MagneW 3000 PLUS Smart Electromagnetic Flowmeter Detector (Ceramic lining)
Model MGG18D

OVERVIEW
The MagneW 3000 PLUS ceramic lining detector is a high-performance and highly-reliable flow meter based on Yamatake's proven MagneW 3000 flow measurement technologies. A broader portfolio of MagneW 3000 PLUS meets various applications.

FEATURES
• A unique high-quality electrode structure offers the strongest ceramic lining detector against thermal shock.
• Ceramic lining detectors range in size from 15 mm to 100 mm are available and meet various severe applications, such as high-temperature, high-pressure, and wearing applications.
• Mirror finish surface of the ceramic lining is available for scaling applications.
• The standard accuracy is +/- 0.5% of rate. Also available is an optional high accuracy calibration rated at +/- 0.35% of rate (sizes of 40mm to 100mm (1-1/2 to 4 inches), combined with MGG14C).

APPLICATIONS
Applicable to a wide range of applications in various industries.

Pulp and paper
Liquid, pulp, chemicals, corrosive liquids, etc.

Petroleum/petrochemical/chemicals
Corrosive liquids, dyes, chemicals, etc.

Public utilities
Service water, sewage, excrement, sludge, sediment slurry etc.

Steel/non-ferrous metals/ceramics
Aluminum slurry, corrosive liquids, etc.

Machinery/equipment/electric machinery
Corrosive liquids, etc.

Construction
Construction material slurry, sediment slurry, cement slurry, etc.

Shipbuilding
Sediment slurry, etc.
FUNCTIONAL SPECIFICATIONS

Type of protection
JIS C 0920 waterproof model
NEMA ICS6-110 TYPE4
IEC PUBL 529 IP66

Temperature range of liquid to be measured
Ceramic lining

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Temperature of the liquid to be measured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integral model</td>
</tr>
<tr>
<td>15 to 100</td>
<td>-40 to +120°C</td>
</tr>
</tbody>
</table>

Measurable electrical conductivity
Combined with model MGG14C converter
3 µS/cm or more
(in case of less than 3 µS/cm, consult your Yamatake representative)

Measurement flow range
Refer to the minimum/maximum set ranges shown in the table below.

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Minimum set range (m³/h) (Minimum constant flow speed of 0 to 0.1 m/s)</th>
<th>Maximum set range (m³/h) (Maximum constant flow speed of 0 to 0.1 m/s)</th>
<th>Flow conversion factor K</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0 to 0.0637</td>
<td>0 to 6.36</td>
<td>1.572</td>
</tr>
<tr>
<td>25</td>
<td>0 to 0.177</td>
<td>0 to 17.6</td>
<td>0.5659</td>
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<tr>
<td>40</td>
<td>0 to 0.453</td>
<td>0 to 45.2</td>
<td>0.2210</td>
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<tr>
<td>50</td>
<td>0 to 0.707</td>
<td>0 to 70.6</td>
<td>0.1415</td>
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<tr>
<td>80</td>
<td>0 to 1.81</td>
<td>0 to 180</td>
<td>0.005526</td>
</tr>
<tr>
<td>100</td>
<td>0 to 2.83</td>
<td>0 to 282</td>
<td>0.03537</td>
</tr>
</tbody>
</table>

Measurement flow velocity range
0 to 10 m/s

Measurable flow pressure
-0.098 to +3.92 MPa {-1 to +40 kgf/cm²}

Flange rating
JIS 10K, 20K, 30K, 40K
ANSI 150, 300, JPI 150, 300
DIN PN10, 16, 25, 40
JIS G3451 F12 (diameter 80 to 100 mm)

Ambient temperature limits
-25 to +60°C (integral model)
-30 to +80°C (integral model)

Ambient humidity limits
10 to 90% RH

Optional specifications

Test report
Calibration certificate, withstand voltage test, insulation resistant, hydrostatic pressure test, physical inspection are included.

Traceability certificate
The following three documents are included.
• Traceability system chart
• Traceability certificate
• Test report

Attaching the tag number to the terminal box
Stamp the tag with the specified number and attach to the terminal box. The maximum number of characters in the tag number is 8.

Attaching the tag number to the neck section
Stamp the tag with the specified number and attach to the neck section of the detector. The maximum number of characters in the tag number is 16.

Mirror finish for ceramic lining
Polish the surface of ceramic lining.

For additional specifications, please contact your Yamatake representative.
PERFORMANCE SPECIFICATIONS

Accuracy
(in combination with the model MGG14C converter)
Vs = Velocity of setting range

<table>
<thead>
<tr>
<th>Vs (m/s)</th>
<th>Velocity during measurement ≥ Vs × 40%</th>
<th>Velocity during measurement ≤ Vs × 40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 ≤ Vs ≤ 10</td>
<td>± 0.5% of rate</td>
<td>± 0.2% of Vs</td>
</tr>
<tr>
<td>0.1 ≤ Vs ≤ 1.0</td>
<td>± (0.1/Vs+0.4)% of rate</td>
<td>± 0.4(0.1/Vs+0.4)% of Vs</td>
</tr>
</tbody>
</table>

Vs (m/s)

<table>
<thead>
<tr>
<th>Vs (m/s)</th>
<th>Velocity during measurement ≥ Vs × 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 ≤ Vs ≤ 10</td>
<td>±0.5% of rate</td>
</tr>
<tr>
<td>0.1 ≤ Vs ≤ 1.0</td>
<td>±(0.1/Vs+0.4)% of rate</td>
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PHYSICAL SPECIFICATIONS

Finish
Corrosion-preventive acrylic resin

Color
Light beige (Munsell 4Y7.2/1.3, terminal box)
Dark beige (Munsell 10YR4.7/0.5, detector housing)

Main body material
Measuring pipe material
Ceramic (Al₂O₃ 99.7%)

Housing
Cast steel (diameter 15, 25 mm)
Aluminum alloy (diameter 40 to 100 mm)

Terminal box
Aluminum alloy (remote model)

Material of parts in contact with liquid
Lining
Ceramic (Al₂O₃ 99.7%)
(diameter 15 to 100 mm)

Electrode
SUS316L, Hastelloy C, Titanium, Zirconium, Tantalum, Tungsten-carbide, Platinum-iridium

Grounding ring
None, Platinum metallize

Structure of electrode
Internal insertion type
(electrode can not be removed)

*) High accuracy calibration is available for sizes of 40 to 100 mm (1½ to 4 inches).
Reference Conditions for high accuracy calibration:
- Fluid: Tap water
- Fluid temperature: 15 to 30°C
- Ambient temperature: 15 to 30°C
- Ambient humidity: 30 to 70%
- Length of straight pipe:
  Upstream > 20×DN
  Downstream > 5×DN
  (DN: Pipe diameter nominal)
- Properly grounded
- Properly centered
INSTALLATION

Electrical connection

**Integral model**
Connection to converter

**Remote model**
G1/2 (PF1/2) internal thread, 1/2 NPT internal thread, CM20 internal thread, Pg 13.5 internal thread

**Pipe connection**
Wafer

Grounding
Resistance lower than 100 Ω

Mounting
Horizontally-mounted electrode

Length of straight pipe

**Upstream side**
A minimum five straight pipe diameters
A minimum 10 straight pipe diameters is required if a diffuser/valve/pump is installed upstream side.

**Downstream side**
Two straight pipe diameters is recommended.

Cable (between remote detector and converter)

**Maximum length**
300 m (depending on fluid conductivity)

**Outer diameter**
10 to 12 mm

**Signal cable**
Dedicated cable (11.4 mm, 0.75 mm²)
or equivalent (CVVS, CEEV, etc.)

**Excitation cable**
Dedicated cable MGA12W
(O.D. 10.5 mm, 2 mm²)
or equivalent (CVV and others)
### MODEL SELECTIONS

**Wafer type (15 to 100 mm) Ceramic (Al₂O₃ 99.7%) liner**

Model MGG18D - I II III IV V VI VII VIII IX X XI Y/Options (some options can be selected per each model)

<table>
<thead>
<tr>
<th>Basic model no.</th>
<th>Selections</th>
<th>Optional selections</th>
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<tr>
<td>MGG18D</td>
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</tr>
</tbody>
</table>

#### I. Line size

- 15 mm: 015
- 25 mm: 025
- 40 mm: 040
- 50 mm: 050
- 80 mm: 080
- 100 mm: 100

#### II. Linear

- Ceramic (Al₂O₃ 99.7%): C

#### III. Piping connection

- Wafer JIS 10K: 11
- Wafer JIS 20K: 12
- Wafer JIS 30K: 13
- Wafer ANSI 150: 21
- Wafer ANSI 300: 22
- Wafer JIS G3451 F12 (Size 80 mm or larger): 31
- Wafer DIN PN10: 41
- Wafer DIN PN16: 42
- Wafer DIN PN25: 43
- Wafer DIN PN40: 44
- Wafer JPI 150: 61
- Wafer JPI 300: 62

#### IV. Electrode

- SUS316L: L
- Hastelloy C: C
- Titanium: K
- Zirconium: H
- Tantalum: T
- Tungsten carbide: W
- Platinum iridium for ceramic lining: P

#### V. Grounding ring

- None (Note 1): X
- Platinum metallize: M

#### VI. Electrical connection / watertight gland

- Integral type: 1
- Remote type
  - G1/2 internal thread / without watertight gland: 2
  - G1/2 internal thread / with brass (Ni-plated) watertight gland: 3
  - G1/2 internal thread / with plastic watertight gland: 4
  - 1/2NPT internal thread / without watertight gland (Note 2): 5
  - CM20 internal thread / without watertight gland: 6
  - Pg 13.5 internal thread / without watertight gland: 7
  - G1/2 internal thread / with SUS304 watertight gland: 8

#### VII. Face-to-face dimensions

- Standard: A

#### VIII. Installation / wiring direction

- Integral type: H
- Remote type
  - Upstream side (horizontal / vertical piping mounting): A
  - Downstream side (horizontal / vertical piping mounting): B
  - Horizontal piping mounting / left side viewed from upstream: C
  - Horizontal piping mounting / right side viewed from upstream: D

#### IX. Calibration

- Standard A
- +/- 0.35% of rate calibration (Size 40 to 100 mm (1 1/2 to 4 inches)): U
- Others: 

#### X. Finish

- Standard: X
  - Corrosion-resistant finish: 1
  - Corrosion-proof finish: 2

#### XI. Bolt / nut

- None: X
  - Carbon steel: 1
  - SUS304: 2

**Note**

1. This specification (without grounding ring) is applicable when the grounding is possible through pipe line. In case of plastic pipes or lined pipes, this selection is not applicable. Please select “M” as grounding ring selection code.
2. Must be selected for CSA/FM NI approval

### Remote type

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<th>Option</th>
<th>Integral type</th>
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<tr>
<td>Yamatake version (must be selected)</td>
<td>Y</td>
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<tr>
<td>Calibration certificate (sent to ordering location separately)</td>
<td>A</td>
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<tr>
<td>Traceability certificate for detector</td>
<td>B</td>
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<tr>
<td>Attachment of the TAG number plate to neck section for detector (Note 3)</td>
<td>L</td>
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<tr>
<td>Mirror-finish ceramic lining</td>
<td>U</td>
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</table>

**Note**

3. Must be selected for Tag no. requirement

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## DIMENSIONS

### Integral style (15 to 25 mm)

![Integral style (15 to 25 mm) diagram]

<table>
<thead>
<tr>
<th>Size</th>
<th>mm</th>
<th>15</th>
<th>25</th>
<th>40</th>
<th>50</th>
<th>80</th>
<th>100</th>
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<td>L</td>
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<td>56</td>
<td>80</td>
<td>86</td>
<td>106</td>
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<td></td>
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<td>2.2</td>
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<td>3.4</td>
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<tr>
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<td>H1</td>
<td>mm</td>
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<td></td>
<td>H2</td>
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<td>mm</td>
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<tr>
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<td>5.5</td>
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<td>12.2</td>
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Remote style (15 to 25 mm)

<table>
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<td>3.5</td>
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<td>8.5</td>
<td>7.4</td>
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</table>

Remote style (40 to 100 mm)

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