GENERAL

The AM7000/SR series is a variable area flowmeter designed and manufactured for sanitary services. The ISO ferrule clamps make its installation on the piping or removing easy. All the liquid wet parts are buff polished. In addition to the reliable local flow indicator with a simple and rigid mechanism, various functions are available including electric transmission, and local integration with pulse or alarm output as well as remote communication as standard.

FEATURES

- A variety of product line-up to meet your requirements
- Local indication, electric transmission, local flow integration, Integration with scaled pulse or alarm output including remote communication
- Detachable to piping with ISO(IDF) ferrules
- Easy to clean, suitable for sanitary services such as foods, beverages, cooking oil, brewing and fine chemicals
- Protection class of indicator is IP67
- Straight through from bottom to top flow direction
- Actual examples of measurement: Water, brine, juice, other liquids, foods, raw materials
# MODEL CODE

<table>
<thead>
<tr>
<th>Basic model</th>
<th>Material/Connection code</th>
<th>Function 1 code</th>
<th>Function 2 code etc.</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Flow direction
- **L**: Bottom → Top
- **E**: Electric transmitter
- **H**: Electric transmitter with HART communication
- **P**: PROFIBUS PA communication
- **T**: Local integration
- **R**: Reed switch
- **N**: Proximity switch
- **M**: Microswitch

## Explosionproof
- **W**: Dust tight, water immersion proof, non-explosionproof
- **E**: Flameproof version

## Wetted material
- **0**: Material of main body: SUS304
- **1**: Material of float: SUS304
- **2**: SUS316
- **3**: SUS316L
- **4**: SUS316L

## Connection standard
- **I**: ISO (IDF) Female
- **D**: Others

## Kind of connector
- **Z**: Female clamp
- **Z**: Others

## Connection size
- **4**: 1S
- **4**: 2S
- **4**: 3S
- **4**: 4S
- **4**: 5S

## Construction, finishing
- **R**: Sanitary (buff polished with #320 to #400)

## Output function
- **R**: Reed switch
- **N**: Proximity switch
- **M**: Microswitch

## Additional function
- **J**: TIS Flameproof version
- **K**: KOSSA Flameproof version
- **C**: NEPSI Flameproof version
- **E**: EX Flameproof version
- **E**: EX Flameproof version (Specify separately)
- **J**: TIS Intrinsically safe version
- **K**: KOSSA Intrinsically safe version
- **C**: NEPSI Intrinsically safe version

## Explosionproof type
- **M**: M20 x 1.5 (F)
- **G**: G1/2 (F)
- **G**: G3/4 (F)
- **N**: NPT1/2 (F)
- **N**: NPT3/4 (F)

## Cable entry
- **O**: Oil-free treatment
- **W**: Water-free treatment
- **L**: Pickling treatment

## Cleaning
- **P**: Special painting color
- **E**: Electrolytic polishing
- **L**: Airtight test

## Paint
- **C**: Waterproof connector
- **G**: Flameproof cable gland
- **A**: Other accessories

## Special specifications
- **Z**: Contact us for details

## Others
- **W**: Double scales, output for main scale
- **W**: Double scales, output for main and sub scales

## Contact us for details
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

### STANDARD SPECIFICATION

#### FUNCTIONS

<table>
<thead>
<tr>
<th>AM7□□□</th>
<th>AM7□□□ /E</th>
<th>AM7□□□ /H</th>
<th>AM7□□□ /P</th>
<th>AM7□□□ /T</th>
<th>AM7□□□ /R□□□</th>
<th>AM7□□□ /N□□□</th>
<th>AM7□□□ /M□□□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local indication</td>
<td>Local indication Electric transmitter</td>
<td>Local indication Electric transmitter HART communication</td>
<td>Local indication PROFIBUS PA</td>
<td>Local indication Electric transmitter Local integration Pulse output Alarm output</td>
<td>Local indication Alarm output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### METER SIZE AND CONNECTION SIZE

<table>
<thead>
<tr>
<th>Meter size</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection size</td>
<td>1S</td>
<td>1S</td>
<td>1.5S</td>
<td>1S</td>
<td>1.5S</td>
<td>1.5S</td>
<td>2S</td>
<td>2S</td>
</tr>
</tbody>
</table>

#### CONNECTION STANDARD: ISO (IDF) Ferrule, Union screw is available on request.

- **FLOW DIRECTION**: Bottom to Top
- **FLUID PRESSURE**: Max. 0.68 MPa
- **FLUID TEMPERATURE**: -20 to 150°C
- **SEAL**: Silicone rubber
- **MATERIALS OF METALLIC PARTS**: SUS304, SUS316, SUS316L
- **WETTED PARTS**: Buff polished with #320 to #400, Electrolytic polishing is available on request.
- **INDICATION ACCURACY**: ±1.5% F.S. as standard, ±1.0% F.S. available on request, consult us.
- **SCALE LENGTH**: 70 mm
- **SCALE RANGE**: 10 : 1
- **PROTECTION CLASS OF INDICATOR**: Dust tight and water immersion proof IP67

#### PAINTING COLOR

<table>
<thead>
<tr>
<th>Painted parts</th>
<th>Color</th>
<th>(Munsell)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>Jade green</td>
<td>7.5BG4/1.5</td>
</tr>
<tr>
<td>Indicator cover, Transmitter</td>
<td>Light gray</td>
<td>N7.5</td>
</tr>
</tbody>
</table>

#### AM7□□□□ (LOCAL INDICATION)

- **AMBIENT TEMPERATURE**: -30 to 80°C
- **Dimension of indicator**

Approx. mass: 2.5kg
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

AM7□□□/E□ indicates flow rate by pointer and scale plate, and outputs electric (4 to 20mA DC) signal which is proportional to flow rate.

In addition to the dust tight and water immersion proof type, the intrinsically safe and flame proof versions are available.

**SPECIFICATION OF TRANSMITTER**

- **Power supply voltage**: 10 to 30V DC (Voltage between transmitter terminals)
  
  (For Intrinsically safe version: 10 to 28V DC / For TIIS/KOSHA Flameproof version: 12 to 30 VDC)

- **Current output**: 4 to 20mA DC
  
  (Effective output range: 4.0 to 21.6mA At abnormal condition, however, 22.8mA or 3.75mA as an option can be output.)

- **Allowable load resistance**: Less than 830Ω (580Ω or less / 24V DC)
  
  Determine the allowable load resistance for each supply voltage using following formula.

  Allowable load resistance \( \leq \frac{\text{Power supply voltage} [\text{V}] - 10}{0.024} [\Omega] \)

  The allowable load resistance includes the one of circuit wiring.

- **Output accuracy**: \( \pm 1.0\% \text{F.S.} \) (Against flow calibration)

- **Low cut off**: 0 to 20\%F.S. (default 7\%F.S.)

- **Damping**: 0 to 20s (default 1s)

- **Cable entry**: Weather proof 2–M20×1.5, 2–G1/2, 2–NPT1/2, Weather proof connector
  
  : Intrinsically safe & Flame proof 2–M20×1.5, 2–G1/2, 2–NPT1/2, Packing type cable gland

  Note: The packing type cable gland model SXC-16BY made by Shimada Electric Co. shall be used for the TIIS flame proof construction. The cable entry for the indicator is G1/2 only.

- **Construction**: Dust tight and water immersion proof IP67
  
  : Intrinsically safe Ex ia IIC T1 to T6 AM7□□□/E2/E
  
  The temperature class of TIIS certified products is T6.

  : Flame proof Ex d IIC T1 to T6 AM7□□□/E1/E
  
  The temperature class is T4 for TIIS, KOSHA Certified products

- **Ambient temp.**: Dust tight and water immersion proof –20 to 70°C
  
  : Intrinsically safe –20 to 60°C Ex ia IIC T1 to T6

  : Flame proof –20 to 55°C Ex d IIC T4 (For TIIS, KOSHA Certified products)

  –20 to 60°C Ex d IIC T1 to T6 (For other certified products)

- **Insulation resistance**: 20 MΩ or more / 500V DC (between batch of power supply terminal and indicator case)

- **Withstand voltage**: 500V AC/1min (between batch of power supply terminal and indicator case)

**DIMENSION OF INDICATOR / TRANSMITTER**

- **Approx. mass**: 3.7kg

**TERMINAL AND WIRING**
**AM7□□□/□ (LOCAL INDICATOR WITH ELECTRIC TRANSMITTER & HART COMMUNICATION)**

AM7□□□/□ indicates flow rate by pointer and scale plate, and outputs electric (4 to 20mA DC) signal equipped with HART Communication complying with Multi-drop. In addition to the dust tight and water immersion proof type, the intrinsically safe and flame proof versions are available.

### SPECIFICATION OF TRANSMITTER

- **Power supply voltage**: 10 to 30V DC (Voltage between transmitter terminals)
  - (For Intrinsically safe version: 10 to 28V DC/For TIIS/KOSHA Flameproof version: 12 to 30 VDC)
- **Current output**: 4 to 20mA DC
  - (Effective output range : 4.0 to 21.6mA At abnormal condition, however, 22.8mA or 3.75mA as an option can be output.)
- **Allowable load resistance**: 230 to 830Ω (Not less than 230Ω load resistance is needed for “with HART communication.”)
  - Determine the allowable load resistance for each supply voltage using following formula.
  - Allowable load resistance \(\leq\) (Power supply voltage [V] –10) / 0.024 [Ω]
  - The allowable load resistance includes the one of circuit wiring.
- **Output accuracy**: ± 1.0%F.S. (Against flow calibration)
- **Low cut off**: 0 to 20%F.S. (default 7% F.S.)
- **Damping**: 0 to 20s (default 1s)
- **Cable entry**: Weather proof 2–M20×1.5, 2–G1/2, 2–NPT1/2, Weather proof connector
  - Intrinsically safe & Flame proof 2–M20×1.5, 2–G1/2, 2–NPT1/2, Packing type cable gland
  - Note: The packing type cable gland model SXC -16BY made by Shimada Electric Co. shall be used for the TIIS flame proof construction. The cable entry for the indicator is G1/2 only.
- **Construction**: Dust tight and water immersion proof IP67
  - Intrinsically safe Ex ia IIC T1 to T6 AM7□□□/H□/□
    - The temperature class of TIIS certified products is T6.
  - Flame proof Ex d I T1 to T6 AM7□□□/H□/□E
    - The temperature class is T4 for TIIS, KOSHA Certified products
- **Ambient temp.**: Dust tight and water immersion proof –20 to 70°C
  - Intrinsically safe –20 to 60°C Ex ia IIC T1 to T6
  - Flame proof –20 to 55°C Ex d IIC T4 (For TIIS, KOSHA Certified products)
  - –20 to 60°C Ex d IIC T1 to T6 (For other certified products)
- **Insulation resistance**: 20 MΩ or more/500V DC (between batch of power supply terminal and indicator case)
- **Withstand voltage**: 500V AC/1min (between batch of power supply terminal and indicator case)

### DIMENSION OF INDICATOR / TRANSMITTER

![Diagram of Indicator/Transmitter]

- **Approx. mass**: 3.7kg

### TERMINAL AND WIRING

![Diagram of Terminal Wiring]
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

AM7□□□/P□ indicates flow rate by pointer and scale plate, and PROFIBUS PA Communication for process automation.
In addition to the dust tight and water immersion proof type, the intrinsically safe and flame proof versions are available.

● SPECIFICATION OF TRANSMITTER

Power supply voltage: Bus power supply 10 to 32V DC
However, the power supply for the intrinsically safe circuit with the safety barrier, and with FISCO system is 10 to 24V DC, and 10 to 17.5V DC respectively.

BUS Communication:
Base current: less than 12mA
In/output signal: Manchester-coded Bus Powered (IEC 61158-2)
Communication protocol: PROFIBUS DP-V1
Device · profile: PROFIBUS PA Profile V3.01
Function block: 1 Analog Input for volume (or mass) flow rate
1 Totalizer for volume (or mass) flow rate

Output accuracy: ±1.0% F.S. (Against flow calibration)

Cable entry:
Weather proof: 2–M20×1.5, 2–G1/2, 2–NPT1/2, Weather proof connector
Intrinsically safe & Flame proof: 2–M20×1.5, 2–G1/2, 2–NPT1/2, Packing type cable gland
Note: The packing type cable gland model SXG-16BY made by Shimada Electric Co. shall be used for the TIIS flame proof construction. The cable entry for the indicator is G1/2 only.

Construction:
Dust tight and water immersion proof IP67
Intrinsically safe: Ex ia IIC T1 to T6 AM7□□□/P2/□
Flame proof: Ex d IIC T1 to T6 AM7□□□/P1/□

Ambient temp.:
Dust tight and water immersion proof –20 to 70°C
Intrinsically safe: –20 to 60°C Ex ia IIC T1 to T6
Flame proof: –20 to 55°C Ex d IIC T1 to T6 (For TIIS certified products)
–20 to 60°C Ex d IIC T1 to T6 (For other certified products)

Insulation resistance: 20 MΩ or more/500V DC (between batch of power supply terminal and indicator case)
Withstand voltage: 500V AC/1min (between batch of power supply terminal and indicator case)

● DIMENSION OF INDICATOR / TRANSMITTER

Approx mass: 3.7kg

● TERMINAL AND WIRING

DP/PA Coupler or DP/PA Link

TOKYO KEISO CO., LTD. TG-F1142-0E
With local flow rate indication, AM7□□□/T□ has the functions of local flow integration, integration pulse output, 4 to 20mA electric output and Hart communication. This series serves the custody of flow. The additional magnetic sensing switches to conventional push buttons are available for customers' convenience. In addition to the dust tight and water immersion proof type, the flame proof version is available.

**SPECIFICATION OF TRANSMITTER**

- **Integration**: 6 digit red LCD (With 8 digit scaling and reset function)
- **Count rate**: Less than 10Hz (Less than 36000 c/h)
- **Pulse or Alarm output**: NPN Open collector 2 point select output (Pulse width : 30ms, 50ms, 100ms, 200ms, 500ms)
  - 1 point alarm + pulse output, or 2 points alarm output
  - (Alarms are selectable from the flow rate or the integrated flow alarm.)
- **Max. voltage**: 30V DC, max. current 50mA
  - (The power supply circuit and the output circuit are insulated.)
- **Reverse-connected protection, Residual voltage when turning it on more less 1.2V (10mA)**
- **Integration accuracy**: ±1.0%FS. (Against flow calibration)
- **Power supply**: 16 to 30V DC (Voltage between transmitter terminals)
- **Current consumption**: Less than 60mA
- **Current output**: 4 to 20mA DC
  - (Effective output range : 4.0 to 21.6mA) At abnormal condition, however, 22.8mA or 3.75mA as an option can be output.
- **Allowable load resistance**: Less than 830Ω (In case of HART communication version : 230 to 830Ω)
  - Determine the allowable load resistance for each supply voltage using following formula.
  - Allowable load resistance \( \equiv (\text{Power supply voltage} \times 10) / 0.024 \) [Ω]
  - The allowable load resistance includes the one of circuit wiring.
- **Output accuracy**: ±1.0%FS. (Against flow calibration)
- **Low cut off**: 0 to 20%FS. (default 7%FS.)
- **Damping**: 0 to 20s (default 1s)
- **Cable entry**: 2–G3/4, 2–NPT3/4, Packing type cable gland
  - Note: The packing type cable gland model SXC -22BY made by Shimada Electric Co. shall be used for the TIIS flame proof construction. The cable entry for the indicator is G3/4 only.
- **Construction**: Dust tight and water immersion proof /IP67 /
  - Ex d IIC T1 to T6 AM7□□□/T□□□E
  - The temperature class is T4 for TIIS, KOSHA certified products
- **Ambient temp.**: Dust tight and water immersion proof
  - -20 to 70°C
  - Flame proof
  - -20 to 55°C / Ex d III C T4 (For TIIS, KOSHA Certified products)
  - -20 to 60°C / Ex d III C T1 to T6 (For other Certified products)
- **Insulation resistance**: 20 MΩ or more/500V DC
  - (between batch of power supply terminal and indicator case)
- **Withstand voltage**: 500V AC/1min
  - (between batch of power supply terminal and indicator case)

**DIMENSION OF INDICATOR/TRANSMITTER**

**TERMINAL AND WIRING**

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal wire</td>
<td>D01+</td>
<td>D01–</td>
<td>D02+</td>
<td>D02–</td>
<td>R+</td>
<td>R–</td>
<td>PS+</td>
<td>PS–</td>
<td>FG</td>
<td></td>
</tr>
</tbody>
</table>

(Attention) D0: Contact output terminals, R: 4–20mA analog output terminals, PS: Power supply, FG: Grounding
**AM7000/SR Series (Metal Tube Variable Area Flowmeter)**

- **AM7□□□□□□/R□** (LOCAL INDICATOR WITH REED SWITCH TYPE ALARM)

AM7□□□□□□/R□ indicates flow rate by pointer and outputs SPST contact at set point for flow alarm.

In addition to the dust tight and water immersion proof type, the intrinsically safe version is available.

### SPECIFICATION OF TRANSMITTER

- **Alarm point**: 2 points (1 point high alarm, 1 point low alarm or 2 points high and low alarm)
- **Switch**: Self-holding reed switch (a or b contact)
- **Rating**: Reed switch (SPST) 10VA AC, 10W DC as resistance load
  - Max. 125V AC/0.5A, Max. 100V DC/0.5A
- **Setting accuracy**: ±1.5% F.S. (Against flow calibration)
  - Note: While switch is on, and if any other flow rate than the alarm setting value is indicated, it may result in causing wrong accuracy.
- **Reset span**: Less than 10% F.S. (Against flow calibration)
- **Cable entry**: G1/2 or NPT1/2 or others
- **Enclosure**: Dust tight and water immersion proof IP67
  - Intrinsically safe To be used in combination with the safety barrier provided by customers.
  - See page 12 for details.
- **Ambient temp.**: –10 to 60°C (The intrinsically safe type is subject to the safety barrier.)
- **Insulation resistance**: 100 MΩ or more/500V DC (between batch of power supply terminal and indicator case)
- **Withstand voltage**: 1500V AC/1min (between batch of power supply terminal and indicator case)

### DIMENSION OF INDICATOR / TRANSMITTER

![Diagram of indicator/transmitter dimensions]

Approx. mass: 2.8kg

### TERMINAL AND WIRING

- **Terminal No.**: 1 2 3
  - High alarm: Wiring of high alarm
  - Terminal No.**: 4 5 6
  - Low alarm: Wiring of low alarm
- **Note**: Terminal No. 4 and 5 are not used for 1 point high alarm. Likewise, terminal No. 1 and 2 are not used for 1 point low alarm.
**AM7□□□/N□ (LOCAL INDICATOR WITH PROXIMITY SWITCH TYPE ALARM)**

With local flow rate indication, AM7□□□/N□ has a proximity switch which outputs alarm signals complying with NAMUR standard. In addition to the dust tight and water immersion proof type, the intrinsically safe version is available.

**SPECIFICATION OF TRANSMITTER**

- **Alarm point**: 2 points (1 point high alarm, 1 point low alarm or 2 points high and low alarm)
- **Power supply voltage**: 8V DC
- **Operating current**: Proximity switch complying with NAMUR, ON :1mA or less, OFF : 3mA or more
- **Switch**: Proximity switch
- **Set Range Accuracy**: ±1.5% F.S. (Against flow calibration)
- **Reset span**: Less than 1.5% F.S. (Against flow calibration)
- **Cable entry**: G1/2 or NPT1/2 or others
- **Enclosure**: Dust tight and water immersion proof IP67
  - Intrinsically safe To be used in combination with the safety barrier provided by customers.

**Ambient temp.**

- Dust tight and water immersion proof –25 to 80°C
- Intrinsically safe –20 to 60°C
  - TiIS-certified transmitter/Ex ia IIC T5
  - –20 to 50°C Other certified transmitter/Ex ia IIC T1...T6
  - (Ambient temperatures above are subject to the safety barrier.)

**Insulation resistance**: 100 MΩ or more/500V DC (between batch of power supply terminal and indicator case)

**Withstand voltage**: 500V DC/1min (between batch of power supply terminal and indicator case)

**DIMENSION OF INDICATOR / TRANSMITTER**

![Dimension Diagram](image)

- **Approx. mass**: 2.8kg

**TERMINAL AND WIRING**

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>High alarm</td>
<td>+</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Terminal No.</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Low alarm</td>
<td>+</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Terminal No.4 and 5 are not used for 1 point high alarm. Likewise, terminal No. 1 and 2 are not used for 1 point low alarm.*
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

AM7□□□/□□□ (LOCAL INDICATOR WITH MICRO SWITCH TYPE ALARM)

With local flow rate indication, AM7□□□/□□□ has a micro switch which outputs SPDT alarm signals.

In addition to the dust tight and water immersion proof type, the intrinsically safe version is available.

SPECIFICATION OF TRANSMITTER

- **Alarm point**: 2 points (1 point high alarm, 1 point low alarm or 2 points high and low alarm)
- **Switch**: Micro switch (c contact)
- **Rating**: 250V AC/5A as resistance load
- **Setting accuracy**: ±1.5% F.S. (Against flow calibration)
  
  Note: While switch is on, and if any other flow rate than the alarm setting value is indicated, it may result in causing wrong accuracy.
- **Reset span**: Less than 20% F.S., less than 30% F.S. when 2 alarm contacts work simultaneously. (Against flow calibration)
- **Cable entry**: G1/2 or NPT1/2 or others
- **Enclosure**: Dust tight and water immersion proof IP67
  
  Intrinsically safe To be used in combination with the safety barrier provided by customers.
  
  See page 12 for details.
- **Ambient temp.**: Dust tight and water immersion proof –25 to 80°C
  
  Intrinsically safe –20 to 60°C subject to the safety barrier.
- **Insulation resistance**: 100 MΩ or more/500V DC (between batch of power supply terminal and indicator case)
- **Withstand voltage**: 1500V AC/1min (between batch of power supply terminal and indicator case)

DIMENSION OF INDICATOR / TRANSMITTER

![Diagram of AM7000/SR Series]

Approx. mass: 2.8kg

TERMINAL AND WIRING

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>High alarm</td>
<td>High alarm</td>
<td>COM.</td>
<td>NC.</td>
</tr>
<tr>
<td>Low alarm</td>
<td>Terminal No.</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Low alarm</td>
<td>COM.</td>
<td>NC.</td>
</tr>
</tbody>
</table>

Note: Terminal No.4, 5, 6 are not used for 1 point high alarm. Likewise, terminal No. 1, 2, 3 are not used for 1 point low alarm.
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

### AM7□□□□/M□/□E (FLAME PROOF)

AM7000SR outputs an alarm signal by SPDT contacts by adding a micro switch to the local flow rate indicator.

#### SPECIFICATION OF TRANSMITTER

| Alarm point | 2 points (1 point high alarm, 1 point low alarm or 2 points high and low alarm) |
| Switch      | Micro switch (c contact) |
| Rating      | 125V AC/1A or 30V DC/1A |
| Setting accuracy | ±1.5% F.S. (Against flow calibration) |

Note: While switch is on, and if any other flow rate than the alarm setting value is indicated, it may result in causing wrong accuracy.

| Reset span | Less than 15% F.S. (Against flow calibration), less than 20% F.S. when 2 alarm contacts work simultaneously. |
| Cable entry | G1/2 or NPT1/2 or others |
| Enclosure  | Dust tight and water immersion proof IP67 |

- Flameproof Ex d IIC T1 to T6
- The temperature class of the model certified by TIIS is T4. See page 12 for details.

| Ambient temp. | Dust tight and water immersion proof –25 to 80°C |
|              | Flameproof –20 to 55°C for the model certified by TIIS Ex d IIC T4 |
|              | –20 to 60°C for the model certified by ATEX or IECEx Ex d IIC T1 to T6 |

| Insulation resistance | 100 MΩ or more/500V DC (between batch of power supply terminal and indicator case) |
| Withstand voltage     | 1500V AC/1min (between batch of power supply terminal and indicator case) |

#### DIMENSION OF INDICATOR / TRANSMITTER

![Dimension Diagram]

Approx. mass: 3.7kg

#### TERMINAL AND WIRING

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>High alarm</td>
<td>COM</td>
<td>NC.</td>
<td>NO.</td>
</tr>
<tr>
<td>Low alarm</td>
<td>COM</td>
<td>NC.</td>
<td>NO.</td>
</tr>
</tbody>
</table>

Note: Terminal No. 4, 5, 6 are not used for 1 point high alarm. Likewise, terminal No. 1, 2, 3 are not used for 1 point low alarm.
AM7000/SR Series (Metal Tube Variable Area Flowmeter)

■ AM7000/SR/□□/□□/E (FLAMEPROOF VERSION)

The flameproof model with electric or PROFIBUS PA or alarm output (microswitch) as an additionally specified feature, is available complying with the standard.

<table>
<thead>
<tr>
<th>EX type</th>
<th>Class</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current transmission</td>
<td>Current Transmission</td>
</tr>
<tr>
<td>TIIS</td>
<td>Ex d IIC T4</td>
<td>○</td>
</tr>
<tr>
<td>KOSHA</td>
<td>Ex d IIC T4</td>
<td>○</td>
</tr>
<tr>
<td>NEPSI</td>
<td>Ex d IIC T1 to T6 Gb</td>
<td>○</td>
</tr>
<tr>
<td>ATEX</td>
<td>II2G Ex d IIC T6... T1 Gb</td>
<td>○</td>
</tr>
<tr>
<td>IECEx</td>
<td>Ex d IIC T6... T1 Gb</td>
<td>○</td>
</tr>
</tbody>
</table>

NOTE: Be sure to use the cable gland shown in the figure below for the TIIS flameproof version (current transmission, current transmission HART communication, PROFIBUS PA communication, or local integration or alarm output).

* Cable diameters applicable to cable glands included in the product.

For the current transmission ,current transmission HART communication, and PROFIBUS PA communication

For the site integration

For the alarm output

SXC-168Y By Simada Electric Co.

SXC-22 By Simada Electric Co.

EXPC-16B by Simada Electric Co.

■ AM7000/SR/□□/□□/I (INTRINSICALLY SAFE VERSION)

Intrinsically safe modes complying with the standard are available depending on additionally specified features of the current transmission, PROFIBUS PA, or alarm output.

<table>
<thead>
<tr>
<th>EX type</th>
<th>Class</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current transmission</td>
<td>Current Transmission</td>
</tr>
<tr>
<td>TIIS</td>
<td>Ex ia IIC T6</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>Ex ia IIC T5</td>
<td>○</td>
</tr>
<tr>
<td>KOSHA</td>
<td>Ex ia IIC T1 to T6</td>
<td>○</td>
</tr>
<tr>
<td>NEPSI</td>
<td>Ex ia IIC T1 to T6 Gb</td>
<td>○</td>
</tr>
<tr>
<td>ATEX</td>
<td>II2 G Ex ia IIC T1... T6 Gb</td>
<td>○</td>
</tr>
</tbody>
</table>

Note 1: The read switch type (AM7□□□/□□□□/□/□) and the micro switch type (AM7□□□/□□□□□/□□/□) are available only when the intrinsically safe relay barrier is used.

The temperature class of the TIIS intrinsically safe proximity switch type (AM7□□□/□□□□□/□□/□) is T5. Consult us for details.

● INTRINSICALLY SAFE SPECIFICATION OF CURRENT TRANSMISSION AND PROFIBUS PA COMMUNICATION

<table>
<thead>
<tr>
<th>Max. voltage for intrinsically safe circuit</th>
<th>Max. current for intrinsically safe circuit</th>
<th>Max. power consumption for intrinsically safe circuit</th>
<th>Capacitance inside intrinsically safe circuit</th>
<th>Inductance inside intrinsically safe circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>28V DC</td>
<td>93mA</td>
<td>650mW</td>
<td>5nF</td>
<td>0.2mH</td>
</tr>
<tr>
<td>24V DC</td>
<td>150mA</td>
<td>1.2W</td>
<td>3nF</td>
<td>0mH</td>
</tr>
<tr>
<td>17.5V DC</td>
<td>400mA</td>
<td>5.4W</td>
<td>3nF</td>
<td>0mH</td>
</tr>
</tbody>
</table>

● INTRINSICALLY SAFE SPECIFICATION OF ALARM OUTPUT

<table>
<thead>
<tr>
<th>Read switch AM7□□□/□□□□□/□/□/□</th>
<th>Proximity switch AM7□□□/□□□□□/□□/□/□</th>
<th>Micro switch AM7□□□/□□□□□/□□/□/□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. voltage for intrinsically safe circuit</td>
<td>30V DC</td>
<td>30V DC</td>
</tr>
<tr>
<td>Max. current for intrinsically safe circuit</td>
<td>500mA</td>
<td>500mA</td>
</tr>
<tr>
<td>Max. power consumption for intrinsically safe circuit</td>
<td>34mW</td>
<td>64mW</td>
</tr>
<tr>
<td>Capacitance inside intrinsically safe circuit</td>
<td>150nF</td>
<td>150nF</td>
</tr>
<tr>
<td>Inductance inside intrinsically safe circuit</td>
<td>150μH</td>
<td>150μH</td>
</tr>
<tr>
<td>Recommended relay barrier EB3C (IDE)</td>
<td>KFD2-SR2-Ex1.W (P&amp;F)(Note 2)</td>
<td>EB3C (IDE)</td>
</tr>
</tbody>
</table>

Note 2: The TIIS intrinsically safe proximity switch has been certified in combination with barriers made by PEPPERL+FUCHS. Be sure to use intrinsically safe proximity switches with the barriers shown below. For other proximity switches, use the explosion-proof barriers conforming to the rated values above.

TIIS intrinsically safe barrier For 1ch/KFD2-SR2-Ex1.W For 2ch/KFD2-SR2-Ex2.W
## DIMENSIONS AND FLOW RATE TABLE

**AM71□□/SR**  
(Flow direction: Bottom—Top)  
(Sanitary type)  
For liquid

![Diagram of AM71□□/SR](image)

### Table 1

Table 1: Figures in ( ) is the flow rate of water (density: 1.0 g/cm³, viscosity: 1.0 mPa·s).

<table>
<thead>
<tr>
<th>Meter size</th>
<th>Flow rate (m³/h)</th>
<th>Pressure loss (kPa)</th>
<th>Conn size</th>
<th>Size (mm)</th>
<th>Mass (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.1—0.47</td>
<td>5</td>
<td>15</td>
<td>500</td>
<td>93</td>
</tr>
<tr>
<td>20</td>
<td>1.6 (1.7)</td>
<td>7.5</td>
<td>15</td>
<td>500</td>
<td>94</td>
</tr>
<tr>
<td>25</td>
<td>4 (4.2)</td>
<td>9.5</td>
<td>15</td>
<td>500</td>
<td>97</td>
</tr>
<tr>
<td>40</td>
<td>7.1 (10)</td>
<td>9</td>
<td>1.5S</td>
<td>500</td>
<td>104</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
<td>7.5</td>
<td>2S</td>
<td>500</td>
<td>110</td>
</tr>
<tr>
<td>(20)</td>
<td>11</td>
<td>2.5S</td>
<td>2S</td>
<td>550</td>
<td>110</td>
</tr>
<tr>
<td>65</td>
<td>27.5 (32)</td>
<td>10</td>
<td>3S</td>
<td>550</td>
<td>119</td>
</tr>
<tr>
<td>80</td>
<td>40.5</td>
<td>10.5</td>
<td>3.5S</td>
<td>550</td>
<td>125</td>
</tr>
<tr>
<td>100</td>
<td>70</td>
<td>11.5</td>
<td>4S</td>
<td>550</td>
<td>138</td>
</tr>
</tbody>
</table>

### Table 2

Table 2

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tapered tube</td>
<td>SUS304</td>
<td>SUS316</td>
<td>SUS316L</td>
<td></td>
<td>With #20 to #400 buff polishing (inner and outer)</td>
</tr>
<tr>
<td>2</td>
<td>Float assembly</td>
<td>SUS304</td>
<td>SUS316</td>
<td>SUS316L</td>
<td>SUS316L</td>
<td>With #20 to #400 buff polishing (inner and outer)</td>
</tr>
<tr>
<td>3</td>
<td>Lower body</td>
<td>SUS304</td>
<td>SUS316</td>
<td>SUS316L</td>
<td></td>
<td>With #20 to #400 buff polishing (inner and outer)</td>
</tr>
<tr>
<td>4</td>
<td>Float guide</td>
<td>SUS304</td>
<td>SUS316</td>
<td>SUS316L</td>
<td></td>
<td>With #20 to #400 buff polishing (inner and outer)</td>
</tr>
<tr>
<td>5</td>
<td>Reducer</td>
<td>A240 304</td>
<td>A240 316L</td>
<td>A240 316L</td>
<td></td>
<td>With #20 to #400 buff polishing (inner and outer)</td>
</tr>
<tr>
<td>6</td>
<td>Indicator</td>
<td>ADC12</td>
<td>ADC12</td>
<td>ADC12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Clamp</td>
<td>SCS13</td>
<td>SCS13</td>
<td>SCS13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Gasket</td>
<td>Silicone rubber</td>
<td>Silicone rubber</td>
<td>Silicone rubber</td>
<td>Standard material</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>NBR</td>
<td>NBR</td>
<td>NBR</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTFE</td>
<td>PTFE</td>
<td>PTFE</td>
<td>PTFE</td>
<td></td>
</tr>
</tbody>
</table>

* SUS316L may be used instead of SUS304 and SUS316 due to production circumstances.  
* JIS materials may be used instead of ASTM for reducers due to production circumstances.  
* Electrolytic polishing is available as an option.
### SELECTION OF FLOWMETER

#### 1. Liquid application

**a. Selection of meter size**

Maximum possible flow rate each meter size is shown in dimension tables. These figures are based on water flow (Density 1.0g/cm³ and Viscosity 1.0MPa·s). If actual fluid condition is different from such figures, a conversion calculation is required as following formula:

\[
Q_w = Q \times 2.59 \sqrt{(7.7/\rho)} \cdot 1
\]

\(Q_w\) : Water converted flow rate (m³/h)
\(Q\) : Flow rate of actual fluid (m³/h)
\(\rho\) : Density of actual fluid (g/cm³)

Example Fluid: Alcohol Density: 0.8g/cm³

\[Q_w = 16 \times 2.59 \sqrt{(7.7/0.8)} \cdot 1 = 16 \times 0.882 = 14.1 \text{ (m³/h)}\]

Referring to table 1, the required meter size is 50. Either the connection size 2S or 2.5S can be used.

**b. Viscosity limit**

In case the Viscosity of fluid is more than 1mPa·s, confirm the suitability in the graph below. Trace viscosity and flow rate and confirm the crossing point is below the curve. If the crossing point is above the curve, consult factory for detailed calculation by computer.

#### Viscosity curve

![Viscosity Curve](image)

2. **Scale graduation**

Customer can select any one of the following 16 standard scale graduations covering the maximum scale range.

Range ability is 10 : 1

#### Standard scale graduation

![Scale Graduation](image)
CAUTIONS

- This flowmeter transmits the displacement caused by the magnet coupling. A surrounding magnetic field might affect its performance.
- Avoid installation near magnetic fields. Magnetic materials including insulation covers may also affect its performance; do not bring them within 20 cm from the flowmeter.
- When installing two or more flowmeters, place them at least the distances shown in figures below apart from each other to avoid mutual interference.
  For maintenance, ensure a clearance of at least 20 cm between the indicator of one flowmeter and the body of other flowmeters.

Local indication and alarm output (flameproof) type
Electric transmitter and PROFINET PA type

<table>
<thead>
<tr>
<th>Meter size 50 or less</th>
<th>Min. 35 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter size 65 or more</td>
<td>Min. 45 cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meter size 50 or less</th>
<th>Min. 40 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter size 65 or more</td>
<td>Min. 50 cm</td>
</tr>
</tbody>
</table>

Min. 20 cm

* Specification is subject to change without notice.