5 to 42 V DC (Communication and I/O Code: JA, JB or JJ)
- Current I/O:
  (Integral Flowmeter and Remote Transmitter)
  Output: 3.6 to 21.6 mA
  Input: ≤ 21.6 mA
- Pulse Output:
  (Integral Flowmeter and Remote Transmitter)
  Output: ≤ 42 V DC, ≤ 120 mA
- Dielectric Strength:
  (Remote Transmitter)
  1500 V AC r.m.s., 1 min, 5 mA
  Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE
  500 V AC r.m.s., 1 min, 5 mA
  Terminals: BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal
- Um:
  (Integral Flowmeter and Remote Transmitter) 60 V DC

*1: The ambient temperature for the process temperature under -50°C is shown as below

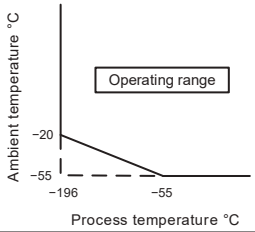


Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

Intrinsically Safe (Certification Code: US2, Communication and I/O Code: JA, JB or JJ)

- Type of Gas Atmosphere Protection
  (Integral Flowmeter) Ex ia IIC T4...T1 Ga
  (Remote Sensor) Ex ia IIC T6...T1 Ga
  (Remote Transmitter) Ex ia IIC T4 Ga
- Ambient Temperature(*1):
  (Integral Flowmeter) -55°C ≤ Ta ≤ +60°C
  (Remote Sensor) T6, T80°C: -55°C ≤ Ta ≤ +40°C
  T5, T95°C to T1, T440°C: -55°C ≤ Ta ≤ +60°C
  (Remote Transmitter) -55°C ≤ Ta ≤ +80°C
- Process Temperature(*1):
  (Integral Flowmeter and Remote Sensor)
  T6: -196°C to +80°C / [+78°C]
  T5: -196°C to +95°C / [+93°C]
  T4: -196°C to +130°C / [+128°C]
  T3: -196°C to +195°C / [+193°C]
  T2: -196°C to +290°C / [+288°C]
  T1: -196°C to +440°C / [+438°C]
  [ ] : Built-in Temperature Sensor
- Atmospheric Pressure: 80kPa to 110 kPa
- Enclosure:
  IP66/IP67 in accordance with only ABNT NBR IEC 60529
- Pollution Degree: 2
- Overvoltage Category: I
- Power Supply:
  (Integral Flowmeter and Remote Transmitter)
  10.5 to 30 V DC
- Current I/O:
  (Integral Flowmeter and Remote Transmitter)
  Output: 3.6 to 21.6 mA
  Input: ≤ 21.6 mA
- Pulse Output:
  (Integral Flowmeter and Remote Transmitter)
  Output: ≤ 30 V DC, ≤ 80 mA
- Dielectric Strength:
  (Integral Flowmeter)
  500 V AC r.m.s., 1 min, 5 mA
  Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to Earth terminal
  Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}-
  Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}-
  (Remote Transmitter)
  500 V AC r.m.s., 1 min, 5 mA
  Terminals: SUPPLY+ and SUPPLY- to D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}-
  Terminals: D_{OUT}+ and D_{OUT}- to A_{IN}+ and A_{IN}-
  Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+, A_{IN}-, BROWN, RED, ORANGE, YELLOW, GREEN and BLUE to Earth terminal
  Terminals: SUPPLY+, SUPPLY-, D_{OUT}+, D_{OUT}-, A_{IN}+ and A_{IN}- to BROWN, RED, ORANGE, YELLOW, GREEN and BLUE
- Electrical Parameter:
  [4-20mA Output: SUPPLY+, SUPPLY-]
  Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH
  [Pulse Output: D_{OUT}+, D_{OUT}-]
  Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH
  [Current Input: A_{IN}+, A_{IN}-]
  Ui: 30V, Ii: 200mA, Pi: 1.0W, Ci: 14.4nF, Li: 1.9µH

*1: The ambient temperature for the process temperature under -55°C is shown as below



Note: The description here shows the explosion protection performance. See the Ambient Temperature Range section for the normal operating ambient temperature range of the device. Please use within the temperature range that satisfies both ranges.

■ Model and Suffix Codes

● **Integral Flowmeter, Remote Sensor**

VY□□□ -□□□ -□ □ □□ □□□□ -□ □ □□ □ 00 /□
Model (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

Model	Single Sensor	Dual Sensor	Specifications
VY015	✓	✓	Vortex flowmeter (Size 15 mm, 1/2 inch)
VY025	✓	✓	Vortex flowmeter (Size 25 mm, 1 inch)
VY040	✓	✓	Vortex flowmeter (Size 40 mm, 1-1/2 inch)
VY050	✓	✓	Vortex flowmeter (Size 50 mm, 2 inch)
VY080	✓	✓	Vortex flowmeter (Size 80 mm, 3 inch)
VY100	✓	✓	Vortex flowmeter (Size 100 mm, 4 inch)
VY150	✓	✓	Vortex flowmeter (Size 150 mm, 6 inch)
VY200	✓	✓	Vortex flowmeter (Size 200 mm, 8 inch)
VY250	✓	-	Vortex flowmeter (Size 250 mm, 10 inch)
VY300	✓	-	Vortex flowmeter (Size 300 mm, 12 inch)
VY400	✓	-	Vortex flowmeter (Size 400 mm, 16 inch)
Suffix Code	**Single Sensor**	**Dual Sensor**	**Specifications**
(1) Certification (*11)	-000		Non-Ex without CE/CRN marking
	-001		Non-Ex with CE marking
	-002		Non-Ex with Canada CRN marking (Dual Seal certification)
	-SF2		IECEx Flameproof "db"
	-SS2		IECEx Intrinsically safe "ia"
	-KF2		ATEX Flameproof "db"
	-KS2		ATEX Intrinsically safe "ia"
	-FF1		FM Explosionproof approval (Dual Seal certification)
	-FS1		FM Intrinsically safe approval (Dual Seal certification)
	-CF1		FMc Explosionproof approval (Dual Seal certification) (Canada)
	-CS1		FMc Intrinsically safe approval (Dual Seal certification) (Canada)
	-JF5	-	Japan Flameproof "db"
	-PF2		Korea Flameproof "db"
	-PS2		Korea Intrinsically safe "ia"
	-UF2		INMETRO Flameproof "db" (Brazil)
	-US2		INMETRO Intrinsically safe "ia" (Brazil)
(2) Type of body	-0	-	General Type
	-1	-	Reduced Bore Type (1 Size Reduction) (*1)
	-2	-	Reduced Bore Type (2 Size Reduction) (*1)
	-4	-	High Pressure Reduced Bore Type (1 Size Reduction) (*1)
	-	-6	Dual-Sensor (Welded) General Type
(3) Type of shedder bar	A	N	General Type
	B	P	General Type with Temperature Sensor (*2)
	C	Q	High Temperature Type
	D	R	High Temperature Type with Temperature Sensor (*2)
	E	S	Cryogenic Type
	G	U	Long Neck Type
	H	V	Long Neck Type with Temperature Sensor (*2)

(4) Body & shedder bar material (*3), (*4), (*5)	BL	EN	[Standard material] Body: CF8M (Stainless steel), Shedder bar: 1.4517/S31803 (Duplex stainless steel)
	BH	EJ	[For high temperature process / cryogenic process / anti-corrosion material] Body: CF8M (Stainless steel), Shedder bar: CW-12MW/N10276 (Nickel alloy)
	BB	EE	[For high temperature process material] Body: CF8M (Stainless steel), Shedder bar: CF8M (Stainless steel)
	HH	-	[For anti-corrosion material] Body: CW-12MW (Nickel alloy), Shedder bar: CW-12MW/N10276 (Nickel alloy)

● **Integral Flowmeter, Remote Sensor (Continued)**

VY□□□ -□□□ -□ □ □□ □□□□ -□ □ □□ □ 00 /□
Model (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(5) Process connection (Wafer) Body material: CF8M (*6)	BAA1	-	ASME Class 150 Wafer
	BAA2	-	ASME Class 300 Wafer
	BAA4	-	ASME Class 600 Wafer
	BAE2	-	EN PN16 Wafer
	BAE4	-	EN PN40 Wafer
	BAJ1	-	JIS 10K Wafer
	BAJ2	-	JIS 20K Wafer
	BAJ4	-	JIS 40K Wafer
(5) Process connection (Wafer) Body material: CW-12MW (*6)	HAA1	-	ASME Class 150 Wafer
	HAA2	-	ASME Class 300 Wafer
	HAA4	-	ASME Class 600 Wafer
	HAE2	-	EN PN16 Wafer
	HAE4	-	EN PN40 Wafer
	HAJ1	-	JIS 10K Wafer
	HAJ2	-	JIS 20K Wafer
	HAJ4	-	JIS 40K Wafer
(5) Process connection (Flange) Body material: CF8M (*6)	BBA1	EBA1	ASME Class 150 Flange (RF)
	BBA2	EBA2	ASME Class 300 Flange (RF)
	BBA4	EBA4	ASME Class 600 Flange (RF)
	BBA5	EBA5	ASME Class 900 Flange (RF)
	BBA6 (*7)	-	ASME Class 1500 Flange (RF)
	BDA1	-	ASME Class 150 Flange (RF & SF)
	BDA2	-	ASME Class 300 Flange (RF & SF)
	BDA4	-	ASME Class 600 Flange (RF & SF)
	BDA5	-	ASME Class 900 Flange (RF & SF)
	BCA4	-	ASME Class 600 Flange (RJ)
	BCA5	-	ASME Class 900 Flange (RJ)
	BCA6 (*7)	-	ASME Class 1500 Flange (RJ)
	BBE1	EBE1	EN PN10 Flange (Type B1)
	BBE2	EBE2	EN PN16 Flange (Type B1)
	BBE3	EBE3	EN PN25 Flange (Type B1)
	BBE4	EBE4	EN PN40 Flange (Type B1)
	BFE1	-	EN PN10 Flange (Type F)
	BFE2	-	EN PN16 Flange (Type F)
	BFE3	-	EN PN25 Flange (Type F)
	BFE4	-	EN PN40 Flange (Type F)
	BBJ1	-	JIS 10K Flange (RF, FF)
	BBJ2	-	JIS 20K Flange (RF)
	BBJ4	-	JIS 40K Flange (RF)
(5) Process connection (Flange) Body material: CW-12MW (*6)	HBA1	-	ASME Class 150 Flange (RF)
	HBA2	-	ASME Class 300 Flange (RF)
	HBJ1	-	JIS 10K Flange (RF)
	HBJ2	-	JIS 20K Flange (RF)
(6) Housing/coating	-1		Standard Material with Standard Coating
	-2		Standard Material with Rugged Coating

● **Integral Flowmeter, Remote Sensor (Continued)**

VY□□□ -□□□ -□ □ □□ □□□□ -□ □ □□ □ 00 /□
Model (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(7) Cable entry (*8)	0		JIS G1/2 Female, one electrical connection (*12)
	2		ASME 1/2 NPT Female, one electrical connection (*9)
	4		ISO M20x1.5 Female, one electrical connection
	A	-	JIS G1/2 Female, two electrical connections
	C	-	ASME 1/2 NPT Female, two electrical connections (*9)
	E	-	ISO M20x1.5 Female, two electrical connections
	J	-	[Only for Japan Flameproof of Integral type] ISO M20x1.5 Female, two electrical connection attached with two Ex-glands (JIS G1/2 Female)
	K	-	[Only for Japan Flameproof of Integral type] ISO M20x1.5 Female, two electrical connection attached with one Ex-gland (JIS G1/2 Female) and one Ex-plug
(8) Communication and input/ output	JA	-	HART 7 communication, 4 to 20 mA DC, Pulse/Status output
	JB	-	HART 7 communication, 4 to 20 mA DC, Pulse/Status output, Analog input
	-	JJ	Upper stream: HART 7 communication, 4-20 mA DC, Pulse/Status Output Down stream: HART 7 communication, 4-20 mA DC, Pulse/Status Output
	NN		None (Remote Sensor)
(9) Display (*10)	1		With Display
	N		Without Display / Remote Sensor
-	0		Always 0
-	0		Always 0
(10) Options	/□		Read "■Option Specifications"

*1: The reduced bore type incorporates a structure in which both the upstream and downstream sides of the sensor are integrated with the reduction pipe/expansion pipe.
*2: The type with a temperature sensor has a temperature sensor (Pt1000) built into the shedder bar.
*3: Body material B□ (CF8M) is equivalent to JIS SCS14A.
*4: When selecting the wetted parts material, carefully consider the characteristics of the process fluids that are used. Selecting inappropriate materials may cause corrosive process fluids to leak out, resulting in injury to personnel or damage to plant facilities. The instrument itself may also become damaged, causing fragments from damaged parts to contaminate your 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 or more). Contact Yokogawa for detailed information about the wetted parts.
*5: For details, read "Body material, shedder bar material, and gasket material (assembled to shedder bar)".
*6: Complies with the following process connection standards.
- ASME: ASME B16.5
- EN: EN 1092-1
- JIS: JIS B 2220
The description for the flange face specification is as follows.
- FF: Flat face
- RF: Raised face
- SF: Smooth finish
- RJ: Ring joint
*7: For BBA6 and BCA6, the body material is F316.
For VY040-□□□-4□□H, the maximum working pressure is the flange rating times 0.8.
*8: The type of cable entry is restricted on explosion protection type models. Read "■Explosion Protection Specifications".
*9: For -KF2, -SF2, -FF1, -CF1, -PF2 and -UF2, the screw length is deeper than the ASME standard for 0.5 to 2 threads.
*10: The display is not available for the remote sensor.
*11: Select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present. In the case that final destination is Taiwan or UAE and the explosion type is required, select IECEx explosion protection type.
*12: Select 'JIS G1/2 Female, one electrical connection' (Cable entry: 0) for remote sensor type of Japan Flameproof.

● **Remote Transmitter**

VY4A -□□□ -□ □ □□ □ 00 /□
Model (1) (2) (3) (4) (5) (6)

Model		Specifications
VY4A		Vortex flowmeter remote transmitter
Suffix Code		**Specifications**
(1) Certification (*3)	-000	Non-Ex without any marking
	-001	Non-Ex with CE marking
	-002	Non-Ex with Canada general safety marking
	-SF2	IECEx Flameproof "db"
	-SS2	IECEx Intrinsically safe "ia"
	-KF2	ATEX Flameproof "db"
	-KS2	ATEX Intrinsically safe "ia"
	-FF1	FM Explosionproof approval
	-FS1	FM Intrinsically safe approval
	-CF1	FMc Explosionproof approval (Canada)
	-CS1	FMc Intrinsically safe approval (Canada)
	-JF5	Japan Flameproof "db"
	-PF2	Korea Flameproof "db"
	-PS2	Korea Intrinsically safe "ia"
	-UF2	INMETRO Flameproof "db" (Brazil)
	-US2	INMETRO Intrinsically safe "ia" (Brazil)
(2) Housing/coating	-1	Standard material with standard coating
	-2	Standard material with rugged coating
(3) Cable entry (*1)	0	Communication and input/output side: JIS G1/2 female, one electrical connection Vortex flowmeter signal cable connection side: JIS G1/2 female
	2	Communication and input/output side: ASME 1/2 NPT female, one electrical connection (*2) Vortex flowmeter signal cable connection side: ASME 1/2 NPT female
	4	Communication and input/output side: ISO M20x1.5 female, one electrical connection Vortex flowmeter signal cable connection side: ISO M20x1.5 female
	A	Communication and input/output side: JIS G1/2 female, two electrical connections Vortex flowmeter signal cable connection side: JIS G1/2 female
	C	Communication and input/output side: ASME 1/2 NPT female, two electrical connections (*2) Vortex flowmeter signal cable connection side: ASME 1/2 NPT female
	E	Communication and input/output side: ISO M20x1.5 female, two electrical connections Vortex flowmeter signal cable connection side: ISO M20x1.5 female
	J	[Only for Japan Flameproof] Communication and input/output side: ISO M20x1.5 Female, two electrical connection attached with two Ex-glands (JIS G1/2 Female) Vortex flowmeter signal cable connection side: JIS G1/2 female
	K	[Only for Japan Flameproof] Communication and input/output side: ISO M20x1.5 Female, two electrical connection attached with one Ex-gland (JIS G1/2 Female) and one Ex-plug Vortex flowmeter signal cable connection side: JIS G1/2 female
(4) Communication and input/output	JA	HART 7 communication, 4 to 20 mA DC, pulse/status output
	JB	HART 7 communication, 4 to 20 mA DC, pulse/status output, analog input
(5) Display	1	With Display
	N	Without Display
-	0	Always 0
-	0	Always 0
(6) Options	/□	Read "■Option Specifications"

*1: The type of cable entry is restricted on explosion protection type models. Read "■Explosion Protection Specifications".
*2: For -KF2, -SF2, -FF1, -CF1, PF2 and UF2, the screw length is deeper than the ASME standard for 0.5 to 2 threads.
*3: Select appropriate equipment in accordance with the laws and regulations of the relevant country/region, when it is used in a location where explosive atmospheres may be present. In the case that final destination is Taiwan or UAE and the explosion type is required, select IECEx explosion protection type.

● Vortex Flowmeter Signal Cable

VY1C -□ -□□□ /□
Model (1) (2) (3)

Model		Specifications
VY1C		Vortex flowmeter signal cable
Suffix Code		**Specifications**
(1) Cable end	-0	Without end finish (*1)
	-1	With end finish
(2) Cable length (*2)	-05M	5 m
	-10M	10 m
	-15M	15 m
	-20M	20 m
	-25M	25 m
	-30M	30 m
	-35M	35 m
	-40M	40 m
	-45M	45 m
	-50M	50 m
	-55M	55 m
	-60M	60 m
	-65M	65 m
	-70M	70 m
	-75M	75 m
	-80M	80 m
	-85M	85 m
	-90M	90 m
	-95M	95 m
Option code		**Specifications**
(3) Options	/C1	End finish parts, 1 set
	/C2	2 sets
	/C3	3 sets
	/C4	4 sets
	/C5	5 sets
	/C6	6 sets
	/C7	7 sets
	/C8	8 sets
	/C9	9 sets

*1: One set of end finish parts is included. Cable length is added by 340mm for the cable end finishing.
*2: Cable length up to 95 m is available, but the length for actual use is 50 m or less. If you specify a length over 50 m, select "-0" for the cable end code and shorten the cable to a length of 50 m or less before use.

Body Material, Shedder Bar Material, and Gasket Material (assembled to shedder bar)
Wafer type (process connection: □A□□) is VY015 to VY100, and flange type (process connection: □B□□) is VY015 to VY400.

Reduced bore type is for flange type only.

Body & shedder bar code: BL and EN

Body material: CF8M (equivalent to SCS14A). (Flange material for VY250 to VY400 is F304.)
F316 (only when type of body is -4: High pressure reduced bore type (1 size reduction))

Bottom plug material: S31803

Shedder bar material: S31803 (VY015), 1.4517 (VY025 to VY300)

Shedder bar type code	Gasket material	Model - Type of body (*1)										
		VY015-0, VY015-6	VY025-0, VY025-6	VY040-0, VY040-6	VY050-0, VY050-6	VY080-0, VY080-6	VY100-0, VY100-6	VY150-0, VY150-6	VY200-0, VY200-6	VY250-0	VY300-0	VY400-0
		VY025-1, VY025-4	VY040-1, VY040-4	VY050-1, VY050-4	VY080-1, VY080-4	VY100-1, VY100-4	VY150-1, VY150-4	VY200-1	--	--	--	--
		VY040-2	VY050-2	VY080-2	VY100-2	VY150-2	VY200-2	--	--	--	--	--
A, N: General type G, U: Long Neck Type	SUS F316 PTFE coating (*2)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
B, P: General type with temperature sensor H, V: Long Neck Type with temperature sensor	SUS F316 PTFE coating (*2)		✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓	✓	✓	✓	
C, Q: High temperature type	SUS F316 Plated with silver											
D, R: High temperature type with temperature sensor	SUS F316 Plated with silver											
E, S: Cryogenic type	SUS F316 PTFE coating											

*1: Body type code specifications are as follows.
-0: General type
-1: Reduced bore type (1 size reduction)
-2: Reduced bore type (2 size reduction)
-4: High pressure reduced bore type (1 size reduction)
-6: Dual-Sensor (Welded) General type

*2: This can be combined with the stainless steel gasket plated with silver (option code /SPG). In that case, the material is SUS F316 plated with silver.

*3: Not available when type of body is -4: High pressure reduced bore type (1 size reduction).

Body & shedder bar code: BB and EE

Body material: CF8M (equivalent to SCS14A). (Flange material for VY250 to VY400 is F304.)

Bottom plug material: SUS316 or SUS F316

Shedder bar material: CF8M

Shedder bar type code	Gasket material	Model - Type of body (*1)										
		VY015-0, VY015-6	VY025-0, VY025-6	VY040-0, VY040-6	VY050-0, VY050-6	VY080-0, VY080-6	VY100-0, VY100-6	VY150-0, VY150-6	VY200-0, VY200-6	VY250-0	VY300-0	VY400-0
		VY025-1	VY040-1	VY050-1	VY080-1	VY100-1	VY150-1	VY200-1	--	--	--	--
A, N: General type G, U: Long Neck Type	SUS F316 PTFE coating (*2)							✓	✓	✓	✓	✓
B, P: General type with temperature sensor H, V: Long Neck Type with temperature sensor	SUS F316 PTFE coating (*2)							✓	✓	✓	✓	
C, Q: High temperature type	SUS F316 Plated with silver							✓	✓	✓	✓	✓
D, R: High temperature type with temperature sensor	SUS F316 Plated with silver							✓	✓	✓	✓	
E, S: Cryogenic type	SUS F316 PTFE coating											

*1: Body type code specifications are as follows.
-0: General type
-1: Reduced bore type (1 size reduction)
-6: Dual-Sensor (Welded) General type

*2: This can be combined with the stainless steel gasket plated with silver (option code /SPG). In that case, the material is SUS F316 plated with silver.

Body & shedder bar code: BH and EJ

Body material: CF8M (equivalent to SCS14A)
F316 (only when type of body is -4: High pressure reduced bore type (1 size reduction))

Bottom plug material: N10276

Shedder bar material: N10276 (VY015), CW-12MW (VY025 to VY200)

Shedder bar type code	Gasket material	Model - Type of body (*1)										
		VY015-0, VY015-6	VY025-0, VY025-6	VY040-0, VY040-6	VY050-0, VY050-6	VY080-0, VY080-6	VY100-0, VY100-6	VY150-0, VY150-6	VY200-0, VY200-6	--	--	--
		VY025-1, VY025-4	VY040-1, VY040-4	VY050-1, VY050-4	VY080-1, VY080-4	VY100-1, VY100-4	VY150-1, VY150-4	VY200-1	--	--	--	--
		VY040-2	VY050-2	VY080-2	VY100-2	VY150-2	VY200-2	--	--	--	--	--
A, N: General type G, U: Long Neck Type	SUS F316 PTFE coating (*2)	✓	✓	✓	✓	✓	✓	✓	✓			
B, P: General type with temperature sensor H, V: Long Neck Type with temperature sensor	SUS F316 PTFE coating (*2)		✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓	✓			
C, Q: High temperature type	SUS F316 Plated with silver		✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓	✓			
D, R: High temperature type with temperature sensor	SUS F316 Plated with silver		✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓	✓			
E, S: Cryogenic type	SUS F316 PTFE coating	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)	✓ (*3)					

*1: Body type code specifications are as follows.
-0: General type
-1: Reduced bore type (1 size reduction)
-2: Reduced bore type (2 size reduction)
-4: High pressure reduced bore type (1 size reduction)
-6: Dual-Sensor (Welded) General type

*2: This can be combined with the stainless steel gasket plated with silver (option code /SPG). In that case, the material is SUS F316 plated with silver.

*3: Not available when type of body is -4: High pressure reduced bore type (1 size reduction).

Body & shedder bar code: HH

Body material: CW-12MW

Bottom plug material: N10276

Shedder bar material: N10276 (VY015), CW-12MW (VY025 to VY150)

Shedder bar type code	Gasket material	Model - Type of body (*1)										
		VY015-0	VY025-0	VY040-0	VY050-0	VY080-0	VY100-0	VY150-0	VY200-0	VY250-0	VY300-0	VY400-0
A: General type G: Long Neck Type	N10276 PTFE coating (*2)	✓	✓	✓	✓	✓	✓	✓				
B: General type with temperature sensor H: Long Neck Type with temperature sensor	N10276 PTFE coating (*2)		✓	✓	✓	✓	✓	✓				
C: High temperature type												
D: High temperature type with temperature sensor												
E: Cryogenic type												

*1: Body type code specifications are as follows.
-0: General type

*2: This cannot be combined with the stainless steel gasket plated with silver (option code /SPG).

Specifications for type with temperature sensor (Shedder bar type: B, D, H, P, R, V) (*1)

Model code			VY025 to VY100 (Wafer type) VY025 to VY300 (Flange type)	
Type of shedder bar			B, P: General type with temperature sensor H, V: Long Neck Type with Temperature Sensor	D, R: High temperature type with temperature sensor
Temperature gauge function	Temperature range (temperature display/output)		-40 to +250°C	-40 to +400°C
	Calculation temperature range	Saturated steam: Mass flow rate (*2)	+100 to +250°C	+100 to +350°C
		Superheated steam: Mass flow rate (*3)	+100 to +250°C	+100 to +400°C (*7)
		Gas: Mass flow rate (*4)	-40 to +250°C	-40 to +400°C
		Water: Mass flow rate (*2)	0 to +250°C	0 to +350°C
		General liquid: Mass flow rate (*5)	-40 to +250°C	-40 to +400°C
		Gas: Volumetric flow rate (normal/standard condition) (*4)	-40 to +250°C	-40 to +400°C
		Saturated steam: Energy flow rate (*6)	+100 to +250°C	+100 to +350°C
		Superheated steam: Energy flow rate (*6)	+100 to +250°C	+100 to +400°C (*7)
		Water: Energy flow rate (*6)	0 to +250°C	0 to +350°C
		Saturated steam: Heat difference flow rate (*6)	+100 to +250°C	+100 to +350°C
		Water: Heat difference flow rate (*6)	0 to +250°C	0 to +350°C
		General liquid: Heat difference flow rate (*5)	-40 to +250°C	-40 to +400°C
Temperature response (50% response)	VY025 to VY200		60 sec (Churning underwater)	
	VY250 to VY300		120 sec (Churning underwater)	
Output signal	Analog output		Select from flow rate or temperature (*8)	
	Pulse output		Flow rate	
	Alarm output		Standard specification alarm, temperature sensor error, etc.	
	Status output		Flow switch: Standard specification (flow rate, total) and temperature	
Display	Upper		Select from flow rate (% or engineering units) or temperature (%) (*9)	
	Lower		Select from totalized value or process value (engineering units) based on temperature or analog input (*10)	

*1: Temperature measurements may be affected by installation conditions such as thermal insulation of piping, or by the temperature distribution of the fluid. Read "■Remarks on Installation" for details on thermal insulation of piping. Thermal insulation of piping is required when measuring the flow rate of saturated steam or superheated steam.

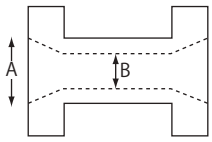
*2: Mass flow rate is calculated by using the built-in saturated steam table to determine the density from the temperature measured by the built-in temperature sensor, the temperature or pressure from the analog input, or fixed value specified in the sizing data. For water, the mass flow rate is calculated by using the built-in saturated steam table to determine the density based on the measured temperature.

*3: Mass flow rate is calculated by using the built-in steam table to determine the density based on the temperature and pressure. The temperature and pressure used to determine the density for the mass flow rate calculation are obtained from a combination of the temperature and pressure from the built-in temperature sensor, the analog input, or fixed value specified in the sizing data.

*4: Volumetric flow rate is calculated by obtaining the measured temperature from the built-in temperature sensor, the temperature or pressure from the analog input, or fixed value specified in the sizing data and applying a compensation. For the mass flow rate calculation, the standard density specified in the sizing data is used in addition to the temperature and pressure.

*5: Mass flow rate is calculated using a quadratic equation to correct for changes in density due to the measured temperature. The standard density specified in the sizing data is used. And, the compensation coefficient parameter settings are required. The heat difference flow rate calculation uses either the mass flow rate results or the original volumetric flow rate results, and the unit of measurement for the value that is specified as the heat conversion coefficient is switched to the mass flow rate unit standard or the volumetric flow rate unit standard for the calculation. The temperature difference is calculated using the temperature from the built-in temperature sensor and the temperature from the analog input, and then the heat difference flow rate is calculated.
*6: Energy flow rate is calculated by using the built-in saturated steam table to determine the density and specific enthalpy from the temperature measured by the built-in temperature sensor, the temperature or pressure from the analog input, or fixed value specified in the sizing data. For water, the Energy flow rate is calculated by using the built-in saturated steam table to determine the density and specific enthalpy based on the measured temperature. The heat difference flow rate is calculated using both the temperature from the built-in temperature sensor and the temperature from the analog input.
*7: It is possible to calculate temperatures up to 450°C.
*8: The factory default setting is flow rate output. When temperature output is selected, the parameter setting needs to be changed.
*9: When the % display setting is selected for the flow rate, "F" is displayed in addition to "%".
When the % display setting is selected for the temperature, "T" is displayed in addition to "%".
*10: Total is set when the instrument is shipped, if the total rate is specified in the sizing data when ordering.

Reduced Bore Type Specifications (Type of body: -1, -2, -4) (*1) (*2)

	Model code	Flange connection size (A)	Type of body -1, -4 (*3) Sensor size (Inner dia.) (B)	Type of body -2 Sensor size (Inner dia.) (B)	Remarks
	VY015	15 mm	-	-	-
	VY025	25 mm	15 (14.6) mm (*3)	-	Pressure loss: For reduced bore type (1 size reduction) and high pressure reduced bore type (1 size reduction), the pressure loss is approximately 15% more than that of general type. For reduced bore type (2 size reduction), the pressure loss is approximately 28% more. (Read "■Sizing" for the calculation method.)
	VY040	40 mm	25 (25.7) mm	15 (14.6) mm (*3)	
	VY050	50 mm	40 (39.7) mm	25 (25.7) mm	
	VY080	80 mm	50 (51.1) mm	40 (39.7) mm	
	VY100	100 mm	80 (71) mm	50 (51.1) mm	
	VY150	150 mm	100 (93.8) mm	80 (71) mm	
	VY200	200 mm	150 (138.8) mm	100 (93.8) mm	
Measurable minimum flow velocity	Liquid, gas, steam		Read "■Sizing".		
Range of measurable flow velocity	Liquid, gas, steam				

*1: Body type code specifications are as follows.
-0: General type
-1: Reduced bore type (1 size reduction)
-2: Reduced bore type (2 size reduction)
-4: High pressure reduced bore type (1 size reduction)
*2: For information on accuracy, read "■Accuracy Details".
For specifications of combinations, read "Body material, shedder bar material, and gasket material (assembled to shedder bar)".
*3: In the case of VY025-1, VY040-2, or models with type of body -4, combination with a shedder bar with built-in temperature sensor or a high temperature type shedder bar is not available.

Flowmeter Selection Guide

- **ASME B16.5**

The models compatible with the process connection pressure ratings are indicated below. Specifications indicated with a check mark can be selected.

If your desired pressure rating is not available (indicated with diagonal line), select a specification with a higher pressure rating.

Body type codes:

-0: General type

-1: Reduced bore type (1 size reduction)

-2: Reduced bore type (2 size reduction)

-4: High pressure reduced bore type (1 size reduction)

-6: Dual-Sensor (Welded) General type

Wafer type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100
-0	Class 150	✓	✓	✓	✓	✓	✓
	Class 300		✓	✓	✓	✓	✓
	Class 600	✓	✓	✓	✓	✓	✓

Flange type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100	VY150	VY200	VY250	VY300	VY400
-0	Class 150	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Class 300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Class 600	✓	✓	✓	✓	✓	✓	✓	✓			
	Class 900	✓	✓	✓	✓	✓	✓	✓	✓			
-1	Class 150		✓	✓	✓	✓	✓	✓	✓			
	Class 300		✓	✓	✓	✓	✓	✓	✓			
-2	Class 150			✓	✓	✓	✓	✓	✓			
	Class 300			✓	✓	✓	✓	✓	✓			
-4	Class 1500		✓	✓	✓	✓	✓	✓				
-6	Class 150	✓	✓	✓	✓	✓	✓	✓	✓			
	Class 300	✓	✓	✓	✓	✓	✓	✓	✓			
	Class 600	✓	✓	✓	✓	✓	✓	✓	✓			
	Class 900	✓	✓	✓	✓	✓	✓	✓	✓			

- Body material: CF8M

Pressure rating	Wafer		Flange (*1) (Raised face)				Flange (*2) (Raised face & smooth finish)				Flange (Ring joint)		
	Process connection code	Model code: Type of body -0	Process connection code	Model code: Type of body -0, -6	Model code: Type of body -1, -4	Model code: Type of body -2	Process connection code	Model code: Type of body -0	Model code: Type of body -1	Model code: Type of body -2	Process connection code	Model code: Type of body -0	Model code: Type of body -4
Class 150	BAA1	VY015 to VY100	BBA1	VY015 to VY400	VY025 to VY200	VY040 to VY200	BDA1	VY015 to VY400	VY025 to VY200	VY040 to VY200	--	--	--
			EBA1	VY015 to VY200	--	--	--	--	--	--	--	--	--
Class 300	BAA2	VY025 to VY100	BBA2	VY015 to VY400	VY025 to VY200	VY040 to VY200	BDA2	VY015 to VY400	VY025 to VY200	VY040 to VY200	--	--	--
			EBA2	VY015 to VY200	--	--	--	--	--	--	--	--	--
Class 600	BAA4	VY015 to VY100	BBA4, EBA4	VY015 to VY200	--	--	BDA4	VY015 to VY200	--	--	BCA4	VY015 to VY200	--
Class 900	--	--	BBA5, EBA5	VY015 to VY200	--	--	BDA5	VY015 to VY200	--	--	BCA5	VY015 to VY200	--
Class 1500 (*3)	--	--	BBA6	--	VY025 to VY150	--	--	--	--	--	BCA6	--	VY025 to VY150

*1: Provided with a serrated finish.
*2: Provided without a serrated finish.
*3: For Class 1500, only process connection codes BBA6 or BCA6 are available, and the type of body is -4 (high pressure reduced bore type (1 size reduction)).

- Body material: CW-12MW

Pressure rating	Wafer		Flange (*1) (Raised face)			
	Process connection code	Model code	Process connection code	Model code		
		Type of body -0		Type of body -0	Type of body -1, -4	Type of body -2
Class 150	HAA1	VY015 to VY100	HBA1	VY015 to VY150	--	--
Class 300	HAA2	VY025 to VY100	HBA2	VY015 to VY100	--	--
Class 600	HAA4	VY015 to VY100	--	--	--	--

*1: Provided with a serrated finish.

• EN1092-1

The models compatible with the process connection pressure ratings are indicated below. Specifications indicated with a check mark can be selected.

If your desired pressure rating is not available (indicated with diagonal line), select a specification with a higher pressure rating.

Body type codes:

-0: General type

-6: Dual-Sensor (Welded) General type

Wafer type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100
-0	PN10						
	PN16						✓
	PN25						
	PN40	✓	✓	✓	✓	✓	✓

Flange type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100	VY150	VY200	VY250	VY300	VY400
-0	PN10								✓			
	PN16				✓	✓	✓	✓	✓			
	PN25								✓			
	PN40	✓	✓	✓	✓	✓	✓	✓	✓			
-6	PN10								✓			
	PN16				✓	✓	✓	✓	✓			
	PN25								✓			
	PN40	✓	✓	✓	✓	✓	✓	✓	✓			

- Body material: CF8M

Pressure rating	Wafer		Flange (Type B1)		Flange (Type F)	
	Process connection code	Model code	Process connection code	Model code	Process connection code	Model code
		Type of body -0		Type of body -0, -6		Type of body -0
PN10	BAE1	--	BBE1, EBE1	VY200	BFE1	VY200
PN16	BAE2	VY100	BBE2, EBE2	VY050 to VY200	BFE2	VY050 to VY200
PN25	BAE3	--	BBE3, EBE3	VY200	BFE3	VY200
PN40	BAE4	VY015 to VY100	BBE4, EBE4	VY015 to VY200	BFE4	VY015 to VY200

- Body material: CW-12MW

Pressure rating	Wafer		Flange (Type B1)		Flange (Type F)	
	Process connection code	Model code Type of body -0	Process connection code	Model code Type of body -0	Process connection code	Model code Type of body -0
PN10	HAE1	--	--	--	--	--
PN16	HAE2	VY100	--	--	--	--
PN25	HAE3	--	--	--	--	--
PN40	HAE4	VY015 to VY100	--	--	--	--

• JIS B 2220

The models compatible with the process connection pressure ratings are indicated below. Specifications indicated with a check mark can be selected.

If your desired pressure rating is not available, select a specification with a higher pressure rating.

Body type codes:

-0: General type

-1: Reduced bore type (1 size reduction)

-2: Reduced bore type (2 size reduction)

Wafer type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100
-0	10K				✓	✓	✓
	20K	✓	✓	✓	✓	✓	✓
	40K	✓	✓	✓	✓	✓	✓

Flange type

Type of body		VY015	VY025	VY040	VY050	VY080	VY100	VY150	VY200	VY250	VY300	VY400
-0	10K	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	20K	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	40K	✓	✓	✓	✓	✓	✓	✓				
-1	10K		✓	✓	✓	✓	✓	✓	✓			
	20K		✓	✓	✓	✓	✓	✓	✓			
-2	10K			✓	✓	✓	✓	✓	✓			
	20K			✓	✓	✓	✓	✓	✓			

- Body material: CF8M

Pressure rating	Wafer		Flange (Raised face)			
	Process connection code	Model code Type of body -0	Process connection code	Model code		
				Type of body -0	Type of body -1	Type of body -2
JIS 10K	BAJ1	VY050 to VY100	BBJ1	VY015 to VY400	VY025 to VY200	VY040 to VY200
JIS 20K	BAJ2	VY015 to VY100	BBJ2	VY015 to VY400	VY040 to VY200	VY040 to VY200
JIS 40K	BAJ4	VY015 to VY100	BBJ4	VY015 to VY150	--	--

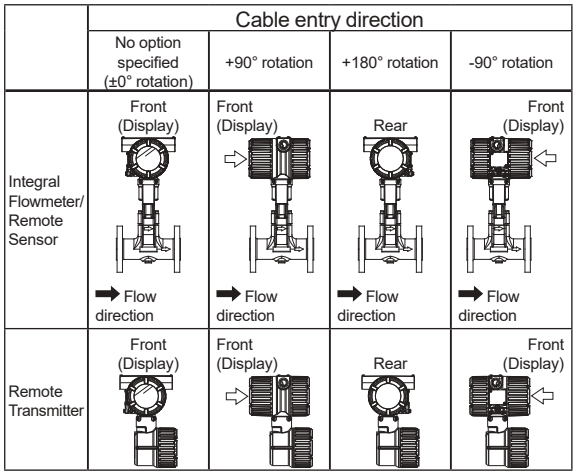
- Body material: CW-12MW

Pressure rating	Wafer		Flange (Raised face)			
	Process connection code	Model code Type of body -0	Process connection code	Model code		
				Type of body -0	Type of body -1	Type of body -2
JIS 10K	HAJ1	VY050 to VY100	HBJ1	VY015 to VY100	--	--
JIS 20K	HAJ2	VY015 to VY100	HBJ2	VY015 to VY100	--	--
JIS 40K	HAJ4	VY015 to VY100	--	--	--	--

■ Option Specifications

Integral Flowmeter, Remote Sensor, Remote Transmitter

Specifications	Description and applicable conditions	Code	Integral type	Remote Sensor	Remote Transmitter
Stainless Steel Gasket plated with Silver	Change the gasket material assembling to the shedder bar: SUS316 stainless steel plated with silver	/SPG	✓	✓	-
[For Integral/Remote Sensor] Dual-Sensor (Welded) Type --- [For Remote Transmitter] Dual-Sensor (Welded) Type for Upstream	[Integral/Remote Sensor] Add this option code in case of selecting the Dual-Sensor type (Body Type). --- [Remote Transmitter] Specify the upstream instrument in case of selecting the Dual-Sensor type (Body Type).	/DS1	✓	✓	✓
[For Remote Transmitter] Dual-Sensor (Welded) Type for Downstream	Specify the downstream instrument in case of selecting the Dual-Sensor type (Body Type).	/DS2	-	-	✓
Degrease Cleansing Treatment (*1)	After calibration, cleaned with water and acetone. And dried with air and package with polyethylene. The label "OIL FREE" is affixed.	/K1	✓	✓	-
Lightning Protector	Transmitter power supply voltage: 10.5 to 30 V DC Allowable current: Max. 6000 A (8 × 20 µs), Repeating 1000 A (8 × 20 µs), 100 times Applicable Standards: IEC 61000-4-4, IEC 61000-4-5	/A	✓	-	✓
Output Signal Down on Failure	The current output signal is set as follows when shipped. Output signal limits: 3.6 to 21.6 mA Output signal at CPU failure or alarm occurrence: 3.6 mA (-2.5%) or less (The standard setting is 21.6 mA (110%) or more at CPU failure or alarm occurrence.)	/C1	✓	-	✓
Output Signal Down on Failure (NAMUR NE43 Compliant)	The current output signal is set as follows when shipped. Output signal limits: 3.8 to 20.5 mA Output signal at CPU failure or alarm occurrence: Low 3.6 mA (-2.5%) or less	/C2	✓	-	✓
Output Signal Up on Failure (NAMUR NE43 Compliant)	The current output signal is set as follows when shipped. Output signal limits: 3.8 to 20.5 mA Output signal at CPU failure or alarm occurrence: High 21.6 mA (110%) or more	/C3	✓	-	✓
Low Ambient Temperature	The transmitter part is inspected and shipped in an environment with an ambient temperature of -50°C.	/LAT	✓	✓	✓
SIL 2 Certification (*2)	Compliant with IEC 61508 (Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems), and therefore compliant with SIL 2. Also compliant with SIL 3 if two instruments are used in a redundant configuration.	/SL	✓	✓	✓
Marine Certificate: ABS	American Bureau of Shipping Type Approval Certificate No.: 21-2168451-PDA	/WCA	✓	✓	✓
Marine Certificate: DNV	Det Norske Veritas Type Approval Certificate No.: TAA0000326	/WCD	✓	✓	✓
Japan Explosion Proof: Temperature Class	JT6: Temperature Class T6	/JT6	✓	✓	✓
	JT5: Temperature Class T5 JT4: Temperature Class T4 JT3: Temperature Class T3 JT2: Temperature Class T2 JT1: Temperature Class T1	/JT5 /JT4 /JT3 /JT2 /JT1	✓	✓	-
Country-specific delivery	Delivery to Japan	/PJ	✓	✓	✓
Stainless Steel Tag Plate (*3)	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 × Width): Approx. 12.5 mm × 40 mm (0.5 in. × 1.6 in.)	/SCT	✓	✓	✓
Stainless Steel Bolt & Nut Assembly	The mounting bolts and nuts of wafer type are supplied. The number of bolts are 4 or 8, depending on the pressure rating. Bolt: SUS304 Nut: SUS304	/BL	✓	✓	-

Specifications	Description and applicable conditions	Code	Integral type	Remote Sensor	Remote Transmitter
Cable Entry Direction Change	Rotate the case of integral flowmeter or remote sensor and change the direction of the cable entry. Read 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. 	/RH	✓	✓	✓
Blanking Plug (*5)	Attach one blanking plug for cable entry of the housing.	/PG	✓	-	✓
	Attach two blanking plugs for cable entry of the housing.	/PG2	✓	-	✓
Material Certificates (EN 10204-3.1)	Material certificates according to EN 10204 Type 3.1 are issued. A cover for the material certificates is included. [Target Parts] E01: 1. Body E02: 1. Body, 2. Shedder Bar (Pot) E03: 1. Body, 2. Shedder Bar (Pot), 3. Bottom Plug E04: 1. Body, 2. Shedder Bar (Pot), 3. Bottom Plug, 4. Welding Rod E05: 1. Body, 2. Shedder Bar (Pot), 3. Bottom Plug, 4. Welding Rod, 5. Plate, 6. Bolt	/E01 /E02 /E03 /E04 /E05	✓	✓	-
Welding Documents: ASME	Welding documents with 3rd party approval according to ASME are issued. 1. Welder/Welding Operator Performance Qualification (or Welder Qualification Record) 2. Welding Procedure Specification (WPS) 3. Procedure Qualification Record (PQR) [Target Parts] 1. Welded portion of bottom plug 2. Welded portion of flange (in the case of welded construction) 3. Welded portion for Body (for Dual-Sensor Type)	/WPA	✓	✓	-
Welding Documents: EN	Welding documents with 3rd party approval according to EN standard are issued. 1. Welder/Welding Operator Performance Qualification (or Welder Qualification Record) 2. Welding Procedure Specification (WPS) 3. Procedure Qualification Record (PQR) [Target Parts] 1. Welded portion of bottom plug 2. Welded portion of flange (in the case of welded construction) 3. Welded portion for Body (for Dual-Sensor Type)	/WPB	✓	✓	-
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	✓	✓	✓
Combined Calibration Certificate	Combination of: - /L2: Calibration Certificate (Level 2) - /L3: Calibration Certificate (Level 3) - /L4: Calibration Certificate (Level 4)	/L6	✓	✓	✓

Specifications	Description and applicable conditions	Code	Integral type	Remote Sensor	Remote Transmitter
Hydrostatic / Pneumatic Test (*4)	Perform a hydrostatic / pneumatic test to check that there is no leakage, and the result is decribed in a test certificate (QIC). For the test medium pressure on each process connection, read the separate table. Test medium: Air, Nitrogen, or Water Retention time: 10 minutes	/T01	✓	✓	-
Hydrostatic Test (*4)	Perform a hydrostatic/pneumatic test to check that there is no leakage, and the result is described in a test certificate (QIC). For the test medium pressure on each process connection, read the separate table. Test medium: Water Retention time: 10 minutes	/T02	✓	✓	-
PMI Test	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. [Target Parts] PM1: 1. Body PM2: 1. Body, 2. Shedder bar	/PM1 /PM2	✓	✓	-
Liquid Penetrant Test	Liquid penetrant test is performed and a test report is issued. [Target Parts] 1. Welded portion of bottom plug, 2. Welded portion of flange (in the case of welded construction) Criteria: ASME B31.1	/PT	✓	✓	-
Liquid Penetrant Test for Dual-Sensor (Welded) Type	Liquid penetrant test is performed and a test report is issued. [Target Parts] 1. Welded portion of bottom plug, 2. Welded portion of flange (in the case of welded construction) 3. Welded portion of body (in the case of dual sensor type) Criteria: ASME B31.1	/PTD	✓	✓	-

Specifications	Description and applicable conditions	Code	Integral type	Remote Sensor	Remote Transmitter
Product Certifications	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPA: Welding Documents: ASME - /T01: Hydrostatic / Pneumatic Test - /PM2: PMI Test - /PT: Liquid Penetrant Test	/P31	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPA: Welding Documents: ASME - /T02: Hydrostatic Test - /PM2: PMI Test - /PT: Liquid Penetrant Test	/P32	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPB: Welding Documents: EN - /T01: Hydrostatic / Pneumatic Test - /PM2: PMI Test - /PT: Liquid Penetrant Test	/P33	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPB: Welding Documents: EN - /T02: Hydrostatic Test - /PM2: PMI Test - /PT: Liquid Penetrant Test	/P34	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPA: Welding Documents: ASME - /T01: Hydrostatic / Pneumatic Test - /PM2: PMI Test - /PTD: Liquid Penetrant Test	/P51	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPA: Welding Documents: ASME - /T02: Hydrostatic Test - /PM2: PMI Test - /PTD: Liquid Penetrant Test	/P52	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPB: Welding Documents: EN - /T01: Hydrostatic / Pneumatic Test - /PM2: PMI Test - /PTD: Liquid Penetrant Test	/P53	✓	✓	-
	Combination of: - /E05: Material Certificate (EN 10204-3.1) - /WPB: Welding Documents: EN - /T02: Hydrostatic Test - /PM2: PMI Test - /PTD: Liquid Penetrant Test	/P54	✓	✓	-

*1: There are cases where calibration water remains in the section between the body and shedder bar, so this is not a degrease treatment in the strict sense.
*2: This cannot be combined with the analog input (Communication and input/output code: JB) or Dual-Sensor (Welded) General Type (Type of Body: -6)
When using this instrument for Safety Instrumented System (SIS) application, use it under the condition that the accuracy is within ±2%. Read "■Accuracy Details".
*3: Up to 30 single-byte alphanumeric characters and symbols can be used on the stainless steel tag plate.
*4: It is only possible to specify the code for either the Hydrostatic/Pneumatic Test Certificate (/T01) or Hydrostatic Test Certificate (/T02), and not both.
*5: This cannot be combined with the cable connection for Japan Flameproof (Cable entry code: J, K)

Test pressure values

Flange pressure rating	Test pressure
JIS 10K	2.1 MPa
JIS 20K	5.0 MPa
JIS 40K	10.0 MPa
ASME Class 150	2.9 MPa
ASME Class 300	7.5 MPa
ASME Class 600	14.9 MPa
ASME Class 900	22.4 MPa
ASME Class 1500 (*1)	37.3 MPa
EN PN10	1.5 MPa
EN PN16	2.4 MPa
EN PN25	3.8 MPa
EN PN40	5.9 MPa

*1: For VY040-□□□-4□□H, the test pressure is 29.8 MPa.

■ Sizing

The basic specifications for each size are described below.

● Measurable range

Table 1: Relationship between minimum velocity and density (When two values are indicated, the larger one is the minimum velocity)

			Liquid		Gas, Steam	
Model code - Type of body			Type of shedder bar			
-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)	A, B, G,H, N, P: General type, E, S: Cryogenic type (*1) U, V: Long Neck Type	C, D, Q, R: High temperature type (*1)	A, B, G, H, N, P: General type, E, S: Cryogenic type (*1) U, V: Long Neck Type	C, D, Q, R: High temperature type (*1)
VY015-0 VY015-6	VY025-1 VY025-4	VY040-2	$\sqrt{250/\rho}$	-	$\sqrt{80/\rho}$ or 3	-
VY025-0 VY025-6	VY040-1 VY040-4	VY050-2	$\sqrt{122.5/\rho}$	$\sqrt{490/\rho}$	$\sqrt{45/\rho}$ or 2	$\sqrt{125/\rho}$ or 2
VY040-0 VY040-6	VY050-1 VY050-4	VY080-2	$\sqrt{90/\rho}$	$\sqrt{302.5/\rho}$	$\sqrt{31.3/\rho}$ or 2	$\sqrt{90.3/\rho}$ or 2
VY050-0 VY050-6	VY080-1 VY080-4	VY100-2	$\sqrt{90/\rho}$	$\sqrt{160/\rho}$	$\sqrt{31.3/\rho}$ or 2	$\sqrt{61.3/\rho}$ or 2
VY080-0 VY080-6	VY100-1 VY100-4	VY150-2	$\sqrt{90/\rho}$	$\sqrt{160/\rho}$	$\sqrt{31.3/\rho}$ or 2	$\sqrt{61.3/\rho}$ or 2
VY100-0 VY100-6	VY150-1 VY150-4	VY200-2	$\sqrt{90/\rho}$	$\sqrt{160/\rho}$	$\sqrt{31.3/\rho}$ or 2	$\sqrt{61.3/\rho}$ or 2
VY150-0 VY150-6	VY200-1	-	$\sqrt{90/\rho}$	$\sqrt{160/\rho}$	$\sqrt{31.3/\rho}$ or 3	$\sqrt{61.3/\rho}$ or 3
VY200-0 VY200-6	-	-	$\sqrt{122.5/\rho}$	$\sqrt{202.5/\rho}$	$\sqrt{45/\rho}$ or 3	$\sqrt{80/\rho}$ or 3
VY250-0	-	-	$\sqrt{160/\rho}$	$\sqrt{360/\rho}$	$\sqrt{61.3/\rho}$ or 3	$\sqrt{125/\rho}$ or 3
VY300-0	-	-	$\sqrt{160/\rho}$	$\sqrt{360/\rho}$	$\sqrt{61.3/\rho}$ or 3	$\sqrt{125/\rho}$ or 3
VY400-0	-	-	$\sqrt{250/\rho}$	$\sqrt{490/\rho}$	$\sqrt{80/\rho}$ or 4	$\sqrt{125/\rho}$ or 4

ρ: Density at operating conditions (kg/m^3) (Unit: m/s)
For liquid: 400 to 2000 kg/m^3
For gas and steam: 0.5 kg/m^3 or more

*1: The high pressure reduced bore type body cannot be combined with a high temperature type or cryogenic type shedder bar.

Table 2: Range of measurable flow velocity

Fluid	Model code - Type of body			Minimum flow velocity	Maximum flow velocity
	-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)		
Liquid	VY015-0 to VY400-0 VY015-6 to VY200-6	VY025-1 to VY200-1 VY025-4 to VY150-4	VY040-2 to VY200-2	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 5000, whichever is greater.	10 m/s (*1)
Gas Steam	VY015-0 to VY400-0 VY015-6 to VY200-6	VY025-1 to VY200-1 VY025-4 to VY150-4	VY040-2 to VY200-2	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 5000, whichever is greater.	80 m/s (*2)

When the flow velocity is lower than the minimum, both the analog output and the pulse output are displayed as "0".

Maximum possible value for span setting: For liquid, a flow rate up to the equivalent of a flow velocity of 15 m/s can be specified.
For gas or steam, a flow rate up to the equivalent of a flow velocity of 120 m/s can be specified.

*1: When density ρ > 1000 kg/m^3, maximum flow velocity V = √[(1/ρ) * 10^5]
*2: When density ρ > 15.6 kg/m^3, maximum flow velocity V = √[(1/ρ) * 10^5]

Table 3: Range of fixed accuracy flow velocity

Fluid	Model code/Type of body			Minimum flow velocity	Maximum flow velocity
	-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)		
Liquid	VY015-0 to VY100-0 VY015-6 to VY100-6	VY025-1 to VY150-1 VY025-4 to VY150-4	VY040-2 to VY200-2	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 20000, whichever is greater.	10 m/s (*1)
	VY150-0 to VY400-0 VY150-6 to VY200-6	VY200-1 -	-	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 40000, whichever is greater.	
Gas Steam	VY015-0 to VY100-0 VY015-6 to VY100-6	VY025-1 to VY150-1 VY025-4 to VY150-4	VY040-2 to VY200-2	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 20000, whichever is greater.	80 m/s (*2), (*3)
	VY150-0 to VY400-0 VY150-6 to VY200-6	VY200-1 -	-	Flow velocity obtained from Table 1 or flow velocity at Reynolds number of 40000, whichever is greater.	

*1: When density ρ > 1000 kg/m^3, maximum flow velocity V = √[(1/ρ) * 10^5]
*2: When density ρ > 15.6 kg/m^3, maximum flow velocity V = √[(1/ρ) * 10^5]
*3: When VY015-6 and VY025-6 is selected, the maximum flow velocity is limited up to 35 m/s.

■ Accuracy Details

Accuracy values are in the range of the fixed accuracy flow velocity (read "Note" below), and all values are accuracy of readings.

● Volumetric flow rate accuracy

Table 4: Volumetric flow rate accuracy

For Single sensor type

<table>
<tr><th rowspan="2">Fluid</th><th rowspan="2">Model code</th><th colspan="3">Type of body</th></tr>
<tr><th>-0: General type</th><th>-1: Reduced bore type
(1 size reduction)
-4: High pressure reduced bore type
(1 size reduction)</th><th>-2: Reduced bore type
(2 size reduction)</th></tr>
<tr><td rowspan="13">Liquid</td><td>VY015</td><td>±1.0%
(20000≤Re<2000*D)
±0.75%
(2000*D≤Re)</td><td>---</td><td>---</td></tr>
<tr><td>VY025</td><td>±1.0%
(20000≤Re<1500*D)
±0.75%
(1500*D≤Re)</td><td rowspan="5">±1.0%
(20000≤Re)</td><td>---</td></tr>
<tr><td>VY040</td><td rowspan="4">±1.0%
(20000≤Re<1000*D)
±0.75%
(1000*D≤Re)</td><td rowspan="5">±1.0%
(20000≤Re)</td></tr>
<tr><td>VY050</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td><td rowspan="5">±1.0%
(40000≤Re<1000*D)
±0.75%
(1000*D≤Re)</td></tr>
<tr><td>VY200</td><td>±1.0%
(40000≤Re)</td></tr>
<tr><td>VY250</td><td rowspan="3">---</td><td rowspan="3">---</td></tr>
<tr><td>VY300</td></tr>
<tr><td>VY400</td></tr>
<tr><td rowspan="13">Gas

Steam</td><td>VY015</td><td rowspan="13">±1.0%
(Flow velocity 35 m/s or less)

±1.5%
(Flow velocity 35 to 80 m/s)</td><td>---</td><td rowspan="2">---</td></tr>
<tr><td>VY025</td><td rowspan="6">±1.0%
(Flow velocity 35 m/s or less)

±1.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY040</td><td rowspan="6">±1.0%
(Flow velocity 35 m/s or less)

±1.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY050</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td></tr>
<tr><td>VY200</td></tr>
<tr><td>VY250</td><td rowspan="3">---</td><td rowspan="3">---</td></tr>
<tr><td>VY300</td></tr>
<tr><td>VY400</td></tr>
</table>

D: Inner diameter of sensor section (mm)
Re: Reynolds number

For Dual sensor type

Fluid	Model code	Type of body
		-6: Dual-Sensor (Welded) General Type
Liquid	VY015	±1.0% (20000≤Re<2000*D) ±0.75% (1500*D≤Re)
	VY025	±1.0% (20000≤Re<1500*D) ±0.75% (1500*D≤Re)
	VY040	±1.0% (20000≤Re<1000*D) ±0.75% (1000*D≤Re)
	VY050	
	VY080	
	VY100	
	VY150	±1.0% (40000≤Re<1000*D) ±0.75% (1000*D≤Re)
	VY200	
Gas Steam	VY015	±2.0% (Flow velocity 35 m/s or less)
	VY025	±1.0% (Flow velocity 35 m/s or less)
	VY040	±1.0% (Flow velocity 35 m/s or less) ±2.5% (Flow velocity 35 to 80 m/s)
	VY050	
	VY080	
	VY100	
	VY150	
	VY200	

D: Inner diameter of sensor section (mm)
Re: Reynolds number

Note:

- This table shows the accuracy for pulse output. For analog output, add ±0.1% of full scale to the values above.
- The guarantee conditions of the liquid volumetric flow rate are based on the accuracy of the product before shipment in our actual water flow testing facility.

  <Measurement conditions>

  Totalized value for 2000 pulses or more

  Straight pipe length: Upstream 10D or more, downstream 5D or more

  Medium: Water

  Density: 900 to 1100 kg/m^3

  Temperature of medium: 10 to 35°C (average 22.5°C)

  Ambient temperature: 10 to 35°C

  Process pressure (absolute pressure): 0.1 to 0.2 MPa
- The accuracy for gas and steam is calculated by adding the measurement error of gas and steam to the liquid measurement accuracy.

● **Mass flow rate accuracy (General type with temperature sensor)**

Table 5: Mass flow rate accuracy (General type with temperature sensor)

For Single sensor type

<table>
<tr><th rowspan="2">Fluid</th><th rowspan="2">Model code</th><th colspan="3">Type of body</th></tr>
<tr><th>-0: General type</th><th>-1: Reduced bore type
(1 size reduction)
-4: High pressure reduced bore type
(1 size reduction)</th><th>-2: Reduced bore type
(2 size reduction)</th></tr>
<tr><td rowspan="11">Liquid</td><td>VY025</td><td>±2.0%
(20000≤Re<1500*D)
±1.5%
(1500*D≤Re)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="4">±2.0%
(20000≤Re<1000*D)
±1.5%
(1000*D≤Re)</td><td rowspan="3">±2.0%
(20000≤Re)</td><td></td></tr>
<tr><td>VY050</td><td rowspan="3">±2.0%
(20000≤Re)</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td><td rowspan="4">±2.0%
(40000≤Re<1000*D)
±1.5%
(1000*D≤Re)</td><td></td></tr>
<tr><td>VY200</td><td>±2.0%
(40000≤Re)</td></tr>
<tr><td>VY250</td><td></td><td></td></tr>
<tr><td>VY300</td></tr>
<tr><td rowspan="10">Gas

Superheated steam</td><td>VY025</td><td rowspan="10">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="8">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td rowspan="8">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY050</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td></tr>
<tr><td>VY200</td></tr>
<tr><td>VY250</td></tr>
<tr><td>VY300</td></tr>
<tr><td rowspan="10">Saturated steam</td><td>VY025</td><td rowspan="8">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="8">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td rowspan="8">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY050</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td></tr>
<tr><td>VY200</td></tr>
<tr><td>VY250</td><td rowspan="2">±3.0%
(Flow velocity 35 m/s or less)
±3.5%
(Flow velocity 35 to 80 m/s)</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>VY300</td></tr>
</table>

D: Inner diameter of sensor section (mm)
Re: Reynolds number

For Dual sensor type

Fluid	Model code	Type of body
		-6: Dual-Sensor (Welded) General Type
Liquid	VY025	±2.0% (20000≤Re<1500*D) ±1.5% (1500*D≤Re)
	VY040	±2.0% (20000≤Re<1000*D) ±1.5% (1000*D≤Re)
	VY050	
	VY080	
	VY100	
	VY150	±2.0% (40000≤Re<1000*D) ±1.5% (1000*D≤Re)
	VY200	
Gas Superheated steam	VY025	±2.0% (Flow velocity 35 m/s or less)
	VY040	±2.0% (Flow velocity 35 m/s or less) ±3.5% (Flow velocity 35 to 80 m/s)
	VY050	
	VY080	
	VY100	
	VY150	
	VY200	
Saturated steam	VY025	±2.0% (Flow velocity 35 m/s or less)
	VY040	±2.0% (Flow velocity 35 m/s or less) ±3.5% (Flow velocity 35 to 80 m/s)
	VY050	
	VY080	
	VY100	
	VY150	
	VY200	

D: Inner diameter of sensor section (mm)
Re: Reynolds number

Note:

- This table shows the accuracy for pulse output. For analog output, add ±0.1% of full scale to the values above.
- Mass flow rate accuracy is a calculated value obtained by adding the density calculation accuracy to the volumetric flow rate accuracy.
- Mass flow rate of superheated steam and volumetric flow rate of gas are calculated by constant pressure.
- For the pressure, use the normal pressure value specified in the sizing data.
- The accuracy of the saturated steam mass flow rate is based on the condition of 100% dryness.

● **Mass flow rate accuracy (High temperature type with temperature sensor)**

Table 6: Mass flow rate accuracy (High temperature type with temperature sensor)

For Single sensor type

<table>
<tr><th rowspan="2">Fluid</th><th rowspan="2">Model code</th><th colspan="3">Type of body</th></tr>
<tr><th>-0: General type</th><th>-1: Reduced bore type
(1 size reduction)
-4: High pressure reduced bore type
(1 size reduction)</th><th>-2: Reduced bore type
(2 size reduction)</th></tr>
<tr><td rowspan="12">Liquid</td><td>VY025</td><td>±2.0%
(20000≤Re<1500*D)
±1.5%
(1500*D≤Re)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="4">±2.0%
(20000≤Re<1000*D)
±1.5%
(1000*D≤Re)</td><td rowspan="3">±2.0%
(20000≤Re)</td><td></td></tr>
<tr><td>VY050</td><td rowspan="3">±2.0%
(20000≤Re)</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td><td rowspan="4">±2.0%
(40000≤Re<1000*D)
±1.5%
(1000*D≤Re)</td><td></td></tr>
<tr><td>VY200</td><td>±2.0%
(40000≤Re)</td></tr>
<tr><td>VY250</td><td></td><td></td></tr>
<tr><td>VY300</td></tr>
<tr><td rowspan="10">Gas

Superheated steam</td><td>VY025</td><td rowspan="10">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="4">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td><td></td></tr>
<tr><td>VY050</td><td rowspan="4">±2.0%
(Flow velocity 35 m/s or less)
±2.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td><td></td></tr>
<tr><td>VY200</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>VY250</td></tr>
<tr><td>VY300</td></tr>
<tr><td rowspan="10">Saturated steam</td><td>VY025</td><td rowspan="10">±3.0%
(Flow velocity 35 m/s or less)
±3.5%
(Flow velocity 35 to 80 m/s)</td><td></td><td></td></tr>
<tr><td>VY040</td><td rowspan="4">±3.0%
(Flow velocity 35 m/s or less)
±3.5%
(Flow velocity 35 to 80 m/s)</td><td></td></tr>
<tr><td>VY050</td><td rowspan="4">±3.0%
(Flow velocity 35 m/s or less)
±3.5%
(Flow velocity 35 to 80 m/s)</td></tr>
<tr><td>VY080</td></tr>
<tr><td>VY100</td></tr>
<tr><td>VY150</td><td></td></tr>
<tr><td>VY200</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>VY250</td></tr>
<tr><td>VY300</td></tr>
</table>

D: Inner diameter of sensor section (mm)
Re: Reynolds number

For Dual sensor type

Fluid	Model code	Type of body
		-6: Dual-Sensor (Welded) General Type
Liquid	VY025	±2.0% (20000≤Re<1500*D) ±1.5% (1500*D≤Re)
	VY040	±2.0% (20000≤Re<1000*D) ±1.5% (1000*D≤Re)
	VY050	
	VY080	
	VY100	
	VY150	±2.0% (40000≤Re<1000*D) ±1.5% (1000*D≤Re)
	VY200	
Gas Superheated steam	VY025	±2.0% (Flow velocity 35 m/s or less)
	VY040	±2.0% (Flow velocity 35 m/s or less) ±3.5% (Flow velocity 35 to 80 m/s)
	VY050	
	VY080	
	VY100	
	VY150	
	VY200	
Saturated steam	VY025	±3.0% (Flow velocity 35 m/s or less)
	VY040	±3.0% (Flow velocity 35 m/s or less) ±4.5% (Flow velocity 35 to 80 m/s)
	VY050	
	VY080	
	VY100	
	VY150	
	VY200	

D: Inner diameter of sensor section (mm)
Re: Reynolds number

Note:

- This table shows the accuracy for pulse output. For analog output, add ±0.1% of full scale to the values above.
- Mass flow rate accuracy is a calculated value obtained by adding the density calculation accuracy to the volumetric flow rate accuracy.
- Mass flow rate of superheated steam and volumetric flow rate of gas are calculated by constant pressure.
- For the pressure, use the normal pressure value specified in the sizing data.
- The accuracy of the saturated steam mass flow rate is based on the condition of 100% dryness.

● Mass flow rate accuracy (when using analog input: Reference information)

Table 7: Mass flow rate accuracy (when using analog input)

For Single sensor type

Applicable fluid	Mass flow rate (*1)	Remarks		
		Temperature/pressure signal for flow rate calculation	Mass flow rate accuracy conditions	Description of flow rate calculation
Saturated steam (Temperature)	±3.8% (Flow velocity 35m/s or less) ±4.0% (Flow velocity 35 to 80m/s)	Temperature (Analog input)	Temperature range: +100 to +330°C Temperature accuracy: ±1.0°C	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature.
Saturated steam (Pressure)	±1.7% (Flow velocity 35m/s or less) ±2.2% (Flow velocity 35 to 80m/s)	Pressure (Analog input)	Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the steam table (IAPWS-IF97) to calculate the density based on the pressure.
Superheated steam (*2)	VY025 to VY200 ±2.0% (Flow velocity 35 m/s or less) ±2.5% (Flow velocity 35 to 80 m/s) VY250, VY300 ±2.5% (Flow velocity 35 m/s or less) ±3.0% (Flow velocity 35 to 80 m/s)	Temperature (built-in temperature sensor) and pressure (analog input)	Temperature conditions Temperature range +100 to +250°C (Type of shedder bar: B, H) Pressure conditions Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature and pressure.
	VY025 to VY200 ±3.7% VY250, VY300 ±6.5%		Temperature conditions Temperature range: +100 to +400°C (Type of shedder bar: D) Pressure conditions Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	
General gas (When deviation factor is not considered)	±2.0% (Flow velocity 35 m/s or less) ±2.5% (Flow velocity 35 to 80 m/s)	Temperature (built-in temperature sensor) and pressure (analog input)	Temperature conditions Temperature range Up to +250°C (Type of shedder bar: B, H) Up to +400°C (Type of shedder bar: D) Pressure conditions Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the equation of state for gas (Combined Gas Law) to perform temperature/pressure compensation calculation with a fixed deviation factor.
General gas (When deviation factor is considered)	Not specified	Temperature (built-in temperature sensor) and pressure (analog input)	Accuracy is not specified because deviation factor varies depending on temperature and pressure conditions.	Use the equation of state for gas (Combined Gas Law) to perform temperature/pressure compensation calculation with a fixed deviation factor.
Liquid (water)	±0.75% or ±1.0% Conditions are based on the volumetric flow rate accuracy for liquid in Table 4.	Temperature (Analog input)	Temperature range: 0 to +90°C Temperature accuracy: ±1.0°C	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature.
Liquid (other than water)	Not specified	Temperature (Analog input)	Accuracy cannot be specified because it varies significantly according to the temperature compensation coefficient setting.	Use the temperature compensation formula (API, JIS K 2249) to calculate the density based on the temperature.

For Dual sensor type

Applicable fluid	Model code	Mass flow rate (*1)	Remarks		
			Temperature/pressure signal for flow rate calculation	Mass flow rate accuracy conditions	Description of flow rate calculation
Saturated steam (Temperature)	VY015	±4.2 (Flow velocity 35m/s or less)	Temperature (Analog input)	Temperature range: +100 to +330°C Temperature accuracy: ±1.0°C	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature.
	VY025	±3.8 (Flow velocity 35m/s or less)			
	VY040	±3.8 (Flow velocity 35m/s or less) ±4.5% (Flow velocity 35 to 80 m/s)			
	VY050				
	VY080				
	VY100				
	VY150				
	VY200				
Saturated steam (Pressure)	VY015	±2.2% (Flow velocity 35m/s or less)	Pressure (Analog input)	Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the steam table (IAPWS-IF97) to calculate the density based on the pressure.
	VY025	±1.7% (Flow velocity 35m/s or less)			
	VY040	±1.7% (Flow velocity 35m/s or less) ±2.8% (Flow velocity 35 to 80 m/s)			
	VY050				
	VY080				
	VY100				
	VY150				
	VY200				
Superheated steam (*2)	VY015		Temperature (built-in temperature sensor) and pressure (analog input)	Temperature conditions Temperature range: +100 to +250°C (Type of shedder bar: P, V) Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature and pressure.
	VY025	±2.0% (Flow velocity 35m/s or less)			
	VY040	±2.0% (Flow velocity 35m/s or less) ±2.8% (Flow velocity 35 to 80 m/s)			
	VY050				
	VY080				
	VY100				
	VY150				
	VY200				
General gas (When deviation factor is not considered)	VY015		Temperature (built-in temperature sensor) and pressure (analog input)	Temperature conditions Temperature range: Up to +250°C (Type of shedder bar: P, V) Up to +400°C (Type of shedder bar: R) Pressure conditions Pressure range: From 0.1 MPa to flange rating Pressure accuracy: ±0.2%	Use the equation of state for gas (Combined Gas Law) to perform temperature/pressure compensation calculation with a fixed deviation factor.
	VY025	±2.0% (Flow velocity 35m/s or less)			
	VY040	±2.0% (Flow velocity 35m/s or less) ±3.5% (Flow velocity 35 to 80 m/s)			
	VY050				
	VY080				
	VY100				
	VY150				
	VY200				
General gas (When deviation factor is considered)	VY015 to VY200	Not specified	Temperature (built-in temperature sensor) and pressure (analog input)	Accuracy is not specified because deviation factor varies depending on temperature and pressure conditions.	Use the equation of state for gas (Combined Gas Law) to perform temperature/pressure compensation calculation with a fixed deviation factor.
Liquid (water)	VY015 to VY200	±0.75% or ±1.0% Conditions are based on the volumetric flow rate accuracy for liquid in Table 4.	Temperature (Analog input)	Temperature range: 0 to +90°C Temperature accuracy: ±1.0°C	Use the steam table (IAPWS-IF97) to calculate the density based on the temperature.
Liquid (other than water)	VY015 to VY200	Not specified	Temperature (Analog input)	Accuracy cannot be specified because it varies significantly according to the temperature compensation coefficient setting.	Use the temperature compensation formula (API, JIS K 2249) to calculate the density based on the temperature.

*1: Mass flow rate accuracy of saturated steam and superheated steam is a calculated value that is obtained by adding the temperature/pressure compensation accuracy to the volumetric flow rate accuracy.
*2: The accuracy of the saturated steam mass flow rate is based on the condition of 100% dryness.

● **Temperature accuracy (Type with temperature sensor)**

Table 8: Temperature accuracy (Type with temperature sensor)

Fluid	Model code	B, P: General type with temperature sensor H,V: Long Neck Type with Temperature Sensor	D, R: High temperature type with temperature sensor
Saturated steam Liquid	VY025	±0.5°C (Fluid temperature < 100°C) ±0.5% of reading (Fluid temperature ≥ 100°C)	±1.0°C (Fluid temperature < 100°C) ±1.0% of reading (Fluid temperature ≥ 100°C)
	VY040		
	VY050		
	VY080		
	VY100		
	VY150		
	VY200		
	VY250	±1.0°C (Fluid temperature < 100°C) ±1.0% of reading (Fluid temperature ≥ 100°C)	±1.0°C (Fluid temperature < 100°C) ±1.0% of reading (Fluid temperature ≥ 100°C)
	VY300		
Superheated steam Gas	VY025	±1.0°C (Fluid temperature < 100°C) ±1.0% of reading (Fluid temperature ≥ 100°C)	±1.0°C (Fluid temperature < 100°C) ±1.0% of reading (Fluid temperature ≥ 100°C)
	VY040		
	VY050		
	VY080		
	VY100		
	VY150		
	VY200		
	VY250	±2.0°C (Fluid temperature < 100°C) ±2.0% of reading (Fluid temperature ≥ 100°C)	±2.0°C (Fluid temperature < 100°C) ±2.0% of reading (Fluid temperature ≥ 100°C)
	VY300		

Note: For analog output, add ±0.1% of full scale to the values above.

● **Calculation formula**

• How to calculate volumetric flow rate at operating conditions

$$Q_f = 3600 \times u \times S, \text{ or } Q_f = \frac{u \times D^2}{354}$$

• Flow velocity calculated from Reynolds number

$$u = 5 \times \frac{v}{D} \text{ (Re=5000)}$$

$$u = 20 \times \frac{v}{D} \text{ (Re=20000)}$$

$$u = 40 \times \frac{v}{D} \text{ (Re=40000)}$$

where

$$Re = \frac{354 \times 10^3 \times Q_f}{v \times D}$$

$$v = \frac{\mu \times 10^3}{\rho_f}$$

Q_f: Volumetric flow rate at operating conditions (m^3/h)
D: Inner diameter of sensor section (mm)
S: Sectional area (m^2)
u: Flow velocity (m/s)
Re: Reynolds number (non unit)
ρ_f: Density at operating conditions (kg/m^3)
μ: Viscosity at operating conditions (mPa·s)
v: Kinematic viscosity at operating conditions (10^{-6} m^2/s)

● **Typical fluid example**

Range of measurable water flow rate (at standard condition of 15°C, density = 1000 kg/m^3)

Model code - Type of body			Measurable range (m^3/h)	Range of fixed accuracy (m^3/h)
-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)		
VY015-0 VY015-6	VY025-1 VY025-4	VY040-2	0.30 to 6	0.94 to 6
VY025-0 VY025-6	VY040-1 VY040-4	VY050-2	0.65 to 18	1.7 to 18
VY040-0 VY040-6	VY050-1 VY050-4	VY080-2	1.3 to 44	2.6 to 44
VY050-0 VY050-6	VY080-1 VY080-4	VY100-2	2.2 to 73	3.3 to 73
VY080-0 VY080-6	VY100-1 VY100-4	VY150-2	4.3 to 142	4.6 to 142
VY100-0 VY100-6	VY150-1 VY150-4	VY200-2	7.5 to 248	7.5 to 248
VY150-0 VY150-6	VY200-1	—	17 to 544	18 to 544
VY200-0 VY200-6	—	—	34 to 973	34 to 973
VY250-0	—	—	60 to 1506	60 to 1506
VY300-0	—	—	86 to 2156	86 to 2156
VY400-0	—	—	177 to 3547	177 to 3547

Range of measurable air flow rate

Model code - Type of body			Flow rate	Measurable range (Nm^3/h)									
-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)		0 MPa	0.1 MPa	0.2 MPa	0.4 MPa	0.6 MPa	0.8 MPa	1.0 MPa	1.5 MPa	2.0 MPa	2.5 MPa
VY015-0 VY015-6	VY025-1 VY025-4	VY040-2	Min.	4.8 (11.1)	6.7(11.1)	8.2 (11.1)	10.5 (11.1)	12.5	16.1	19.7	28.6	37.5	46.4
			Max.	48.2	95.8	143	239	334	429	524	762	1000	1238
VY025-0 VY025-6	VY040-1 VY040-4	VY050-2	Min.	11.0 (19.5)	15.5 (19.5)	19.0 (19.5)	24.5	29	33.3	40.6	59	77.5	95.9
			Max.	149	297	444	739	1034	1329	1624	2361	3098	3836
VY040-0 VY040-6	VY050-1 VY050-4	VY080-2	Min.	21.8 (30.0)	30.8	37.8	48.7	61.6	79.2	97	141	184	229
			Max.	356	708	1060	1764	2468	3171	3875	5634	7394	9153
VY050-0 VY050-6	VY080-1 VY080-4	VY100-2	Min.	36.2 (38.7)	51	62.4	80.5	102	131	161	233	306	379
			Max.	591	1174	1757	2922	4088	5254	6420	9335	12249	15164
VY080-0 VY080-6	VY100-1 VY100-4	VY150-2	Min.	70.1	98.4	120	155	197	254	310	451	591	732
			Max.	1140	2266	3391	5642	7892	10143	12394	18021	23648	29274
VY100-0 VY100-6	VY150-1 VY150-4	VY200-2	Min.	122	172	211	272	344	442	540	786	1031	1277
			Max.	1990	3954	5919	9847	13775	17703	21632	31453	41274	51095
VY150-0 VY150-6	VY200-1	—	Min.	268	377	485	808	1131	1453	1776	2583	3389	4196
			Max.	4358	8659	12960	21559	30163	38765	47365	68867	90373	111875
VY200-0 VY200-6	—	—	Min.	575	809	990	1445	2022	2599	3175	4617	6059	7501
			Max.	7792	15482	23172	38549	53933	69313	84693	123138	161591	200046
VY250-0	—	—	Min.	1037	1461	1788	2306	3127	4019	4911	7140	9370	11600
			Max.	12049	23939	35833	59611	83400	107181	130968	190418	249881	309334
VY300-0	—	—	Min.	1485	2093	2561	3303	4479	5756	7033	10226	13419	16612
			Max.	17256	34286	51317	85370	119441	153499	187556	272699	357856	443017
VY400-0	—	—	Min.	2790	3933	4812	7020	9821	12622	15422	22424	29426	36427
			Max.	28378	56385	84391	140405	196418	252432	308445	448479	588513	728547

Note:

- Listed gauge pressures are at a process temperature of 0°C.
- Listed flow rates are at normal conditions (0°C, 0.101325 MPa (1 atm)), Type of Shedder bar: A, B, E, G, H, N, P, S, U, V.
- Maximum flow rates are calculated based on flow velocity of 80 m/s (all within range of fixed accuracy).
- Values in parentheses after minimum values indicate the lower limit of the range of fixed accuracy. Minimum values without parentheses are equal to the lower limit of the range of fixed accuracy.

Range of measurable saturated steam flow rate

Model code - Type of body			Flow rate	Measurable range (kg/h)									
-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)		0.1 MPa	0.2 MPa	0.4 MPa	0.6 MPa	0.8 MPa	1.0 MPa	1.5 MPa	2.0 MPa	2.5 MPa	3.0 MPa
VY015-0 VY015-6	VY025-1 VY025-4	VY040-2	Min.	5.8 (10.7)	7.0 (11.1)	8.8 (11.6)	10.4 (12.1)	11.6 (12.3)	12.8	15.3	19.1	23.6	28.1
			Max.	55.8	80	129	177	225	272	390	508	628	748
VY025-0 VY025-6	VY040-1 VY040-4	VY050-2	Min.	13.4 (18.9)	16.2 (20.0)	20.5	24.1	27.1	30	36	41	49	58
			Max.	169.7	247.7	400	548	696	843	1209	1575	1945	2318
VY040-0 VY040-6	VY050-1 VY050-4	VY080-2	Min.	26.5 (29.2)	32	40.6	47.7	53.8	59	72	93	116	138
			Max.	405	591	954	1310	1662	2012	2884	3759	4640	5532
VY050-0 VY050-6	VY080-1 VY080-4	VY100-2	Min.	44	53	67.3	79	89	98	119	156	192	229
			Max.	671	979	1580	2170	2753	3333	4778	6228	7688	9166
VY080-0 VY080-6	VY100-1 VY100-4	VY150-2	Min.	84.9	103	130	152	171	189	231	300	371	442
			Max.	1295	1891	3050	4188	5314	6435	9224	12024	14842	17694
VY100-0 VY100-6	VY150-1 VY150-4	VY200-2	Min.	148	179	227	267	300	330	402	524	647	772
			Max.	2261	3300	5326	7310	9276	11232	16102	20986	25907	30883
VY150-0 VY150-6	VY200-1	—	Min.	324	392	498	600	761	922	1322	1723	2127	2536
			Max.	4950	7226	11661	16010	20315	24595	35258	45953	56729	67624
VY200-0 VY200-6	—	—	Min.	697	841	1068	1252	1410	1649	2364	3081	3803	4534
			Max.	8851	12918	20850	28627	36325	43976	63043	82165	101433	120913
VY250-0	—	—	Min.	1256	1518	1929	2260	2546	2801	3655	4764	5882	7011
			Max.	13687	19977	32243	44268	56172	68005	97489	127058	156854	186978
VY300-0	—	—	Min.	1799	2174	2762	3236	3646	4012	5235	6823	8423	10041
			Max.	19602	28609	46175	63397	80445	97390	139614	181960	224633	267772
VY400-0	—	—	Min.	3381	4086	5187	6078	6848	8002	11472	14957	18468	22003
			Max.	32217	47070	75834	104152	132193	160037	229449	299131	369366	440055

Note:

- Listed gauge pressures are at a process temperature of 0°C.
- Listed flow rates are calculated in case of Type of Shedder bar: A, B, E, G, H, N, P, S, U, V.
- Maximum flow rates are calculated based on flow velocity of 80 m/s (all within range of fixed accuracy).
- Values in parentheses after minimum values indicate the lower limit of the range of fixed accuracy. Minimum values without parentheses are equal to the lower limit of the range of fixed accuracy.

Inner diameter and nominal values

Model code/Type of body			Inner diameter of sensor section (mm)	Nominal K-factor (Pulse/L)	Nominal pulse frequency	
-0: General type -6: Dual-Sensor (Welded) General Type	-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	-2: Reduced bore type (2 size reduction)			Hz / (m/s)	Hz / (m^3/h)
VY015-0 VY015-6	VY025-1 VY025-4	VY040-2	14.6	376	62.7	104
VY025-0 VY025-6	VY040-1 VY040-4	VY050-2	25.7	68.6	35.5	19.1
VY040-0 VY040-6	VY050-1 VY050-4	VY080-2	39.7	18.7	23.1	5.19
VY050-0 VY050-6	VY080-1 VY080-4	VY100-2	51.1	8.95	18.3	2.49
VY080-0 VY080-6	VY100-1 VY100-4	VY150-2	71.0	3.33	13.2	0.925
VY100-0 VY100-6	VY150-1 VY150-4	VY200-2	93.8	1.43	9.88	0.397
VY150-0 VY150-6	VY200-1	—	138.8	0.441	6.67	0.123
VY200-0 VY200-6	—	—	185.6	0.185	5.00	0.0514
VY250-0	—	—	230.8	0.0966	4.04	0.0268
VY300-0	—	—	276.2	0.0563	3.37	0.0156
VY400-0	—	—	354.2	0.0265	2.61	0.00736

● **Pressure loss**

The pressure loss calculation formulas for each type of body are shown below.

Type of body	Pressure loss calculation formula	Pressure loss calculation example
-0: General type	$\Delta P = 108 \times 10^{-5} \times \rho_f \times u^2 \cdots (1)$ or $\Delta P = 135 \times \rho_f \times Q_f^2/D^4 \cdots (2)$ ΔP : Pressure loss (kPa) ρ_f : Fluid density at operating conditions (kg/m^3) u : Flow velocity (m/s) Q_f : Volumetric flow rate at operating conditions (m^3/h) D : Inner diameter of sensor section (mm)	Pressure loss for VY050-□□□-0 with hot water at 80°C and flow rate of 30 m^3/h [1] Given that the density of water at 80°C is 972 kg/m^3, equation (2) is as follows: $\Delta P = 135 \times 972 \times 30^2 / 51.1^4$ $= 17.3$ kPa [2] When using equation (1), the flow velocity at a flow rate of 30 m^3/h is calculated as follows: $u = 354 \times Q_f / D^2 = 354 \times 30 / 51.1^2$ $= 4.07$ m/s. Therefore, $\Delta P = 108 \times 10^{-5} \times 972 \times 4.07^2$ $= 17.3$ kPa
-1: Reduced bore type (1 size reduction) -4: High pressure reduced bore type (1 size reduction)	$\Delta P = 124 \times 10^{-5} \times \rho_f \times u^2 \cdots (3)$ or $\Delta P = 155 \times \rho_f \times Q_f^2/D^4 \cdots (4)$	Pressure loss for VY040-□□□-1 with hot water at 50°C and flow rate of 10 m^3/h [1] Given that the density of water at 50°C is 992 kg/m^3, equation (4) is as follows: $\Delta P = 155 \times 992 \times 10^2 / 25.7^4$ $= 35.3$ kPa [2] When using equation (3), the flow velocity at a flow rate of 10 m^3/h is calculated as follows: $u = 354 \times Q_f / D^2 = 354 \times 10 / 25.7^2$ $= 5.4$ m/s. Therefore, $\Delta P = 124 \times 10^{-5} \times 992 \times 5.4^2$ $= 35.3$ kPa
-2: Reduced bore type (2 size reduction)	$\Delta P = 138 \times 10^{-5} \times \rho_f \times u^2 \cdots (5)$ or $\Delta P = 173 \times \rho_f \times Q_f^2/D^4 \cdots (6)$	Pressure loss for VY050-□□□-2 with hot water at 50°C and flow rate of 15 m^3/h [1] Given that the density of water at 50°C is 992 kg/m^3, equation (6) is as follows: $\Delta P = 173 \times 992 \times 15^2 / 25.7^4$ $= 88.5$kPa [2] When using equation (5), the flow velocity at a flow rate of 15 m^3/h is calculated as follows: $u = 354 \times Q_f / D^2 = 354 \times 15 / 25.7^2$ $= 8.0$ m/s. Therefore, $\Delta P = 138 \times 10^{-5} \times 992 \times 8.0^2$ $= 88.5$ kPa
-6: Dual-Sensor (Welded) General Type	$\Delta P = 216 \times 10^{-5} \times \rho f \times u^2 \cdots (7)$ or $\Delta P = 270 \times \rho f \times Qf / D \cdots (8)$	Pressure loss for VY050-□□□-6 with hot water at 80°C and flow rate of 30 m^3/h [1] Given that the density of water at 80°C is 972 kg/m^3, equation (8) is as follows: $\Delta P = 270 \times 972 \times 30^2 / 51.1^4$ $= 34.6$ kPa [2] When using equation (7), the flow velocity at a flow rate of 30 m^3/h is calculated as follows: $u = 354 \times Q_f / D^2 = 354 \times 30 / 51.1^2$ $= 4.07$ m/s. Therefore, $\Delta P = 216 \times 10^{-5} \times 972 \times 4.07^2$ $= 34.8$ kPa

● **Cavitation (minimum back pressure)**

Cavitation occurs when the flow line pressure is low and flow velocity is high during liquid measurement, preventing correct measurement of flow rate. The optimum line pressure can be obtained from the following equation.

$P = 2.7 \times \Delta P + 1.3 \times P_0 \cdots (9)$

P : Line pressure (kPa absolute) at distance of 2D to 7D from flowmeter on downstream side

ΔP : Pressure loss (kPa)

P_0 : Saturation vapor pressure of a liquid at operating conditions (kPa absolute)

(Example) Confirmation of presence of cavitation

Perform the check at the highest flow rate with the maximum pressure loss.

Suppose that the line pressure is 120 kPa abs, and the flow rate scale is 0 to 30 m^3/h. According to the saturated steam table, the saturated steam pressure of water at 80°C is $P_0 = 47.4$ kPa abs. Therefore, equation (9) is as follows:

$P = 2.7 \times 17.3 + 1.3 \times 47.4$

$= 108.3$ kPa abs

Since the line pressure of 120 kPa abs is higher than the minimum line pressure of 108.3 kPa abs, no cavitation occurs.

- **Error due to pressure change**

  In the measurement of gas and steam, error may occur due to pressure changes when handling the pressure as a fixed value. In particular, since the pressure loss in the reduced bore type is greater than that of the general type at the same flow rate, a difference occurs between the upstream line pressure and the downstream line pressure.

  Since compensation needs to be performed on the downstream line pressure for the vortex flowmeter, setting the upstream line pressure is subject to error due to the pressure difference.

  Downstream line pressure is expressed by the following equation.

  $P_d = P_u - \Delta P$

  P_d : Downstream line pressure (kPa abs)

  P_u : Upstream line pressure (kPa abs)

  ΔP : Pressure loss (kPa)

(Example) Calculation of the downstream line pressure

Perform the calculation at the operating flow rate. This is an example of volumetric flow rate at normal conditions (N: 1 atm, 0°C, 0%).

In this example, the flow rate scale (maximum) is 0 to 1000 Nm^3/h, the operating flow rate is 700 Nm^3/h, the upstream line pressure is 1000 kPa abs, the temperature is 30°C, and the fluid density at operating conditions is 11.5 kg/m^3.

First, convert the operating flow rate from volumetric flow rate at normal conditions Q_n (Nm^3/h) to the volumetric flow rate at operating conditions Q_f (m^3/h).

$$Q_f = Q_n \times \frac{P_n}{P_f} \times \frac{T_f}{T_n} \times K$$

$$= 700 \times \frac{101.3}{1000} \times \frac{273.15 + 30}{273.15} \times 1 = 78.7 \ m^3/h$$

P_n: Pressure at normal conditions (kPa)

P_f: Pressure at operating conditions (kPa)

T_n: Temperature value at normal conditions (°C)

T_f: Temperature value at operating conditions (°C)

K: Deviation factor

Next, use the formula in "●Pressure loss" ((2), (4) or (6)) to calculate the pressure loss ΔP in the operating flow rate and obtain the downstream line pressure P_d.

<General type, 50 mm>

$\Delta P = 135 \times 11.5 \times 78.7^2 / 51.1^4 = 1.4$ kPa
Therefore, $P_d = 1000 - 1.4 = 998.6$ (kPa abs).

<Reduced bore type (1 size reduction), 50 mm>

$\Delta P = 155 \times 11.5 \times 78.7^2 / 39.7^4 = 4.4$ kPa
Therefore, $P_d = 1000 - 4.4 = 995.6$ (kPa abs).

<Reduced bore type (2 size reduction), 50 mm>

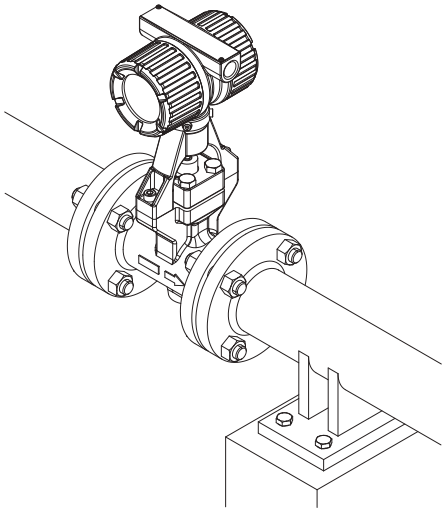
$\Delta P = 173 \times 11.5 \times 78.7^2 / 25.7^4 = 28.2$ kPa
Therefore, $P_d = 1000 - 28.2 = 971.8$ (kPa abs).

<Dual-Sensor (Welded) General type, 50 mm>

$\Delta P = 270 \times 11.5 \times 78.7^2 / 51.1^4 = 2.8$ kPa
Therefore, Pd = 1000 - 2.8 = 997.2 (kPa abs).

■ Remarks on Installation

● Piping support
Support the piping to suppress the vibration.



● Installation position
Design the piping so that the flowmeter is always filled with the fluid that flows through (constantly filled condition).

If the flowmeter is in the constantly filled condition, measurement can be performed even when the pipe is installed vertically or at inclined angle. However, it is recommended to avoid installing the instrument with the transmitter positioned below the piping. When the fluid temperature is -40°C or less, do not install the instrument with the transmitter positioned below the piping.

● Upstream conditions
Install the instrument in a section of straight pipe where the upstream side is sufficiently rectified.

● Adjacent pipes
Use the adjacent pipes indicated in the table below, which have a larger inner diameter than that of the vortex flowmeter.

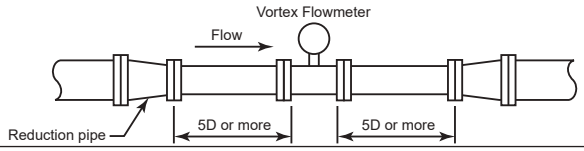
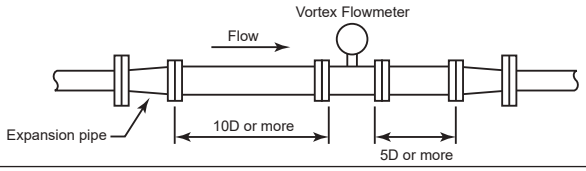
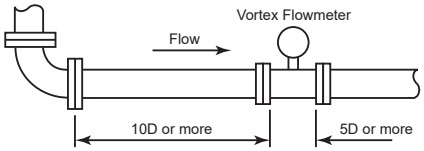
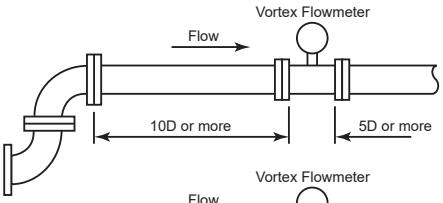
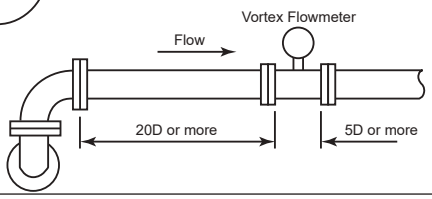
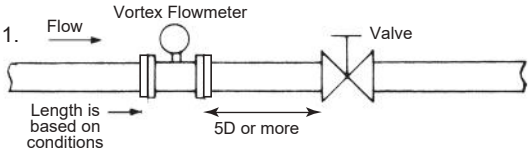
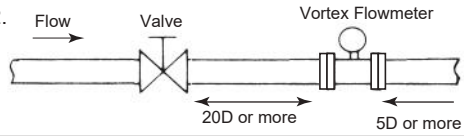
Model code	Type of body	Adjacent pipe
VY015 to VY050	-0: General type, -6: Dual-Sensor (Welded) General Type	Sch40 or pipe with larger inner diameter than Sch40
VY025 to VY080	-1: Reduced bore type (1 size reduction)	
VY040 to VY100	-2: Reduced bore type (2 size reduction)	
VY080 to VY400	-0: General type	Sch80 or pipe with larger inner diameter than Sch80
VY080 to VY200	-6: Dual-Sensor (Welded) General Type	
VY100 to VY200	-1: Reduced bore type (1 size reduction)	
VY150 to VY200	-2: Reduced bore type (2 size reduction)	
VY025 to VY150	-4: High pressure reduced bore type (1 size reduction)	Sch160 or pipe with larger inner diameter than Sch160

● Straight pipe length
Check the conditions of the upstream and downstream piping, and provide the required pipe lengths.

If the conditions cannot be satisfied, the Karman vortex may not be generated properly. In this case, consider a flowmeter that does not require straight piping, such as a Coriolis mass flowmeter.

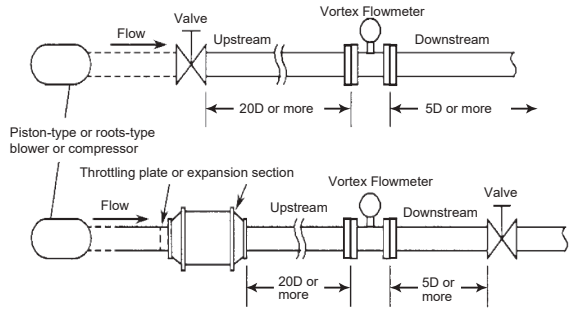
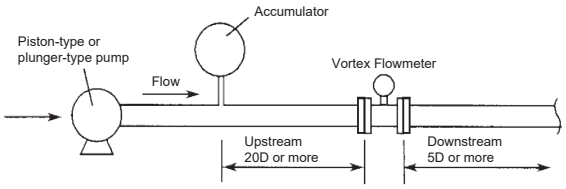
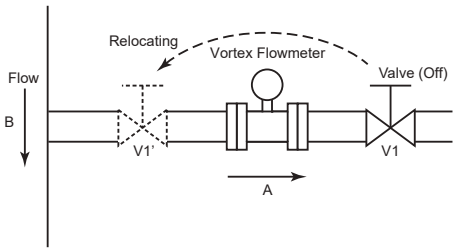
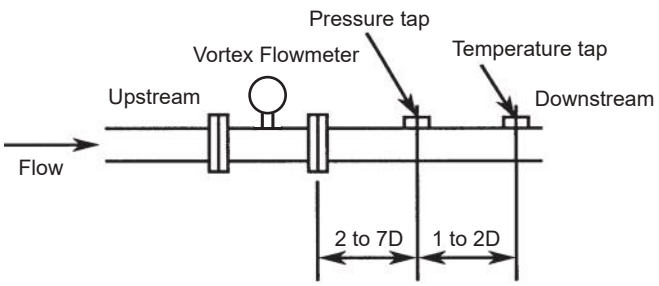
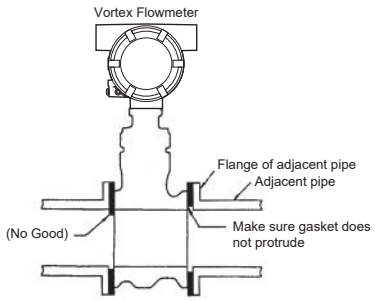
● Straight pipe length and recommendations (1)

D: Nominal diameter of vortex flowmeter (mm)

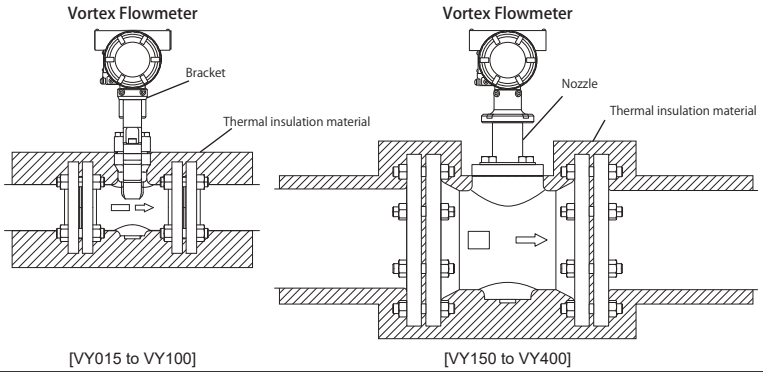
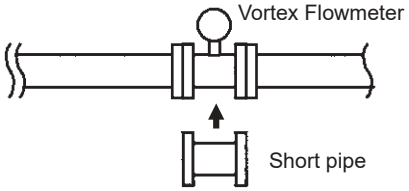
Description	Figure
● Reduction pipe Ensure that the upstream straight pipe length is 5D or more, and the downstream straight pipe length is 5D or more.	
● Expansion pipe Ensure that the upstream straight pipe length is 10D or more, and the downstream straight pipe length is 5D or more.	
● Bent pipe Ensure that the upstream straight pipe length is 10D or more, and the downstream straight pipe length is 5D or more. 1. Single bend pipe 2. Double bend pipe, coplanar 3. Double bend pipe, non coplanar	1.  2.  3. 
● Valve position and straight pipe length 1. Install the valve on the downstream side of the vortex flowmeter. Read the information above for the upstream straight pipe length depending on the conditions, and ensure that the downstream straight pipe length is 5D or more. 2. If the valve needs to be installed on the upstream of the vortex flowmeter, ensure that the upstream straight pipe length is 20D or more, and the downstream straight pipe length is 5D or more.	1.  2. 

● Straight pipe length and recommendations (2)

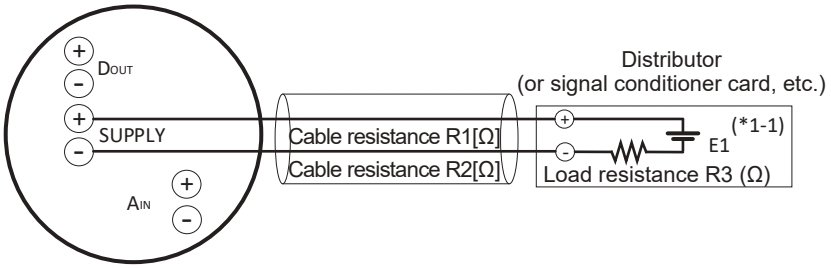
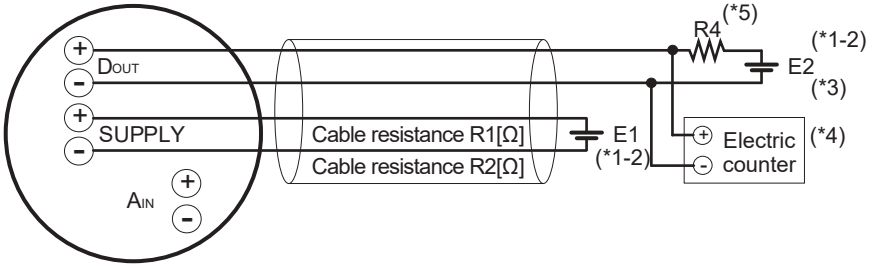
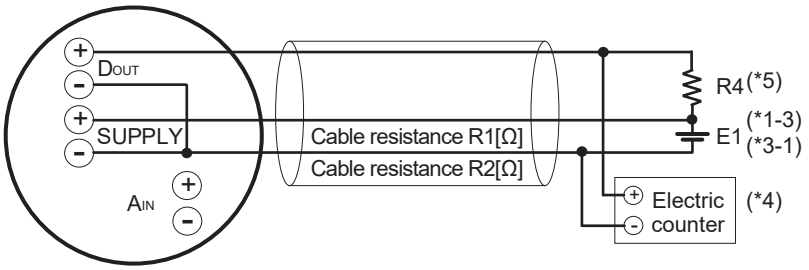
D: Nominal diameter of vortex flowmeter (mm)

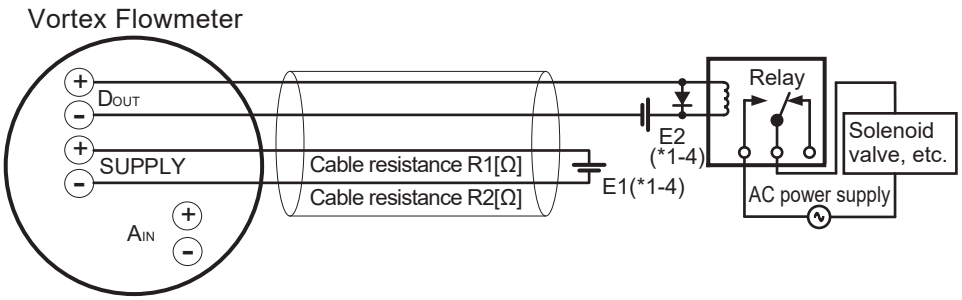
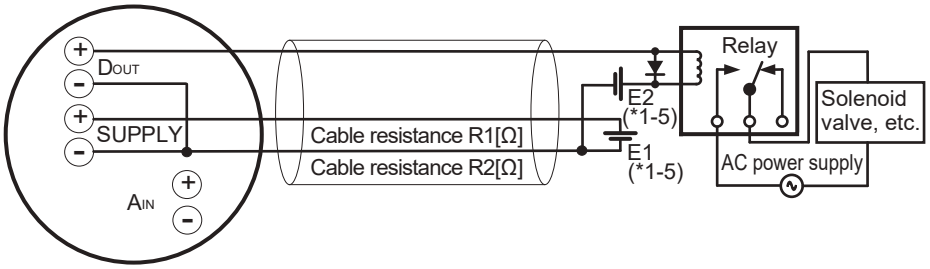
Description	Figure
● Fluid vibration Fluid vibration may occur in a gas line or high-pressure liquid line (approximately 1 MPa or more) that uses a piston-type or roots-type blower or compressor. In these cases, install the vortex flowmeter on the downstream side of the valve at a distance of 20D or more, and ensure a length of 5D or more on the downstream side of the flowmeter. If the piping design requires that a valve be installed on the downstream side of the vortex flowmeter, install a vibration damping device such as throttling plate or expansion section on the upstream side of the vortex flowmeter.	
● Installing near a pump If a piston-type or plunger-type pump is used, install an accumulator on the upstream side of the vortex flowmeter to reduce fluid vibration in the piping.	
● Effect of pulsation pressure due to T-type piping If pulsation pressure occurs due to T-type piping, install a valve on the upstream side of the vortex flowmeter. Example: As shown in the figure, when the flow rate of A is zero because V1 is closed, pulsation pressure is detected when B is flowing, which causes the zero point of the meter to fluctuate. To prevent this from occurring, change the valve installation location to V1'. Note: In case of the Reduced Bore Type, moisture may be remained upstream of the flowmeter. Drain it appropriately.	
● Pressure and temperature taps When temperature/pressure compensation is to be performed, install a pressure tap on the downstream side of the vortex flowmeter at a distance of 2D to 7D. Then install a temperature tap on the downstream side of the pressure tap at a distance of 1D to 2D. When using a temperature tap only, install it on the downstream side of the vortex flowmeter at a distance of 3D to 9D.	
● Mounting gasket Avoid mounting gaskets that protrude into the pipe line, as this may cause inaccurate readings. Use gaskets with bolt holes to prevent protrusion into the piping line. When using a spiral gasket (without bolt holes), confirm the size with the gasket-manufacturer, as standard items may not be used for certain flange ratings.	

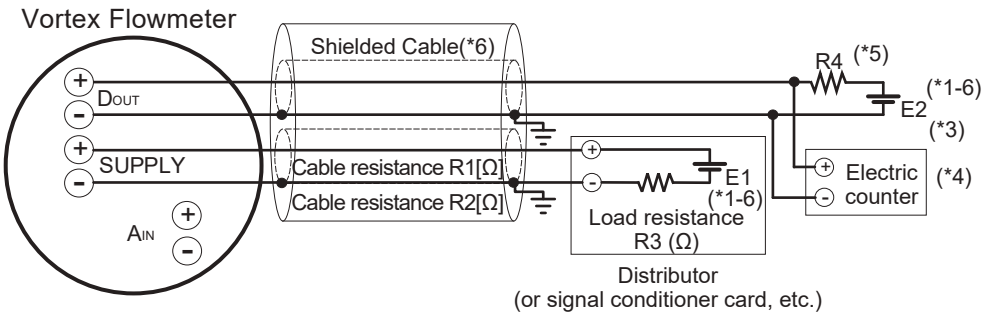
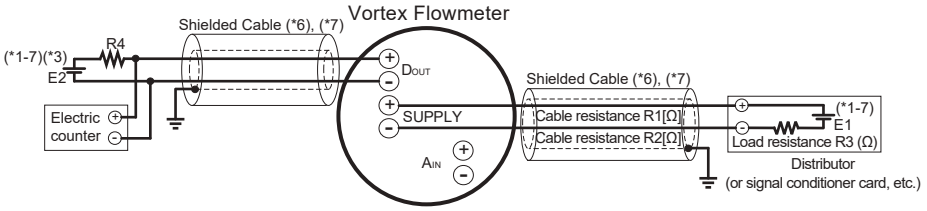
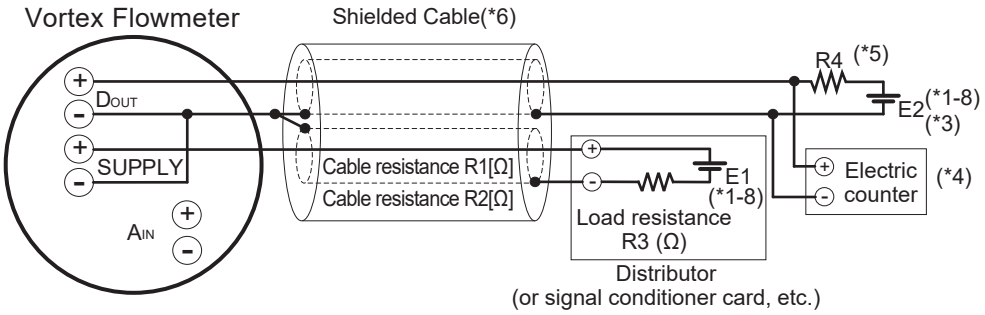
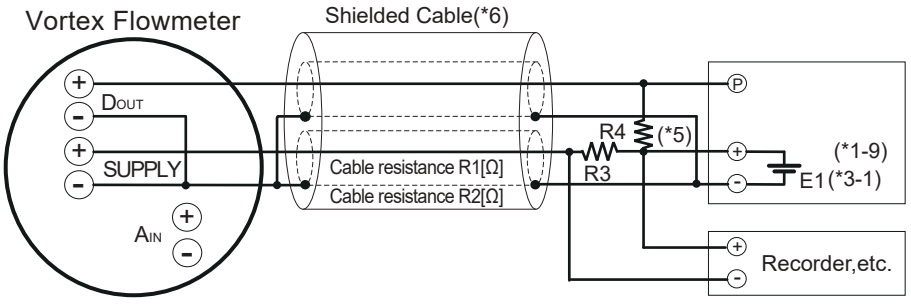
● Straight pipe length and recommendations (3)

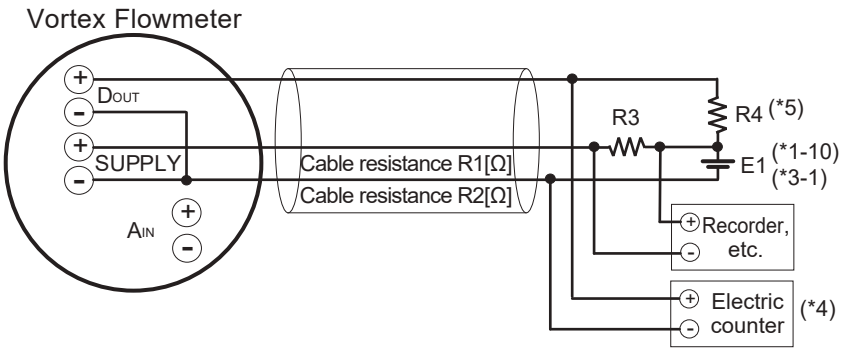
Description	Figure
● Thermal insulation of integral flowmeter and remote sensor When applying thermal insulation to a pipe carrying high-temperature fluid, do not wrap the insulating material around the bracket (VY015 to VY100) or the nozzle (VY150 to VY400).	
● Flushing (cleaning) the pipe If there is a possibility of scaling or sludge (hot water, mud) inside newly installed or repaired piping, flush the piping before operation. When performing flushing, use bypass piping to avoid damaging the flowmeter. If there is no bypass piping, install a short pipe in place of the flowmeter when performing flushing.	

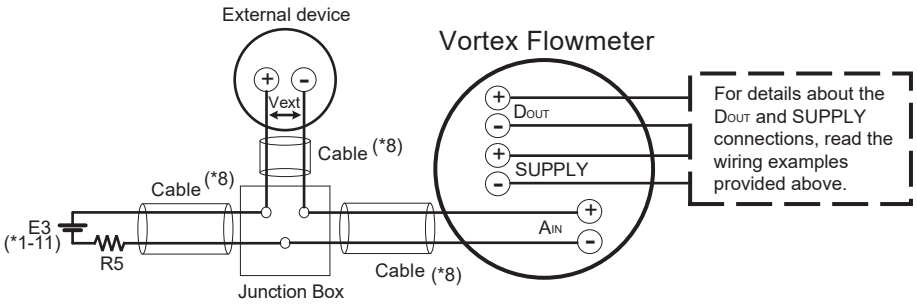
● **Wiring examples**

Connection	Description
● **Analog output** Example: One cable entry 2-wire cable HART communication possible Communication distance up to 2 km (with CEV cable)	Vortex Flowmeter  *1-1: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 42 (*2)
● **Pulse output** Example 1: One cable entry 4-wire cable HART communication not possible	Vortex Flowmeter  *1-2: 0.0244×(R1+R2)+10.5 ≤ E1[V] ≤ 42 (*2) E2[V] ≤ 30
Example 2: (Replacement from DY) One cable entry 3-wire cable HART communication not possible	Vortex Flowmeter  *1-3: 0.0244×(R1+R2)+10.5 ≤ E1[V] ≤ 30

Connection	Description
● **Status output and alarm output** Example 1: One cable entry 4-wire cable HART communication not possible	 *1-4: 0.0244×(R1+R2)+10.5 ≤ E1[V] ≤ 42 (*2) E2: 30Vdc max, 80mA max
Example 2: (Replacement from DY) One cable entry 3-wire cable HART communication not possible	 *1-5: 0.0244×(R1+R2)+10.5 ≤ E1[V] ≤ 42 (*2) E2: 30Vdc max, 80mA max

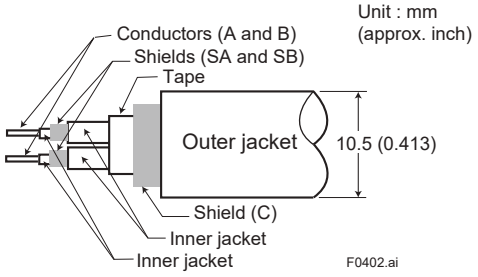
Connection	Description
● **Simultaneous analog/pulse output (*9)** Example 1: One cable entry 2-wire individually shielded cables HART communication possible Communication distance up to 2 km (with AX01C-A*11 cable)	 *1-6: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 42 (*2) E2[V] ≤ 30
Example 2: Two cable entries 2-wire individually shielded cables HART communication possible Communication distance up to 2 km (with CEV-S cable)	 *1-7: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 42 (*2) E2[V] ≤ 30
Example 3 (Replacement from DY Example 1): One cable entry 2-wire individually shielded cables (*10) HART communication possible Ccommunication distance up to 2 km (with AX01C-A*11 cable)	 *1-8: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 42 (*2) E2[V] ≤ 30
Example 4 (Replacement from DY Example 2): One cable entry 2-wire individually shielded cables (*10) HART communication possible Communication distance up to 200 m (with AX01C-A*11 cable)	 *1-9: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 42 (*2)

<table>
<tr><th>Connection</th><th>Description</th></tr>
<tr><td>Example 5 (Replacement from DY Example 3):
One cable entry
3-wire cable (*10)
HART communication not possible</td><td> 

*1-10: 0.0244×(R1+R2+R3)+10.5 ≤ E1[V] ≤ 30</td></tr>
<tr><td>● Analog input
Two cable entry
2-wire cable</td><td> 

*1-11: Vext+(R5+R6+R7)×I+3.8 ≤ E3[V] ≤ 42 (*2)
Vext: Minimum operating voltage of external device
I: Maximum current flowing in loop
Voltage between A_{IN} terminals is 3.8 V typ with loop current of 20 mA.
Calculate with 4.2 V if used at low temperature below 0°C.</td></tr>
</table>

*2: If lightning protector (option code /A) is installed, calculate with maximum voltage of 30 V.
*3: The flowmeter requires a power supply with a maximum output current of E2/R4 or more.
*3-1: The flowmeter requires a power supply with a maximum current of E1/R4+22.4 mA or more.
*4: To avoid the influence of external noise, use an electric counter that suits the pulse output frequency.
*5: Resistor is not necessary in case of an electric counter that can receive the contact pulse signal directly. (R4 is in open state.)
*6: Separate shielded cables are required for SUPPLY and DOUT.
*7: Communication cannot be performed if shielded cables are not used, but simultaneous analog and pulse output is possible.
*8: Add all cable resistance values on the positive side to obtain R6 (Ω).
Add all cable resistance values on the negative side to obtain R7 (Ω).
*9: When using simultaneous analog/pulse output, communication may be more susceptible to noise than when using analog output only.
*10: This example describes the wiring method when reusing existing digitalYEWFLO wiring cables. For a new installation, use 2-wire individually shielded cables.
*11: AX01C-A is the the dedicated signal cable (without cable end finish) for Yokogawa Magnetic Flowmeter ADMAG TI series. Other shield cable which is equivalent architecture to AX01C-A can be used for DY. However the material of insulator may decrease the communication distance.



● **Load resistance R for pulse output**
Use formulas (1) and (2) to calculate the load resistance and power, and select the resistance.

$$\frac{E(V)}{80\ (mA)} \leq R\ (k\Omega) \leq \frac{0.1}{C\ (\mu F) \times f(kHz)} \quad \cdots (1)$$

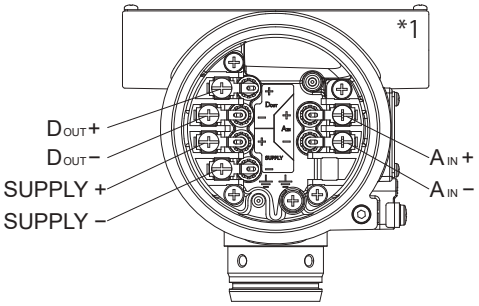
$$P\ (mW) = \frac{E^2\ (V)}{R\ (k\Omega)} \quad \cdots (2)$$

E: Power supply voltage (V)
C: Cable capacitance (μF) (for CEV cable, C ≈ 0.1 μF/km)
f: Pulse output frequency (kHz)
P: Resistor power (mW)
R: Load resistance for pulse output (kΩ)

■ Terminal Layout Diagram

○ Integral Transmitter Case

Terminal screw size: M4

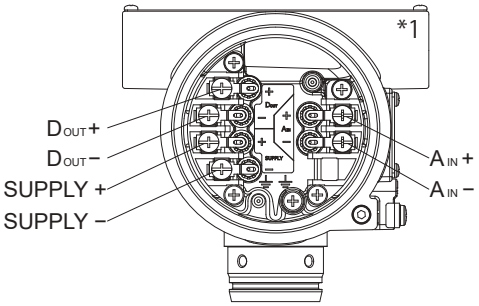


Terminal	Application
SUPPLY +, -	HART communication and analog output
D_{OUT} +, -	Pulse/status output
A_{IN} +, - (*2)	Analog input

*1: When -0 (JIS G1/2 female, one electrical connection), -2 (ASME 1/2 NPT female, one electrical connection), or -4 (ISO M20x1.5 female, one electrical connection) is selected for the cable entry, it is only located on the right side in this view.
*2: The A_{IN} terminal is present only when JB (HART 7 communication, 4 to 20 mA DC, pulse/status output, analog input) is selected for communication and input/output.

○ Remote Transmitter Case

Terminal screw size: M4

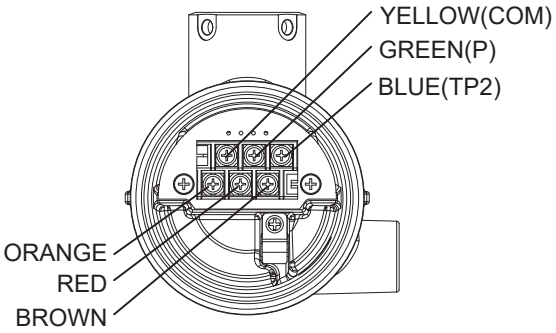


Terminal	Application
SUPPLY +, -	HART communication and analog output
D_{OUT} +, -	Pulse/status output
A_{IN} +, - (*2)	Analog input

*1: When -0 (JIS G1/2 female, one electrical connection), -2 (ASME 1/2 NPT female, one electrical connection), or -4 (ISO M20x1.5 female, one electrical connection) is selected for the cable entry, it is only located on the right side in this view.
*2: The A_{IN} terminal is present only when JB (HART 7 communication, 4 to 20 mA DC, pulse/status output, analog input) is selected for communication and input/output.

○ Remote Transmitter Terminal Box

Terminal screw size: M4

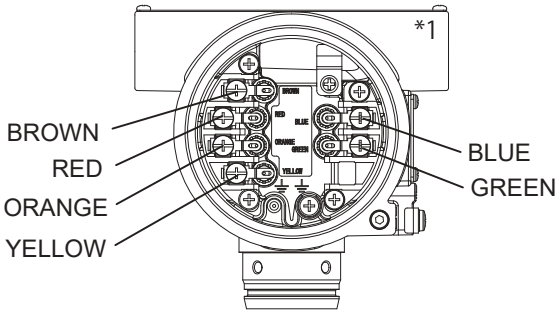


Terminal	Application
BROWN, RED, ORANGE, YELLOW, GREEN, BLUE (*1)	Connect the vortex flowmeter signal cable (VY1C)

*1: Match the colors of the vortex flowmeter signal cable (VY1C) with the corresponding terminals.

○ Remote Sensor Terminal Box

Terminal screw size: M4



Terminal	Application
BROWN, RED, ORANGE, YELLOW, GREEN, BLUE (*1)	Connect the vortex flowmeter signal cable (VY1C)

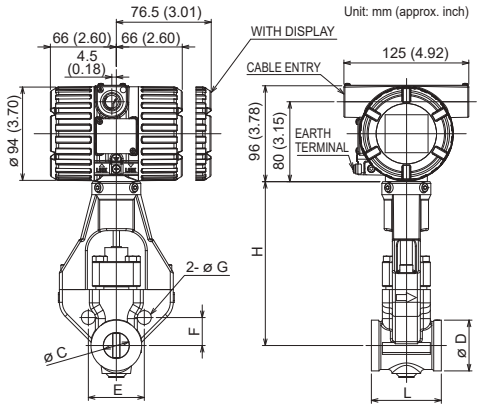
*1: The cable entry is only located on the right side when viewed from the front.
*2: Match the colors of the vortex flowmeter signal cable (VY1C) with the corresponding terminals.

■ External Dimensions

(1) Integral Flowmeter/Remote Sensor

● **Wafer type**
Diameter 15 to 100 mm

VY015 -□□□-0 □ □□ □□□□-□□□□□00
VY025 → Process connection
VY040 → Type of shedder bar
VY050 → Type of body
VY080
VY100 → Model



■ ASME Class 150 to 600

For details about the height H and inner diameter C, read the "Common dimension specifications" table.

Process connection code	Model	External dimensions mm (approx. inch) Lay Length L	Outer Diameter ΦD	Hole Distance E	Hole Height F	Hole Diameter ΦG	Weight kg (lb) Type of body	-0			
							Process connection code	BAA□		HAA□	
							Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BAA1 HAA1	VY015	70(2.76)	35.1(1.38)	42.7(1.68)	21.4(0.84)	14(0.55)	VY015	3.3(7.3)	3.7(8.2)	3.5(7.7)	3.9(8.5)
	VY025	70(2.76)	50.8(2)	56(2.2)	28(1.1)	14(0.55)	VY025	4.2(9.3)	4.6(10.1)	4.5(10)	4.9(10.9)
	VY040	70(2.76)	73(2.87)	69.7(2.74)	34.8(1.37)	14(0.55)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.4)
	VY050	75(2.95)	92(3.62)	-	-	-	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	-	-	-	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	72.9(2.87)	88(3.46)	17(0.67)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)
BAA2 HAA2	VY015	-	-	-	-	-	VY015	-	-	-	-
	VY025	70(2.76)	50.8(2)	62.9(2.48)	31.4(1.24)	17(0.67)	VY025	4.2(9.3)	4.6(10.1)	4.5(10)	4.9(10.9)
	VY040	70(2.76)	73(2.87)	80.8(3.18)	40.4(1.59)	20(0.79)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.4)
	VY050	75(2.95)	92(3.62)	48.6(1.91)	58.7(2.31)	17(0.67)	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	64.4(2.54)	77.7(3.06)	20(0.79)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	76.6(3.02)	92.5(3.64)	20(0.79)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)
BAA4 HAA4	VY015	70(2.76)	35.1(1.38)	47.1(1.85)	23.5(0.93)	14(0.55)	VY015	3.3(7.3)	3.7(8.2)	3.5(7.7)	3.9(8.5)
	VY025	70(2.76)	50.8(2)	62.9(2.48)	31.4(1.24)	17(0.67)	VY025	4.2(9.3)	4.6(10.1)	4.5(10)	4.9(10.9)
	VY040	70(2.76)	73(2.87)	80.8(3.18)	40.4(1.59)	20(0.79)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.4)
	VY050	75(2.95)	92(3.62)	48.6(1.91)	58.7(2.31)	17(0.67)	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	64.4(2.54)	77.7(3.06)	20(0.79)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	82.6(3.25)	99.7(3.93)	23(0.91)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)

*: Lay Length (L) tolerances are as follows.
- VY015 to VY050: ±2.3 mm
- VY080 to VY100: ±2.7 mm

■ EN PN10 to 40

For details about the height H and inner diameter C, read the "Common dimension specifications" table.

Process connection code	Model	External dimensions mm (approx. inch)					Weight kg (lb)				
		Lay Length	Outer Diameter	Hole Distance	Hole Height	Hole Diameter	Type of body	-0			
		L	ΦD	E	F	ΦG	Process connection code	BAE□		HAE□	
							Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BAE1 HAE1	VY015	-	-	-	-	-	VY015	-	-	-	-
	VY025	-	-	-	-	-	VY025	-	-	-	-
	VY040	-	-	-	-	-	VY040	-	-	-	-
	VY050	-	-	-	-	-	VY050	-	-	-	-
	VY080	-	-	-	-	-	VY080	-	-	-	-
	VY100	-	-	-	-	-	VY100	-	-	-	-
BAE2 HAE2	VY015	-	-	-	-	-	VY015	-	-	-	-
	VY025	-	-	-	-	-	VY025	-	-	-	-
	VY040	-	-	-	-	-	VY040	-	-	-	-
	VY050	-	-	-	-	-	VY050	-	-	-	-
	VY080	-	-	-	-	-	VY080	-	-	-	-
	VY100	120(4.72)	157.2(6.19)	68.9(2.71)	83.1(3.27)	17(0.67)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)
BAE3 HAE3	VY015	-	-	-	-	-	VY015	-	-	-	-
	VY025	-	-	-	-	-	VY025	-	-	-	-
	VY040	-	-	-	-	-	VY040	-	-	-	-
	VY050	-	-	-	-	-	VY050	-	-	-	-
	VY080	-	-	-	-	-	VY080	-	-	-	-
	VY100	-	-	-	-	-	VY100	-	-	-	-
BAE4 HAE4	VY015	70(2.76)	35.1(1.38)	46(1.81)	23(0.91)	13(0.51)	VY015	3.3(7.3)	3.7(8.2)	3.5(7.7)	3.9(8.6)
	VY025	70(2.76)	50.8(2)	60.1(2.37)	30.1(1.19)	13(0.51)	VY025	4.2(9.3)	4.6(10.1)	4.5(9.9)	4.9(10.8)
	VY040	70(2.76)	73(2.87)	77.8(3.06)	38.9(1.53)	17(0.67)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.3)
	VY050	75(2.95)	92(3.62)	-	-	-	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	61.2(2.41)	73.9(2.91)	17(0.67)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	72.7(2.86)	87.8(3.46)	21(0.83)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)

*: Lay Length (L) tolerances are as follows.
- VY015 to VY050: ±2.3 mm
- VY080 to VY100: ±2.7 mm

■ JIS 10K to 40K

For details about the height H and inner diameter C, read the "Common dimension specifications" table.

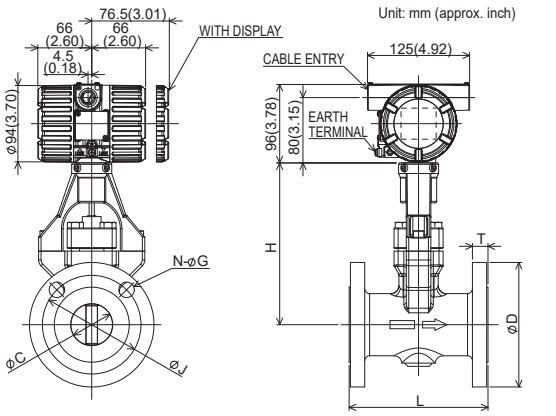
Process connection code	Model	External dimensions mm (approx. inch)					Weight kg (lb)				
		LayLength	Outer Diameter	Hole Distance	Hole Height	Hole Diameter	Type of body	-0			
		L	ΦD	E	F	ΦG	Process connection code	BAJ□		HAJ□	
							Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BAJ1 HAJ1	VY015	-	-	-	-	-	VY015	-	-	-	-
	VY025	-	-	-	-	-	VY025	-	-	-	-
	VY040	-	-	-	-	-	VY040	-	-	-	-
	VY050	75(2.95)	92(3.62)	-	-	-	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	57.4(2.26)	69.3(2.73)	17(0.67)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	67(2.64)	80.8(3.18)	17(0.67)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)
BAJ2 HAJ2	VY015	70(2.76)	35.1(1.38)	49.5(1.95)	24.7(0.97)	13(0.51)	VY015	3.3(7.3)	3.7(8.2)	3.5(7.7)	3.9(8.6)
	VY025	70(2.76)	50.8(2)	63.6(2.5)	31.8(1.25)	17(0.67)	VY025	4.2(9.3)	4.6(10.1)	4.5(9.9)	4.9(10.8)
	VY040	70(2.76)	73(2.87)	74.2(2.92)	37.1(1.46)	17(0.67)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.3)
	VY050	75(2.95)	92(3.62)	45.9(1.81)	55.4(2.18)	17(0.67)	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	61.2(2.41)	73.9(2.91)	21(0.83)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	70.8(2.79)	85.5(3.37)	21(0.83)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)
BAJ4 HAJ4	VY015	70(2.76)	35.1(1.38)	56.6(2.23)	28.3(1.11)	17(0.67)	VY015	3.3(7.3)	3.7(8.2)	3.5(7.7)	3.9(8.6)
	VY025	70(2.76)	50.8(2)	67.2(2.65)	33.6(1.32)	17(0.67)	VY025	4.2(9.3)	4.6(10.1)	4.5(9.9)	4.9(10.8)
	VY040	70(2.76)	73(2.87)	84.9(3.34)	42.4(1.67)	21(0.83)	VY040	4.8(10.6)	5.2(11.5)	5.2(11.5)	5.6(12.3)
	VY050	75(2.95)	92(3.62)	49.8(1.96)	60.1(2.37)	17(0.67)	VY050	6.5(14.3)	6.9(15.2)	7.2(15.9)	7.6(16.8)
	VY080	100(3.94)	127(5)	65.1(2.56)	78.5(3.09)	21(0.83)	VY080	9.9(21.8)	10.3(22.7)	11.2(24.7)	11.6(25.6)
	VY100	120(4.72)	157.2(6.19)	78.5(3.09)	94.7(3.73)	23(0.91)	VY100	13.3(29.3)	13.7(30.2)	15.2(33.5)	15.6(34.4)

*: Lay Length (L) tolerances are as follows.
- VY015 to VY050: ±2.3 mm
- VY080 to VY100: ±2.7 mm

● **Flange type - General type**

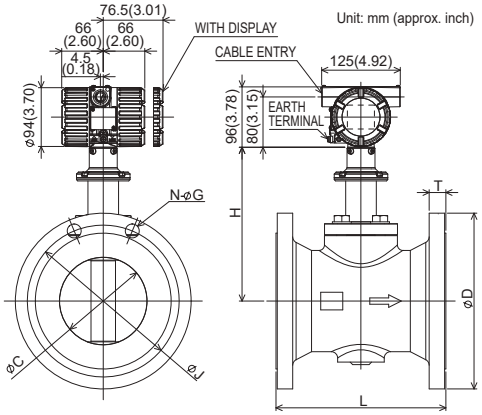
Diameter 15 to 100 mm

VY015 -□□□-0 □ □□ □□□□-□□□□□00
VY025 → Process connection
VY040 → Type of shedder bar
VY050 → Type of body
VY080
VY100
→ Model



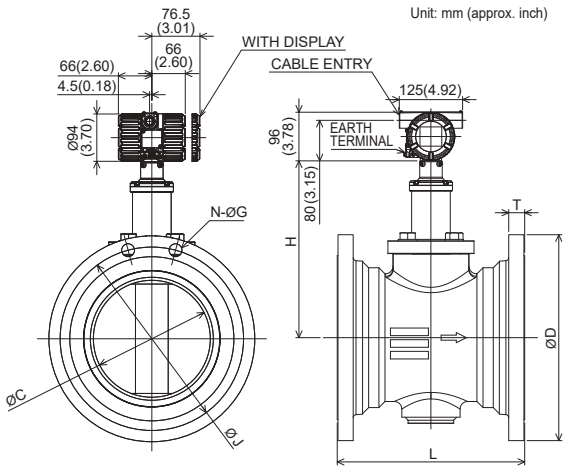
Diameter 150 to 200 mm

VY150 -□□□-0 □ □□ □□□□-□□□□□00
VY200 → Process connection
→ Type of shedder bar
→ Type of body
→ Model



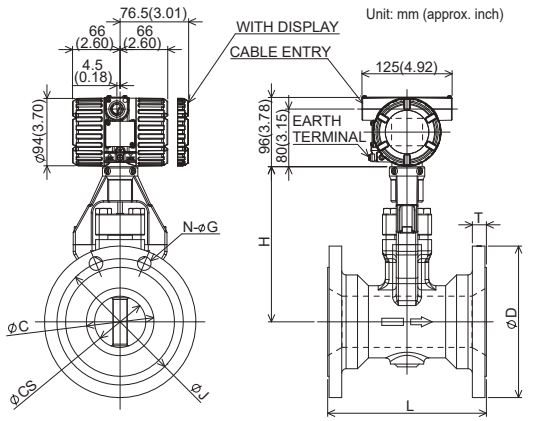
Diameter 250 to 400 mm

VY250 -□□□-0 □ □□ □□□□-□□□□□00
VY300 → Process connection
→ Type of shedder bar
→ Type of body
VY400
→ Model



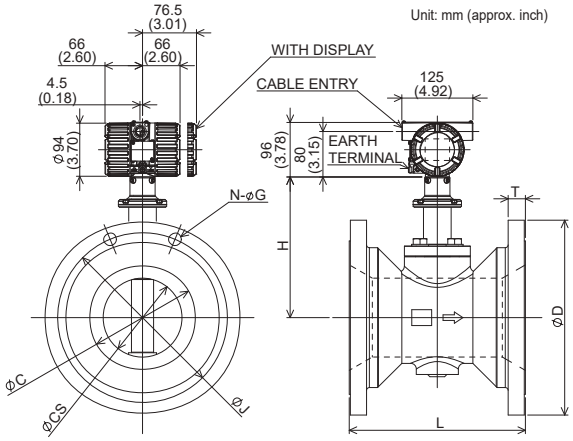
● **Flange type - Reduced bore type (1 size reduction)**
Diameter 25 to 150 mm

VY025 -□□□-1 □ □□ □□□□-□□□□□00
VY040 ↳ Process connection
VY050 ↳ Type of shedder bar
VY080 ↳ Type of body
VY100
VY150
↳ Model



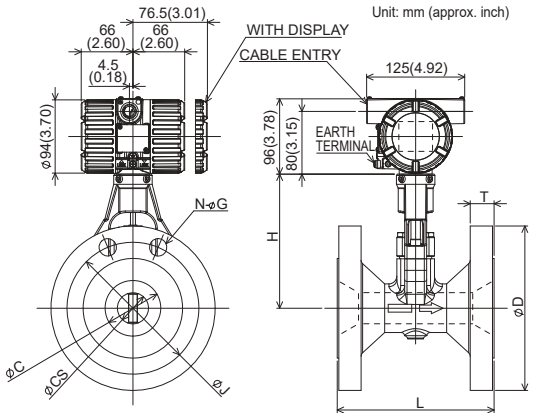
Diameter 200 mm

VY200 -□□□-1 □ □□ □□□□-□□□□□00
↳ Process connection
↳ Type of shedder bar
↳ Type of body
↳ Model



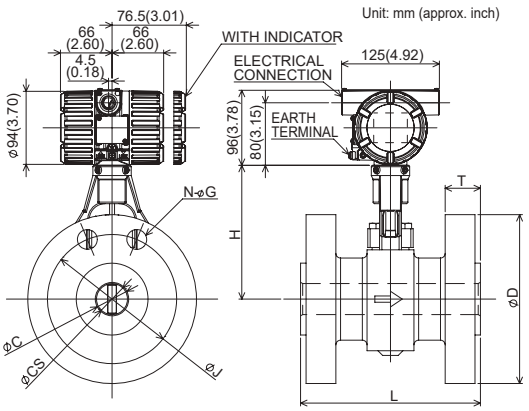
● **Flange type - Reduced bore type (2 size reduction)**
Diameter 40 to 200 mm

VY040 -□□□-2 □ □□ □□□□-□□□□□00
VY050 ↳ Process connection
VY080 ↳ Type of shedder bar
VY100 ↳ Type of body
VY150
VY200
↳ Model



● **Flange type - High pressure reduced bore type (1 size reduction)**
Diameter 25 to 150 mm

VY025 -□□□-4 □ □□ □□□□-□□□□□00
VY040 ↳Process connection
VY050 ↳Type of shedder bar
VY080 ↳Type of body
VY100
VY150
↳Model



■ ASME Class 150 to 1500

For details about the height H, inner diameter C, and sensor inner diameter CS, read the "Common dimension specifications" table.

	External dimensions mm (approx. inch)							Weight kg (lb)								
Process connection code	Model	Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Process connection code	BBA□ & BDA□						HBA□	
								Type of body	-0		-1 or -4		-2		-0	
		L	ΦD	T	ΦJ	N	ΦG	Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BBA1 BDA1 HBA1	VY015	130(5.12)	88.9(3.5)	11.7 (0.46)	60.5 (2.38)	4	15.9 (0.63)	VY015	4.6(10.1)	5(11)	-	-	-	-	5(11)	5.5(12.1)
	VY025	150(5.91)	108(4.25)	14.7 (0.58)	79.2 (3.12)	4	15.9 (0.63)	VY025	7.1(15.7)	7.5(16.5)	6(13.2)	-	-	-	7.9(17.4)	8.4(18.5)
	VY040	150(5.91)	127(5)	17.7(0.7)	98.6 (3.88)	4	15.9 (0.63)	VY040	8.6(19)	9(19.8)	9.9(21.8)	10.3 (22.7)	8.1(17.9)	-	9.7(21.4)	10.2 (22.5)
	VY050	170(6.69)	152.4(6)	19.5 (0.77)	120.7 (4.75)	4	19.1 (0.75)	VY050	12.2 (26.9)	12.6 (27.8)	11.9 (26.2)	12.3 (27.1)	11.1 (24.5)	11.5 (25.4)	13.9 (30.6)	14.4 (31.7)
	VY080	200(7.87)	190.5 (7.5)	24.4 (0.96)	152.4(6)	4	19.1 (0.75)	VY080	20.5 (45.2)	20.9 (46.1)	22.4 (49.4)	22.8 (50.3)	16.7 (36.8)	17.1 (37.7)	23.6(52)	24.1 (53.1)
	VY100	220(8.66)	228.6(9)	24.4 (0.96)	190.5 (7.5)	8	19.1 (0.75)	VY100	27.9 (61.5)	28.3 (62.4)	31.1 (68.6)	31.5 (69.4)	26(57.3)	26.4 (58.2)	32.3 (71.2)	32.8 (72.3)
	VY150	270 (10.63)	279.4(11)	25.9 (1.02)	241.3 (9.5)	8	22.2 (0.87)	VY150	36.9 (81.3)	36.9 (81.3)	49.9(110)	49.9(110)	43.8 (96.6)	43.8 (96.6)	42.9 (94.6)	43.3 (95.5)
	VY200	310(12.2)	342.9 (13.5)	28.9 (1.14)	298.5 (11.75)	8	22.2 (0.87)	VY200	55.9 (123.2)	55.9 (123.2)	71.2(157)	71.2(157)	72.4 (159.6)	72.4 (159.6)	-	-
	VY250	370 (14.57)	406.4(16)	30.5 (1.20)	362 (14.25)	12	25.4(1)	VY250	90.5 (199.5)	90.5 (199.5)	-	-	-	-	-	-
	VY300	400 (15.75)	482.6(19)	32.3 (1.27)	431.8(17)	12	25.4(1)	VY300	140.5 (309.7)	140.5 (309.7)	-	-	-	-	-	-
	VY400	520 (20.47)	596.9 (23.5)	37.1 (1.46)	539.8 (21.25)	16	28.6 (1.13)	VY400	300.5 (662.5)	300.5 (662.5)	-	-	-	-	-	-
BBA2 BDA2 HBA2	VY015	130(5.12)	95.3 (3.75)	14.7 (0.58)	66.5 (2.62)	4	15.9 (0.63)	VY015	4.8(10.6)	5.2(11.5)	-	-	-	-	5.2(11.5)	5.7(12.6)
	VY025	150(5.91)	124(4.88)	17.7(0.7)	88.9(3.5)	4	19.1 (0.75)	VY025	7.7(17)	8.1(17.9)	7.5(16.5)	-	-	-	8.6(19)	9.1(20.1)
	VY040	150(5.91)	155.4 (6.12)	21.1 (0.83)	114.3 (4.5)	4	22.2 (0.87)	VY040	9.8(21.6)	10.2 (22.5)	13.1 (28.9)	13.5 (29.8)	9.3(20.5)	-	11.1 (24.5)	11.6 (25.6)
	VY050	170(6.69)	165.1 (6.5)	22.6 (0.89)	127(5)	8	19.1 (0.75)	VY050	13.7 (30.2)	14.1 (31.1)	14.1 (31.1)	14.5(32)	12.6 (27.8)	13(28.7)	15.7 (34.6)	16.1 (35.5)
	VY080	200(7.87)	209.6 (8.25)	28.9 (1.14)	168.1 (6.62)	8	22.2 (0.87)	VY080	24.3 (53.6)	24.7 (54.5)	27.4 (60.4)	27.8 (61.3)	20.5 (45.2)	20.9 (46.1)	28.1 (61.9)	28.6 (63.1)
	VY100	220(8.66)	254(10)	32.2 (1.27)	200.2 (7.88)	8	22.2 (0.87)	VY100	36.4 (80.2)	36.8 (81.1)	41.5 (91.5)	41.9 (92.4)	34.5 (76.1)	34.9 (76.9)	42.3 (93.3)	42.8 (94.4)
	VY150	270 (10.63)	317.5 (12.5)	37.1 (1.46)	269.7 (10.62)	12	22.2 (0.87)	VY150	54.9(121)	54.9(121)	72.2 (159.2)	72.2 (159.2)	61.8 (136.2)	61.8 (136.2)	-	-
	VY200	310(12.2)	381(15)	41.6 (1.64)	330.2(13)	12	25.4(1)	VY200	80.9 (178.4)	80.9 (178.4)	103.4 (228)	103.4 (228)	97.4 (214.7)	97.4 (214.7)	-	-
	VY250	370 (14.57)	444.5 (17.5)	48(1.89)	387.4 (15.25)	16	28.6 (1.13)	VY250	125.5 (276.7)	125.5 (276.7)	-	-	-	-	-	-
	VY300	400 (15.75)	520.7 (20.5)	51.3 (2.02)	450.9 (17.75)	16	31.8 (1.25)	VY300	178.5 (393.5)	178.5 (393.5)	-	-	-	-	-	-
	VY400	520 (20.47)	647.7 (25.5)	57.7 (2.27)	571.5 (22.5)	20	34.9 (1.37)	VY400	370.5 (816.8)	370.5 (816.8)	-	-	-	-	-	-
BBA4 BDA4	VY015	130(5.12)	95.3 (3.75)	21.2 (0.83)	66.5 (2.62)	4	15.9 (0.63)	VY015	5.1(11.2)	5.5(12.1)	-	-	-	-	-	-
	VY025	150(5.91)	124(4.88)	24.5 (0.96)	88.9(3.5)	4	19.1 (0.75)	VY025	8.2(18.1)	8.6(19)	-	-	-	-	-	-
	VY040	150(5.91)	155.4 (6.12)	29.4 (1.16)	114.3 (4.5)	4	22.2 (0.87)	VY040	11.8(26)	12.2 (26.9)	-	-	-	-	-	-
	VY050	170(6.69)	165.1 (6.5)	32.4 (1.28)	127(5)	8	19.1 (0.75)	VY050	15.3 (33.7)	15.7 (34.6)	-	-	-	-	-	-
	VY080	200(7.87)	209.6 (8.25)	38.8 (1.53)	168.1 (6.62)	8	22.2 (0.87)	VY080	25.9 (57.1)	26.3(58)	-	-	-	-	-	-
	VY100	240(9.45)	273.1 (10.75)	45.1 (1.78)	215.9 (8.5)	8	25.4(1)	VY100	51.3 (113.1)	51.7(114)	-	-	-	-	-	-
	VY150	310(12.2)	355.6(14)	54.8 (2.16)	292.1 (11.5)	12	28.6 (1.13)	VY150	84.9 (187.2)	84.9 (187.2)	-	-	-	-	-	-
	VY200	370 (14.57)	419.1 (16.5)	62.6 (2.46)	349.3 (13.75)	12	31.8 (1.25)	VY200	136.5 (300.9)	182.5 (402.3)	-	-	-	-	-	-
	VY250	-	-	-	-	-	-	VY250	-	-	-	-	-	-	-	-
	VY300	-	-	-	-	-	-	VY300	-	-	-	-	-	-	-	-
	VY400	-	-	-	-	-	-	VY400	-	-	-	-	-	-	-	-

	External dimensions mm (approx. inch)							Weight kg (lb)							
Process connection code	Model	Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Process connection code	BBA□ & BDA□						HBA□	
								Type of body	-0		-1 or -4		-2		-0	
		L	ΦD	T	ΦJ	N	ΦG	Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BBA5 BDA5	VY015	160(6.3)	120.7 (4.75)	29.4 (1.16)	82.6 (3.25)	4	22.2 (0.87)	VY015	8(17.6)	8.4(18.5)	-	-	-	-	-	-
	VY025	190(7.48)	149.4 (5.88)	35.4 (1.39)	101.6(4)	4	25.4(1)	VY025	11.6 (25.6)	12(26.5)	-	-	-	-	-	-
	VY040	200(7.87)	177.8(7)	38.8 (1.53)	124(4.88)	4	28.6 (1.13)	VY040	16.7 (36.8)	17.1 (37.7)	-	-	-	-	-	-
	VY050	230(9.06)	215.9 (8.5)	45.1 (1.78)	165.1 (6.5)	8	25.4(1)	VY050	27(59.5)	27.4 (60.4)	-	-	-	-	-	-
	VY080	245(9.65)	241.3 (9.5)	45.1 (1.78)	190.5 (7.5)	8	25.4(1)	VY080	36.2 (79.8)	36.6 (80.7)	-	-	-	-	-	-
	VY100	280 (11.02)	292.1 (11.5)	51.5 (2.03)	235(9.25)	8	31.8 (1.25)	VY100	56.4 (124.3)	56.8 (125.2)	-	-	-	-	-	-
	VY150	336 (13.23)	381(15)	62.6 (2.46)	317.5 (12.5)	12	31.8 (1.25)	VY150	106.5 (234.8)	106.5 (234.8)	-	-	-	-	-	-
	VY200	386(15.2)	469.9 (18.5)	70.5 (2.78)	393.7 (15.5)	12	38.1(1.5)	VY200	182.5 (402.3)	182.5 (402.3)	-	-	-	-	-	-
	VY250	-	-	-	-	-	-	VY250	-	-	-	-	-	-	-	-
	VY300	-	-	-	-	-	-	VY300	-	-	-	-	-	-	-	-
	VY400	-	-	-	-	-	-	VY400	-	-	-	-	-	-	-	-
BBA6	VY015	-	-	-	-	-	-	VY015	-	-	-	-	-	-	-	-
	VY025	220(8.66)	149.4 (5.88)	35.4 (1.39)	101.6(4)	4	25.4(1)	VY025	-	-	14.9 (32.8)	-	-	-	-	-
	VY040	220(8.66)	177.8(7)	38.8 (1.53)	124(4.88)	4	28.6 (1.13)	VY040	-	-	23.4 (51.6)	-	-	-	-	-
	VY050	230(9.06)	215.9 (8.5)	45.1 (1.78)	165.1 (6.5)	8	25.4(1)	VY050	-	-	37.7 (83.1)	-	-	-	-	-
	VY080	280 (11.02)	266.7 (10.5)	54.8 (2.16)	203.2(8)	8	31.8 (1.25)	VY080	-	-	69(152.1)	-	-	-	-	-
	VY100	300 (11.81)	311.2 (12.25)	60.8 (2.39)	241.3 (9.5)	8	34.9 (1.37)	VY100	-	-	104 (229.3)	-	-	-	-	-
	VY150	400 (15.75)	393.7 (15.5)	89.6 (3.53)	317.5 (12.5)	12	38.1(1.5)	VY150	-	-	229.8 (506.6)	-	-	-	-	-
	VY200	-	-	-	-	-	-	VY200	-	-	-	-	-	-	-	-
	VY250	-	-	-	-	-	-	VY250	-	-	-	-	-	-	-	-
	VY300	-	-	-	-	-	-	VY300	-	-	-	-	-	-	-	-
	VY400	-	-	-	-	-	-	VY400	-	-	-	-	-	-	-	-

*: Lay Length (L) tolerances are as follows.
- VY015 to VY300: ±3.0 mm
- VY400: ±5.0 mm

Process connection code	Model	External dimensions mm (approx. inch)						Weight kg (lb)				
		Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Process connection code	BCA□			
								Type of body	-0		-4	
		L	ΦD	T	ΦJ	N	ΦG	Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BCA4	VY015	140(5.51)	95.3(3.75)	19.76(0.78)	66.5(2.62)	4	15.9(0.63)	VY015	5(11)	5.4(11.9)	-	
	VY025	170(6.69)	124(4.88)	23.85(0.94)	88.9(3.5)	4	19.1(0.75)	VY025	8.4(18.5)	8.8(19.4)	-	
	VY040	185(7.28)	155.4(6.12)	28.75(1.13)	114.3(4.5)	4	22.2(0.87)	VY040	12.2(26.9)	12.6(27.8)	-	
	VY050	205(8.07)	165.1(6.5)	33.32(1.31)	127(5)	8	19.1(0.75)	VY050	16.3(35.9)	16.7(36.8)	-	
	VY080	235(9.25)	209.6(8.25)	39.73(1.56)	168.1(6.62)	8	22.2(0.87)	VY080	27.6(60.8)	28(61.7)	-	
	VY100	270(10.63)	273.1(10.75)	46.02(1.81)	215.9(8.5)	8	25.4(1)	VY100	53.3(117.5)	53.7(118.4)	-	
	VY150	325(12.8)	355.6(14)	55.72(2.19)	292(11.5)	12	28.6(1.13)	VY150	90.5(199.5)	90.5(199.5)	-	
	VY200	375(14.76)	419.1(16.5)	63.52(2.5)	349.3(13.75)	12	31.8(1.25)	VY200	139.5(307.5)	139.5(307.5)	-	
	VY250	-	-	-	-	-	-	VY250	-	-	-	
	VY300	-	-	-	-	-	-	VY300	-	-	-	
	VY400	-	-	-	-	-	-	VY400	-	-	-	
BCA5	VY015	160(6.3)	120.7(4.75)	28.75(1.13)	82.6(3.25)	4	22.2(0.87)	VY015	7.3(16.1)	7.7(17)	-	
	VY025	190(7.48)	149.4(5.88)	34.75(1.37)	101.6(4)	4	25.4(1)	VY025	11.9(26.2)	12.3(27.1)	-	
	VY040	200(7.87)	177.8(7)	38.15(1.5)	124(4.88)	4	28.6(1.13)	VY040	16.8(37)	17.2(37.9)	-	
	VY050	230(9.06)	215.9(8.5)	46.02(1.81)	165.1(6.5)	8	25.4(1)	VY050	27.4(60.4)	27.8(61.3)	-	
	VY080	250(9.84)	241.3(9.5)	46.03(1.81)	190.5(7.5)	8	25.4(1)	VY080	36.8(81.1)	37.2(82)	-	
	VY100	285(11.22)	292.1(11.5)	52.42(2.06)	235(9.25)	8	31.8(1.25)	VY100	57.1(125.9)	57.5(126.8)	-	
	VY150	340(13.39)	381(15)	63.62(2.5)	317.5(12.5)	12	31.8(1.25)	VY150	107.5(237)	107.5(237)	-	
	VY200	390(15.35)	469.9(18.5)	71.42(2.81)	393.7(15.5)	12	38.1(1.5)	VY200	183.5(404.5)	183.5(404.5)	-	
	VY250	-	-	-	-	-	-	VY250	-	-	-	
	VY300	-	-	-	-	-	-	VY300	-	-	-	
	VY400	-	-	-	-	-	-	VY400	-	-	-	
BCA6	VY015	-	-	-	-	-	-	VY015	-	-	-	
	VY025	220(8.66)	149.4(5.88)	34.9(1.37)	101.6(4)	4	25.4(1)	VY025	-	-	16.2(35.7)	
	VY040	220(8.66)	177.8(7)	38.2(1.5)	124(4.88)	4	28.6(1.13)	VY040	-	-	25.2(55.6)	
	VY050	230(9.06)	215.9(8.5)	46.1(1.81)	165.1(6.5)	8	25.4(1)	VY050	-	-	40.7(89.7)	
	VY080	280(11.02)	266.7(10.5)	55.8(2.2)	203.2(8)	8	31.8(1.25)	VY080	-	-	73.2(161.4)	
	VY100	300(11.81)	311.2(12.25)	61.8(2.43)	241.3(9.5)	8	34.9(1.37)	VY100	-	-	109(240.3)	
	VY150	400(15.75)	393.7(15.5)	92.1(3.63)	317.5(12.5)	12	38.1(1.5)	VY150	-	-	236.2(520.7)	
	VY200	-	-	-	-	-	-	VY200	-	-	-	
	VY250	-	-	-	-	-	-	VY250	-	-	-	
	VY300	-	-	-	-	-	-	VY300	-	-	-	
	VY400	-	-	-	-	-	-	VY400	-	-	-	

*: Lay Length (L) tolerances are as follows.
- VY015 to VY050: ±4.0 mm
- VY080 to VY200: ±5.0 mm

■ EN PN10 to 40

For details about the height H, inner diameter C, and sensor inner diameter CS, read the "Common dimension specifications" table.

Process connection code	Model	External dimensions mm (approx. inch)						Weight kg (lb)		
		Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Process connection code	BBE□ & BFE□	
								Type of body	-0	
		L	ΦD	T	ΦJ	N	ΦG	Type of shedder bar	A, B	C, D, E, G, H
BBE1 BFE1	VY015	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	VY040	-	-
	VY050	-	-	-	-	-	-	VY050	-	-
	VY080	-	-	-	-	-	-	VY080	-	-
	VY100	-	-	-	-	-	-	VY100	-	-
	VY150	-	-	-	-	-	-	VY150	-	-
	VY200	310(12.2)	340(13.39)	24(0.94)	295(11.61)	8	22(0.87)	VY200	46.8(103.2)	46.8(103.2)
	VY250	-	-	-	-	-	-	VY250	-	-
	VY300	-	-	-	-	-	-	VY300	-	-
	VY400	-	-	-	-	-	-	VY400	-	-
BBE2 BFE2	VY015	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	VY040	-	-
	VY050	170(6.69)	165(6.5)	18(0.71)	125(4.92)	4	18(0.71)	VY050	11.8(26)	12.2(26.9)
	VY080	200(7.87)	200(7.87)	20(0.79)	160(6.3)	8	18(0.71)	VY080	19.9(43.9)	20.3(44.8)
	VY100	220(8.66)	220(8.66)	20(0.79)	180(7.09)	8	18(0.71)	VY100	23.7(52.2)	24.1(53.1)
	VY150	270(10.63)	285(11.22)	22(0.87)	240(9.45)	8	22(0.87)	VY150	33.9(74.7)	33.9(74.7)
	VY200	310(12.2)	340(13.39)	24(0.94)	295(11.61)	12	22(0.87)	VY200	46.8(103.2)	46.8(103.2)
	VY250	-	-	-	-	-	-	VY250	-	-
	VY300	-	-	-	-	-	-	VY300	-	-
	VY400	-	-	-	-	-	-	VY400	-	-
BBE3 BFE3	VY015	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	VY040	-	-
	VY050	-	-	-	-	-	-	VY050	-	-
	VY080	-	-	-	-	-	-	VY080	-	-
	VY100	-	-	-	-	-	-	VY100	-	-
	VY150	-	-	-	-	-	-	VY150	-	-
	VY200	310(12.2)	360(14.17)	30(1.18)	310(12.2)	12	26(1.02)	VY200	54.1(119.3)	54.1(119.3)
	VY250	-	-	-	-	-	-	VY250	-	-
	VY300	-	-	-	-	-	-	VY300	-	-
	VY400	-	-	-	-	-	-	VY400	-	-
BBE4 BFE4	VY015	130(5.12)	95(3.74)	16(0.63)	65(2.56)	4	14(0.55)	VY015	4.7(10.4)	5.1(11.2)
	VY025	150(5.91)	115(4.53)	18(0.71)	85(3.35)	4	14(0.55)	VY025	7.4(16.3)	7.8(17.2)
	VY040	150(5.91)	150(5.91)	18(0.71)	110(4.33)	4	18(0.71)	VY040	9.3(20.5)	9.7(21.4)
	VY050	170(6.69)	165(6.5)	20(0.79)	125(4.92)	4	18(0.71)	VY050	11.8(26)	12.2(26.9)
	VY080	200(7.87)	200(7.87)	24(0.94)	160(6.3)	8	18(0.71)	VY080	20.5(45.2)	20.9(46.1)
	VY100	220(8.66)	235(9.25)	24(0.94)	190(7.48)	8	22(0.87)	VY100	27.9(61.5)	28.3(62.4)
	VY150	270(10.63)	300(11.81)	28(1.1)	250(9.84)	8	26(1.02)	VY150	43.4(95.7)	43.4(95.7)
	VY200	310(12.2)	375(14.76)	34(1.34)	320(12.6)	12	30(1.18)	VY200	56.4(124.3)	56.4(124.3)
	VY250	-	-	-	-	-	-	VY250	-	-
	VY300	-	-	-	-	-	-	VY300	-	-
	VY400	-	-	-	-	-	-	VY400	-	-

*: Lay Length (L) tolerances are as follows.
- VY015 to VY200: ±3.0 mm

■ JIS 10K to 40K

For details about the height H, inner diameter C, and sensor inner diameter CS, read the "Common dimension specifications" table.

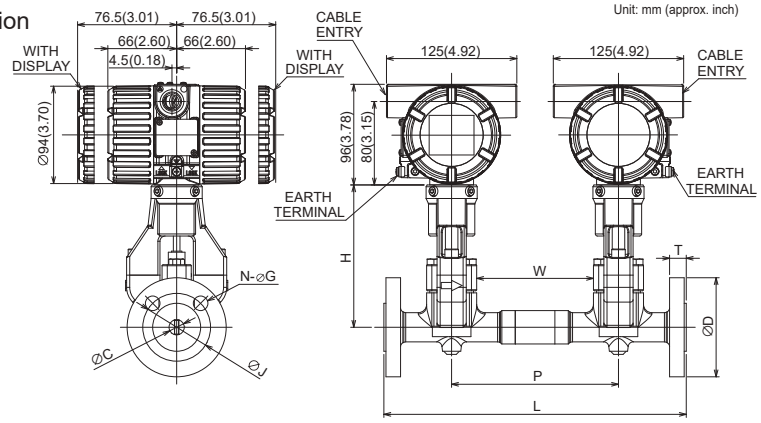
	External dimensions mm (approx. inch)							Weight kg (lb)								
Process connection code	Model	Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Process connection code	BBJ□						HBJ□	
								Type of body	-0		-1		-2		-0	
		L	ΦD	T	ΦJ	N	ΦG	Type of shedder bar	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H	A, B	C, D, E, G, H
BBJ1 HBJ1	VY015	130(5.12)	95(3.74)	12(0.47)	70(2.76)	4	15(0.59)	VY015	4.7(10.4)	5.1(11.2)	-	-	-	-	5.1(11.2)	5.6(12.3)
	VY025	150(5.91)	125(4.92)	14(0.55)	90(3.54)	4	19(0.75)	VY025	7.4(16.3)	7.8(17.2)	6.6(14.6)	-	-	-	8.3(18.3)	8.7(19.2)
	VY040	150(5.91)	140(5.51)	16(0.63)	105(4.13)	4	19(0.75)	VY040	8.7(19.2)	9.1(20.1)	10(22)	10.5 (23.1)	8.2(18.1)	-	9.8(21.6)	10.3 (22.7)
	VY050	170(6.69)	155(6.1)	16(0.63)	120(4.72)	4	19(0.75)	VY050	11.6 (25.6)	12(26.5)	11(24.3)	11.4 (25.1)	10.5 (23.1)	10.9(24)	13.2 (29.1)	13.7 (30.2)
	VY080	200(7.87)	185(7.28)	18(0.71)	150(5.91)	8	19(0.75)	VY080	17.9 (39.5)	18.3 (40.3)	19.1 (42.1)	19.5(43)	14.1 (31.1)	14.5(32)	20.6 (45.4)	21.1 (46.5)
	VY100	220(8.66)	210(8.27)	18(0.71)	175(6.89)	8	19(0.75)	VY100	23.3 (51.4)	23.7 (52.2)	25.5 (56.2)	25.9 (57.1)	21.4 (47.2)	21.8 (48.1)	26.9 (59.3)	27.4 (60.4)
	VY150	270 (10.63)	280 (11.02)	22(0.87)	240(9.45)	8	23(0.91)	VY150	33.9 (74.7)	33.9 (74.7)	46.4 (102.3)	46.4 (102.3)	40.8 (89.9)	40.8 (89.9)	-	-
	VY200	310(12.2)	330 (12.99)	22(0.87)	290 (11.42)	12	23(0.91)	VY200	45.9 (101.2)	45.9 (101.2)	59.2 (130.5)	59.2 (130.5)	62.4 (137.6)	62.4 (137.6)	-	-
	VY250	370 (14.57)	400 (15.75)	24(0.94)	355 (13.98)	12	25(0.98)	VY250	78.5 (173.1)	78.5 (173.1)	-	-	-	-	-	-
	VY300	400 (15.75)	445 (17.52)	24(0.94)	400 (15.75)	16	25(0.98)	VY300	100.5 (221.6)	100.5 (221.6)	-	-	-	-	-	-
	VY400	520 (20.47)	560 (22.05)	29(1.14)	510 (20.08)	16	27(1.06)	VY400	265.5 (585.3)	265.5 (585.3)	-	-	-	-	-	-
BBJ2 HBJ2	VY015	130(5.12)	95(3.74)	14(0.55)	70(2.76)	4	15(0.59)	VY015	4.8 (10.6)	5.2(11.5)	-	-	-	-	5.2(11.5)	5.7(12.6)
	VY025	150(5.91)	125(4.92)	16(0.63)	90(3.54)	4	19(0.75)	VY025	7.6 (16.8)	8(17.6)	7(15.4)	-	-	-	8.5(18.7)	9(19.8)
	VY040	150(5.91)	140(5.51)	18(0.71)	105(4.13)	4	19(0.75)	VY040	8.9 (19.6)	9.3(20.5)	10.6 (23.4)	11(24.3)	8.4(18.5)	-	10(22)	10.5 (23.1)
	VY050	170(6.69)	155(6.1)	18(0.71)	120(4.72)	8	19(0.75)	VY050	12.1 (26.7)	12.5 (27.6)	11.6 (25.6)	12(26.5)	11(24.3)	11.4 (25.1)	13.8 (30.4)	14.3 (31.5)
	VY080	200(7.87)	200(7.87)	22(0.87)	160(6.3)	8	23(0.91)	VY080	20.5 (45.2)	20.9 (46.1)	22.2 (48.9)	22.6 (49.8)	16.7 (36.8)	17.1 (37.7)	23.6(52)	24.1 (53.1)
	VY100	220(8.66)	225(8.86)	24(0.94)	185(7.28)	8	23(0.91)	VY100	27.3 (60.2)	27.7 (61.1)	30.5 (67.2)	30.9 (68.1)	25.4(56)	25.8 (56.9)	31.6 (69.7)	32.1 (70.8)
	VY150	270 (10.63)	305 (12.01)	28(1.1)	260 (10.24)	12	25(0.98)	VY150	43.9 (96.8)	43.9 (96.8)	56.8 (125.2)	56.8 (125.2)	50.8(112)	50.8(112)	-	-
	VY200	310(12.2)	350 (13.78)	30(1.18)	305 (12.01)	12	25(0.98)	VY200	52.9 (116.6)	52.9 (116.6)	74.6 (164.5)	74.6 (164.5)	69.4(153)	69.4(153)	-	-
	VY250	370 (14.57)	430 (16.93)	34(1.34)	380 (14.96)	12	35(1.38)	VY250	100.5 (221.6)	100.5 (221.6)	-	-	-	-	-	-
	VY300	400 (15.75)	480(18.9)	36(1.42)	430 (16.93)	16	27(1.06)	VY300	128.5 (283.3)	128.5 (283.3)	-	-	-	-	-	-
	VY400	520 (20.47)	605 (23.82)	46(1.81)	540 (21.26)	16	33(1.3)	VY400	308.5 (680.1)	308.5 (680.1)	-	-	-	-	-	-
BBJ4	VY015	130(5.12)	115(4.53)	20(0.79)	80(3.15)	4	19(0.75)	VY015	6.4(14.1)	6.8(15)	-	-	-	-	-	-
	VY025	150(5.91)	130(5.12)	22(0.87)	95(3.74)	4	19(0.75)	VY025	9.1(20.1)	9.5(20.9)	-	-	-	-	-	-
	VY040	150(5.91)	160(6.3)	24(0.94)	120(4.72)	4	23(0.91)	VY040	12.4 (27.3)	12.8 (28.2)	-	-	-	-	-	-
	VY050	170(6.69)	165(6.5)	26(1.02)	130(5.12)	8	19(0.75)	VY050	14.8 (32.6)	15.2 (33.5)	-	-	-	-	-	-
	VY080	200(7.87)	210(8.27)	32(1.26)	170(6.69)	8	23(0.91)	VY080	25.9 (57.1)	26.3(58)	-	-	-	-	-	-
	VY100	220(8.66)	250(9.84)	36(1.42)	205(8.07)	8	25(0.98)	VY100	38.6 (85.1)	39(86)	-	-	-	-	-	-
	VY150	270 (10.63)	355 (13.98)	44(1.73)	295 (11.61)	12	33(1.3)	VY150	76.9 (169.5)	76.9 (169.5)	-	-	-	-	-	-
	VY200	-	-	-	-	-	-	VY200	-	-	-	-	-	-	-	-
	VY250	-	-	-	-	-	-	VY250	-	-	-	-	-	-	-	-
	VY300	-	-	-	-	-	-	VY300	-	-	-	-	-	-	-	-
	VY400	-	-	-	-	-	-	VY400	-	-	-	-	-	-	-	-

*: Lay Length (L) tolerances are as follows.
- VY015 to VY300: ±3.0 mm
- VY400: ±5.0 mm

● **Flange type - Dual-Sensor (Welded) General type**

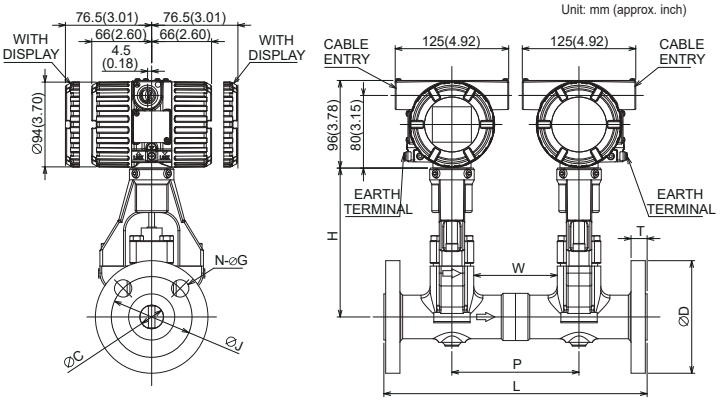
Diameter 15 mm

VY015 -□□□-6 □ □□ □□□□-□□□□□00
- Process connection
- Type of shedder bar
- Type of body
- Model



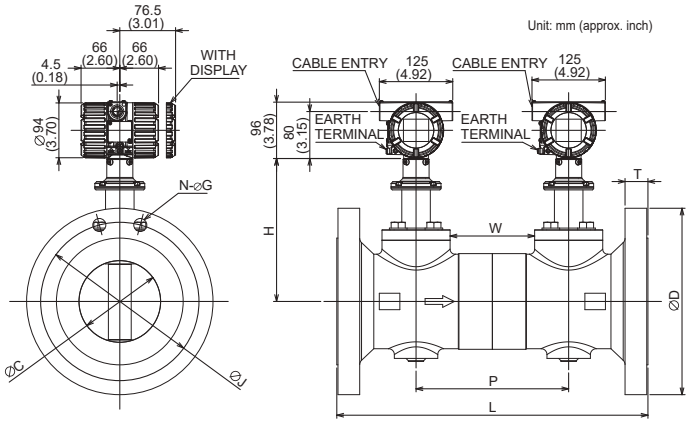
Diameter 25 to 100 mm

VY025 -□□□-6 □ □□ □□□□-□□□□□00
VY040
VY050
VY080
VY100
- Process connection
- Type of shedder bar
- Type of body
- Model



Diameter 150 to 200 mm

VY150 -□□□-6 □ □□ □□□□-□□□□□00
VY200
- Process connection
- Type of shedder bar
- Type of body
- Model



■ ASME Class 150 to 900

For details about the height H, inner diameter C, and sensor inner diameter CS, read the "Common dimension specifications" table.

Process connection code	External dimensions mm (approx. inch)									Weight kg (lb)		
	Model	Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Sensor Distance	Central Gap Distance	Process connection code	EBA□	
										Type of body	-6	
		L	ΦD	T	ΦJ	N	ΦG	P	W	Type of shedder bar	N, P	Q, R, S, U, V
EBA1	VY015	290(11.42)	88.9(3.50)	11.7(0.46)	60.5(2.38)	4	15.9(0.63)	160(6.30)	112(4.41)	VY015	8.6(18.9)	9.4(20.7)
	VY025	290(11.42)	108(4.25)	14.7(0.58)	79.2(3.12)	4	15.9(0.63)	140(5.51)	92(3.62)	VY025	12.8(28.2)	13.6(29.9)
	VY040	290(11.42)	127(5.00)	17.7(0.7)	98.6(3.88)	4	15.9(0.63)	140(5.51)	92(3.62)	VY040	14.9(32.8)	15.7(34.5)
	VY050	320(12.60)	152.4(6.00)	19.5(0.77)	120.7(4.75)	4	19.1(0.75)	150(5.91)	90(3.54)	VY050	20.6(45.3)	21.4(47.1)
	VY080	370(14.57)	190.5(7.50)	24.4(0.96)	152.4(6.00)	4	19.1(0.75)	170(6.69)	102(4.02)	VY080	33.2(73.0)	34(74.8)
	VY100	420(16.54)	228.6(9.00)	24.4(0.96)	190.5(7.50)	8	19.1(0.75)	200(7.87)	120(4.72)	VY100	45.7(100.5)	46.5(102.3)
	VY150	530(20.87)	279.4(11.00)	25.9(1.02)	241.3(9.50)	8	22.2(0.87)	260(10.24)	144(5.67)	VY150	57.8(127.2)	57.8(127.2)
	VY200	610(24.02)	342.9(13.50)	28.9(1.14)	298.5(11.75)	8	22.2(0.87)	300(11.81)	162(6.38)	VY200	84.8(186.6)	84.8(186.6)
EBA2	VY015	290(11.42)	95.3(3.75)	14.7(0.58)	66.5(2.62)	4	15.9(0.63)	160(6.30)	112(4.41)	VY015	8.7(19.1)	9.5(20.9)
	VY025	290(11.42)	124(4.88)	17.7(0.7)	88.9(3.50)	4	19.1(0.75)	140(5.51)	92(3.62)	VY025	13.1(28.8)	13.9(30.6)
	VY040	290(11.42)	155.4(6.12)	21.1(0.83)	114.3(4.50)	4	22.2(0.87)	140(5.51)	92(3.62)	VY040	15.2(33.4)	16(35.2)
	VY050	320(12.60)	165.1(6.50)	22.6(0.89)	127(5.00)	8	19.1(0.75)	150(5.91)	90(3.54)	VY050	22.3(49.1)	23.1(50.8)
	VY080	370(14.57)	209.6(8.25)	28.9(1.14)	168.1(6.62)	8	22.2(0.87)	170(6.69)	102(4.02)	VY080	37.5(82.5)	38.3(84.3)
	VY100	420(16.54)	254(10.00)	32.2(1.27)	200.2(7.88)	8	22.2(0.87)	200(7.87)	120(4.72)	VY100	55.1(121.2)	55.9(123.0)
	VY150	530(20.87)	317.5(12.50)	37.1(1.46)	269.7(10.62)	12	22.2(0.87)	260(10.24)	144(5.67)	VY150	78.6(172.9)	78.6(172.9)
	VY200	610(24.02)	381(15.00)	41.6(1.64)	330.2(13.00)	12	25.4(1.00)	300(11.81)	162(6.38)	VY200	110.7(243.5)	110.7(243.5)
EBA4	VY015	290(11.42)	95.3(3.75)	21.2(0.83)	66.5(2.62)	4	15.9(0.63)	160(6.30)	112(4.41)	VY015	9.1(20.0)	9.9(21.8)
	VY025	290(11.42)	124(4.88)	24.5(0.96)	88.9(3.50)	4	19.1(0.75)	140(5.51)	92(3.62)	VY025	13.9(30.6)	14.7(32.3)
	VY040	290(11.42)	155.4(6.12)	29.4(1.16)	114.3(4.50)	4	22.2(0.87)	140(5.51)	92(3.62)	VY040	18.5(40.7)	19.3(42.5)
	VY050	320(12.60)	165.1(6.5)	32.4(1.28)	127(5.00)	8	19.1(0.75)	150(5.91)	90(3.54)	VY050	24.3(53.5)	25.1(55.2)
	VY080	370(14.57)	209.6(8.25)	38.8(1.53)	168.1(6.62)	8	22.2(0.87)	170(6.69)	102(4.02)	VY080	38.7(85.1)	39.5(86.9)
	VY100	440(17.32)	273.1(10.75)	45.1(1.78)	215.9(8.50)	8	25.4(1.00)	200(7.87)	120(4.72)	VY100	74.9(164.8)	75.7(166.5)
	VY150	600(23.62)	355.6(14.00)	54.8(2.16)	292.1(11.50)	12	28.6(1.13)	290(11.42)	174(6.85)	VY150	136.9(301.2)	136.9(301.2)
	VY200	675(26.57)	419.1(16.50)	62.6(2.46)	349.3(13.75)	12	31.8(1.25)	305(12.01)	165(6.50)	VY200	233.4(513.5)	233.4(513.5)
EBA5	VY015	300(11.81)	120.7(4.75)	29.4(1.16)	82.6(3.25)	4	22.2(0.87)	140(5.51)	92(3.62)	VY015	12.7(27.9)	13.5(29.7)
	VY025	330(12.99)	149.4(5.88)	35.4(1.39)	101.6(4.00)	4	25.4(1.00)	140(5.51)	92(3.62)	VY025	16.6(36.5)	17.4(38.3)
	VY040	340(13.39)	177.8(7.00)	38.8(1.53)	124(4.88)	4	28.6(1.13)	140(5.51)	92(3.62)	VY040	22.9(50.4)	23.7(52.1)
	VY050	380(14.96)	215.9(8.50)	45.1(1.78)	165.1(6.50)	8	25.4(1.00)	150(5.91)	90(3.54)	VY050	35.4(77.9)	36.2(79.6)
	VY080	415(16.34)	241.3(9.5)	45.1(1.78)	190.5(7.50)	8	25.4(1.00)	170(6.69)	102(4.02)	VY080	49(107.8)	49.8(109.6)
	VY100	460(18.11)	292.1(11.5)	51.5(2.03)	235(9.25)	8	31.8(1.25)	180(7.09)	100(3.94)	VY100	73.4(161.5)	74.2(163.2)
	VY150	635(25.00)	381(15.00)	62.6(2.46)	317.5(12.50)	12	31.8(1.25)	299(11.77)	183(7.20)	VY150	136.9(301.2)	136.9(301.2)
	VY200	695(27.36)	469.9(18.50)	70.5(2.78)	393.7(15.50)	12	38.1(1.50)	309(12.17)	169(6.65)	VY200	233.4(513.5)	233.4(513.5)

*: Lay Length (L) tolerances are as follows.
- VY015 to VY200: ±3.0 mm

■ EN PN10 to 40

For details about the height H, inner diameter C, and sensor inner diameter CS, read the "Common dimension specifications" table.

Process connection code	External dimensions mm (approx. inch)									Weight kg (lb)		
	Model	Lay Length	Outer Diameter	Flange Thickness	Bolt Circle Diameter	No. of Bolt Holes	Bolt Hole Diameter	Sensor Distance	Central Gap Distance	Process connection code	EBE□	
										Type of body	-6	
		L	ΦD	T	ΦJ	N	ΦG	P	W	Type of shedder bar	N, P	Q, R, S, U, V
EBA1	VY015	-	-	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	-	-	VY040	-	-
	VY050	-	-	-	-	-	-	-	-	VY050	-	-
	VY080	-	-	-	-	-	-	-	-	VY080	-	-
	VY100	-	-	-	-	-	-	-	-	VY100	-	-
	VY150	-	-	-	-	-	-	-	-	VY150	-	-
	VY200	610(24.02)	340(13.39)	24(0.94)	295(11.61)	8	22(0.87)	300(11.81)	162(6.38)	VY200	71.9(158.2)	71.9(158.2)
EBA2	VY015	-	-	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	-	-	VY040	-	-
	VY050	320(12.60)	165(6.50)	18(0.71)	125(4.92)	4	18(0.71)	150(5.91)	90(3.54)	VY050	19.4(42.7)	20.2(44.4)
	VY080	370(14.57)	200(7.87)	20(0.79)	160(6.30)	8	18(0.71)	170(6.69)	102(4.02)	VY080	32.8(72.2)	33.6(73.9)
	VY100	420(16.54)	220(8.66)	20(0.79)	180(7.09)	8	18(0.71)	200(7.87)	120(4.72)	VY100	40(88.0)	60.8(133.8)
	VY150	530(20.87)	285(11.22)	22(0.87)	240(9.45)	8	22(0.87)	260(10.24)	144(5.67)	VY150	54.1(119.0)	54.1(119.0)
	VY200	610(24.02)	340(13.39)	24(0.94)	295(11.61)	12	22(0.87)	300(11.81)	162(6.38)	VY200	71.4(157.1)	71.4(157.1)
EBA2	VY015	-	-	-	-	-	-	-	-	VY015	-	-
	VY025	-	-	-	-	-	-	-	-	VY025	-	-
	VY040	-	-	-	-	-	-	-	-	VY040	-	-
	VY050	-	-	-	-	-	-	-	-	VY050	-	-
	VY080	-	-	-	-	-	-	-	-	VY080	-	-
	VY100	-	-	-	-	-	-	-	-	VY100	-	-
	VY150	-	-	-	-	-	-	-	-	VY150	-	-
	VY200	610(24.02)	360(14.17)	30(1.18)	310(12.20)	12	26(1.02)	300(11.81)	162(6.38)	VY200	81.9(180.2)	81.9(180.2)
EBA4	VY015	290(11.42)	95(3.74)	16(0.63)	65(2.56)	4	14(0.55)	160(6.30)	112(4.41)	VY015	8.1(17.8)	8.9(19.6)
	VY025	290(11.42)	115(4.53)	18(0.71)	85(3.35)	4	14(0.55)	140(5.51)	92(3.62)	VY025	12.7(27.9)	13.5(29.7)
	VY040	290(11.42)	150(5.91)	18(0.71)	110(4.33)	4	18(0.71)	140(5.51)	92(3.62)	VY040	15.2(33.4)	16(35.2)
	VY050	320(12.60)	165(6.50)	20(0.79)	125(4.92)	4	18(0.71)	150(5.91)	90(3.54)	VY050	18.9(41.6)	19.7(43.3)
	VY080	370(14.57)	200(7.87)	24(0.94)	160(6.30)	8	18(0.71)	170(6.69)	102(4.02)	VY080	32.7(71.9)	33.5(73.7)
	VY100	420(16.54)	235(9.25)	24(0.94)	190(7.48)	8	22(0.87)	200(7.87)	120(4.72)	VY100	45.5(100.1)	46.3(101.9)
	VY150	530(20.87)	300(11.81)	28(1.10)	250(9.84)	8	26(1.02)	260(10.24)	144(5.67)	VY150	66.9(147.2)	66.9(147.2)
	VY200	610(24.02)	375(14.76)	34(1.34)	320(12.60)	12	30(1.18)	300(11.81)	162(6.38)	VY200	89.4(196.7)	89.4(196.7)

*: Lay Length (L) tolerances are as follows.
- VY015 to VY200: ±3.0 mm

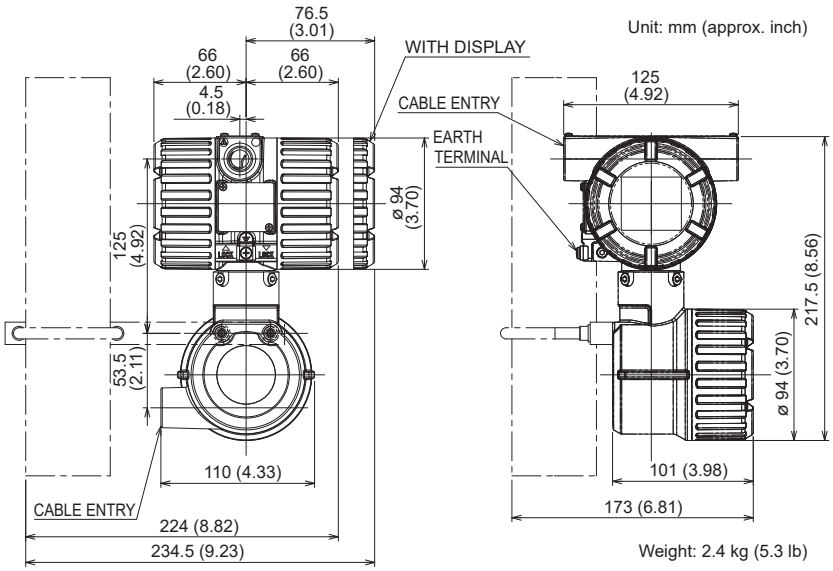
● **Height/Inner diameter/Sensor inner diameter dimensions (Common dimension specifications)**
For dimensions other than those indicated below, read the dimension specifications table for the relevant type and model.

Model	Type of body	Shedder bar type code	Shedder bar material code	Height	Inner diameter	Sensor inner diameter
				H	ΦC	ΦCS
VY015	-0	A	-	136.5(5.37)	14.6(0.57)	-
		E, G	-	218(8.58)	14.6(0.57)	-
	-6	N	-	136.5(5.37)	14.6(0.57)	-
		S, U	-	218(8.58)	14.6(0.57)	-
VY025	-0	A, B	-	164(6.46)	25.7(1.01)	-
		C, D, E, G, H	-	224(8.82)	25.7(1.01)	-
	-1 or -4	A	-	136.5(5.37)	25.7(1.01)	14.6(0.57)
		E, G	-	218(8.58)	25.7(1.01)	14.6(0.57)
	-6	N, P	-	164(6.46)	25.7(1.01)	-
		Q, R, S, U, V	-	224(8.82)	25.7(1.01)	-
VY040	-0	A, B	-	171(6.73)	39.7(1.56)	-
		C, D, E, G, H	-	231(9.09)	39.7(1.56)	-
	-1 or -4	A, B	-	164(6.46)	39.7(1.56)	25.7(1.01)
		C, D, E, G, H	-	224(8.82)	39.7(1.56)	25.7(1.01)
	-2	A	-	136.5(5.37)	39.7(1.56)	14.6(0.57)
		E, G	-	218(8.58)	39.7(1.56)	14.6(0.57)
	-6	N, P	-	171(6.73)	39.7(1.56)	-
		Q, R, S, U, V	-	231(9.09)	39.7(1.56)	-
VY050	-0	A, B	-	198(7.8)	51.1(2.01)	-
		C, D, E, G, H	-	258(10.16)	51.1(2.01)	-
	-1 or -4	A, B	-	171(6.73)	51.1(2.01)	39.7(1.56)
		C, D, E, G, H	-	231(9.09)	51.1(2.01)	39.7(1.56)
	-2	A, B	-	164(6.46)	51.1(2.01)	25.7(1.01)
		C, D, E, G, H	-	224(8.82)	51.1(2.01)	25.7(1.01)
	-6	N, P	-	198(7.80)	51.1(2.01)	-
		Q, R, S, U, V	-	258(10.16)	51.1(2.01)	-
VY080	-0	A, B	-	215(8.46)	71(2.8)	-
		C, D, E, G, H	-	275(10.83)	71(2.8)	-
	-1 or -4	A, B	-	198(7.8)	71(2.8)	51.1(2.01)
		C, D, E, G, H	-	258(10.16)	71(2.8)	51.1(2.01)
	-2	A, B	-	171(6.73)	71(2.8)	39.7(1.56)
		C, D, E, G, H	-	231(9.09)	71(2.8)	39.7(1.56)
	-6	N, P	-	215(8.46)	71(2.80)	-
		Q, R, S, U, V	-	275(10.83)	71(2.80)	-
VY100	-0	A, B	-	236(9.29)	93.8(3.69)	-
		C, D, E, G, H	-	296(11.65)	93.8(3.69)	-
	-1 or -4	A, B	-	215(8.46)	93.8(3.69)	71(2.8)
		C, D, E, G, H	-	275(10.83)	93.8(3.69)	71(2.8)
	-2	A, B	-	198(7.8)	93.8(3.69)	51.1(2.01)
		C, D, E, G, H	-	258(10.16)	93.8(3.69)	51.1(2.01)
	-6	N, P	-	236(9.29)	93.8(3.69)	-
		Q, R, S, U, V	-	296(11.65)	93.8(3.69)	-
VY150	-0	A, B	BL, BH, HH	244.5(9.63)	138.8(5.46)	-
			BB	251.5(9.9)	138.8(5.46)	-
		C, D, G, H	BL, BH	344.5(13.56)	138.8(5.46)	-
			BB	351.5(13.84)	138.8(5.46)	-
	-1 or -4	A, B	-	236(9.29)	138.8(5.46)	93.8(3.69)
		C, D, G, H	-	296(11.65)	138.8(5.46)	93.8(3.69)
	-2	A, B	-	215(8.46)	138.8(5.46)	71(2.8)
		C, D, G, H	-	275(10.83)	138.8(5.46)	71(2.8)
	-6	N, P	EN, EJ	244.5(9.63)	138.8(5.46)	-
			EE	251.5(9.90)	138.8(5.46)	-
		Q, R, S, U, V	EN, EJ	344.5(13.56)	138.8(5.46)	-
			EE	351.5(13.84)	138.8(5.46)	-

Model	Type of body	Shedder bar type code	Shedder bar material code	Height	Inner diameter	Sensor inner diameter
				H	ΦC	ΦCS
VY200	-0	A, B	BL, BH	286.5(11.28)	185.6(7.31)	-
			BB	293.5(11.56)	185.6(7.31)	-
		C, D, G, H	BL, BH	406.5(16)	185.6(7.31)	-
			BB	413.5(16.28)	185.6(7.31)	-
	-1	A, B	BL, BH	244.5(9.63)	185.6(7.31)	138.8(5.46)
			BB	251.5(9.9)	185.6(7.31)	138.8(5.46)
		C, D, G, H	BL, BH	344.5(13.56)	185.6(7.31)	138.8(5.46)
			BB	351.5(13.84)	185.6(7.31)	138.8(5.46)
	-2	A, B	-	236(9.29)	185.6(7.31)	93.8(3.69)
		C, D, G, H	-	296(11.65)	185.6(7.31)	93.8(3.69)
	-6	N, P	EN, EJ	286.5(11.28)	185.6(7.31)	-
			EE	293.5(11.56)	185.6(7.31)	-
		Q, R, S, U, V	EN, EJ	406.5(16.00)	185.6(7.31)	-
			EE	413.5(16.28)	185.6(7.31)	-
VY250	-0	A, B	-	349(13.74)	230.8(9.09)	-
		C, D, G, H	-	508(20)	230.8(9.09)	-
VY300	-0	A, B	-	379(14.92)	276.2(10.87)	-
		C, D, G, H	-	538(21.18)	276.2(10.87)	-
VY400	-0	A	-	446(17.56)	354.2(13.94)	-
		C, G	-	596(23.46)	354.2(13.94)	-

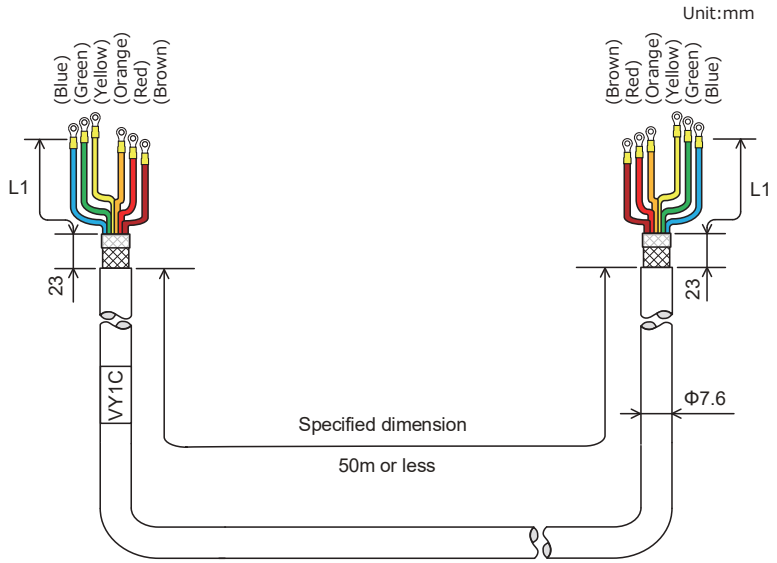
Unit: mm (approx. inch)

(2) Remote Transmitter



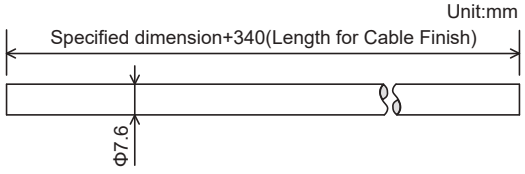
(3) Remote Transmitter signal cable

- Cable end: With end finish
  VY1C-1-□□□



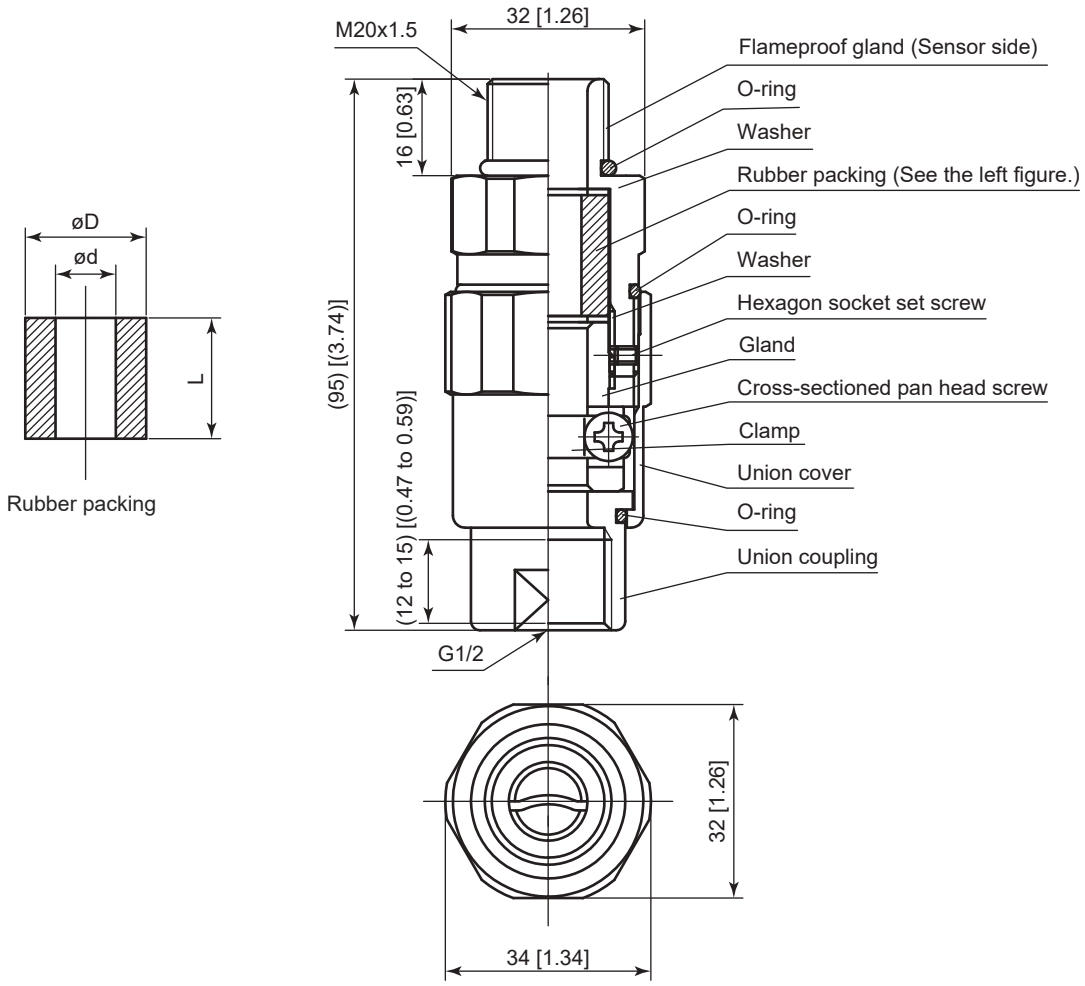
Cable color	L1 length (mm)
Brown	75 +5/-0
Red	80 +5/-0
Orange	90 +5/-0
Yellow	105 +5/-0
Green	100 +5/-0
Blue	95 +5/-0

- Cable end: Without end finish
  VY1C-0-□□□



(4) Flameproof Packing Adapter (Certification Code: JF5)

Unit: mm ([ ]: approx.inch)



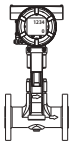
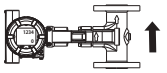
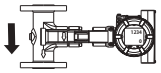
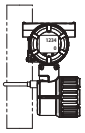
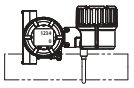
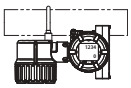
Unit: mm ([ ]: approx.inch)

Dimensions of rubber packing (before compression)			Identification mark of rubber packing	Cable outer diameter	
L	øD	ød		Min.	Max.
20 [0.79]	ø20 [0.79]	ø10 [0.39]	ø10 [0.39]	ø8.0 [0.31]	ø10.0 [0.39]
20 [0.79]	ø20 [0.79]	ø12 [0.47]	ø12 [0.47]	ø10.0 [0.39]	ø12.0 [0.47]

F45.ai

■ Ordering Information

1. Model, suffix codes, and options
2. Sizing number (required when ordering):
   Create the sizing data by using the specification selection tool or FlowConfigurator.
3. Selection of upper display flow rate (when "With Display" is selected):
   Select % or engineering unit.
4. Tag No.:
   - Tag plate (up to 16 single-byte alphanumeric characters and symbols)
   - HART communication (up to 32 single-byte alphanumeric characters and symbols)
   - Stainless steel tag plate (up to 30 single-byte alphanumeric characters and symbols when option code /SCT is selected)
5. Final destination selection
6. Name of customer on Calibration Certificate (when option code /L2, /L3, /L4 or /L6 is selected)
7. Cable entry direction (when option code /RH is selected):
   +90°, -90°, +180°
8. Direction of display at shipment (when "With Display" is selected):
   0°, +90°, -90°

	Direction of display		
	Not specified or 0° rotation	+90° rotation	-90° rotation
Integral Flowmeter	 ➡ Flow direction	 Flow direction	 Flow direction
Remote Sensor	 Installation example	 Installation example	 Installation example

9. Tag No. for downstream transmitter (when dual sensor integral type is selected)
   - Tag plate (up to 16 single-byte alphanumeric characters and symbols)
   - HART communication (up to 32 single-byte alphanumeric characters and symbols)
   - Stainless steel tag plate (up to 30 single-byte alphanumeric characters and symbols when option code /SCT is selected)

■ Related Documents

Document title	Document No.
Vortex Flowmeter VY Series	GS 01F07A00-01EN
FSA130 Magnetic Flowmeter/Vortex Flowmeter Verification Tool	GS 01E21A04-01EN
Vortex Flowmeter VY Series Read Me First	IM 01F07A21-01Z1
Vortex Flowmeter VY Series Safety Manual	IM 01F07A21-02EN
Vortex Flowmeter VY Series Installation Manual	IM 01F07A01-01EN
Vortex Flowmeter VY Series Maintenance Manual	IM 01F07A01-02EN
Vortex Flowmeter VY Series HART Communication Type	IM 01F07A02-01EN
Vortex Flowmeter VY Series Verification Tool	IM 01F07A04-01EN
Vortex Flowmeter VY Series FM (USA) Explosion Protection Type	IM 01F07A03-01EN
Vortex Flowmeter VY Series FM (Canada) Explosion Protection Type	IM 01F07A03-02EN
Vortex Flowmeter VY Series ATEX Explosion Protection Type	IM 01F07A03-03EN
Vortex Flowmeter VY Series IECEx Explosion Protection Type	IM 01F07A03-04EN
Vortex Flowmeter VY Series Japan Explosion Protection Type	IM 01F07A03-05JA
Vortex Flowmeter VY Series INMETRO Explosion Protection Type	IM 01F07A03-07PT
Vortex Flowmeter VY Series KOREAN Explosion Protection Type	IM 01F07A03-10KO

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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.