

Easy setting function

Frequently used settings can be set from the normal screen using shortcut operations.

Change main screen display	
Switch setting Hysteresis mode Window mode	
Integrated Switch setting	
Integrated Pulse setting	
Accumulation reset	
Key lock	



Water-use components

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.
- Never 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. When supporting fluorine-based fluids, the product can be used only with the fluids described in the applicable 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. IIC3 Ex ec II C T4 Gc 0°C when option (ATEX compatible) is selected ≤T_a≤ Can be used in 50°C environments. Refer to "Options (ATEX compatible)" on P. 445 for use conditions.

⚠ WARNING

- Corrosive environment**
Do not use this product in an atmosphere containing corrosive gases such as sulfur dioxide.
- Fluid/ambient temperatures**
Use in a fluid temperature range of 1 to 95°C (-10 to 95°C for fluorine-based liquid) and an ambient temperature range of 0 to 50°C. If the fluid temperature rises to 95 °C or higher, 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. When the fluid and ambient temperatures are high, the product may also get hot. There is a risk of burns if it is touched directly. 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.
- 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, reduce 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

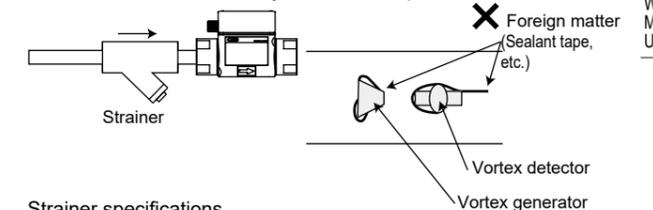
This product is CE-marked, indicating conformity with the EMC Directives. The standard for the immunity for industrial environments applied to this product is EN61000-6-2; the following requirements must be satisfied in order to conform to this standard:

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.

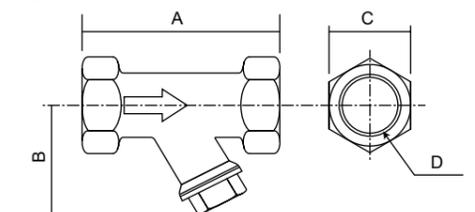


Strainer specifications

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

When using after adjusting to a small flow rate with the manual valve, the valve's opening (clearance) becomes very small. If there are large foreign bodies in the fluid, they may clog the clearance and reduce the flow rate.

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

Flow rate sensor

Compact flow sensor (gas)

Compact flow sensor (air)

Compact flow sensor (liquid)

Water Manifold Unit

Flow rate sensor

Compact flow sensor (gas)

Compact flow sensor (air)

Compact flow sensor (liquid)

Water Manifold Unit

Ending

Ending

■ Vibration / Impact

Do not use this product in an environment exposed to vibration of 20 m/s² and over, and shock of 98 m/s² and over. This may cause malfunction and/or damage, as this product uses the Karman's vortex type detection principle.

■ 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. Regarding manual valves

⚠ CAUTION

■ Since the manual valve (needle) does not have a closing function, internal leakage will occur even when the valve is fully closed. If a closing function is required, select the manual valve (cock).

■ After adjusting the flow rate with the manual valve, be sure to fix it with the push lock for the cock type and the lock nut for the needle type. If not fixed, the flow rate will fluctuate.

■ Do not use the manual valve continuously.

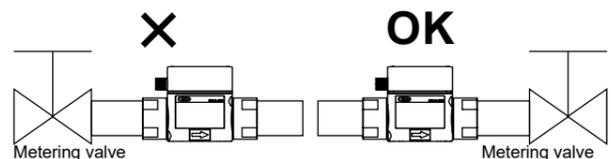
■ The position of the dial mark on the needle type varies depending on the individual model. It does not indicate an absolute opening.

4. Piping

⚠ 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. When it is unavoidable and the valve is arranged on the primary side, provide a straight pipe with a diameter of 10 times or more between the valve and the flow rate 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.)



■ 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.

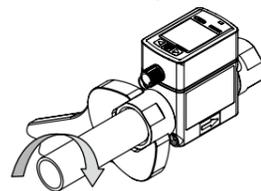
■ Using an elbow or bush in the piping

When using an elbow or bush in the piping, provide straight piping sections of at least 10D on the IN side and 5D on the OUT side when using a WFK2-100 or WFK2-250 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 WFK2-005, WFK2-020 and WFK2-050 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)	Rc1 1/4 (32 A)	Rc1-1/2 (40 A)
5D	50 mm	75 mm	100 mm	125 mm	160 mm	200 mm
10D	100 mm	150 mm	200 mm	250 mm	320 mm	400 mm

■ When mounting piping or fittings to this product, always hold the attachment on the mounting side with a tool. Holding the body of the product or the attachment on the opposite side may lead to damage.



■ Keep the cable far away from power cords or other things that may cause noise. Noise can cause malfunctions.

Option (ATEX compatible)

■ The following are supported.
II3 G Ex ec II C T4 Gc 0°C ≤ Ta ≤ 50°C

■ Working conditions

- 1) When using, store in a protection box and protect the flow rate sensor from all directions.
Protection box strength: Higher than DC01, DC03, DC04, DC05, DC06, DC07.
Plate thickness: 1 mm or more
Clearance between flow rate sensor and plate: 70 mm or more
- 2) There is a risk of static electric discharge. Attach to grounded metal and wipe with a wet cloth.
- 3) Use in a clean environment with a contamination level of 2 or more.

■ Fluid temperature rating

The temperature of the fluid measured for explosion-proof specifications is 95°C.

■ ATEX Directive

EN standards for explosive atmospheres
EN IEC 60079-0:2018
EN 60079-7:2015

⚠ WARNING

■ Do not remove or insert cables while energized in an explosive atmosphere.

⚠ CAUTION

■ Use an M12 cable compliant with the ATEX Directive.

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"