GENERAL

The Coriolis mass flowmeter MASSMAX® 3400 series consists of the single Z-shaped measuring tube which is well-accepted as very small flow measurement, and newly-developed high performance converter MMC400. The epoch-making sensing technologies have achieved the accurate flow measurement of very small flow rate with a wide rangeability. Stainless steel 316L as standard and Hastelloy® C22 as an option are used for the wetted parts of the flowmeter. With 3 sizes of 1, 3 and 4mm MASSMAX® MMC400 is suitable for the accurate measurement of very small flow rate as low as 1 kg/h or less.

FEATURES

- Single Z-shaped measuring tube
- Maximum pressure rating 30 MPa
- High accuracy: ±0.1% of reading (+ Zero stability)
- Excellent zero stability and high vibration proof
- Duplicated protection with outer housing made of stainless steel
- Available both sensor-converter integrally mounted compact type, and separately mounted remote type
- Certified explosion-proof by ATEX and TIIS
  ATEX : Equipment intended for use in potentially explosive atmosphere in Europe
  TIIS : Technology Institute of Industrial Safety in Japan
- CE Marking

STANDARD SPECIFICATIONS

- Measuring Principle: Coriolis force
- Meter Size: 01, 03, 04 mm
- Measuring Range:

<table>
<thead>
<tr>
<th>Meter size</th>
<th>Lower flow limit kg/h</th>
<th>S</th>
<th>Nominal max. flow rate kg/h</th>
<th>H (Option)</th>
<th>03</th>
<th>Nominal max. flow rate kg/h</th>
<th>04</th>
<th>Lower flow limit kg/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>0.3</td>
<td>S</td>
<td>0.333</td>
<td>H</td>
<td>03</td>
<td>2.166</td>
<td>04</td>
<td>7.5</td>
</tr>
<tr>
<td>03</td>
<td>2.166</td>
<td>S</td>
<td>0.033</td>
<td>H</td>
<td>03</td>
<td>0.033</td>
<td>04</td>
<td>0.1166</td>
</tr>
</tbody>
</table>

- Enclosure: IP66/67 (IEC 60529)
- Ambient Temperature: -40 to + 55°C (Compact version) -40 to + 60°C (Separate Sensor and Converter)
- Density: 400 to 3000 kg/m³

Fluid Specifications

- Fluid: Liquid
- Fluid Temperature and Pressure:

<table>
<thead>
<tr>
<th>Measuring Tube</th>
<th>Temperature °C</th>
<th>Pressure (abs) MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>S Stainless steel 316L</td>
<td>-40 to + 150°C</td>
<td>0 to 15</td>
</tr>
</tbody>
</table>
| H Hastelloy® C22 | -40 to + 30 MPa (abs)

*1 Refer to [Explosion Proof] for fluid temperature range of Ex type
*2 “Temperature” and “Pressure” in this table means allowable temperature and pressure range of the measuring tube. Besides, the maximum operating condition of the process must be within “Pressure and temperature rating table” shown in this Technical Guidance.

- Process Connection: 1/4” NPT Male
- Materials:
  - Wetted Part:
    - Material symbol: S, H (Option)
    - Measuring Tube: Stainless steel 316L, Hastelloy® C22
    - Fittings: Stainless steel 316L, Hastelloy® C22
  - Non Wetted Part:
    - Outer housing: Stainless steel 316L
    - Base plate: Stainless steel 316L

- Outer housing protection:
  - 3 MPa (abs) or less in fluid pressure: Standard
  - More than 3 MPa (abs) in fluid pressure: With a bursting disc
**Converter**

- **Housing Material**: Aluminum alloy
- **Painting**: Siloxane coating
- **Color**: Grey (Converter housing), Jade green (Converter cover / Terminal box cover)
- **Power Supply**: 100 V to 230 V AC (85 V to 253 V AC)
- **Supply Frequency**: 48 to 63 Hz
- **Power Consumption**: AC: approx. 22 VA, DC: approx. 12 W
- **Grounding**: Grounding resistance must be less than 100Ω for Non-Ex version
- **Cable Entry**: 2 × G1/2 Female adapter or 2 × 1/2 NPT Female adapter or 2 × M20 × 1.5 Female thread or 2 × G1/2 Flame proof adapter for TIIS-Ex
- **Painting**: Siloxane coating

**Presentation**: Changeable from 4 screens. Each screen shows maximum 3 lines of data. The data include instantaneous mass flow rate capable bar graph indication, totalizing mass flow, instantaneous volume flow rate, totalizing volume flow, density, temperature, and flow trend graph in %. The setting data and self-diagnosis data are also presented.

**Contents**

- **Pulse width**: Selectable from:
  - Pulse rate: 2 to 36,000,000 pulse/h, or 0.01 Hz to 10 kHz
- **Output frequency**: Max. 10 kHz
- **Residual voltage at close**: 100 mA or less (f ≤ 100 Hz)
- **Passive (powered externally)**: Voltage Max. 32 V DC, 100 mA
- **Active (powered internally)**: Load resistance Max. 1000 Ω
- **Load rating**: Max. 32 V DC, 100 mA
- **Control target**: Selectable from:
  1. No status output, set as default on delivery at factory
  2. Flow direction identification
  3. Flow over range
  4. Totalizing preset
  5. Identification of range when double ranges are used.
  6. Errors and measurement alarms of flow, density, temperature and others
  7. Others

**Indication and outputs**

- **Indicator**: Blue dot matrix LCD with back light
- **Presentation**: 128 × 64 pixels, or 59 × 31 mm
- **Status output**: Open collector output
- **Status output rating**: Max. 32 V DC, 100 mA
- **Residual voltage at close**: <0.2 V when load current ≤ 10 mA
- **<2 V when load current ≤ 100 mA
- **Status output voltage**: 2 V when load current ≤ 10 mA
- **<0.2 V when load current ≤ 10 mA
- **<2 V when load current ≤ 100 mA
- **Status output current**: Max. 6.5 mA at 24 V DC
- **Control target**: Selectable from:
  1. No control input, set as default on delivery at factory
  2. To hold output
  3. To lock output to 0%
  4. To reset totalized counter
  5. To reset errors
  6. To identify range while double ranges are used
  7. Others

**Combination of output types**

- **Standard**: 1 × 4 to 20 mA output, 1 × pulse output, 1 × status output
  - Option 1: 2 × 4 to 20 mA output, 1 × pulse output, total 4
  - Option 2: 3 × 4 to 20 mA output, 1 × pulse output, total 4
  - Option 3: 2 × 4 to 20 mA output, 2 × status or pulse output selectable total 4
- **Low cut-off**: Current output and pulse output can be set separately per each indication.
- **Time constant**: Current output and pulse output can be set separately per each indication.
- **Set point**: 0 to 100.0 seconds at 0.1 second step

**Standard functions**

- **Arbitrary measuring units can be set freely**: Mass or volume flow rate, and per time is prescribed freely in maximum 7 letters.
- **Bi-directional flow measuring**: Forward or reverse flow is measurable. Flow direction is output as status output.
- **Self-diagnosis**: Error and status messages are presented.
- **Functioning**: CPU, memory, software, hardware, output connection
- **Status**: Over-range, count-over, power failure
- **Application**: Oscillating balance of measuring tube, vibration energy, other sensor circuit diagnosis
- **Testing**: Built-in current and pulse simulation outputs allow loop check without calibrator.
- **Data setting with infra-red touch sensors**: 4 touch sensors allow to set data from outside without opening cover.

While the cover is opened the keys are used as push buttons.

**Massmax 3400 Series Single Measuring Tube for Small Flow / Coriolis Mass Flowmeter**

**Converter**

- **Housing Material**: Aluminum alloy
- **Color**: SS316L as an option
- **Painting**: Siloxane coating
- **Painting**: Grey (Converter housing), Jade green (Converter cover / Terminal box cover)
- **Power Supply**: 100 V to 230 V AC (85 V to 253 V AC)
- **Supply Frequency**: 48 to 63 Hz
- **Power Consumption**: AC: approx. 22 VA, DC: approx. 12 W
- **Grounding**: Grounding resistance must be less than 100Ω for Non-Ex version
- **Cable Entry**: 2 × G1/2 Female adapter or 2 × 1/2 NPT Female adapter or 2 × M20 × 1.5 Female thread or 2 × G1/2 Flame proof adapter for TIIS-Ex
- **Painting**: Siloxane coating

**Presentation**: Changeable from 4 screens. Each screen shows maximum 3 lines of data. The data include instantaneous mass flow rate capable bar graph indication, totalizing mass flow, instantaneous volume flow rate, totalizing volume flow, density, temperature, and flow trend graph in %. The setting data and self-diagnosis data are also presented.

**Contents**

- **Pulse width**: Selectable from:
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- **Active (powered internally)**: Load resistance Max. 1000 Ω
- **Load rating**: Max. 32 V DC, 100 mA
- **Control target**: Selectable from:
  1. No status output, set as default on delivery at factory
  2. Flow direction identification
  3. Flow over range
  4. Totalizing preset
  5. Identification of range when double ranges are used.
  6. Errors and measurement alarms of flow, density, temperature and others
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**Indication and outputs**

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**Standard functions**

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- **Status**: Over-range, count-over, power failure
- **Application**: Oscillating balance of measuring tube, vibration energy, other sensor circuit diagnosis
- **Testing**: Built-in current and pulse simulation outputs allow loop check without calibrator.
- **Data setting with infra-red touch sensors**: 4 touch sensors allow to set data from outside without opening cover.

While the cover is opened the keys are used as push buttons.
**Accuracy calibrated at the factory**

- **Mass Flow (Pulse output)**
  
<table>
<thead>
<tr>
<th>Accuracy</th>
<th>±0.1% of reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero stability</td>
<td>≤0.0057% of nominal max. flow rate</td>
</tr>
</tbody>
</table>

Note: The figures of accuracy and zero stability above are based on the conditions that measured fluid is water with 20°C and 0.2 MPa.

[Measuring error] (Accuracy + Zero stability)

![Graph showing Measuring error vs. Flow rate](image)

<table>
<thead>
<tr>
<th>Flow rate (%) of nominal max. flow rate</th>
<th>Measuring error (% of reading)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.106</td>
</tr>
<tr>
<td>50%</td>
<td>0.111</td>
</tr>
<tr>
<td>20%</td>
<td>0.129</td>
</tr>
<tr>
<td>10%</td>
<td>0.157</td>
</tr>
<tr>
<td>5%</td>
<td>0.214</td>
</tr>
<tr>
<td>1.5%</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Note: The measured flow rate less than 1% of the nominal maximum flow rate, i.e. less than lower flow limit is out of the guaranteed accuracy.

Influences of process condition changes

- **Temperature**: ±0.0056%/°C of nominal maximum flow rate
- **Pressure**: ±0.013%/0.1 MPa of nominal maximum flow rate

Above figures show the influences of process condition changes after zero adjustment.

**Temperature (Indicated value)**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>−40 to +150°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±1°C</td>
</tr>
</tbody>
</table>

**Pressure and temperature rating table**

- Hastelloy® C22 sensor
- Stainless steel sensor tube
- Outer housing *1

*1 Specify the bursting disc when the process pressure is more than the limitation.

**Explosion Proof**

- **TIIS Technology Institute of Industrial Safety in Japan**
  
  (1) **Compact type (Sensor-converter integrally mounted compact type)**
  
  Model: MMM3400C-JEx
  
  a) Type of protection and class: Sensor Ex ia IIC T4
  
  Converter Ex d [ia] IIC T4
  
  Terminal box Ex d IIC T4
  
  Ambient temperature: −20 to +50°C
  
  Fluid temperature: −40 to +90°C
  
  b) Type of protection and class: Sensor Ex ia IIC T3
  
  Converter Ex d [ia] IIC T3
  
  Terminal box Ex d IIC T3
  
  Ambient temperature: −20 to +40°C
  
  Fluid temperature: −40 to +150°C
  
(2) **Remote type sensor**

  Model: MMS3000F-JEx
  
  a) Type of protection and class: Ex ia IIC T4
  
  Ambient temperature: −20 to +80°C
  
  Fluid temperature: −40 to +90°C
  
  b) Type of protection and class: Ex ia IIC T3
  
  Ambient temperature: −20 to +60°C
  
  Fluid temperature: −40 to +130°C
  
(3) **Remote type converter**

  Model: MMC400F-JEx
  
  Type of protection and class: Ex d [ia] IIC T6
  
  Ambient temperature: −20 to +60°C

- **ATEX**
  
  (1) **Compact type (Sensor-converter integrally mounted compact type)**
  
  Model: MMM3400C-Ex
  
  Type of protection and class: Ex d ia IIC T4 ... T1 Ga / Gb others
  
  Temperature class | Max. Fluid temperature | Ambient temperature |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>−40°C to +40°C</td>
<td>−40°C to +40°C</td>
</tr>
<tr>
<td>T5</td>
<td>−40°C to +70°C</td>
<td>−40°C to +70°C</td>
</tr>
<tr>
<td>T4</td>
<td>−40°C to +90°C</td>
<td>−40°C to +90°C</td>
</tr>
<tr>
<td>T3...T1</td>
<td>−40°C to +150°C</td>
<td>−40°C to +150°C</td>
</tr>
<tr>
<td>T4</td>
<td>−40°C to +90°C</td>
<td>−40°C to +90°C</td>
</tr>
<tr>
<td>T3...T1</td>
<td>−40°C to +150°C</td>
<td>−40°C to +150°C</td>
</tr>
<tr>
<td>T6...T1</td>
<td>−40°C to +65°C</td>
<td>−40°C to +65°C</td>
</tr>
</tbody>
</table>

(2) **Remote type sensor**

  Model: MMS3000F-Ex
  
  Type of protection and class: Ex d ia [Ga] IIC T6...T1 Ga/Gb others
  
  Temperature class | Max. Fluid temperature | Ambient temperature |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>−40°C to +40°C</td>
<td>−40°C to +40°C</td>
</tr>
<tr>
<td>T5</td>
<td>−40°C to +70°C</td>
<td>−40°C to +70°C</td>
</tr>
<tr>
<td>T4</td>
<td>−40°C to +90°C</td>
<td>−40°C to +90°C</td>
</tr>
<tr>
<td>T3...T1</td>
<td>−40°C to +150°C</td>
<td>−40°C to +150°C</td>
</tr>
<tr>
<td>T4</td>
<td>−40°C to +90°C</td>
<td>−40°C to +90°C</td>
</tr>
<tr>
<td>T3...T1</td>
<td>−40°C to +150°C</td>
<td>−40°C to +150°C</td>
</tr>
<tr>
<td>T6...T1</td>
<td>−40°C to +65°C</td>
<td>−40°C to +65°C</td>
</tr>
</tbody>
</table>

(3) **Remote type converter**

  Model: MMC400F-Ex
  
  Type of protection and class: Ex d [ia] IIC T6 Ga others
  
  Temperature class | Ambient temperature |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>−40°C to +65°C</td>
</tr>
</tbody>
</table>
NAME OF EACH PART

Compact Version

Converter
Sensor
Cable entry
Power supply
Input / Output
Outer housing
Base plate
Process connection

FLOW RANGE

<table>
<thead>
<tr>
<th>Meter size</th>
<th>Nominal max. flow rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kg/h</td>
</tr>
<tr>
<td></td>
<td>kg/min</td>
</tr>
<tr>
<td>01</td>
<td>20</td>
</tr>
<tr>
<td>03</td>
<td>130</td>
</tr>
<tr>
<td>04</td>
<td>450</td>
</tr>
</tbody>
</table>

MEASURING TUBE DIMENSIONS

<table>
<thead>
<tr>
<th>Meter size</th>
<th>Material</th>
<th>Measuring tube dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inside diameter</td>
</tr>
<tr>
<td>01</td>
<td>S</td>
<td>1.20</td>
</tr>
<tr>
<td>03</td>
<td>S</td>
<td>2.58</td>
</tr>
<tr>
<td>04</td>
<td>S</td>
<td>3.94</td>
</tr>
</tbody>
</table>

Material S: Stainless steel 316L
H: Hastelloy® C22
ELECTRICAL CONNECTION

[Input and output terminals] MMC400C/F
● 1 × current output, 1 × pulse output, 1 × status output, 1 × control input, as standard input and outputs

The power supply terminal block has a protection cover.

---

**Terminals** | **Description**
--- | ---
L/L+ | AC Power or DC power, “L+” for plus and “L−” for minus in DC power
N/L− | Earth

**Terminals** | **Polarity** | **Description of standard outputs**
--- | --- | ---
D− | − | Pulse or status output
D | + | Status output
C | + | Control input or status output
B− | − | Current output 4 to 20 mA (internal power supply)
B | + | Current output No.2 (internal power)
A+ | + | Current output No.3 (internal power)
A− | − | Current output No.1 (internal power)

Converter specifications:

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D−</td>
<td>Pulse or status output</td>
</tr>
<tr>
<td>D</td>
<td>Pulse or status output</td>
</tr>
<tr>
<td>C−</td>
<td>Current output No.1 (internal power)</td>
</tr>
<tr>
<td>C</td>
<td>Current output No.1 (internal power)</td>
</tr>
<tr>
<td>B−</td>
<td>Current output No.2 (internal power)</td>
</tr>
<tr>
<td>B</td>
<td>Current output No.2 (internal power)</td>
</tr>
<tr>
<td>A+</td>
<td>Current output No.3 (internal power)</td>
</tr>
<tr>
<td>A−</td>
<td>Current output No.3 (internal power)</td>
</tr>
</tbody>
</table>

Remote type sensor cable]

MMS3000F + MMC400F
Converter MMC400F side
● Terminals: Spring clamp type
● Exclusive use cable to be connected

Sensor MMS3000F side
● Terminals: Spring clamp type
● Exclusive use cable to be connected
---

Sensor cable for exclusive use
● 10-core compound cable with 0.5 mm² conductor
● Cable outside diameter: Approx. 11 mm
● Maximum length: 20 m

---

Converter specifications:

<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>D−</td>
<td>Pulse or status output</td>
<td>Pulse or status output</td>
</tr>
<tr>
<td>D</td>
<td>Pulse or status output</td>
<td>Pulse or status output</td>
</tr>
<tr>
<td>C−</td>
<td>Current output No.1 (internal power)</td>
<td>Current output No.1 (internal power)</td>
</tr>
<tr>
<td>C</td>
<td>Current output No.1 (internal power)</td>
<td>Current output No.1 (internal power)</td>
</tr>
<tr>
<td>B−</td>
<td>Current output No.2 (internal power)</td>
<td>Pulse or status output No.2</td>
</tr>
<tr>
<td>B</td>
<td>Current output No.2 (internal power)</td>
<td>Pulse or status output No.2</td>
</tr>
<tr>
<td>A+</td>
<td>Current output No.3 (internal power)</td>
<td>Current output No.3 (internal power)</td>
</tr>
<tr>
<td>A−</td>
<td>Current output No.3 (internal power)</td>
<td>Current output No.3 (internal power)</td>
</tr>
</tbody>
</table>
**DIMENSIONS**

**Compact version [MMM3400C]**

![Diagrams of compact version](image1)

- **Mass**: approx. 1.2 kg
- **Length "G"**
  - 26 mm with a G1/2 female adapter
  - 26 mm with a 1/2 NPT female adapter
  - 85 mm with a TiIS explosionproof type adapter

**Sensor of remote type [MMS3000F]**

![Diagrams of sensor of remote type](image2)

- **Mass**: approx. 10 kg
- **Note**: The base plate of flowmeter shall be fixed firmly on a pedestal or the like. Do not support flowmeters by piping or piping fittings.

**Converter of remote type [MMC400F]**

![Diagrams of converter of remote type](image3)

- **Mass**: approx. 5.8 kg
- **Length "G"**
  - 26 mm with a G1/2 female adapter
  - 26 mm with a 1/2 NPT female adapter
  - 85 mm with a TiIS explosionproof type adapter

**Note**: The base plate of flowmeter shall be fixed firmly on a pedestal or the like. Do not support flowmeters by piping or piping fittings.
**DIMENSIONS (option)**

- Compact type (MMM3400C) with flange fitting
  15A JIS20K, 1/2 ASME150lb, 1/2 ASME300lb

| Mass: Approx. 12 kg |

- With a bursting disk (for illustration purposes)
  When fluid pressure exceeds 3 MPa, a bursting disk is added to the outer housing for releasing pressure.

- Heating jacket (for illustration purposes)
  A heating jacket cannot be used with a bursting disk.
### Measuring Tube Material: S (Stainless Steel 316L) [Standard] / H (Hastelloy® C22) [Option]

<table>
<thead>
<tr>
<th>Product Specifications</th>
<th>Sensor and converter integrally mounted compact type</th>
<th>Sensor and converter separately mounted remote type</th>
</tr>
</thead>
<tbody>
<tr>
<td>General purpose, non explosionproof</td>
<td>MMM3400C- │ MMS3000F- │ MM400F</td>
<td></td>
</tr>
<tr>
<td>TiIS explosionproof</td>
<td>MMM3400C-JEx- │ MMS3000F-JEx- │ MM400F-JEx</td>
<td></td>
</tr>
<tr>
<td>ATEX explosionproof</td>
<td>MMM3400C-Ex- │ MMS3000F-Ex- │ MM400F-Ex</td>
<td></td>
</tr>
</tbody>
</table>

Note: TiIS explosionproof version is certified by Technology Institute of Industrial Safety in Japan.

Material code either S or H is designated in ■.
Size code either 01 or 03 or 04 is designated in □□.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Sensor code</td>
<td>TK</td>
<td>MMS3000 Sensor (Single Z-shaped Measuring Tube)</td>
<td>○</td>
</tr>
<tr>
<td>Meter Size</td>
<td>01, 03, 04</td>
<td>Meter size 01, 03, 04</td>
<td>○</td>
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<tr>
<td>Measuring Code</td>
<td>4</td>
<td>always 4</td>
<td>○</td>
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<tr>
<td>Measuring Tube Material</td>
<td>S, H</td>
<td>Stainless steel 316L, Hastelloy® C22</td>
<td>○</td>
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<tr>
<td>Measuring Tube Surface Finish</td>
<td>0</td>
<td>Standard</td>
<td>○</td>
</tr>
<tr>
<td>Process Connection</td>
<td>HK</td>
<td>1/4” NPT Male</td>
<td>○</td>
</tr>
<tr>
<td>Outer Housing Pressure Rating</td>
<td>A, C</td>
<td>3 MPa (Operating pressure &lt; 3 MPa at 20°C), 6.3 MPa (Operating pressure &lt; 6.3 MPa at 20°C)</td>
<td>○</td>
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<tr>
<td>Heating jacket and Air purge</td>
<td>0, 2, 3</td>
<td>Without, Heating jacket (1/4 NPT Female), Air purge connection (1/2 NPT Female)</td>
<td>○</td>
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<tr>
<td>Explosion Proof Approvals</td>
<td>1, 9</td>
<td>ATEX explosionproof, TiIS explosionproof</td>
<td>○</td>
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<tr>
<td>Hygienic / Sanitary Approvals</td>
<td>0</td>
<td>Without</td>
<td>○</td>
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<tr>
<td>Version</td>
<td>0, 1</td>
<td>Compact version (Integral), Separate version (Remote)</td>
<td>○</td>
</tr>
<tr>
<td>Calibration</td>
<td>0, 1, A, B</td>
<td>Standard 3 point ow calibration, 5 point ow calibration, 3 point flow calibration + density calibration, 5 point flow calibration + density calibration</td>
<td>○</td>
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<tr>
<td>Degreasing</td>
<td>0, 1</td>
<td>Without, Degreasing wetted parts</td>
<td>○</td>
</tr>
<tr>
<td>Special Feature</td>
<td>/Z</td>
<td>Involved</td>
<td>○</td>
</tr>
</tbody>
</table>
STANDARD ACCESSORIES

- Data sheet for setting : 1 set
- Instruction Manual : 1 set

OPTIONS

- Water-proof cable gland for cable connection "G1/2", Model code "WG"
- Numbers of cable entries for external connection "3", Model code "3G"
- Metal fixtures for 2" pipe mount, Model code "PM"

SPECIFICATION CODES WHEN ORDERING

1. Model and specifications
   Examples
   Model : MMM3400C
   Sensor Code : TK014S0HK0A000000
   Converter Code : TK5344A0520012100000

2. Options as requested.
   Specify them with their codes.
INSTALLATION NOTES

Observe followings for the installation of MASSMAX® 3400 on the piping.

- In both cases of horizontal and vertical installation, the base plate of flowmeter shall be fixed firmly on a pedestal or the like by using 4 mounting holes located on the base plate as shown in figure ① below. Do not support the flowmeter by piping or piping fittings.
- Install the flowmeter on the vertical piping within the allowable inclination as shown in drawings ②. Do not install the flowmeter on the inclined piping.
- Do not install the flowmeter as note 1 and note 2 below.
- Arrange the piping so that the measuring tube is filled with fully liquid.
- Install the control valve at the downstream side of the flowmeter, if required, to avoid possible cavitation caused by throttling of upstream control valve.

① Install the flowmeter on the flat surface.

② When installing the flowmeter on the vertical lines, install it within the following inclination to make draining and venting easy during the stoppage of fluid.

Inclination angle
S01 : less than 7 degrees, S03 and S04 less than 13 degrees

Note 1: Avoid too much stress to the flowmeter from the installed piping. Eliminate any distortion or centering deviation of piping before installation.

Note 2: Do not install the flowmeter upside down.

* Specification is subject to change without notice.