OUTLINE

MA-900 MICRO FLOWMETER is a metal tube variable area flowmeter which is designed for the measurement of minute, small flow of liquids and gases. In addition to local indication version, alarm contact is optionally available.

FEATURES

- Very minute flow measurement is possible
  Full scale of 0.5L/h (water) is possible. Very suitable for small quantity injection process and other test processes.
- Compact and light weight
  Offers easy assembling onto various equipment
- High accuracy
  Thanks to newly designed magnet following mechanism, higher accuracy compared to existing version has been achieved. The scale plate is also designed for easy observation.
- Covering high temperature and pressure
  Max. 250°C, 20MPa can be covered. (Except for very minute flow ranges)
- Anti corrosive capability
  Besides standard material of stainless steel, special metallic materials are also available to cover very corrosive fluids.
- Low pressure loss
  Newly designed float reduces pressure loss during operation.
- Adjustable flow alarm contact
  Field adjustable, Hall element type alarm contact can be optionally provided.

MODEL CODE

<table>
<thead>
<tr>
<th>MA-9</th>
<th>Function</th>
<th>Flow direction</th>
<th>Material</th>
<th>Connection</th>
<th>Additional Function</th>
<th>Alarm Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>Rc 1/4</td>
<td>VU</td>
<td>L Low alarm</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>15AJIS10KFF</td>
<td>VU</td>
<td>H High alarm</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>15AJIS10KFF</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>20AJIS10KFF</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>25AJIS10KFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>Other thread connection</td>
<td>VU</td>
<td>Needle valve at outlet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>1</td>
<td>Other flange connection</td>
<td>VU</td>
<td>Needle valve at inlet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>1</td>
<td>Other special connection</td>
<td></td>
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</tr>
</tbody>
</table>

*: Specify only for Alarm version
MA-900 Series MICRO FLOWMETER

**STANDARD SPECIFICATION**

**MEASURING OBJECT**
Liquids and Gases

Viscosity limit for liquid flow measurement

<table>
<thead>
<tr>
<th>Meter size</th>
<th>Viscosity (Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>1.0 mPa•s</td>
</tr>
<tr>
<td>1/2</td>
<td>2.0 mPa•s</td>
</tr>
<tr>
<td>3/4, 1</td>
<td>5.0 mPa•s</td>
</tr>
</tbody>
</table>

*(Free from solids and particles)*

**MEASURING RANGE**

- **Liquid measurement**
  - (Water) Min.: 0.1 to 0.5 L/h, Max.: 60 to 600 L/h
  - Measurement range may differ depending on the viscosity of liquid.

- **Gas measurement**
  - (Air, 0°C, 1 atm) Min.: 3 to 15 L/h (nor), Max.: 2.2 to 22 m³/h (nor)
  - Measurement range may differ depending on the pressure or viscosity of liquid.

**RANGEABILITY**
10 : 1
10 : 2 for versions with full scale smaller than 5L/h (Water) or 100L/h (nor) (Air).
It may differ depending on the viscosity of liquid.

**FLUID TEMP.**
0 to 100°C as standard
TOKYO KEISO will comply with your requirement up to 250°C generally as an option.
The maximum temperature of gas service in the case float is made of PPS is 150°C, and the maximum temperature of MA-950 is 85°C.
Consult our factory about your requirement.
Heat-resistant glass is used for up to 2.9 L/h water or up to 100 L/h (nor) air. In this case, the maximum fluid temperature is 120°C and the maximum allowable thermal shock is 80°C.

**FLUID PRESS.**
Max. 2.94 MPa
High press. 19.6MPa (Subject to flange rating)

**INDICATION ACCURACY**
±3.0%F.S.
The accuracy of glass tube inserted type is ±5%F.S.

**PAINTING**
Munsell 7.5BG4/1.5 (Indicator part only)

**ALARM CONTACT**
**AVAILABILITY**
1 point (Low or High)

**SETTING**
Adjustable by moving setting pointer (within graduation range)

**SETTING ACCURACY**
±3.0%F.S. (Against flow calibration)

**DETECTION**
Hall element IC

**OUTPUT**
Open collector output

**RATING**
18 V DC, Max. 15mA

**RESET SPAN**
Less than 15%F.S. (Against flow calibration)

**CONNECTION**
M3 screw terminal

**CABLE ENTRY**
G1/2 thread

**METER ENCLOSURE**
Watertight (Equiv. to IP65)

**PROCESS CONNECTION**

**STD.**
Rc1/4, 3/8, 1/2, 3/4 or 1,
10A, 15A, 20A or 25AJIS10KFF flange

**OPTION**
NPT and other threads, flange other than JIS10KFF

**FLOW DIRECTION**
Bottom→Top, Bottom→Top side,
Bottom side→Top side,
Bottom rear→Top rear

**INSTALLATION**
Supported by piping

**MATERIAL**
Refer to MATERIAL CONSTRUCTION

**APPROX. MASS**
1 kg (Rc1/4 thread)

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**MATERIAL CONSTRUCTION**

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>Material</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>SCS14 or SUS316 *1</td>
</tr>
<tr>
<td>2</td>
<td>Tapered tube</td>
<td>SUS316 *2</td>
</tr>
<tr>
<td>3</td>
<td>Float</td>
<td>SUS316 *3</td>
</tr>
<tr>
<td>4</td>
<td>Packing</td>
<td>PTFE *4</td>
</tr>
<tr>
<td>5</td>
<td>Indicator</td>
<td>ADC12</td>
</tr>
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<td>6</td>
<td>Fittings</td>
<td>SUS304 (STD.) or SUS316 *5</td>
</tr>
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*1: SUS 316 for 3/8” meter size in case of versions with full scale smaller than 2.9L/h (Water) or 100L/h (nor) (Air).
*2: Glass tapered tube will be inserted for 3/8” meter size in case of versions with full scale smaller than 2.9L/h (Water) or 100L/h (nor) (Air). Allowable thermal shock will be 80°C
*3: PPS resin / Titanium will be used for 1/2” meter size, and PPS resin / SUS316 will be used for 3/4 and 1” meter sizes in gas measurement applications.
*4: Packing is not an external pressure part.
*5: Connection fitting material can be selected for flange or elbow. Specify requirement when ordering.

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**STANDARD SPECIFICATION**

**PROCESS CONNECTION**

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**DIMENSIONS**

- **Flow direction**: BOTTOM TO TOP, Screw connection

- **Flow direction**: BOTTOM SIDE (or REAR) TO TOP SIDE (or REAR), Screw connection

- **Flow direction**: BOTTOM TO TOP, Flange connection

The male and female socket are attached except the types of L160mm.

- **Flow direction**: BOTTOM TO TOP, Screw connection, Needle valve provided at outlet

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**Meter size**

<table>
<thead>
<tr>
<th>Water L/h</th>
<th>Air L(h)/nor</th>
<th>Full scale</th>
<th>Connection screw size (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3/8</strong></td>
<td>2.9</td>
<td>100</td>
<td>180 160 210 230 230</td>
</tr>
<tr>
<td><strong>1/2</strong></td>
<td>29.9</td>
<td>630</td>
<td>180 180 160 230 230</td>
</tr>
<tr>
<td><strong>3/4</strong></td>
<td>300</td>
<td>4900</td>
<td>180 180 180 160 230</td>
</tr>
<tr>
<td><strong>1</strong></td>
<td>600</td>
<td>22000</td>
<td>200 180 180 180 160</td>
</tr>
</tbody>
</table>

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**L (mm)**

- **3/8**: 89 59 2-RcD (MAX70)
- **1/2**: 89 59 2-RcD (MAX70)
- **3/4**: 89 59 2-RcD (MAX70)
- **1**: 89 59 2-RcD (MAX70)

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*1: Up to Air 8300L/h (nor)  
*2: Up to Water 400L/h, Air 11000L/h (nor)  
*3: Up to Water 600L/h, Air 22000L/h (nor)  

L (mm) may change. According to the pressure difference before and behind the valve.
MA-900 Series MICRO FLOWMETER

WIRING FOR MA-95

![Circuit Diagram](image)

- **Vcc**: Rating voltage 18V
- **Vo (off)**: Open voltage 18V
- **Isink**: Output inflow current 15mA
- **Ta**: AMB. Temp. -30 to +85°C

OPTIONS

- **Needle valve**
- **Magnet Strainer**

The strainer installed at upstream eliminates particles in the fluid. Select a proper mesh of the filter adequate for the size of particles. A magnet is molded in the float and in case ferrous powder are involved in the fluid, smooth movement of float will not be obtained. It is recommended to install a Magnet Strainer in upstream of the line to eliminate the ferrous contents.

Fluid pressure: Max. 1.5 MPa
Fluid temperature: Max. 200°C
Nominal size: Rc1/4", 3/8", 1/2"
Filter: 100 mesh/inch
(Option: Up to 200 mesh/inch)
Material: Body: SCS14
Filter: SUS 304, SUS316

ORDERING FORM

Specify the following for order / inquiry:

- **MODEL CODE**: MA-9
- **FLUID NAME**: __________________________
- **DENSITY**: __________________________
- **VISCOSITY**:  mPa·s
- **PRESS.**: MPa
- **TEMP.**: °C
- **MEASURING RANGE**: L/h, L/h (nor)
- **CONNECTION SIZE**: mm
- **CONNECTION STANDARD**: Rc, JIS10KFF
- **MATERIAL**: Standard, Special (Specify)
- **FOR ALARM VERSION**
  - Contact: High, Low
  - Setting point: L/h, L/h (nor)
- **SPECIAL INSTRUCTION IF ANY**: __________________________

* Specification is subject to change without notice.

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