Safety Precautions

Be sure to read this section before use.
Refer to Intro 17 for General Precautions.

Design / Selection

1. Working fluids

DANGER

■Do not use the water as drinking water.
As it does not conform to the requirements of the Food Sanitation Act, do not use this product for applications that measure water entering the human body. Intended applications include industrial sensors.

■Do not use this product with flammable fluids.

WARNING

■This product cannot be used as a billing meter.
Do not use this product for commercial transactions as it is not compliant with the Measurement Act. It cannot be calibrated, so use it as an industrial sensor.

■Applicable fluid is water (industrial water, pure water); do not use with any other fluid.

2. Working environment

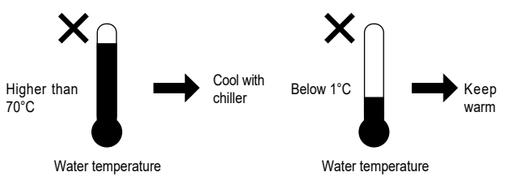
DANGER

■Flammable environment
Never use this product in an explosive gas atmosphere. The structure is not explosion-proof, and explosions or fires could occur.

WARNING

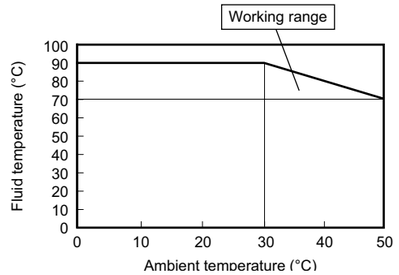
■Corrosive environment
Do not use this product in an atmosphere containing corrosive gases such as sulfur dioxide.

■Fluid/ambient temperatures
Use with fluid temperature within the range of 1 to 70°C. If the fluid temperature rises to 70°C and over, cool it down using a cooling system such as a chiller. As well, if there is a risk of freezing, drain the product or keep it warm to prevent freezing. Even if the ambient temperature is within the specified range, do not use this product in a location where rapid changes in temperature can occur.



Ambient temperature should be in the range of 0 to 50°C.

The WFK3060 Series can be used in the following ranges.



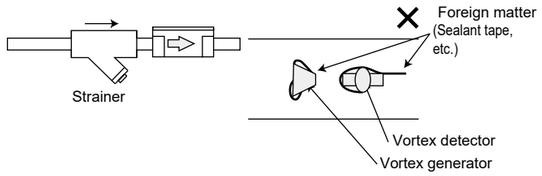
■Max. working pressure
Do not use at a pressure exceeding the max. working pressure, as excessive pressure can cause product failure. To prevent the pressure from reaching the max. working pressure, particularly due to water hammer, take the following measures:
(1) Using a water hammer reduction valve or other similar mechanism, regulate the valve closing speed.
(2) Using elastic piping material, e.g. rubber hose, and an accumulator, absorb the impact pressure.
(3) Make the pipe length as short as possible.

■Drip-proof environment
This product employs a dust-proof, drip-proof structure that provides reliability during maintenance and cleaning, during which it may be exposed to water splashing. However, avoid using this product in a location where it may be constantly exposed to water or intense splattering of water and/or oil.

■CE-compliance working conditions
This product is CE-marked, indicating conformity with the EMC Directives. The standard for the immunity for industrial environments applied to this product is EN61000-6-2; the following requirements must be satisfied in order to conform to this standard:
Conditions
●The evaluation of this product is performed by using a cable that has a power supply line and a signal line paired to assess the product's performance.
●This product is not equipped with surge protection. Implement surge protection measures on the system side.

CAUTION

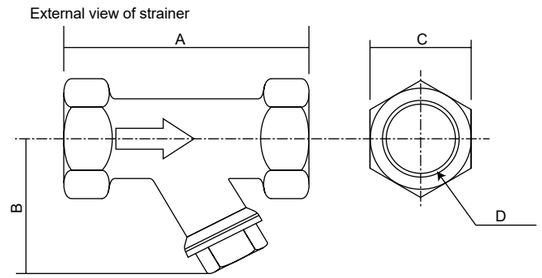
■If there is a risk of foreign matter entering the fluid, install a filter (strainer) on the primary side. If foreign matter adheres to the vortex generator or vortex detector, measurement accuracy can be compromised.



Strainer specifications

Item	Specifications
Specification fluid	Water
Proof pressure MPa	2
Working pressure range MPa	0 to 1
Ambient temperature °C	1 to 90
Main material	**Specifications**
Body	Bronze casting
Strainer	Stainless steel

External view of strainer



Model No.	A	B	C	D
WF-FL-280730	70	44	23	Rc 3/8
WF-FL-280731	80	49	28	Rc 1/2
WF-FL-280732	100	57	35	Rc 3/4
WF-FL-280733	115	72	43	Rc1
WF-FL-280734	135	82	52	Rc1 1/4
WF-FL-280735	160	98	59	Rc1-1/2

■Vibration / Impact
Do not use this product in an environment exposed to vibration of 20 m/s^2 and over, and shock of 98 m/s^2 and over. This may cause malfunction and/or damage, as this product uses the Karman's vortex type detection principle.

× Vibration 20 m/s^2 or more × Shock 98 m/s^2 or more

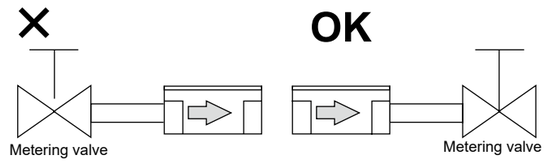
■Hardware check and other internal settings are performed during the first two seconds or so after turning ON the power. Display and output do not function normally during this period. Particularly, if a transistor output is used in the control of an interlock circuit, an abnormal stop may occur. Mask the output during this period.

3. Wiring

CAUTION

■Pipes can be installed in any orientation, vertical, horizontal, etc. Note that pipes should be installed so that the fluid constantly fills the piping while it flows through the pipes. When installing a pipe vertically, making the fluid flow upward can reduce the influence of air bubbles inside.

■If a pipe is narrowed just before the flow rate sensor, or if there is a valve or other restricting component on the primary side, cavitation occurs inside the pipe, preventing accurate measurement. For this reason, such piping should be installed on the secondary side of the sensor. Cavitation...(Vapor cavities that form due to the static pressure at end points, such as a ship propeller, dropping below the vapor pressure of the water. Reduced efficiency or screw damage may result.)



However, operating the pump with the secondary side valve closed may cause the flow rate sensor to detect pressure waves from the pump, resulting in incorrect indication. If this occurs, install the valve on the primary side. When doing so, ensure that a straight pipe with a diameter of 10 times or more bore size is installed between the valve and the flow rate sensor.

■Using an elbow or bush in the piping
●When using an elbow or bush in the piping, provide straight piping sections of at least 10 D on the IN side and 5 D on the OUT side when using a WFK3060 Series model. Note that bore size change by bush should be limited to one size. Without a straight pipe, measurement accuracy can be compromised due to disturbances in the flow rate and/or pressure distribution.
(Straight pipes are not necessary for the WFK3004, 3012, and 3032 Series. However, it is recommended that a straight pipe is installed to ensure stable measurements.)
* Where "D" indicates the inner diameter of the piping material. Refer to the table below for specific values.

Bore size	Rc3/8 (10 A)	Rc1/2 (15 A)	Rc3/4 (20 A)	Rc1 (25 A)
5D	50 mm	75 mm	100 mm	125 mm
10D	100 mm	150 mm	200 mm	250 mm

■Keep the cable away from all noise sources, including power distribution wires. Noise can cause malfunctions.

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → "Model No.→ Instruction Manual