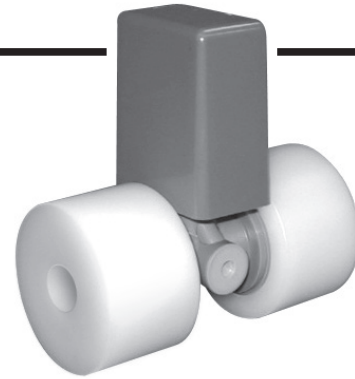


GENERAL SPECIFICATIONS

ULTRASONIC VORTEX FLOWMETER (PEEK series)



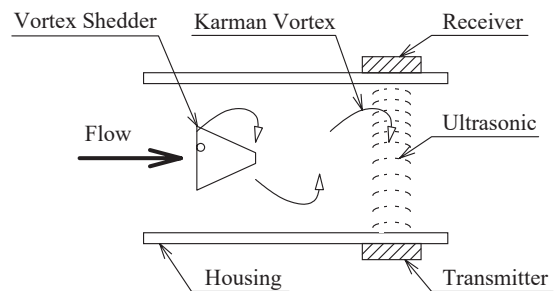
GS-F3030E-04



Overview

The ultrasonic vortex flowmeter is a flowmeter only for the liquid where the Karman vortex regularly generated in the downstream of the vortex shedding bluff body put in the flow is detected with the ultrasonic sensor of non-contact. In the PEEK series, there is neither a seal nor a pocket, except in the piping connection part, because liquid contact parts are molded as one body with an excellent corrosion-resistant PEEK resin. Therefore, the PEEK series is suitable for the measurements such as chemicals, corrosive fluids and ultra-pure waters.

Principle of Measurement



Features

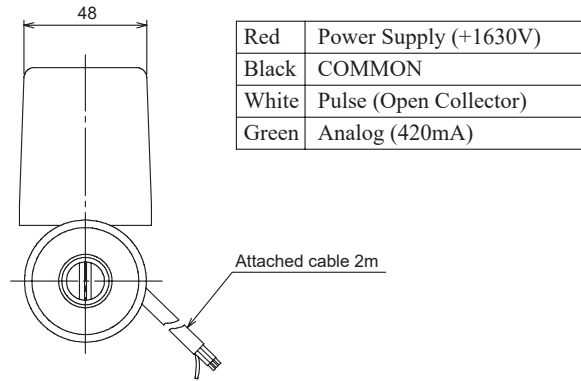
- High Accuracy**
 Because the Karman vortex frequency is detected by ultrasonic, the flow can be measured with a high accuracy in the wide flow range.
- Excellent Corrosion-resistant Feature**
 Because an excellent corrosion-resistant PEEK resin is used for the parts in contact with liquid, it is suitable for the measurements of ultra-pure water and chemicals.
- Complete Pocketless Structure**
 Because of the pocketless structure where fluid is always moving, it is suitable for the measurements of the liquid which causes chemical reactions or liquid that changes quality easily.
- Noise Resisting Structure**
 Because a high frequency ultrasonic sensor is used, the sensor is not influenced by mechanical noise such as piping vibrations.
- Maintenance-Free Structure**
 Maintenance is easy because the measurement system has no moving parts.
- Light-weight**
 PEEK series flowmeter is lightened by the resin and can be directly installed at the resin piping of the ultra-pure water line etc.
- Various Applications**
 Because the filling material is not used in PEEK resin, metal ion is not liquated so that it can measure non-conducted fluid including ultra-pure water.

Standard Specification (Measuring Unit)

Applicable Fluid	Liquid (Including corrosive fluid, and ultra-pure water.)	
Accuracy	±3% RD (± 1% RD : Option)	
Flow Rate Range	1.7220 L/min (Depending on the connection size and the viscosity.)	
Fluid Temperature	0140°C	
Working Pressure	0.390.98 MPa (Depending on the joint material and temperature.)	
Connection Size	15 mm (1/2B), 25 mm (1B)	
Joint Type	Screwed, Flange (Wafer)	
Material	Housing	PEEK resin
	Case	ABS resin
	O-ring	Fluorine Rubber
	Joint	PP, PVDF
Piping Installation	Horizontal, Vertical, Diagonal	

Standard Specification (Transmission Unit)

Output Pulse	Type	Non-compensated Pulse
	Output Signal	Open Collector
	Unit of Pulse	Approx. 340P/L (connection size 15mm) Approx. 84P/L (connection size 25mm)
	Duty	Approx. 50%
	Pulse Width (at maximum flow)	Approx. 1.0ms (connection size 15mm) Approx. 1.6ms (connection size 25mm)
	Capacity	30V DC 0.1A
Analog Output	Output Signal	420mA
	Time Constant	Approx. 3 second
	Load Resistance	0500Ω
Power Supply		1630V ±10% DC
Power Consumption		50mA
Structure		Drip-Proof (IP64)
Case Material		ABS (acrylonitrile-butadien-styrene) resin
Outer Cable		CVVS 4 wick shield liner (Wick wire 0.3mm ² , Outside diameter φ5.7)
Ambient Temperature		0 60°C
Ambient Humidity		5100%RH (Non-condensate)



Joint Material and Fluid Condition

Joint Material	Max. Working Pressure	Working Fluid Temperature
PP	0.98 MPa	0 30 °C
	0.58 MPa	31 60 °C
	0.39 MPa	61 80 °C
PVDF	0.98 MPa	0 60 °C
	0.83 MPa	61 80 °C
	0.73 MPa	81 90 °C
	0.58 MPa	91 100 °C

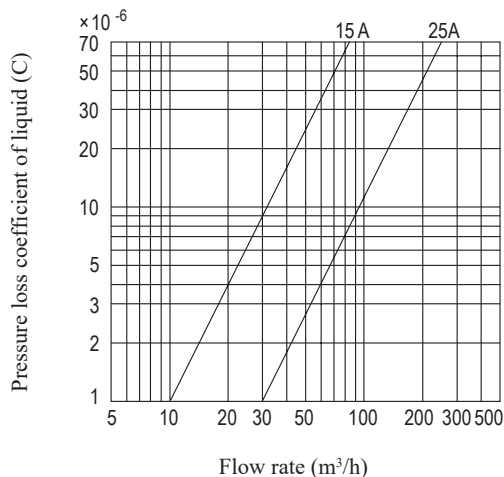
Flow Rate Range (Accuracy ± 3%, ± 1%) (±1% : Option)

Conn. Size (mm)	Accuracy Guaranteed Minimum Flow (L/min)										Max. Flow Rate (L/min)
	Kinematic Viscosity (10 ⁻⁶ m ² /s)										
	0.3	0.5	0.7	1	2	3	4	5	7		
15	3.4	5.0	6.7	10	20	30	40	50	70		80
25	8.4	15	20	29	57	85	114	142	200		220

Flow Rate Range Which Can Be Measured

Conn. Size (mm)	Minimum Flow which can be measured (L/min)										Max. Flow Rate (L/min)
	Kinematic Viscosity (10 ⁻⁶ m ² /s)										
	0.3	0.5	0.7	1	2	3	4	5	7		
15	1.7	2.5	3.4	5.0	10	15	20	25	35		80
25	3.4	5.9	8.4	12	24	35	47	59	82		220

Pressure Loss Characteristics



Note 1) The pressure loss is calculated from next expression.

$$\Delta P = C \times \gamma$$

ΔP : Pressure loss (MPa)

C : Pressure loss coefficient (left table)

γ : Density of fluid (kg/m³)

2) Please hold the line pressure more than the next value at the exit side of the flowmeter to prevent the cavitation.

$$P_d = 2.7 \times \Delta P + 1.3 \times P_o$$

P_d : The downstream side pressure

(MPa abs, absolute pressure)

ΔP : Pressure loss (MPa)

P_o : Steam pressure of fluid at measuring temperature

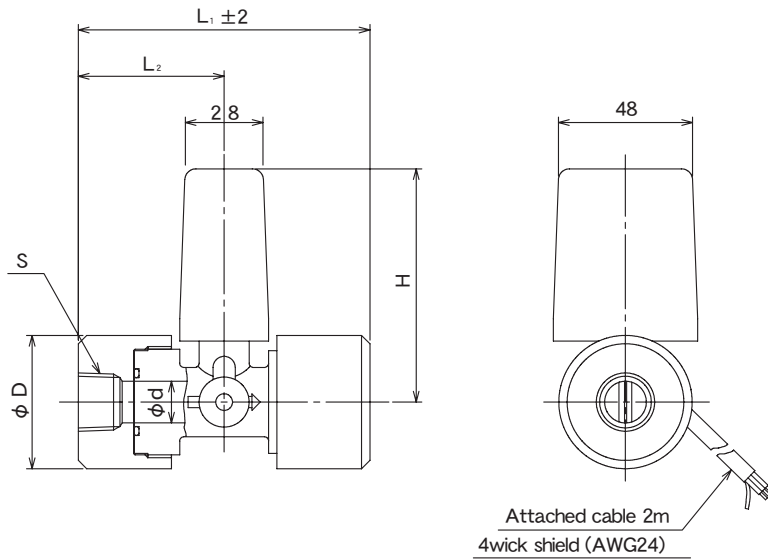
(MPa abs, absolute pressure)

Basic Models

1	2	3	4	5	6	7	8	9	10	11	12	Contents			
F U P												ULTRASONIC VORTEX FLOWMETER (PEEK series)			
Conn. Size		B 4										1/2 B (15 mm)			
		B 8										1 B (25 mm)			
Max. Working Pressure		B										Max. Working Pressure [() : Fluid Temperature]		Joint Material	
												0.39 MPa (at 80°C) ~ 0.98 MPa (at 30°C)	PP		
												0.58 MPa (at 100°C) ~ 0.98 MPa (at 60°C)	PVDF		
Pulse Transmitter													Structure	Output Pulse	Analog Output
		N W											Drip-Proof (IP64)	Open Collector	4 ~20 mA
Joint Material													B	PP	
													C	PVDF	
Joint Type													D	Screwed	
													E	Flange (Wafer)	

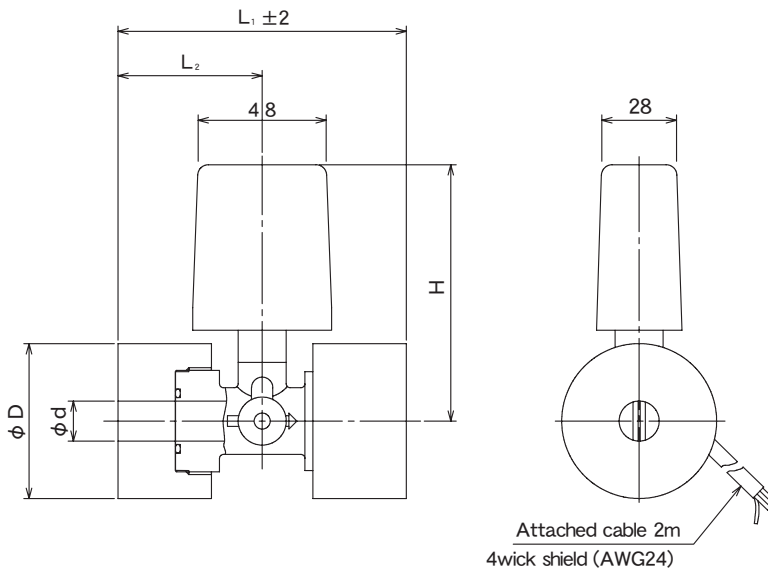
Dimension Drawing

■ Screwed Type



Conn. Size (mm)	Dimensions (mm)						Approx Weight (g)
	L ₁	L ₂	H	d	D	S	
15	105	53	84	15	48	Rc1/2	250
25	146	73	95	25	68	Rc 1	450

■ Flange Type (Wafer)



Conn. Size (mm)	Dimensions (mm)					Approx Weight (g)
	L ₁	L ₂	H	d	D	
15	108	54	107	15	58	250
25	160	80	95	25	77	450

Attention Piping and Installation

- To prevent the influence which the flow such as one-sided flow or turn flow gives to the instrumental error, install the tube longer than 10D on the entrance side and install the tube longer than 2D on the exit side of the flow meter. (D is nominal pipe diameter)
- Make sure to set flow direction shown on the flowmeter the actual fluid flow direction.
- Align the flowmeter with piping using appendant collors. Misalignment will cause accuracy instability.
- The gasket must not protrude in the passage between the flowmeter and the connected piping to secure the flow measurement accuracy.
- As for the installation position, any horizontal, vertical or diagonal position is possible. However, always fill the piping with the fluid in any positions. The measurement will become impossible in the 2-phase flow (gas and liquid) or in the bubble mixed flow.
- Inside diameter of the piping connected inlet and outlet side of the flowmeter should be equal or larger than the inside diameter of the flowmeter to ensure the flow measurement accuracy.
- This flowmeter is very vibration-proof. However install a support if there is extreme vibration, which may cause the damage of piping.
- Please avoid the installation of the flowmeter in areas of extreme high temperature, low temperature, large heat radiation and corrosive atmosphere is strong.
- If a feeding pump like plunger or bellows type is used, pulsation flow will causes measuring error. Minimize the pulsation flow by means of an orifice and the chamber.
- Please use this flowmeter indoors because of the gush prevention type structure.
- Please do not use this flowmeter in a dangerous place because it is not an explosion-proof structure.

Attention Wiring

- Please set up the signal lines away from high voltage and high electric current source to prevent the noise mixed.
- Please separate wiring from the power line as much as possible.
- Length of the attached cable is 2m. Please relay the wiring with joint box etc. when transmitting to the long distance. The cable between these points must use shield cable which meets the undermentioned specification.

Output	Number of Wicks	Sectional Area
Either pulse or analog	3C shield	0.3sq or more
Output pulse and analog simultaneously	4C shield	0.3sq or more

Maximum transmission distance: 100m, Recommended cable: CVVS

Ordering Instruction

	Item	Contents
1	Applications	For Production Control etc
2	Applicable Fluid	Name, Composition, Existence of Admixture, Existence of Corrosive
3	Flow Rate	Maximum, Normal, Minimum, Full Scale, (Use time per day) (L/min)
4	Fluid Temperature	Maximum, Normal, Minimum (°C)
5	Fluid Pressure	Maximum, Normal, Minimum (MPa)
6	Viscosity and Density of Fluid	Viscosity (at°C), Density (at°C)
7	Power Supply	
8	Connected Meter	Totalizer, Recorder, Indicator, etc
9	Transmission Distance	(m)

*Be sure to read the instruction manual carefully before you use this meter to ensure you use it correctly.

*Note that the contents may be subject to change without notice.

● Contact

Tokico System Solutions, Ltd.

Global Business Div.
Sales Management Headquarters

Parale Mitsui Bldg, 8, Higashida-cho, Kawasaki-ku,
Kawasaki-shi, Kanagawa 210-0005 Japan

TEL . 81-50-3852-5336

FAX . 81-44-222-7155

URL : <https://www.tokicosys.com/en/>