Karman Vortex Flow Sensor for Water
FLUEREX WFK3000 Series
FLOW SENSOR FOR WATER WFK3000 SERIES

Large flow rate with compact body

60L/min
Large flow rate type
New release!!

Output variation types added
Size and range that are easy to design with

New release of small water sensors with large flow rates!

WFK3060  WFK3032

FLUEREX - Karman Vortex Flow sensor for Water

WFK3000 SERIES

Rich model variations

<table>
<thead>
<tr>
<th>Model variations</th>
<th>Port size</th>
<th>Flow rate range (L/min)</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFK3000 S Series</td>
<td>Rc3/8</td>
<td>1.5 - 60</td>
<td>Water temperature measuring function (Rc3/8 only) Analog output temperature range: 10 to 70°C</td>
</tr>
<tr>
<td></td>
<td>Rc1/2</td>
<td>4.0 - 60</td>
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<tr>
<td>WFK3000 M Series</td>
<td>Rc3/8</td>
<td>1.5 - 60</td>
<td></td>
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<tr>
<td></td>
<td>Rc1/2</td>
<td>4.0 - 60</td>
<td></td>
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<tr>
<td>WFK3000 C Series</td>
<td>Rc3/8</td>
<td>1.5 - 60</td>
<td></td>
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<tr>
<td></td>
<td>Rc1/2</td>
<td>4.0 - 60</td>
<td></td>
</tr>
</tbody>
</table>

Rich model variations

C type variations added
Sensor type will be ready for use as soon as wiring is completed. Setting of switch type is done simply by turning the rotary switch. Troublesome switch settings are not required.

**WFK3000S**  
Sensor type: 1 analog output

**WFK3000M**  
Switch type: 2 switch output

**WFK3000C**  
Sensor/switch type: 1 analog output, 1 switch output

### Built-in water temperature measuring function
The sensor type can incorporate the water temperature measuring function. Enables water temperature measurements without additional work or space for installation. (WFK3000S Option)

### Equivalent to IP65 degree of protection
Safe to use in food equipment or such other equipment that requires drip-proofness.

### Example of applications

**Semiconductor**  
Semiconductor manufacturing equipment

- Cooling and temperature control of semiconductor manufacturing equipment.
- Etching, grinding, dicing, CVD.

**Hardening**  
Induction hardening device

- Quantitative management of cooling water.

The reliable Karman’s vortex method is utilized. Unlike the impeller type, you are freed from trouble caused by debris and rust in the piping as there are no moving parts.

### Highly reliable measurements

**Controls**

- Communication
- I/O unit
- A/D conversion unit

- Recorder
- Monitoring and displaying flow rate

- Detecting problems (controlling peripheral devices)

**Water**  
Water flow rate

**Air**  
Air flow rate

**Solenoid valve**

**Valve**

**Output terminal**

**Abnormal flow rate detection**

**RLC**

**Input terminal**

**Output terminal**

**Air operated Valve**
# FLUEREX
## WFK3000S Series
(Compact/Device Built-in Sensor Type)

### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WFK3004S-10</th>
<th>WFK3004S-15</th>
<th>WFK3012S-10</th>
<th>WFK3012S-15</th>
<th>WFK3032S-10</th>
<th>WFK3032S-15</th>
<th>WFK3060S-20</th>
<th>WFK3060S-25</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptions</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Flow rate measurement range L/min</td>
<td>0.5 to 4.0</td>
<td>1.5 to 12</td>
<td>4.0 to 32</td>
<td>8.0 to 60</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Port size Rc</td>
<td>3/8</td>
<td>1/2</td>
<td>3/8</td>
<td>1/2</td>
<td>3/8</td>
<td>1/2</td>
<td>3/4</td>
<td>1</td>
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<tr>
<td>Port material Stainless steel: SCS13</td>
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<tr>
<td>Applicable fluid Clear water, industrial water</td>
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<td></td>
</tr>
<tr>
<td>Max. working pressure MPa</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Proof pressure MPa</td>
<td>1.5</td>
<td></td>
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</tr>
<tr>
<td>Ambient temperature °C</td>
<td>0 to 50 (85%RH or less)</td>
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<tr>
<td>Fluid temperature °C</td>
<td>1 to 70</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Precision</strong></td>
<td>±2.5% F.S.</td>
<td></td>
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</tr>
<tr>
<td><strong>Temperature characteristics</strong></td>
<td>±5% F.S. (10 to 50°C, 20°C reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Pressure loss</strong> MPa</td>
<td>0.06 or less (at 4.0 L/min)</td>
<td>0.05 or less (at 12 L/min)</td>
<td>0.06 or less (at 32 L/min)</td>
<td>0.05 or less (at 60 L/min)</td>
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<tr>
<td>Response time 1 sec (Note 1)</td>
<td></td>
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<tr>
<td><strong>Output</strong></td>
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<tr>
<td>Display None</td>
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</tr>
<tr>
<td>Analog output Standard: 0 to 5 VDC/Option: 4 to 20 mA, 1 to 5 V, 0 to 10 VDC</td>
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<tr>
<td>Power supply voltage 12 to 24 VDC±10% (MAX 80 mA) 15 to 24 VDC for option A3</td>
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<tr>
<td>Cable 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm</td>
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<tr>
<td>Mounting orientation Unrestricted in vertical/horizontal orientation</td>
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<tr>
<td>Straight piping section None (Note 2) IN side 10D, OUT side 5D</td>
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<tr>
<td>Degree of Protection Equivalent to IP65 (excluding the unit with optional water temperature measuring function)</td>
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</tr>
<tr>
<td>Weight g</td>
<td>380</td>
<td>410</td>
<td>380</td>
<td>410</td>
<td>380</td>
<td>410</td>
<td>470</td>
<td>510</td>
</tr>
<tr>
<td>Bracket weight g</td>
<td>28 (including screws)</td>
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</tbody>
</table>

**Note 1**: This is the time required to return to 70% of the original output after the normal flow rate (in use) is instantly dropped to 0.

**Note 2**: A straight pipe (IN side 10D, OUT side 5D) should be installed to eliminate the effect of piping conditions. (D indicates the connection port diameter.)

**Analog output**

<table>
<thead>
<tr>
<th>-A0 (load 50 kΩ and over)</th>
<th>-A1 (load up to 500 Ω)</th>
<th>-A2 (load 50 kΩ and over)</th>
<th>-A3 (load 50 kΩ and over)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output [V]</td>
<td>5</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>min. Water flow rate</td>
<td>max. Water flow rate</td>
<td>min. Water flow rate</td>
<td>max. Water flow rate</td>
</tr>
<tr>
<td>Output [mA]</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* min. is the minimum value and max. is the maximum value in the flow rate range.

**Water temperature measuring function (option)**

Water flow indicator: green
Lights when water flows within the specified range.

Power indicator: red
Lights when the power is ON.

### Descriptions

<table>
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<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
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<td>Measurement temperature °C</td>
<td>10 to 70°C</td>
</tr>
<tr>
<td>Port size Rc</td>
<td>R3/8 (Note 1)</td>
</tr>
<tr>
<td>Temperature output (analog)</td>
<td>1 to 7 VDC (linear Output)</td>
</tr>
<tr>
<td>Precision</td>
<td>±2°C (under 50°C) (Note 2) ±3°C (50°C to 70°C) (Note 3)</td>
</tr>
</tbody>
</table>

(Note 1) Port size is Rc3/8 only.

(Note 2) When the difference between the fluid temperature and ambient temperature is within ±10°C.

(Note 3) However, the working fluid temperature and ambient temperature difference must be within 20°C.

Also, the conditions must be within product specifications.
Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Flow rate measurement range (L/min)</th>
<th>Port size</th>
<th>Applicable fluid</th>
<th>Max. working pressure MPa</th>
<th>Proof pressure MPa</th>
<th>Ambient temperature °C</th>
<th>Fluid temperature °C</th>
<th>Precision</th>
<th>Temperature characteristics</th>
<th>Pressure loss MPa</th>
<th>Response time (Note 1)</th>
<th>Output display</th>
<th>Switch output</th>
<th>Power supply voltage</th>
<th>Cable</th>
<th>Installation</th>
<th>Degree of protection</th>
<th>Weight g</th>
<th>Bracket weight g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFK3004M-10</td>
<td>WFK3004M-15</td>
<td>WFK3012M-10</td>
<td>WFK3012M-15</td>
<td>WFK3032M-10</td>
<td>WFK3032M-15</td>
<td>WFK3060M-20</td>
<td>WFK3060M-25</td>
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</tr>
<tr>
<td>Port size</td>
<td>Rc</td>
<td>3/8</td>
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<td>3/8</td>
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<td>3/8</td>
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<td>Port material</td>
<td>Stainless steel: SCS13</td>
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<tr>
<td>Applicable fluid</td>
<td>Clear water, industrial water</td>
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<tr>
<td>Max. working pressure MPa</td>
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<tr>
<td>Proof pressure MPa</td>
<td>1.5</td>
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<td>Fluid temperature °C</td>
<td>0 to 50 (85%RH or less)</td>
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<tr>
<td>Fluid temperature °C</td>
<td>1 to 70</td>
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</tr>
<tr>
<td>Precision</td>
<td>±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min (less than 10 L/min), 1 L/min (10 L/min and over))</td>
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</tr>
<tr>
<td>Temperature characteristics</td>
<td>±5% F.S. (10 to 50°C, 20°C reference)</td>
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<tr>
<td>Pressure loss MPa</td>
<td>0.06 or less (at 4.0 L/min)</td>
<td>0.05 or less (at 12 L/min)</td>
<td>0.06 or less (at 32 L/min)</td>
<td>0.05 or less (at 60 L/min)</td>
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</tr>
<tr>
<td>Response time</td>
<td>1 sec (Note 1)</td>
<td></td>
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</tbody>
</table>

Output display

- Instant flow rate 2 digit LED display

Switch output

- 2 point transistor output (select NPN/PNP) |
- MAX. DC50mA |
- Internal voltage drop (NPN) 2.0 V or less (PNP) 2.5 V or less |

Power supply voltage

- 12 to 24 VDC±10% (MAX80mA) |

Cable

- 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm |

Installation

- Unrestricted in vertical/horizontal orientation |

Degree of protection

- Equivalent to IP65 |

Weight

- 380 g | 410 g | 380 g | 410 g | 410 g | 410 g | 470 g | 510 g |

Bracket weight

- 28 g (including screws) |

Note 1: When the switch output is set to 70% of the normal flow rate (used), the time until the switch output occurs after the flow rate drops instantly to 0.

Note 2: A straight pipe (IN side 10D, OUT side 5D) should be installed to eliminate the effect of piping conditions. (D indicates the connection port diameter.)

Functional explanation

- 2 digit digital display |
- Displays the instant flow rate |
- Less than 10L/min: Decimal number displayed |
- 10L/min or more: Integer number displayed |
- Rotary switch for output setting |

- Output light: green (OUT1)* |
- Lights when switch output is ON. |
- Output light: red (OUT2) |
- Lights when switch output is ON. |
- OUT1: lead wire (black) |
- OUT2: lead wire (orange) |

Switch output operation

- [Output option: NO/PO] |
- [Output option: N1/P1] |
- h (hysteresis) |
- Set value |
- Instant flow rate (L/min) |
- ON |
- Switch output |
- OFF |

Switch output set value (L/min)

<table>
<thead>
<tr>
<th>Rotary switch contact number</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFK3004M</td>
<td>WFK3012M</td>
</tr>
<tr>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td>5</td>
<td>1.0</td>
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<tr>
<td>6</td>
<td>1.5</td>
</tr>
<tr>
<td>7</td>
<td>2.0</td>
</tr>
<tr>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>10</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- Hysteresis |
- 0.1 | 0.5 | 1.0 | 3.0 |
### FLUEREX

### WFK3000C Series

(Compact/Device Built-in Sensor & Switch Type)

#### Specifications

| Model No.  | Description                        | Flow rate measurement range L/min | Port size Rc | Applicable Fluid            | Max. working pressure MPa | Proof pressure MPa | Ambient temperature °C | Fluid temperature °C | Precision | Temperature characteristics | Pressure loss | Response time | Output display  | Analog output | Switch Output | Rating | Internal voltage drop | Power supply voltage | Cable | 3 m | 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm | Installation | Mounting orientation | Straight piping section | Degree of protection | Equivalent to IP65 | Weight | Bracket weight g 28 (including screws) |
|------------|------------------------------------|-----------------------------------|-------------|-----------------------------|----------------------------|------------------------|----------------------|------------------------|-------------|------------------------|-------------------|--------------|-------------------|-------------------|------------------|---------------------|------------------|----------------|------------------------------------------------|--------------|-----------------------------|---------------------|------------------|------------------|-------------|----------------------------------------|
| WFK3004C-10 | Flow rate range 0.5 to 4.0         | 3/8 1/2                            | 1/2         | Clear water, industrial water | 1                          | 1.5                    | 0 to 50 (85%RH or less) | 1 to 70                | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | ± 5% F.S. (10 to 50°C, 20°C reference) | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | 0.06 or less (at 4.0 L/min) | 1 sec (Note 1) | Instant flow rate 2 digit LED display | Standard: 0 to 5 VDC /option: 4 to 20mA, 1 to 5 V, 0 to 10 VDC | 1 point transistor output (select NPN/PNP) | MAX. DC 50 mA | (NPN) 2.0V or less (PNP) 2.5V or less | 12 to 24VDC±10% (MAX 80mA) 15 to 24 VDC for option A3 | 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm | Unrestricted in vertical/horizontal orientation | None (Note 2) | IN side 10D, OUT side 5D | Equivalent to IP65 | 380 410 380 410 380 410 470 510 | 28 (including screws) |
| WFK3004C-15 | Flow rate range 1.5 to 12          | 3/8 1/2                            | 1/2         | Clear water, industrial water | 1                          | 1.5                    | 0 to 50 (85%RH or less) | 1 to 70                | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | ± 5% F.S. (10 to 50°C, 20°C reference) | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | 0.06 or less (at 12 L/min) | 1 sec (Note 1) | Instant flow rate 2 digit LED display | Standard: 0 to 5 VDC /option: 4 to 20mA, 1 to 5 V, 0 to 10 VDC | 1 point transistor output (select NPN/PNP) | MAX. DC 50 mA | (NPN) 2.0V or less (PNP) 2.5V or less | 12 to 24VDC±10% (MAX 80mA) 15 to 24 VDC for option A3 | 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm | Unrestricted in vertical/horizontal orientation | None (Note 2) | IN side 10D, OUT side 5D | Equivalent to IP65 | 380 410 380 410 380 410 470 510 | 28 (including screws) |
| WFK3012C-10 | Flow rate range 4.0 to 32          | 3/4 1/2                            | 1/2         | Clear water, industrial water | 1                          | 1.5                    | 0 to 50 (85%RH or less) | 1 to 70                | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | ± 5% F.S. (10 to 50°C, 20°C reference) | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | 0.06 or less (at 32 L/min) | 1 sec (Note 1) | Instant flow rate 2 digit LED display | Standard: 0 to 5 VDC /option: 4 to 20mA, 1 to 5 V, 0 to 10 VDC | 1 point transistor output (select NPN/PNP) | MAX. DC 50 mA | (NPN) 2.0V or less (PNP) 2.5V or less | 12 to 24VDC±10% (MAX 80mA) 15 to 24 VDC for option A3 | 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm | Unrestricted in vertical/horizontal orientation | None (Note 2) | IN side 10D, OUT side 5D | Equivalent to IP65 | 380 410 380 410 380 410 470 510 | 28 (including screws) |
| WFK3012C-15 | Flow rate range 8.0 to 60          | 1/2                                | 1/2         | Clear water, industrial water | 1                          | 1.5                    | 0 to 50 (85%RH or less) | 1 to 70                | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | ± 5% F.S. (10 to 50°C, 20°C reference) | ±2.5% F.S. ± 1 digit (1 digit = 0.1 L/min less than 10 L/min, 1 L/min (10 L/min and over)) | 0.06 or less (at 60 L/min) | 1 sec (Note 1) | Instant flow rate 2 digit LED display | Standard: 0 to 5 VDC /option: 4 to 20mA, 1 to 5 V, 0 to 10 VDC | 1 point transistor output (select NPN/PNP) | MAX. DC 50 mA | (NPN) 2.0V or less (PNP) 2.5V or less | 12 to 24VDC±10% (MAX 80mA) 15 to 24 VDC for option A3 | 3 m, 4-core, final diameter 4.8 mm, core wire 0.2 mm², insulator outer diameter 1.3 mm | Unrestricted in vertical/horizontal orientation | None (Note 2) | IN side 10D, OUT side 5D | Equivalent to IP65 | 380 410 380 410 380 410 470 510 | 28 (including screws) |

#### Functional explanation

- **2 digit digital display:**
  - Displays the instantaneous flow rate.
  - *Less than 10L/min: Decimal number displayed. 10 L/min or more: Integer number displayed.*

- **Rotary switch for output setting:**
  - Allows you to set the switch output level in 10 steps.
  - *Use a precision driver or similar tool to set the rotary switch. Be extremely careful since applying excessive force to the rotating part may result in contact failure.*
  - *Ensure to align the arrow with the scale mark. If it is set in a halfway point, output may become unstable.*
  - *Turn off the power before setting the switch output.*
  - *The set flow rate will be displayed when you close the cover after the switch output setting. The rotary switch may be pre-set to the required level.*

- **Switch output operation**
  - [Output option: NO/PO]
  - [Output Option: N1/P1]
  - **Switch output setting value**
    - **Rotary switch contact number**
    - **Model**
      - **WFK3004C**
      - **WFK3012C**
      - **WFK3032C**
      - **WFK3060C**
    - **Set value**
      - **Instant flow rate (L/min)**
      - **Hysteresis**

<table>
<thead>
<tr>
<th>Rotary switch contact number</th>
<th>WFK3004C</th>
<th>WFK3012C</th>
<th>WFK3032C</th>
<th>WFK3060C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.6</td>
<td>2.0</td>
<td>5.0</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>0.7</td>
<td>3.0</td>
<td>9.0</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>0.8</td>
<td>4.0</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>0.9</td>
<td>5.0</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>1.0</td>
<td>6.0</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>1.5</td>
<td>7.0</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td>7</td>
<td>2.0</td>
<td>8.0</td>
<td>21</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>2.5</td>
<td>9.0</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>3.0</td>
<td>10</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>0</td>
<td>3.5</td>
<td>11</td>
<td>30</td>
<td>55</td>
</tr>
</tbody>
</table>

- **Hysteresis**
  - 0.1
  - 0.5
  - 1.0
  - 3.0
Pressure loss

- **WFK3004**

  ![Diagram for WFK3004]

- **WFK3012**

  ![Diagram for WFK3012]

- **WFK3020**

  ![Diagram for WFK3020]

- **WFK3060**

  ![Diagram for WFK3060]
Model designation (set model No.)

- Sensor type

WFK 3 012 S- 10 A0 T B

A Shape
B Flow rate range
C Port size
D Analog output
E Water temperature measuring function
F Bracket

[Example of model designation]
WFK3004S-10-A0
A Shape: Compact, device built-in
B Flow rate range: 0.5 to 4 L/min
C Port size: Rc3/8
D Analog output: 0 to 5 VDC
E Water temperature measuring function: None
F Bracket: None

- Switch type

WFK 3 012 M- 10 N0 B

A Shape
B Flow rate range
C Port size
D Alarm output
E Bracket

[Example of model designation]
WFK3012M-15-N1B
A Shape: Compact, device built-in
B Flow rate range: 1.5 to 12 L/min
C Port size: Rc1/2
D Alarm output: NPN2 point (b contact)
E Bracket: Attached

Note 1: Contact CKD for G thread/NPT thread.

Note 1: If you select “T” with a water measurement function, only the port size “10” and analog output "A0, A2, A3" can be selected.

Note 2: Contact CKD for G thread/NPT thread.
Model designation

- Sensor/switch type

**WFK 3 004 C- 10 - A0 N0 B**

- **A** Shape
- **B** Flow rate range
- **C** Port size
- **D** Analog output
- **E** Alarm output
- **F** Bracket

### Code Descriptions

<table>
<thead>
<tr>
<th>Code</th>
<th>Shape</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Compact, device built-in</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow rate range</th>
<th>004 0.5 to 4.0 L/min</th>
<th>012 1.5 to 12 L/min</th>
<th>032 4.0 to 32 L/min</th>
<th>060 8.0 to 60 L/min</th>
</tr>
</thead>
</table>

**Port size**

<table>
<thead>
<tr>
<th>Flow rate range</th>
<th>004 Rc3/8</th>
<th>012 Rc1/2</th>
<th>032 Rc3/4</th>
<th>060 Rc1</th>
</tr>
</thead>
</table>

**Analog output**

- **A0** 0 to 5 VDC
- **A1** 4 to 20 mA DC
- **A2** 1 to 5 VDC
- **A3** 0 to 10 VDC

**Alarm output**

- **N0** NPN transistor output, 1 point (a contact)
- **N1** NPN transistor output, 1 point (b contact)
- **P0** PNP transistor output, 1 point (a contact)
- **P1** PNP transistor output, 1 point (b contact)

**Bracket**

- **Blank** None
- **B** With bracket (including fixing screws)

### Model designation

[Example of model designation]

**WFK3004C-10-A0N0B**

- **A** Shape: Compact, device built-in
- **B** Flow rate range: 0.5 to 4 L/min
- **C** Port size: Rc3/8
- **D** Analog output: 0 to 5 VDC
- **E** Alarm output: NPN1 point (a contact)
- **F** Bracket: Attached

### Internal Structure and Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Parts name</th>
<th>Material</th>
<th>Quantity</th>
<th>No.</th>
<th>Parts name</th>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cover packing</td>
<td>NBR, Nitrile rubber</td>
<td>1</td>
<td>8</td>
<td>Screw for cover</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Cable packing</td>
<td>NBR, Nitrile rubber</td>
<td>1</td>
<td>9</td>
<td>Electric component section</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Cable gland</td>
<td>PPS resin</td>
<td>1</td>
<td>10</td>
<td>O-ring</td>
<td>NBR, Nitrile rubber</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Temperature sensor (option)</td>
<td>Thermistor</td>
<td>(1)</td>
<td>11</td>
<td>O-ring</td>
<td>NBR, Nitrile rubber</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Attachment</td>
<td>SC513, Stainless casting</td>
<td>2</td>
<td>12</td>
<td>Karman’s Vortex Detection Sensor</td>
<td>PPS resin (interior: piezoceramic)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Body</td>
<td>PPS resin</td>
<td>1</td>
<td>13</td>
<td>Bracket (option)</td>
<td>SPC, Steel</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Cover</td>
<td>PC resin</td>
<td>1</td>
<td></td>
<td></td>
<td>Zinc plating</td>
<td>1</td>
</tr>
</tbody>
</table>

* Liquid contacting parts are (5), (6), (10), (11) and (12).
### Dimensions

- **WFK3004**, **WFK3012**, **WFK3032**

  - Port size: 10 (Rc3/8)

- **WFK3000 Series**

  - Port size: 15 (Rc1/2)

  - Bracket (option)

  - Semitransparent section (Only the LED is visible from outside.)

  - (The figure shows the switch type with 2-digit display)

---

**Cable length 3000**

(Conductor 0.2mm²)

**Semitransparent section** (Only the LED is visible from outside.)

(The figure shows the switch type with 2-digit display)
Dimensions

- **WFK3060**

  - Port size: 20 (Rc3/4)

  - Port size: 25 (Rc1)
Always read the safety precautions before wiring.

4-core cabtyre cables 0.2 mm² are used.

Option

<table>
<thead>
<tr>
<th>Sensor Type (analogue output)</th>
<th>Switch type (switch output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0: (0-5 [V])</td>
<td>-N0: (NPN a-contact, 2 points)</td>
</tr>
<tr>
<td>A1: (4-20 [mA])</td>
<td>-N1: (NPN b-contact, 2 points)</td>
</tr>
<tr>
<td>A2: (1-5 [V])</td>
<td>-P0: (PNP a-contact, 2 points)</td>
</tr>
<tr>
<td>A3: (0-10 [V])</td>
<td>-P1: (PNP b-contact, 2 points)</td>
</tr>
</tbody>
</table>

* The sensor/switch type alarm output will be 1 point.

**WFK3***S (sensor type voltage output: -A0, -A2, -A3)

- Connect to (+) of DC power supply: 12 to 24 VDC ± 10% (Option A3: 15 to 24 VDC ± 10%)
- Analog output: Voltage in proportion to flow rate is output
- Standard: NC/Option T: temperature output (voltage output)
- Connect to (-) of DC power supply: 0 VDC

**WFK3***S (sensor type current output: -A1)

The current output (A1) has 2 types of wiring methods. Please use a wiring method that is tailored to the contents printed on the product side.

- Connect to (+) of DC power supply: 12 to 24 VDC ± 10%
- Connect to 4-20 mA input unit
- Connect to (-) of DC power supply: 0 VDC

**WFK30***M (switch type NPN output: -N0, -N1)

- Connect to (+) of DC power supply: 12 to 24 VDC ± 10%
- Switch 2 (OUT2) output: MAX 30 VDC ±50mA
- Switch 1 (OUT1) output: MAX 30 VDC ±50mA
- Connect to (-) of DC power supply: 0 VDC

* Note
When connecting two or more flow rate sensors to the upper-level input circuit (receiver), carefully prevent signal interference.
WFK3000 Series

Wiring Method

**WFK3***M (switch type PNP output: -P0, -P1)**

- Connect to (+) of DC power supply: 12 to 24 VDC ±10%
- Switch 2 (OUT2) output: MAX 50mA
- Switch 1 (OUT1) output: MAX 50mA
- Connect to (-) of DC power supply: 0 VDC

**WFK3***C (sensor type voltage output specifications: -A0, -A2, -A3, switch type NPN output specifications: N0, N1)**

- Connect to (+) of DC power supply: 12 to 24 VDC ±10%
- Analog output: Voltage in proportion to flow rate is output
- Switch (OUT) output: MAX 30 VDC • 50mA
- Connect to (-) of DC power supply: 0 VDC

**WFK3***C (sensor type voltage output: -A1, switch type NPN output: N0, N1)**

- Connect to (+) of DC power supply: 12 to 24 VDC ±10%
- Connect to 4-20 mA input unit
- Switch (OUT) output: MAX 30 VDC • 50mA
- Connect to (-) of DC power supply: 0 VDC

**WFK3***C (sensor type voltage output: -A0, -A2, -A3, switch type PNP output: P0, P1)**

- Connect to (+) of DC power supply: 12 to 24 VDC ±10%
- Analog output: Voltage in proportion to flow rate is output
- Switch (OUT) output: MAX 30 VDC • 50mA
- Connect to (-) of DC power supply: 0 VDC

**WFK3***C (sensor type voltage output: -A1, switch type PNP output: P0, P1)**

- Connect to (+) of DC power supply: 12 to 24 VDC ±10%
- Connect to 4-20 mA input unit
- Switch (OUT) output: MAX 30 VDC • 50mA
- Connect to (-) of DC power supply: 0 VDC
Safety precautions
Be sure to read the instructions before use

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

Product selection, its usage and handling, as well as adequate maintenance management are important in order to safely use CKD products.

Observe warnings and precautions to ensure device safety.
Check that the safeness of the device is ensured, and work to manufacture safe devices.

Warning

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience in handling such parts.

2 Use this product in accordance with specifications.
This product must not be used outside its stated specifications. Do not attempt to modify or additionally machine the product.
In addition, since this product is intended for general use as an industrial machine part, use in outdoors (outdoor type excluded) or use in the following environments and conditions are not applicable.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.
ISO4414, JIS B 8370 (Pneumatic System Rules)
JFPS 2008 (Principles for pneumatic cylinder selection and use)
High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle this product or remove devices before confirming safety.
Inspect and service the machine and devices after confirming safety of the entire system related to this product.
Note that there may be hot or charged sections even after operation is stopped.
When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety such as pop-out prevention measures is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

The safety cautions are ranked as “DANGER”, “WARNING” and “CAUTION” in this section.

DANGER: When a dangerous situation may occur through mishandling, leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.
WARNING: When a dangerous situation may occur through mishandling, leading to fatal or serious injuries.
CAUTION: If handled incorrectly, a dangerous situation may occur, resulting in minor injury or property damage only.

Note that some items described as “CAUTION” may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Disclaimer

1 Warranty period
Warranty period of this product is one (1) year from the first delivery to the specified delivery destination.

2 Scope of warranty
In the event that any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment.
Note that the following faults are excluded from the warranty:
(1) Product abuse/misuse, contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by factors other than the delivered product
(3) Use beyond original design purposes.
(4) Third-party repair/modification
(5) Faults caused by factors that could not be predicted through technological methods in practical use at the time of delivery.
(6) Faults resulting from natural disasters or accidents for which CKD is not liable.
The warranty mentioned here covers the delivered product in working condition. The scope of warranty will not cover losses induced by defects in the delivered product.

3 Compatibility confirmation
The customer is responsible for confirming the compatibility of CKD products with their systems, machines and equipment.
Water-related equipment

Safety precautions

Be sure to read the instructions before use

Design & Selection

1. Working fluid

DANGER

- Do not use this product with 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 to enter the human body. Use this as an industrial sensor.
- Never use this product with a flammable fluid.

WARNING

- This product cannot be used as a business meter. Do not use this product for commercial transaction as it is not compliant with the Measurement Act. We cannot meet your requests for calibration, etc., so use this as an industrial sensor.
- The only applicable fluid is water (industrial water, clear water); do not use with any other fluid.

2. Working environment

DANGER

- Explosion-proof environment
  
  Do not use this product in an explosive gas atmosphere. This product does not have an explosion-proof structure; therefore, using it in such an environment may result in explosion and fire.

WARNING

- Corrosive environment
  
  Do not use this product in a corrosive gas atmosphere, such as sulfur dioxide.
- Fluid temperature and ambient temperature
  
  Fluid temperature should be in the range of 1 to 70°C. If the fluid temperature rises to 70°C or above, cool it down using a cooling system such as a chiller. On the other hand, if there is a risk of freezing, drain the product or warm it up 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 use of WFK3060 is possible only following the conditions below.

![Working range graph]

Maximum working pressure

This product fails if pressure exceeding the maximum working pressure is used. Check that the pressure is less than the maximum working pressure. To prevent the pressure reaching the maximum pressure due to the water hammer, take the following measures:

1. Use a water hammer reduction valve or other similar mechanism, and regulate the valve closing speed.
2. Use elastic piping material such as rubber hose, as well as an accumulator, and absorb the impact pressure.
3. Make the pipe length as short as possible.

Drip-proof environment

Do not use this product in a location where it can be constantly exposed to water or heavy water/oil spattering.

Conditions of use for CE compliance

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:

- The assessment of this product is performed by using a cable pairing a power supply line and a signal line, treating this cable as a signal line.
- This product is not equipped with surge immunity. Implement surge protection measures on the system side.

DANGER

- Do not use this product with 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 to enter the human body. Use this as an industrial sensor.
- Never use this product with a flammable fluid.

WARNING

- This product cannot be used as a business meter. Do not use this product for commercial transaction as it is not compliant with the Measurement Act. We cannot meet your requests for calibration, etc., so use this as an industrial sensor.
- The only applicable fluid is water (industrial water, clear water); do not use with any other fluid.

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![Working range graph]

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- The assessment of this product is performed by using a cable pairing a power supply line and a signal line, treating this cable as a signal line.
- This product is not equipped with surge immunity. Implement surge protection measures on the system side.
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**

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specified fluid</td>
<td>Water</td>
</tr>
<tr>
<td>Withstanding pressure</td>
<td>MPa</td>
</tr>
<tr>
<td>Working pressure range</td>
<td>MPa</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Main material specifications**

<table>
<thead>
<tr>
<th>Body</th>
<th>Bronze casting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strainer</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

---

**External view of strainer**

---

**Vibration/shock**

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. Such vibration or shock may cause malfunction and/or damage as this product uses Karman's vortex type detection principle.

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**CAUTION**

The analog output of the wiring diagram below is A1 (4-20mA) only

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**Note 1)** Connecting more than one analog output 4-20 mA sensor to the same common input circuit (upper level computer, sequencer, etc.) as shown above makes the respective signals interfere with each other, preventing correct operation. In this case please use the voltage output type (standard, A2, A3).

* The voltage at point A and that at point B are connected inside the input circuit, which gives them the same electrical potential, creating an error in the respective analog outputs.

**Note 2)** If the power supply (24 VDC) of the upper level input circuit is not insulated, install separate power supplies for the input circuit and the sensor.
Use the product with a power supply voltage and output within the specified range.
Applying a voltage that is outside of the specified range may cause malfunction, damage to the sensor, electrical shock, and/or fire. Do not use any load that exceeds the rated output. Using such a load may result in damage to the output part or fire.

Check the line color and terminal no. when connecting wires. While an overcurrent protection circuit for the output transistor and a protection circuit for erroneous wiring, using diodes for preventing reverse connection, are implemented, these do not protect against all incorrect wiring. Incorrect wiring can result in malfunction, failure, or damage to the sensor. Check the instruction manual for line colors and terminal nos. in order to ensure correct wiring.

Check wiring insulation. Make sure that the wires do not come into contact with other circuits, and that there is no ground fault or insulation failure between terminals. Otherwise, overcurrent may flow into the sensor, causing damage.

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

Keep unused wires from coming into contact with other wires.

Do not short-circuit the output contact. When a load is short-circuited, the overcurrent protection circuit is triggered to prevent damage to the output transistor; however, if this state persists, the output transistor could be damaged. Overcurrent protection...About 50mA

Do not use this product for loads generating surge voltage. While an element that protects against surge is inserted, repeated exposure to surges can lead to damage. Use relays and solenoid valves that are equipped with surge absorption elements. If there is a surge source on the same power supply line, similarly implement surge protection.

Make sure that the lead wire is free of repeated bends and tension. Failure to observe this could result in a wire break.

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

If a pipe is narrowed right before the flow rate sensor, or if there is a valve or other throttling component on the primary side, cavitation occurs inside the pipe, preventing accurate measurements. For this reason, such piping should be installed on the secondary side of the sensor. Cavitation: (Vapor bubbles form when static pressure at the back is smaller than water vapor pressure, such as with a boat screw. Cavitation can cause reduced performance and damage to the screw.)

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 and over the bore size is installed between the valve and the flow rate sensor.

When using an elbow or bush in the piping
When using an elbow or bush in the piping, provide straight piping sections with at least 10D on the IN side and 5D on the OUT side when using a WFK3060 series model. However, port size change by bush should be within one rank. Note that, 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.) * "D" here indicates the inner diameter of the piping material. Refer to the table below for specific values.

<table>
<thead>
<tr>
<th>Port size</th>
<th>Rc3/8 (10A)</th>
<th>Rc1/2 (15A)</th>
<th>Rc3/4 (20A)</th>
<th>Rc1 (25A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5D</td>
<td>50mm</td>
<td>75mm</td>
<td>100mm</td>
<td>125mm</td>
</tr>
<tr>
<td>10D</td>
<td>100mm</td>
<td>150mm</td>
<td>200mm</td>
<td>250mm</td>
</tr>
</tbody>
</table>

Use the proper torque to tighten the pipes when connecting them.
- Using the appropriate torque can ensure the prevention of water leakage and screw damage.
- First tighten the screw by hand to ensure that threads are not damaged, then use a tool.

**Recommended values**

<table>
<thead>
<tr>
<th>Port thread</th>
<th>Tightening torque N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc3/8</td>
<td>31 to 33</td>
</tr>
<tr>
<td>Rc1/2</td>
<td>41 to 43</td>
</tr>
<tr>
<td>Rc3/4</td>
<td>62 to 65</td>
</tr>
<tr>
<td>Rc1</td>
<td>83 to 86</td>
</tr>
</tbody>
</table>
When installing piping, make sure that the direction of the flow matches the direction of the arrow marked on the body. Connecting the pipe in the wrong direction causes the flow rate to be indicated as less than the actual flow rate or zero.

Before installing piping, clean the pipes to remove all foreign matter, cutting chips and remains of testing water from the pipes. Check that force is not applied to resin parts when piping.

Make sure that no seal tape or adhesive enters the pipes when connecting the piping.

If there is a significant difference between the ambient temperature and the fluid temperature condensation occurs, which can enter electrical parts, causing operation failure. If condensation may occur, ensure that the mounting orientation of the flow rate sensor is horizontal and the display is facing upward.

When connecting pipes, wrap sealing tape in the opposite direction from threads starting 2 mm inside from the end of piping threads.

If sealing tape protrudes from pipe threads, it could be cut when screwed in. This could cause the tape to enter the solenoid valve and lead to faults.

When using a liquid sealant, make sure to keep it away from resin parts. Resin parts can be damaged if a sealant adheres.

If a problem occurs during operation, turn off the power immediately and stop the use of the product. Contact the dealership. Slight heating (40°C) of the display section is not abnormal.

Hardware check and other internal settings are performed during the first two seconds after turning on the power. Display and output do not function properly 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.

If the output setting value is changed, control system devices could operate unintentionally. Stop devices before changing settings.

Ensure proper operation through periodic inspections.

When removing the equipment, shut off power, make sure that no water pressure is applied, and take other safety precautions before the removal.

Do not disassemble or modify this product. Doing so could result in faults.

For cleaning, use mild detergent or any other non-polluting cleaning agent.

During use & maintenance

1. Common

**CAUTION**

- If a problem occurs during operation, turn off the power immediately and stop the use of the product. Contact the dealership. Slight heating (40°C) of the display section is not abnormal.

- Hardware check and other internal settings are performed during the first two seconds after turning on the power. Display and output do not function properly 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.

- If the output setting value is changed, control system devices could operate unintentionally. Stop devices before changing settings.

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- When removing the equipment, shut off power, make sure that no water pressure is applied, and take other safety precautions before the removal.

- Do not disassemble or modify this product. Doing so could result in faults.

- For cleaning, use mild detergent or any other non-polluting cleaning agent.

2. Applicable fluid

**CAUTION**

- Follow the precautions below for the applicable fluids to be measured. If the following water quality standards are not met, performance may be compromised.

- The water quality of the applicable fluid should be as per the "Guideline of Water Quality for Refrigeration and Air Conditioning Equipment" (Water quality standard: Cooling system - Circulating type - Circulating water) provided by the Japan Refrigeration and Air Conditioning Industry Association.

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Chemical formula</th>
<th>Unit</th>
<th>Water quality standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>pH (25°C)</td>
<td></td>
<td>6.5 to 8.2</td>
</tr>
<tr>
<td>Electrical conductivity</td>
<td>Cl−</td>
<td>mS/m (25°C)</td>
<td>0.2 to 80 *1</td>
</tr>
<tr>
<td>Chloride ion</td>
<td>SO4²−</td>
<td>mg/L (ppm)</td>
<td>200 or less</td>
</tr>
<tr>
<td>Sulfate ion</td>
<td>CaCO3</td>
<td>mg/L (ppm)</td>
<td>200 or less</td>
</tr>
<tr>
<td>Acid consumption (pH 4.8)</td>
<td>CaCO3</td>
<td>mg/L (ppm)</td>
<td>100 or less</td>
</tr>
<tr>
<td>Total hardness</td>
<td>CaCo3</td>
<td>mg/L (ppm)</td>
<td>200 or less</td>
</tr>
<tr>
<td>Calcium hardness</td>
<td>SiO2</td>
<td>mg/L (ppm)</td>
<td>50 or less</td>
</tr>
<tr>
<td>Ionized silica</td>
<td>Fe</td>
<td>mg/L (ppm)</td>
<td>1.0 or less</td>
</tr>
<tr>
<td>Iron</td>
<td>Cu</td>
<td>mg/L (ppm)</td>
<td>0.3 or less</td>
</tr>
<tr>
<td>Copper</td>
<td>S²−</td>
<td>mg/L (ppm)</td>
<td>Not detected</td>
</tr>
<tr>
<td>Sulfide ion</td>
<td>NH⁴⁺</td>
<td>mg/L (ppm)</td>
<td>1.0 or less</td>
</tr>
<tr>
<td>Ammonium ion</td>
<td>Cl</td>
<td>mg/L (ppm)</td>
<td>0.3 or less</td>
</tr>
<tr>
<td>Residue chlorine</td>
<td>CO²⁻</td>
<td>mg/L (ppm)</td>
<td>4.0 or less</td>
</tr>
<tr>
<td>Free carbonic acid</td>
<td>Stability index</td>
<td>mg/L (ppm)</td>
<td>6.0 to 7.0</td>
</tr>
</tbody>
</table>

*1 Electrical conductivity should be 0.2 (mS/m) and over. For use in a range of 0.05 to 0.2 (mS/m), contact CKD. Do not use for ultra pure water, i.e. water with an electrical conductivity of below 0.05 (mS/m).
Related products

**Multi Monitor MD Series**
- Compatible with flow rate/pressure without sensor selection.
- Analog output proportional to indicated value is possible.
- Clear, three-colour display.
- Lock mechanism for misoperation prevention.
- Low energy mode function for power saving.
- Scaling function allows the conversion of sensor input into an arbitrary numerical value.

**Capacitance Magnetic Flow Sensor WFC Series**
- Penetration structure employment allows use without issue even where water quality is poor.
- Capacitance employment prevents accumulation of foreign matter, leading to detection failure.
- Repeated precision when using elbow pipes guaranteed.
- Does not require a stabilized power supply or a noise-countering ferrite core.
- Zero point modulation enabled by external input.
- Display 180° inversion function built in.
- Backflow detecting mechanism built in.

**Karman Vortex Type Flow Sensor for Water WFK 5000, 6000, 7000 Series**
- Karman’s vortex detection method enables use in environments with bad water quality.
- A large effective cross-sectional area can minimize pressure loss.
- The energy needed to operate the water pump can be effectively reduced.
- 1.0 sec. high speed response has been enabled by our unique vortex street frequency processing technology.
- Display of instantaneous flow and integrating flow rates can be alternated with one touch.
- 5-digit digital display (WFK5027/6027) is equipped to enable one-day integrating flow rate to be viewed at a glance.
- Besides alarm output, analog output for record keeping is included as standard.

**Water Integrated Unit WXU Series**
- Space saving without piping.
  Installation space significantly reduced by unitization, with discrete piping connection eliminated.
  Footprint 80% reduced compared to CKD previous models (2-fluid control type).
- Improved quality.
  Due to no screwed piping between components, the risk of external leak is eliminated.
  The execution of work does not let in foreign matter.
- Man-hours reduced.
  Man-hours for troublesome piping design, piping work, material arrangement etc. are reduced significantly.