# TECHNICAL GUIDANCE

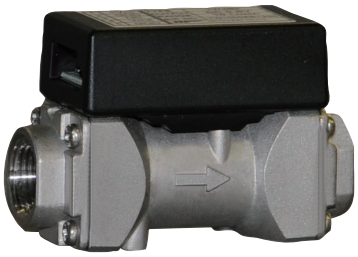
Axial flow type, compact, inexpensive
For various cooling water systems

# TW-080/TW-090

MINI-TURBINE FLOWMETER

## OUTLINE

The TW-080 and TW-090 mini-turbine flowmeters are axial flow type wheel flowmeters. Guided by the built-in vortex guide, the fluid flowing spirally rotates the wheel made of plastic magnet. Thus the flow rate is measured by detecting the rotation of the wheel with a magnet sensor. The flowmeter is ideal for various cooling water system with a compact design thanks to precision casting and excellent cost performance.



## FEATURES

- ❑ Compact and light-weight by precision casting.
- ❑ Pulse or voltage output.
- ❑ Liquid can be purged by air from the downstream.
- ❑ Easy overhauling, cleaning and maintenance.
- ❑ Low price owing to intensive cost down.

## STANDARD SPECIFICATIONS

- ● Measuring fluid : Water and various liquids without solids (Viscosity: Less than 2 mPa·s)
- ● Fluid pressure : Maximum 1.0 MPa (at 25℃ )
- ● Fluid temperature : 0 to 60℃ (Without freezing)
- ● Ambient temperature : 0 to 60℃ (Without freezing and condensation)
- ● Installation : Horizontal or vertical
- ● Flow direction : One way (indicated by the arrow on the body)
- ● Accuracy : ± 3% F.S.

【TW-08 □ (voltage output) type】

- ● Output : 0 to 5 V DC
- ● Power supply : 12 to 24 V DC, 18 mA
- ● Load resistance : 100 kΩ or more
- ● Electrical connection : Connector

  Note: Connectors and cables (up to 5 m) should be prepared by the customer. If these are to be included, please notify us when ordering.
- ● Construction : Not waterproof
- ● Mass : Approx. 0.3 kg

【TW-09 □ (pulse output) type】

- ● Output : Open collector pulse (Unscaled)
- ● Pulse frequency : Actual measurement value is indicated on product name plate.
- ● Power supply : 12 to 24 V DC, 12 mA
- ● Load rating : Maximum 24 V DC, 15 mA
- ● Electrical connection : 3 core cable AWG24 (1 m)
- ● Construction : Protected against dripping water (Equivalent to IP62)
- ● Mass : Approx. 0.2 kg

## MODEL CODE AND PRESSURE LOSS

| Model code | | | Description | |
|---|---|---|---|---|
| TW-0 | □ | □ | | |
| Output | 8 | | Voltage output: 0 to 5 V DC | |
| | 9 | | Pulse output: Open collector | |
| Range of flow rate Connection size | | 0 | 0.2 to 2 L/min | Rc1/4 |
| | | 1 | 0.3 to 3 L/min | |
| | | 2 | 0.5 to 5 L/min | |
| | | 3 | 1 to 10 L/min | Rc3/8 |
| | | 4 | 2 to 20 L/min | |

| Model | Pressure loss (kPa)* |
|---|---|
| TW-0□0 | 40 |
| TW-0□1 | 32 |
| TW-0□2 | 20 |
| TW-0□3 | 11 |
| TW-0□4 | 18 |

* Pressure loss at the maximum flow rate

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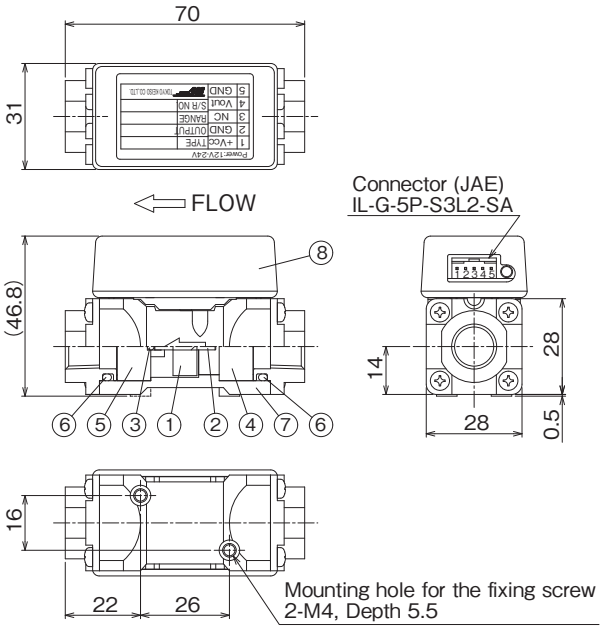
## DIMENSIONS AND ELECTRICAL CONNECTION

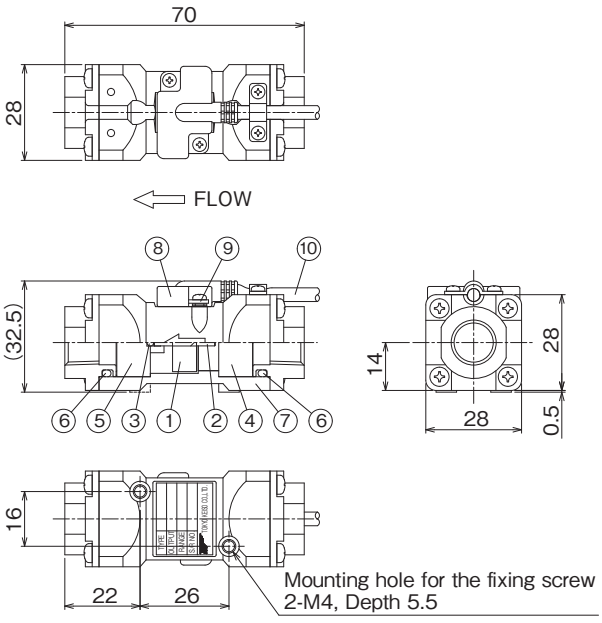
### 〈 TW-080 〉

| Terminal number | Function | |
|---|---|---|
| 1 | +Vcc | Power supply (+) |
| 2 | GND | Power supply (–) |
| 3 | NC | Unused |
| 4 | Vout | Output (+) |
| 5 | GND | Output (–) |




### 〈 TW-090 〉

| Wire color | Function |
|---|---|
| Red | Power supply (+) |
| White | Output (+) |
| Black | Power supply (—), Output (—) |
| Black (thick) | Shield |




| No. | Name | Material | No. | Name | Material |
|---|---|---|---|---|---|
| 1 | Wheel | Nylon 12+Fe (plastic magnet) | 6 | O-ring | NBR |
| 2 | Shaft | Zirconia | 7 | Flow path body | SCS14 |
| 3 | Ball bearing | Zirconia | 8 | Cover | TW-08□: ABS, TW-09□: PVC |
| 4 | Vortex guide | PBT | 9 | Circuit board | — |
| 5 | Downstream guide | PBT | 10 | Cable | PVC sheath |

## PRECAUTION

- ❑ Do not put a signal cable along with other power lines.
- ❑ The inner diameter of the process piping and the joint for the TW-0 □ 3/0 □ 4 types (Rc3/8) must be $\phi$ 10.9 mm or larger.
- ❑ Installation is to be made at the place free from the influence of external magnetic field which affects the characteristics.
- ❑ Use this flowmeter where there is no stagnation of air around the wheel and also in the state of water filled up.
- ❑ Avoid the air blow from the upstream. Otherwise, the wheel and shaft might be damaged.
- ❑ Flush the piping before installation. Install a filter in the upstream if necessary to prevent foreign matter flowing into the flowmeter.

* Specification is subject to change without notice.

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