# MagneW<sup>™</sup> PLUS+

# **Electromagnetic Flowmeter Detector** (General, FM Nonincendive Approval)

Model MGG18/MGG19/MGG11

#### **OVERVIEW**

The MagneW PLUS+ electromagnetic flowmeter detector is a high performance, highly reliable flowmeter developed with Azbil Corporation's proven MagneW3000 flow measurement technologies. Model MGG18 (watertight model) and model MGG19 (submersible model) offer superior process flowrate measurement and couple with a wide range of MagneW PLUS+ converters.

#### **FEATURES**

#### **High performance lining**

- A new, exclusive high quality lining technology and a special mirror-finish PFA lining offers higher anti-adhesive properties than existing models.
- The mirror-finish PFA lining is particularly applicable for measurement of sticky pulp and gypsum slurries.
- Only pure white PFA with no additives is used to make new linings.
- The successful embedded punch plate that offers proven performance under conditions such as rapid thermal change and negative pressure. PFA linings with diameter ranges from 2.5 mm to 600 mm (0.1 to 24 inches) are available, making selection of the best lining easy for a wide variety of applications.

#### Replacement interfacing detector (optional)

• This detector can replace the detector interfaces of our existing models and those of other manufacturers. Please consult an Azbil Corp. representative for details.

#### **Rugged detector structure**

- A stainless steel case has been adopted for sizes of 2.5 mm to 200 mm (0.1 to 8 inches).
- A watertight structure effective for environments where moisture and condensation tends to occur is used for the water-tight model (model MGG18).



Size 2.5 to 600 mm (0.1 to 24 inches)



Size 700 to 1100 mm (28 to 44 inches)

## A wide variety of piping connections

- A hose or union joint or clamp can be selected for very small size models (diameters of 2.5 to 15 mm (0.1 to 1/2 inches)).
- A flange structure is available for all sizes (sizes of 2.5 to 1100 mm (0.1 to 44 inches).
- A wafer construction can be also selected (sizes of 2.5 to 200 mm (0.1 to 8 inches)).
- Sizes of 65 and 125 mm (2½ and 5 inches) have been added to our existing product lineup.

#### Compatibility

 Remote model converters can be used in combination with our conventional converters. Please consult an Azbil Corp. representative for details.

#### Type of protection

Model MGG 18/19 are suitable for use in FM Nonincendive Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups F and G; Class III, Division 2.

#### **Improved Accuracy Specification**

The standard accuracy is +/- 0.5 % of rate. Also available is an optional high accuracy calibration rated at +/- 0.35 % of rate (sizes of 40 mm to 350 mm (1½ to 14 inches), combined with MGG14C).

#### **APPLICATIONS**

#### **Pulp and paper**

Pulp liquids, chemicals, corrosive liquids, industrial water, wastewater, etc.

#### Petroleum/petrochemical/chemicals

Corrosive liquids, dyestuffs, chemicals, industrial water, waste water, etc.

#### **Public utilities**

Water supply systems, sewage systems, community drainage, human waste, sludge, sediment slurry, regulation of total effluent, etc.

#### Food

Potable water, light, medium and high density fluids, industrial water, waste water, etc.

#### Steel/nonferrous metals/ceramics

Aluminum slurry, cooling water, industrial water, corrosive liquids, wastewater, etc.

## Machinery/equipment/electric machinery

Corrosive liquids, cooking water, circulating water, industrial water, wastewater, etc.

#### Construction

Building material slurry, sediment slurry, cement slurry, industrial water, etc.

## Shipbuilding

Sediment slurry etc.

#### **Electric power**

Corrosive liquids, cooling water, industrial water, wastewater, etc.

#### Gas

Circulating water for air conditioning, etc.

#### **FUNCTIONAL SPECIFICATIONS**

#### Type of protection

#### Model MGG18, MGG11

JIS C 0920 watertight model NEMA ICS6-110 TYPE4X IEC PUBL 529 IP67

#### **Model MGG19**

JIS C 0920 submersible model NEMA ICS6-110 TYPE6 IEC PUBL 529 IP68

Note: The performance of the submersible model was evaluated by sinking it 1 m below the surface of contaminated water for 1 month.

If the product will be submerged for a long consecutive period of time or in a corrosive fluid, please contact us.

#### FM approval for MGG18 and MGG19

Nonincendive for Class I, Division 2, Groups A, B, C and D Suitable for Class II, Division 2, Groups F and G Suitable for Class III, Division 2, indoor and outdoor (type 4X) hazardous locations.

## **European Pressure Equipment Directive** (2014/68/EU)

This product is subject to the European Pressure Equipment Directive (PED).

Article 4 of the PED differentiates pressure equipment according to the degree of danger.

The maximum allowable pressure of this product is stated on page 5 of this document. Note, however, that because this product is designed and manufactured in accordance with sound engineering practice (SEP) as described in article 4, section 3 of the PED, there are restrictions on the pressure range when this product is used in a country where PED is applicable.

Determine the maximum allowable pressure by checking the following items.

(1) Group of the fluid

Check the group of the fluid according to article 13 of the PED.

- Group 1: Hazardous fluids
- Group 2: Non-hazardous fluids
- (2) Vapor pressure at the maximum allowable temperature of the measured fluid

Check the applicable category, (i) or (ii).

- (i) Liquid whose vapor pressure at the maximum allowable temperature is greater than 0.5 bar above normal atmospheric pressure (1013 mbar)
- (ii) Liquid having a vapor pressure at the maximum allowable temperature of not more than 0.5 bar above normal atmospheric pressure (1013 mbar)
- (3) Nominal size (DN) of the electromagnetic flowmeter Check the nominal size of the flowmeter.
- (4) Maximum allowable pressure for equipment designed by

In table 1, find the cell where the results of (1), (2), and (3) meet.

"Tables 6–9" shown in table 1 below are taken from article 4 and annex II of the PED.

(5) Maximum pressure

Whichever of the pressures below is the lowest is the applicable pressure.

- Maximum pressure for this product: see page 5 of this document
- Maximum pressure for SEP equipment defined by the PED: see (4) above
- Maximum pressure for the flange: see the applicable standard

Table 1: Maximum allowable pressure for SEP products

(1) Fluid group		Group 1		Group 2		Group 1		Group 2		
(2) Vapor	(2) Vapor pressure		(i)		(i)		(ii)		(ii)	
PED table		Table 6		Table 7		Table 8		Table 9		
				(4) Maxin	num allowable	pressure				
	mm	bar	MPa	bar	MPa	bar	MPa	bar	MPa	
	2.5	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit	
	5	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit	
	10	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit	
	15	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit	
	25	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit	
	40	0.5	0.05	25.0	2.50	No limit	No limit	No limit	No limit	
	50	0.5	0.05	20.0	2.00	No limit	No limit	No limit	No limit	
	65	0.5	0.05	15.3	1.53	No limit	No limit	No limit	No limit	
	80	0.5	0.05	12.5	1.25	25.0	2.50	No limit	No limit	
	100	0.5	0.05	10.0	1.00	20.0	2.00	No limit	No limit	
(3)	125	0.5	0.05	8.0	0.80	16.0	1.60	No limit	No limit	
Nominal size	150	0.5	0.05	6.6	0.66	13.3	1.33	No limit	No limit	
(DN)	200	0.5	0.05	5.0	0.50	10.0	1.00	No limit	No limit	
	250	0.5	0.05	4.0	0.40	8.0	0.80	20.0	2.00	
	300	0.5	0.05	3.3	0.33	6.6	0.66	16.6	1.66	
	350	0.5	0.05	2.8	0.28	5.7	0.57	14.2	1.42	
	400	0.5	0.05	2.5	0.25	5.0	0.50	12.5	1.25	
	450	0.5	0.05	2.2	0.22	4.4	0.44	11.1	1.11	
	500	0.5	0.05	2.0	0.20	4.0	0.40	10.0	1.00	
	600	0.5	0.05	1.6	0.16	3.3	0.33	10.0	1.00	
	700	0.5	0.05	1.4	0.14	2.8	0.28	10.0	1.00	
	800	0.5	0.05	1.2	0.12	2.5	0.25	10.0	1.00	
	900	0.5	0.05	1.1	0.11	2.2	0.22	10.0	1.00	
	1000	0.5	0.05	1.0	0.10	2.0	0.20	10.0	1.00	
	1100	0.5	0.05	0.9	0.09	1.8	0.18	10.0	1.00	

#### Line size

2.5, 5, 10, 15, 25, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1100 mm

(0.1, 0.2, 3/8, 1/2, 1, 1½, 2, 2½, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40, 44 inches)

#### Flange rating

JIS 10K, JIS 16K, JIS 20K, JIS 30K, JPI 150, JPI 300, ANSI 150, ANSI 300, DIN PN10, DIN PN16, DIN PN25, DIN PN40 (Size 2.5 to 65 mm (0.1 to 2.5 inches))

JIS 10K, JIS 16K, JIS 20K, JIS 30K, JIS G3443-2 F12 JPI 150, JPI 300, ANSI 150, ANSI 300, DIN PN10, DIN PN16, DIN PN25, DIN PN40 (Size 80 to 200 mm (3 to 8 inches))

JIS 10K, JIS 16K, JIS 20K, JIS G3443-2 F12 JPI 150, JPI 300, ANSI 150, ANSI 300, DIN PN10, DIN PN16, DIN PN25 (Size 250 to 600 mm (10 to 24 inches), PFA/ETFE lining)

JIS 10K, JIS G3443-2 F12, JPI 150, ANSI 150, DIN PN10 (Size 700 to 1100 mm (28 to 44 inches), chloroprene rubber lining)

## Reference flange standard

JIS B 2210 (1984) ANSI B16.5 (1988) JPI-7S-15-93

#### **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

#### **Material certificate**

Material certificate for electrode/grounding ring

#### Gasket for plastic piping

When the detector is being mounted on plastic pipe, attach this gasket between the lining and the grounding ring, and between the grounding ring and the plastic pipe flange.

#### 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 of 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 with stainless wire. The maximum number of characters of the tag number is 16.

#### Water free treatment

Condensation is removed from wetted surfaces.

#### Oil free treatment

When removed from wetted surfaces.

Note) For additional specifications, please contact your Azbil Corporation representative.

## **PERFORMANCE SPECIFICATIONS**

#### Accuracy

(in combination with the model MGG14C converter) Size 2.5 to 15 mm (0.1 to 1/2 inch)>

Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs × 40 %	Velocity during measurement ≤ Vs × 40 %
$1.0 \le Vs \le 10$	±0.5 % of rate	±0.2 % of Vs
0.1 ≤ Vs ≤ 1.0	±(0.1/Vs+0.4)% of rate	±0.4(0.1/Vs+0.4)% of Vs

<Size 25 to 600 mm (1 to 24 inches)>

Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs ×20 %	Velocity during measurement ≤ Vs ×20 %
$1.0 \le Vs \le 10$	±0.5 % of rate	±0.1 % of Vs
$0.1 \le \text{Vs} \le 1.0$	±(0.1/Vs+0.4)%	±0.2(0.1/Vs+0.4)%
0.1 2 7 3 2 1.0	of rate	of Vs

<Size 700 to 1100 mm (28 to 44 inches)>

Vs = Velocity of setting range

Vs (m/s)	Velocity during measurement ≥ Vs × 50 %	Velocity during measurement ≤ Vs × 50 %
$1.0 \le Vs \le 10$	±1.0 % of rate	±0.5 % of Vs
$0.1 \le \text{Vs} \le 1.0$	±(0.2/Vs+0.8)% of rate	(0.1/Vs+0.4)% of Vs

Accuracy is guaranteed by the totalized flow volume under the condition of continuous flow measurement for 30 seconds or longer.

## **Additional accuracy:**

Effect of ambient magnetic field:  $\pm 0.2$  % FS (at 400 A/m) or less

#### **Vibration effect**

Integral style: 4.9 m/s<sup>2</sup> (0.5 G) max.

Remote style converter:  $4.9 \text{ m/s}^2 (0.5 \text{ G}) \text{ max}$ . Remote style detector:  $19.6 \text{ m/s}^2 (2 \text{ G}) \text{ max}$ .

## **Output fluctuation:**

When  $1 \le Vs \le 10$  m/s:  $\pm 0.1$  % FS or less When  $0.1 \le Vs \le 1$  m/s:  $\pm 0.1/Vs$  % FS or less

## Measurable fluid temperature range:

#### PFA lining

Diamatan	Measurable fluid temperature (°C)				
Diameter (mm)	Integral model	Remote model	Submersible		
(111111)			model		
2.5 to 10	-40 to +120	-40 to +100	_		
15 to 200	-40 to +120	-40 to +160	-40 to +60		
250 to 600	-40 to +120	-40 to +120	-40 to +60		

Note: The maximum measurable fluid temperature for the submersible model (MGG12) is 60 °C.

#### ETFE lining

Diamatan	Measurable fluid temperature (°C)				
Diameter (mm)	Integral model	Remote model	Submersible		
(mm)			model		
80 to 200	-40 to +120	-40 to +120	-40 to +60		
250 to 600	-40 to +120	-40 to +120	-40 to +60		

#### Polyurethane rubber lining

Diameter	Measurable fluid temperature (°C)
(mm)	Integral/remote/submersible models
25 to 200	-40  to  +50

#### Chloroprene rubber lining

Diameter	Measurable fluid	temperature (°C)
(mm)	Integral/remote models	Submersible model
250 to 600	-10 to +70	-10 to +60
700 to 1100	-10 to +70	_

## Measurable fluid pressure range (depending on Frange rating):

PFA/ETFE lining;

-0.098 to +2.94 MPa

Polyurethane rubber lining;

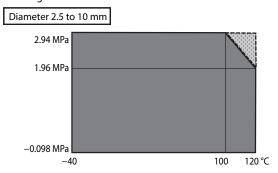
-0.098 to +2.94 MPa

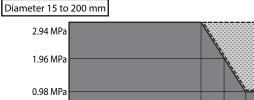
Chloroprene rubber lining;

-0.098 to +0.98 MPa

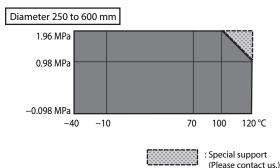
## Integral/remote models

#### PFA lining



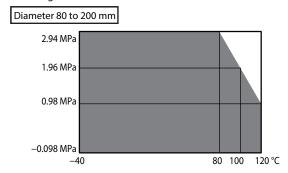




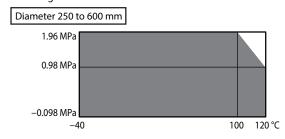


## Integral/remote models

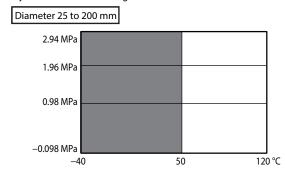
## ETFE lining



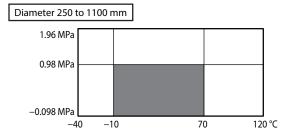
#### ETFE lining



#### Polyurethane rubber lining

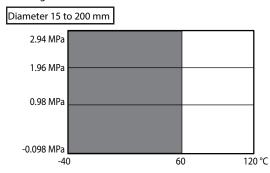


#### Chloroprene rubber lining

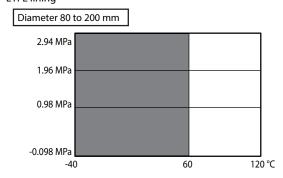


## Submersible model

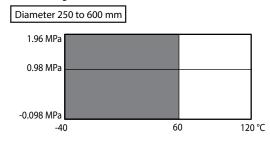
#### PFA lining



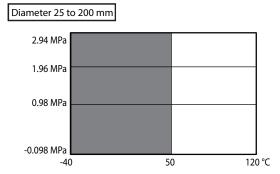
#### ETFE lining



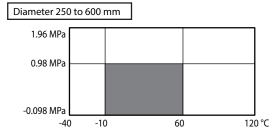
#### PFA/ETFE lining



#### Polyurethane rubber lining



## Chloroprene rubber lining



## Measurable electrical conductivity

Combined with model MGG14C converter 3  $\mu\text{S/cm}$  or more

## **Measurement flow range**

Refer to the minimum/maximum set ranges shown in the table below

Size			velocity range is 0 to 0.33 ft/s) m range	Maximum flow velocity range is 0 to 10 m/s (0 to 32.8 ft/s) Maximum range		Conversion
mm	inch	m³/h	GPM	m³/h	GPM	
2.5	0.1	0 to 0.001768	0 to 0.007782	0 to 0.1767	0 to 0.7781	56.59
5	0.2	0 to 0.007069	0 to 0.03113	0 to 0.7068	0 to 3.112	14.15
10	3/8	0 to 0.02828	0 to 0.1246	0 to 2.827	0 to 12.45	3.537
15	1/2	0 to 0.06362	0 to 0.2802	0 to 6.361	0 to 28.01	1.572
25	1	0 to 0.1768	0 to 0.7782	0 to 17.67	0 to 77.81	0.5659
40	1½	0 to 0.4524	0 to 1.993	0 to 45.23	0 to 199.2	0.2210
50	2	0 to 0.7069	0 to 3.113	0 to 70.68	0 to 311.2	0.1415
65	2½	0 to 1.195	0 to 5.261	0 to 119.4	0 to 526.0	0.08371
80	3	0 to 1.810	0 to 7.969	0 to 180.9	0 to 796.8	0.05526
100	4	0 to 2.828	0 to 12.46	0 to 282.7	0 to 1245	0.03537
125	5	0 to 4.418	0 to 19.46	0 to 441.7	0 to 1945	0.02264
150	6	0 to 6.362	0 to 28.02	0 to636.1	0 to 2801	0.01572
200	8	0 to 11.31	0 to 49.81	0 to 1130	0 to 4980	0.008842
250	10	0 to 17.68	0 to 77.82	0 to 1767	0 to 7781	0.005659
300	12	0 to 25.45	0 to 112.1	0 to 2544	0 to 11205	0.003930
350	14	0 to 34.64	0 to 152.6	0 to 3463	0 to 15251	0.002887
400	16	0 to 45.24	0 to 199.3	0 to 4523	0 to 19920	0.002210
450	18	0 to 57.26	0 to 252.2	0 to 5725	0 to 25211	0.001747
500	20	0 to 70.69	0 to 311.3	0 to 7068	0 to 31125	0.001415
600	24	0 to 101.8	0 to 448.3	0 to 10178	0 to 44820	0.0009824
700	28	0 to 138.6	0 to 610.1	0 to 13854	0 to 61005	0.0007218
800	32	0 to 181.0	0 to 796.9	0 to 18095	0 to 79680	0.0005526
900	36	0 to 229.1	0 to 1009	0 to 22902	0 to 100846	0.0004366
1000	40	0 to 282.8	0 to 1246	0 to 28274	0 to 124501	0.0003537
1100	44	0 to 342.2	0 to 1507	0 to 34211	0 to 150646	0.0002923

#### PHYSICAL SPECIFICATIONS

#### Main body material

## Measuring pipe materials

SUS304 stainless steel

#### **Flange**

SUS304 stainless steel (size 2.5 to 65 mm (0.1 to  $2\frac{1}{2}$  inches))

Carbon steel + corrosion-preventive coating (size 80 to 600 mm (3 to 24 inches))

Carbon steel (size 700 to 1100 mm (28 to 44 inches))

#### Case

SCS13 stainless steel (size 2.5 to 15 mm (0.1 to 1/2 inch)) SUS304 stainless steel (size 25 to 200 mm (1 to 8 inches)) SS400 carbon steel (size 250 to 1100 mm (10 to 44 inches))

#### **Terminal box**

Aluminum alloy (remote model)

finish

#### **Paint**

#### Model MGG18

#### **Standard**

Terminal box

Baked acrylic paint

Detector case (size 250 to 1100 mm (10 to 44 inches))

Epoxy paint

#### Corrosion-resistant paint

Terminal box

Baked acrylic paint

Detector case (size 250 to 1100 mm (10 to 44 inches))

Epoxy paint

#### Corrosion-proof paint

Terminal box

Epoxy paint

Detector case (size 250 to 1100 mm (10 to 44 inches))

Epoxy paint

#### **Model MGG19**

Tar epoxy paint

#### Color

#### **Model MGG18**

Cover: light beige (Munsell 4Y7.2/1.3)

Housing: dark beige (Munsell 10YR4.7/0/5)

#### Model MGG19

black

#### **Process wetted material**

#### Lining

PFA (size 2.5 to 600 mm (0.1 to 24 inches)) ETFE (size 80 to 600 mm (3 to 24 inches))

Polyurethane rubber (size 25 to 200 mm (1 to 8 inches)) Chloroprene rubber (size 250 to 1100 mm (10 to 44 inches))

#### **Electrode**

SUS316L, ASTM B574 (Hastelloy C-276 equivalent), titanium, zirconium, tantalum, tungsten-carbide, platinum/iridium

#### **Grounding ring**

SUS316, ASTM B575 (Hastelloy C-276 equivalent), titanium, zirconium, tantalum, platinum

#### **Union joint**

SUS316 (size 2.5 to 15 mm (0.1 to 1/2 inch))

#### Hose

SUS316 (size 2.5 to 15 mm (0.1 to 1/2 inch))

#### **IDF Clamp**

SUS316 (size 2.5 to 15 mm (0.1 to 1/2 inch))

#### Tri Clamp

SUS316 (size 2.5 to 15 mm (0.1 to 1/2 inch))

#### Gasket

PTFE (if the grounding ring is not made of SUS316)

#### **O-ring**

Viton rubber (with union joints)

#### **INSTALLATION**

#### **Ambient temperature limits**

 $-25 \text{ to} + 60 \,^{\circ}\text{C} \, (-13 \text{ to} + 140 \,^{\circ}\text{F}) \, (\text{integral model})$ 

-30 to +80 °C (-22 to +176 °F) (remote model, PFA lining)

-30 to + 60 °C (-22 to + 140 °F) (remote model, polyurethane rubber lining/chloroprene rubber lining)

-30 to + 60 °C (-22 to + 140 °F) (Submersible model, PFA/ETFA lining)

 $-30 \text{ to} + 50 \,^{\circ}\text{C} (-22 \text{ to} + 122 \,^{\circ}\text{F})$  (Submersible model, polyure-thane rubber lining)

## **Ambient humidity limits**

5 to 100 % RH

#### **Electrical connection**

#### Integral model

Connected to converter

#### Remote model

#### General model

 $\mathrm{G1/2}$  (PF1/2) internal thread, 1/2 NPT internal thread, CM20 internal thread,

Pg 13.5 internal thread.

#### **FM Nonincendive model**

1/2NPT internal thread for model MGG18 Watertight gland for model MGG19

#### Pipe connection

Wafer (size 2.5 to 200 mm (0.1 to 8 inches))
Flange (size 2.5 to 1100 mm (0.1 to 44 inches))
Union (size 2.5 to 15 mm (0.1 to 1/2 inch))
Hose (size 2.5 to 15 mm (0.1 to 1/2 inch))
IDF Clamp (size 2.5 to 15 mm (0.1 to 1/2 inch))
Tri Clamp (size 2.5 to 15 mm (0.1 to 1/2 inch))

#### Nuts and bolts (for wafer models)

S20C carbon steel, SUS304 stainless steel

#### Grounding

Resistance less than 100  $\Omega$ 

#### Length of straight pipe

#### **Upstream side**

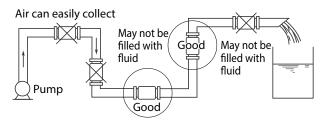
A minimum five straight pipe diameters A minimum 10 straight pipe diameters is required if a diffuser/valve/pump is installed upstream side.

#### Downstream side

Two straight pipe diameters is recommended.

#### Installation location

Install this product in a place where the inside of the detector will always be filled with the process fluid. An installation example is shown in the figure below.



Installation example

#### Note:

- Install the detector in a place like those circled in the above figure so that it stays full of fluid. If the detector is used when it is not full of fluid, an output error may result.
- If the process fluid is highly viscous, installing the detector in a vertical pipe is recommended in order to ensure axisymmetric flow.
- Provide a straight pipe section upstream of the installation location. Refer to the figure below for the straight pipe length.

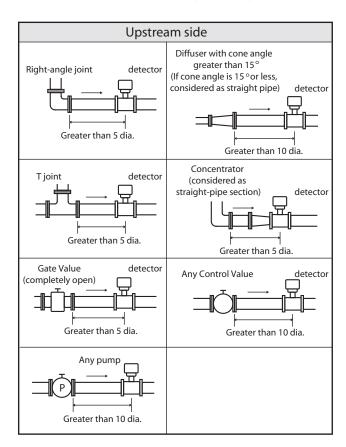


Figure 1.

## Cable (between remote detector and converter)

Maximum length 300 m (984 ft) (depends on fluid conductivity) Outer diameter 10 to 12 mm (0.4 to 0.47 inch)

## Signal cable

Dedicated cable: MGA12W (O.D. 11.4 mm,  $0.75 \text{ mm}^2$ ) or equivalent (CVVS, CEEV etc.)

#### **Excitation cable**

 $\label{eq:mga12W} Dedicated \ cable: MGA12W \\ (O.D.\ 10.5\ mm,\ 2\ mm^2) \ or \ equivalent \ (CVV \ and \ others)$ 

## Maximum cable length of MGA12W cable

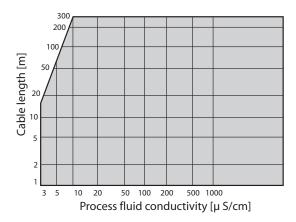


Figure 2. Maximum cable length of MGA12W cable

## **Notice for installation**

To fully enjoy the performance of the device, please choose an appropriate location according to the following.

#### **Notice after installation**

#### **⚠** WARNING

When removing the device from the piping, make sure that there is no line pressure or process fluid inside of the device. Removing the device before depressurizing may result in serious injury.

## **⚠** CAUTION

Do not use the device as a foothold. It may cause injury or damage of the device.

#### **Notice for environment**

- Install the flowmeter in a location with an ambient temperature of -25 °C to 60 °C (-13 °F to 140 °F) and an ambient humidity of 5 to 100%RH to prevent equipment malfunction or output errors.
- Do not install the flowmeter near high-current power lines, motors or transformers to prevent damage from electromagnetic induction, which can cause equipment malfunction or output errors.
- Do not install the flowmeter in a location subject to severe vibration or in a highly corrosive atmosphere. The converter and detector can be damaged.
- When install some electromagnetic flowmeters in closer location, keep minimum 500 mm (20 inch) space from each flowmeter. Closer electromagnetic flowmeter installation may cause magnetic interference each other and results in output errors.
- When installing DC-powered electromagnetic flow meters adjacent to each other, make sure that there is a space of 500 mm or more between the ends of the detectors.

#### **Notice for application**

- Electrochemically homogeneous fluid
   Install the device where the process fluid is electrochemically homogeneous. If two kind of process fluids are mixed at the upstream side, the process fluid must be uniformly mixed.
- The application which the electric conductivity changes or non-homogeneous fluid
   Do not use the device for the following fluid conditions even if the electric conductivity, temperature, and pressure are within the device specifications. Those fluid may cause of inaccurate flow measurement.
  - Fluids that have sufficient conductivity at high temperature but do not meet the conductivity requirement at room temperature (about 20 °C (68 °F)).

(e.g. fatty acids and soap)

• Some fluids contain surfactant

(e.g. rinse, shampoo and CWM (coal water mixture))

- Insulating adhesive materials
   (eg. kaolinite, kaolin, calcium stearate)
- Insufficiently mixed fluid
   (Ex.: Fluid just after chemical dosing)
- If the fluid is cold water and there is a possibility of condensation, select optional specification 6, "Condensation countermeasure," when ordering.
- The following fluids will permeate the PFA liner. The vent hole option is recommended for the following fluids.
  - Nitric acid
  - · Aqueous ammonia
  - High temperature sodium hydrate

If an electromagnetic flowmeter is installed in air-conditioning equipment, etc., where black pipes are often used for closed piping and water temperature is about 85 °C, black rust (a conductive substance) may be generated due to pipe corrosion. If it sticks to the inner surface of the flowmeter, the measured output value may drop. To be precise, depending on various environmental conditions such as the amount of dissolved oxygen, black rust may occur even at temperatures around 60 °C. The rate of progress of corrosion, the type and amount of corrosion, and the amount of adhesion also differ depending on the environment at the installation site. If the electromagnetic flowmeter is used in such an installation environment, it is necessary to control the water quality to prevent pipe corrosion by measures such as using a corrosion inhibitor.

To further ensure reliable measurement, periodic wiping of the inside of the electromagnetic flowmeter is needed.

\* Please contact an Azbil representative for cleaning of the inside of the electromagnetic flowmeter.

Notes on installation location:

• Legs are attached to some models to prevent them from falling over before installation. If the product is installed with the legs attached, please also consider earthquake resistance where appropriate.

Notes on submersible models:

• The entire surface of the detector's terminal box is covered with waterproof paint. If opened, the terminal box is no longer waterproof.

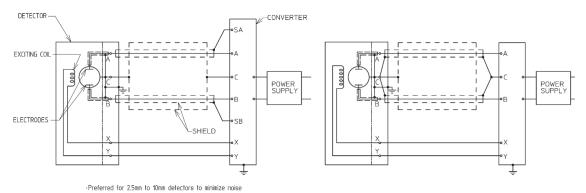
#### For FM Nonincendive model

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, Class II, Division 2, Groups F and G; Class III, Division 2.

If the combination of detector MGG 18/19 and converter MGG 14 C is used as an FM - NI product, both the detector and the converter must be used in combination with the NI specification.

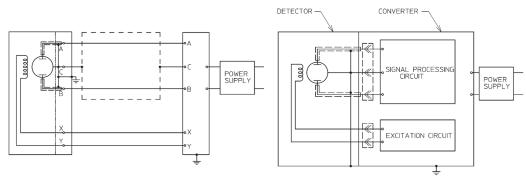
## ⚠ CAUTION

Power supply and internal voltage of ordinary equipment to the earth shall not exceed 250 V AC 50/60 Hz, 250 V DC in case of normal /fault conditions.



REMOTE TYPE : CONFIGURATION #1

REMOTE TYPE : CONFIGURATION #2



REMOTE TYPE: CONFIGURATION #3

INTEGRAL TYPE : CONFIGURATION #1

Table 2

TYPE	MODEL NO.	MAX.AMBIENT TEMP.	MAX.FLUID TEMP	LINING	SIZE
	MGG14C		_	_	_
	MGM14C		_	ı	_
D.MECOD 4.1	MGM18D,F	60.00	120 °C	PFA,ETFE	40 to 600A
INTEGRAL	MGG18D,F,U	60 °C	120 °C	PFA,ETFE	2.5 to 600A
	MGG18D		50 °C	POLYURETHANE	25 to 200A
	MGS18U		120 °C	PFA	15 to 125A
	MGG14C	60 °C	_	-	_
			160 °C	PFA	2.5 to 200A
	MGG18D,F	80 °C	120.00	PFA	250 to 600A
			120 °C	ETFE	2.5 to 600A
REMOTE	MGG18D	60 °C	50 °C	POLYURETHANE	25 to 200A
	MGG18U	22.00	120 °C	PFA,ETFE	2.5 to 15A
	MGG19D,F,U	80 °C	120 °C	PFA,ETFE	2.5 to 600A
	MGG19D	60 °C	50 °C	POLYURETHANE	25 to 200A
	MGS18U	80 °C	160 °C	PFA	15 to 125A

Note 1. Ambient Temperature, Process Temperature: See table 2.

- 2. Power Supply and Internal Voltage of Ordinary Equipment to the Earth. shall not exceed AC250V 50/60Hz, DC250V incase of Normal/Fault conditions.
- 3. In Division 2 Location.

- Fluid being measured must be non-flammable.
- Install Wiring per NEC 501-4(b) or 502-4(b).
- 4. Degree of Protetion of Enclosure

MGG14C, MGG18D,U,F, MGS18U, MGM14C, MGM18D,F: Type 4X MGG19D,U,F: Type 6P

#### **MODEL SELECTION**

#### Contents of model number table

Detector (General model)

Structure / Basic model no.	Lining	Pipe connection	Size		Ref. page
Watertight model MGG18U	PFA	Union / Hose / Clamp	2.5 to 15 mm	(0.1 to 1/2 inch)	page 14
Watertight model MGG18D	PFA	Wafer	2.5 to 10 mm	(0.1 to 3/8 inch)	page 15
Watertight model MGG18D	PFA / ETFE	Wafer	15 to 200 mm	(1/2 to 8 inches)	page 16
Watertight model MGG18F	PFA / ETFE	Flange	15 to 200 mm	(1/2 to 8 inches)	page 17
Watertight model MGG18F	PFA / ETFE	Flange	250 to 600 mm	(10 to 24 inches)	page 18
Watertight model MGG18D	Polyurethane rubber	Wafer	25 to 200 mm	(1 to 8 inches)	page 19
Watertight model MGG18F	Chloroprene rubber	Flange	250 to 600 mm	(10 to 24 inches)	page 20
Watertight model MGG11F	Chloroprene rubber	Flange	700 to 1100 mm	(28 to 44 inches)	page 21

#### Detector (Submersible model)

Structure / Basic model no.	Lining	Pipe connection	Size		Ref. page
Submersible model MGG19D	PFA / ETFE	Wafer	15 to 200 mm	(1/2 to 8 inches)	page 22
Submersible model MGG19F	PFA / ETFE	Flange	15 to 200 mm	(1/2 to 8 inches)	page 23
Submersible model MGG19F	PFA / ETFE	Flange	250 to 600 mm	(10 to 24 inches)	page 24
Submersible model MGG19D	Polyurethane rubber	Wafer	25 to 200 mm	(1 to 8 inches)	page 25

Note) All MGG19 models satisfy FM Nonincendive approval.

	PFA / ETFE lining
	Rubber lining

## **Lining Characteristics**

#### PFA:

PFA is a chemical-resistant, heat-resistant, and adhesion-resistant lining material that can be used for almost any corrosive liquid. Select this lining for use with corrosive liquids (sulfuric acid, hydrochloric acid, caustic soda, acetic acid, etc.). However, for nitric acid and hydrofluoric acid, the service life may be shorter if the concentration and pressure are high.

#### ETFE:

Chemical resistance is slightly lower than that of a PFA lining. Do not use ETFE for strongly corrosive liquids such as sulfuric acid, fluoric acid, nitric acid, and hydrochloric acid. In terms of abrasion resistance, ETFE is about 1.5 times stronger than PFA. Therefore, it can be used for pulp slurry (except for black liquor) and will have a longer service life than PFA. However, because it has lower heat resistance than PFA, it cannot be used in a pipeline with fluids at 120 °C or higher. Do not use the flowmeter in a pipeline that will be cleaned with steam.

#### **Rubber:**

Both polyurethane and chloroprene are excellent for abrasion resistance, but because they have little chemical resistance, they cannot be used for corrosive liquids.

## Union / Hose / Clamp type (2.5 to 15 mm (0.1 to 1/2 inch)) PFA lining

Model MGG18U - I II III IV V VI VII VIII IX - X - Y / Options (some options can be selected per each model)

	Basic model no.		_	Select	tions					Optio	nai	selec	t.	
	MGG18	8U	-										-	
													Ī	
I	Line size	2.5 mm	(0.1 inch)	002										
		5 mm	(0.2 inch)	005										
		10 mm	(3/8 inch)	010										
		15 mm	(1/2 inch)	015										
II	Lining	PFA			P	1								
III	Piping	Union join	t R1/2 (PT1/2) external thread			U1								
	connection		t 1/2NPT external thread	,		U2								
		Union join	t R1/2 (PT1/2) internal thread			U3								
		Union join	t 1/2NPT internal thread	,		U4								
		Hose joint				H1								
		IDF clamp				C1								İ
		Tri clamp				C2								
IV	Electrode	SUS316L		,			L							
		ASTM B57	74 (Hastelloy C-276 equivalent)				С							
		Titanium					K							
		Zirconium	1				Н							
		Tungsten c	earbide (only for size 10 mm or upper)				W							
		Other												
V	Grounding ring	SUS316												
	Electrical	Integral ty	pe						1					
	connection / watertight gland	Remote												
		type	G1/2 internal thread / with brass (Ni-plate		nt glan	d			3					
			G1/2 internal thread / with plastic watertig						4					
			1/2NPT internal thread / without watertight		ote 1)				5					
			CM20 internal thread / without watertight						6					
			Pg 13.5 internal thread / without watertigh						7					
			G1/2 internal thread / with SUS304 watert						8					
VII	Face-to-face	Standard		0 0						A	1			
VIII	Installation /	Integral ty	pe								Н			
	wiring direction	Remote	Upstream side (horizontal / vertical piping	mounting)							A			
		type	Downstream side (horizontal / vertical pip		ng)						В			
			Horizontal piping mounting / left side view			n					C			
			Horizontal piping mounting / right side vie								D			
IX	Calibration	Standard	1-188,8		-T							A		
		Other											-	
		Other											J	
X	Finish	Standard												-
			-resistant finish											-
			-proof finish											-
	1	2011031011	Proof tillion											ل
ptions	Azbil Corporation	version (m	ust be selected)		Y									
0	Traceability certifi				В	_								

sus	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
0	Material certificate (only for electrodes and ground rings)	С
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for FM NI approval

- 2. Must be selected for Tag no. requirement
- 3. This option code cannot be selected with Electrical connection code "5".

## Wafer type (2.5 to 10 mm (0.1 to 3/8 inch)) PFA lining

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

	Basic model no.			Selections		Optio	ions							
	MGG18	BD	] .									-		
														Г
I	Line size	2.5 mm	(0.1 inch)	002										
		5 mm	(0.2 inch)	005										
		10 mm	(3/8 inch)	010										
II	Lining	PFA		P	]									
III	Piping	Wafer JIS 10	)K		11									
	connection	Wafer JIS 20	OK .		12									
		Wafer JIS 30			13									
			0/20K for 10 mm flange		14									
			OK for 10 mm flange		15									
		Wafer ANS	I 150		21									
		Wafer ANS	I 300		22									
		Wafer DIN	PN10		41									
		Wafer DIN	PN16		42									
		Wafer DIN	PN25		43									
		Wafer DIN			44									
			PN10/16/25/40 for 10 mm flange		45									
		Wafer JPI 1:			61									
		Wafer JPI 30			62									
IV	Electrode	SUS316L	-			L								
			4 (Hastelloy C-276 equivalent)			C								
		Titanium	* *			K								
		Zirconium				Н								
		Tantalum				Т								
			arbide (only for size 10 mm)			W								
		Platinum ir				P								
		Other												
V	Grounding ring	SUS316					S							
	Grounding ring		5 (Hastelloy C-276 equivalent)				С							
		Titanium	(Hastenoy C-270 equivalent)				K							
		Zirconium					Н							
		Tantalum					Т							
		Platinum					P							
		Other					Г							
3.7T	F1 1							1	-					
VI	Electrical connection /	Integral typ Remote	G1/2 internal thread / without watert	sinhe alam d				2	-					
	watertight gland							3	-					
	watertight gland	type	G1/2 internal thread / with brass (Ni-											
			G1/2 internal thread / with plastic wa 1/2NPT internal thread / without wat					5	-					
									1					
			CM20 internal thread / without water					6	1					
			Pg 13.5 internal thread / without water					7 8	-					
3777	Ease to for	Ctandand	G1/2 internal thread / with SUS304 v	vatertignt gland				8	Α.					
VII	Face-to-face dimensions	Standard							A					
* ****		Other												
VIII	Installation /	Integral typ							-	Н				
	wiring direction	Remote	Upstream side (horizontal / vertical p							A				
		type	Downstream side (horizontal / vertic							В				
			Horizontal piping mounting / left sid							С				
***	0.11	0, 1, 1	Horizontal piping mounting / right si	ide viewed from upstream						D				
IX	Calibration	Standard									A			
		Other									_			
		1												
X	Finish	Standard											X	
			resistant finish										1	
		Corrosion-	proof finish	,									2	L
XI	Bolt / nut	None												
		Carbon stee	el											
	1	SUS304												

su	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
Op	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

- Note) 1. Must be selected for FM NI approval
  - 2. Must be selected for Tag no. requirement
  - 3. This option code cannot be selected with Electrical connection code "5".

## Wafer type (15 to 200 mm (1/2 to 8 inches)) PFA / ETFE lining

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

	Basic model no.		_	Selections Optional										ions
	MGG18	D	-											
I	Line size	15 mm	(1/2 inch)	015										
		25 mm	(1 inch)	025										
		40 mm	(1½ inches)	040										
		50 mm	(2 inches)	050										
		65 mm	(2½ inches)	065										
		80 mm	(3 inches)	080										
		100 mm	(4 inches)	100										
		125 mm	(5 inches)	125										
		150 mm	(6 inches)	150										
		200 mm	(8 inches)	200	-									
II	Lining		to 200 mm (3 to 8 inches))		E P									
TIT	Diata a	PFA Wafer JIS 10K			P	11								
III	Piping	Wafer JIS 10K				12	-							
	connection	Wafer JIS 20K				13								
		Wafer ANSI 15				21								
		Wafer ANSI 30				22	-							
			43-2 F12 (size 80 mm or larger)			31								
		Wafer DIN PN				41								
		Wafer DIN PN				42								
		Wafer DIN PN				43								
		Wafer DIN PN			-	44								
		Wafer JPI 150		-		61								
		Wafer JPI 300				62								
IV	Electrode	SUS316L					L	1						
1	Licetrode		Hastelloy C-276 equivalent)				С	1						
		Titanium	, ,				K	1						
		Zirconium					Н	1						
		Tantalum					Т	1						
		Tungsten carbi	de				W	]						
		Platinum iridiu	ım				P	]						
		Other					_							
V	Grounding ring	SUS316						S						
		ASTM B575 (H	Hastelloy C-276 equivalent)					С						
		Titanium						K						
		Zirconium						Н						
		Tantalum						T						
		Platinum						P						
		Other												
VI	Electrical	Integral type							1	]				
	connection /	Remote type	G1/2 internal thread / without watertight gland						2					
	watertight gland		G1/2 internal thread / with brass (Ni-plated) water		nd				3					
			G1/2 internal thread / with plastic watertight glan						4					
			1/2NPT internal thread / without watertight gland	d (Note 1)	)				5	-				
			CM20 internal thread / without watertight gland	1					6	-				
			Pg 13.5 internal thread / without watertight gland						7	-				
3777	F 4 C	Standard	G1/2 internal thread / with SUS304 watertight gla	and					8	Α.				
VII	Face-to-face									A	-			
37177	dimensions	Other Integral type									17			
VIII	Installation /	Integral type	Unstream side (horizontal / warti1	ting)							H A			
	wiring direction	Remote type	Upstream side (horizontal / vertical piping moun  Downstream side (horizontal / vertical piping mo								B			
			Horizontal piping mounting / left side viewed fro		ım			-	-	-	С			
			Horizontal piping mounting / right side viewed from								D	1		
IX	Calibration	Standard	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	apott				-	-	-		A		
171	Camoración	Standard +/- 0.35 % of rate calibration (Size 40 to 200 mm (1 1/2 to 8 inches))									U			
		Other												
	1	1						-	-	-				
X	Finish	Standard		-									X	1
Λ	1 1111011	Corrosion-resi	stant finish										1	1
		Corrosion-pro											2	1
XI	Bolt / nut	None											-	X
		Carbon steel												1
		SUS304												2
		_												

su	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
OF	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

- Note) 1. Must be selected for FM NI approval
  - 2. Must be selected for Tag no. requirement
  - 3. This option code cannot be selected with Electrical connection code "5".

## Flange type (15 to 200 mm (1/2 to 8 inches)) PFA / ETFE lining

Model MGG18F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

Vit   Sector   Section		Basic model no.			Select	ions						Optic	nal	selecti	ions	
State		MGG18	BF	] .											-	
State				<b>-</b>												
State	I	Line size	15 mm	(1/2 inch)	015											
Street   12 inches   0.00			25 mm	(1 inch)	025											
A					040											
No more   Claichean   1000																
1.25 mm																
125 mm			80 mm													
150 mm   (6) inches)   200   200 mm   (8) inches    200 mm   (8																
Note																
III																
PFA	**			_ ` `	200	-										
High   Flipping   Flange   H5 10K   11   12   13   14   15   14   15   15   15   15   15	II	Lining		to 200 mm (3 to 8 inches))												
Connection   Flange   18-20K   12			1			Р	**	-								
Flange JNS 165	III		<u> </u>				_	-								
Flange ANSI 150		connection					-	-								
Flange ANS 300							<del>-</del>									
Flange   IS G3443-2 F12 (tine size 80 mm or larger)																
Flange DIN PN16								-								1
Flange DNP PN16   D2   Flange DNP PN25   D3   Flange DNP PN25   D3   Flange DNP PN40   D4   Flange PN150   P1   P1   P1   P1   P1   P1   P1   P				-			_									1
Plange DNP PN25								+								1
Flange DIN PN40							_									1
Flange   Pl   300								1								
Flange Pil 300								-								
V			_													
V   Electrode   SUS316L	IV	Flange material					1.2	1	!							
ASTM B574 (Hastelloy C-276 equivalent)	1 4	Trange material														
ASTM B574 (Hastelloy C-276 equivalent)	V	Electrode							I.							
Titanium	\ \ \	Electrode		Hastellov C-276 equivalent)												
Zirconium																
Tantalum																
Tungsten carbide																
Other				ide					W							
VI																
ASTM B575 (Hastelloy C-276 equivalent)			Other													
ASTM B575 (Hastelloy C-276 equivalent)	VI	Grounding ring	SUS316							S						ĺ
Zirconium			ASTM B575 (I	Hastelloy C-276 equivalent)						С	i					
Tantalum			Titanium							K	İ					
Platinum			Zirconium							Н						
Other			Tantalum							Т	1					
VII Electrical connection / watertight gland			Platinum							P						
connection / watertight gland    Remote type			Other							_						
connection / watertight gland  Remote type  G1/2 internal thread / without watertight gland G1/2 internal thread / with plastic watertight gland G1/2 internal thread / with plastic watertight gland G1/2 internal thread / without watertight gland G1/2 internal thread / without watertight gland G1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland G1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland G1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland G1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland Rd1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland Rd1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland Rd1/2 internal thread / without watertight gland Pg 13.5 internal thread / without watertight gland Rd1/2 internal thread / wit	VII	Electrical	Integral type								1					1
watertight gland    G1/2 internal thread / with brass (Ni-plated) watertight gland   3   4   1/2NPT internal thread / with plastic watertight gland   4   1/2NPT internal thread / without watertight gland   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      VIII   Face-to-face dimensions   Other											2					1
1/2NPT internal thread / without watertight gland (Note 1)		watertight gland		G1/2 internal thread / with brass (Ni-plated) v	watertight gla	nd					3					1
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   8      VIII   Face-to-face dimensions   Other       IX   Installation / wiring direction   Integral type   Upstream side (horizontal / vertical piping mounting)   B   Horizontal piping mounting / left side viewed from upstream   C   Horizontal piping mounting / right side viewed from upstream   D     X   Calibration   Standard   4 /- 0.35 % of rate calibration (Size 40 to 200 mm (1 1/2 to 8 inches))   U     XI   Finish   Standard   Corrosion-resistant finish   Standard   X   Corrosion-resistant finish   I   1											4					1
Pg 13.5 internal thread / without watertight gland   7   G1/2 internal thread / with SUS304 watertight gland   8																1
VIII   Face-to-face dimensions   Other											6					
VIII       Face-to-face dimensions       Standard       A         IX       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         X       Calibration       Standard         +/- 0.35 % of rate calibration (Size 40 to 200 mm (1 1/2 to 8 inches))       U         Other      XI  Finish  Standard  Corrosion-resistant finish																1
dimensions   Other				G1/2 internal thread / with SUS304 watertight	t gland						8					1
IX	VIII											A				1
wiring direction  Remote type  Upstream side (horizontal / vertical piping mounting)  Downstream side (horizontal / vertical piping mounting)  Horizontal piping mounting / left side viewed from upstream  C  Horizontal piping mounting / right side viewed from upstream  D  X  Calibration  Standard  -/- 0.35 % of rate calibration (Size 40 to 200 mm (1 1/2 to 8 inches))  Other  XI  Finish  Standard  Corrosion-resistant finish  Standard  Corrosion-resistant finish												_				1
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			T												1
Horizontal piping mounting / left side viewed from upstream   C   Horizontal piping mounting / right side viewed from upstream   D		wiring direction	Remote type													1
$ \begin{array}{ c c c c c } \hline & & & & & & & & & & & & & & & & & \\ \hline X & Calibration & & Standard & & & & & & & & & \\ & & +/- 0.35 \% \ of \ rate \ calibration \ (Size \ 40 \ to \ 200 \ mm \ (1 \ 1/2 \ to \ 8 \ inches)) & & & & & & & & & & \\ \hline XI & Finish & Standard & & & & & & & & \\ \hline XI & Corrosion-resistant \ finish & & & & & & & & & \\ \hline \end{array} $																1
X   Calibration   Standard   A																1
+/- 0.35 % of rate calibration (Size 40 to 200 mm (1 1/2 to 8 inches))		0.11	0, 1 1	riorizontai piping mounting / right side viewe	eu irom upstre	am							D			1
XI Finish Standard X Corrosion-resistant finish 1	X	Calibration			-1			-						_		1
XI Finish Standard X Corrosion-resistant finish 1				ate calibration (Size 40 to 200 mm (1 1/2 to 8 in	cnes))									U		1
Corrosion-resistant finish 1			Otner													1
Corrosion-resistant finish 1		I	la , :													-
	XI	Finish														_
Corrosion-proof linish 2																
		l	Corrosion-pro	001 11111911				-								

us	Azbil Corporation version (must be selected)	Y
tio	Traceability certificate for detector	В
Options	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

- Note) 1. Must be selected for FM NI approval
  - 2. Must be selected for Tag no. requirement
  - 3. This option code cannot be selected with Electrical connection code "5".

No. SS2-MGG200-0100 Azbil Corporation

## Flange type (250 to 600 mm (10 to 24 inches)) PFA / ETFE lining

Model MGG18F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

	Basic model no.			Selection	ns						Optio	nal	select	tions	
	MGG18	3F	1 .											-	
	•		•											Ī	Т
I	Line size	250 mm	(10 inches)	250											
		300 mm	(12 inches)	300											
		350 mm	(14 inches)	350											
		400 mm	(16 inches)	400											
		450 mm	(18 inches)	450											
		500 mm	(20 inches)	500											
		600 mm	(24 inches)	600											
II	Lining	ETFE			Е										
		PFA			P										
III	Piping	Flange JIS 10K J1													
	connection	Flange JIS 20K				J2									
		Flange ANSI 1	50			A1									
		Flange ANSI 3	00 (Size 16 inches or smaller)			A2									
		Flange JIS G34				G1									
		Flange DIN Pl	÷		-	D1									
		Flange DIN Pl			_	D2									
		Flange DIN Pl			_	D3									
		Flange JPI 150				P1									
		_	(Size 400 mm or smaller)		_	P2									
IV	Flange material	Standard	(				1								
1 V	Trange material	Other													
V	Elt J.	SUS316L					-	L							
V	Electrode	<u> </u>	Hastelloy C-276 equivalent)					C							
		Titanium	lastency C-270 equivalent)					K							
		Zirconium						Н							
		Tantalum	:1.					T W							
		Tungsten carbi						P							
		Platinum iridi	um					Р							
		Other													
VI	Grounding ring	SUS316							S						
			Hastelloy C-276 equivalent)						С						
		Titanium							K						
		Other							_						
VII	Electrical	Integral type								1					
	connection /	Remote type	G1/2 internal thread / without watertigh	-						2					
	watertight gland		G1/2 internal thread / with brass (Ni-pla							3					
			G1/2 internal thread / with plastic water							4					
			1/2NPT internal thread / without water							5					
			CM20 internal thread / without watertig							6					
			Pg 13.5 internal thread / without watert							7					
			G1/2 internal thread / with SUS304 water	ertight gland						8					
VIII	Face-to-face	Standard									A				
	dimensions	Other										L			
IX	Installation /	Integral type										Н			
	wiring direction	Remote type	Upstream side (horizontal / vertical pipi	ng mounting)								A			
			Downstream side (horizontal / vertical p	piping mounting)								В			
			Horizontal piping mounting / left side v	iewed from upstream								С			
			Horizontal piping mounting / right side	viewed from upstrear	n							D			
X	Calibration	Standard											A	1	
		+/- 0.35 % of r	ate calibration (Size 250 to 350 mm (10 to	14 inches))									U	1	
		Other	•	·										1	
	II.	1												J	
															- 1
ΥI	Finish	Standard													+
XI	Finish	Standard Corrosion-resi	istant finish										-	-	

ns	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
Ор	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for FM NI approval

- 2. Must be selected for Tag no. requirement
- 3. This option code cannot be selected with Electrical connection code "5".

## Wafer type (25 to 200 mm (1 to 8 inches)) Polyurethane rubber lining

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

	Basic model no.		_	Select	Selections								select	tions	
	MGG18	BD	] -										] -		
													Ī		
I	Line size	25 mm	(1 inch)	025											
		40 mm	(1½ inches)	040											
		50 mm	(2 inches)	050											
		65 mm	(2½ inches)	065											
		80 mm	(3 inches)	080											
		100 mm	(4 inches)	100											
		125 mm	(5 inches)	125 150											
		150 mm	(6 inches) (8 inches)												
II	Lining	200 mm Polyurethane r	·	200	Q										
III	-	Wafer JIS 10K	dobei			11									
111	Piping connection	Wafer JIS 20K				12									
	Connection	Wafer JIS 30K				13									
		Wafer ANSI 15				21									
		Wafer ANSI 30				22									
		-	43-2 F12 (line size 80 mm or larger)			31									
		Wafer DIN PN	· · · · · · · · · · · · · · · · · · ·			41									
		Wafer DIN PN				42									
		Wafer DIN PN	125			43									
		Wafer DIN PN	140			44									
		Wafer JPI 150				61									
		Wafer JPI 300				62									
IV	Electrode	SUS316L					L								
		Titanium					K	]							
		Tungsten carbi	ide (only for size 10 mm)				W								
		Other					_								
V	Grounding ring	SUS316						S							
		Titanium						K							
		Other						_							
VI	Electrical	Integral type							1						
	connection /	Remote type	G1/2 internal thread / without watertight gla						2						
	watertight gland		G1/2 internal thread / with brass (Ni-plated)		nd				3						
			G1/2 internal thread / with plastic watertigh						4						
			1/2NPT internal thread / without watertight	-					5						
			CM20 internal thread / without watertight g						6						
			Pg 13.5 internal thread / without watertight						7						
			G1/2 internal thread / with SUS304 watertig	tht gland					8						
VII	Face-to-face	Standard								A					
77777	dimensions	Integral type									LT				
VIII	Installation /	Remote type	Upstream side (horizontal / vertical piping n	nounting)							H A				
	wiring direction	Kemote type	Downstream side (horizontal / vertical piping h								B				
			Horizontal piping mounting / left side viewe		m						С				
			Horizontal piping mounting / right side view	wed from unstre	am						D				
IX	Calibration	Standard	I - I - I - I - I - I - I - I - I - I -	apour								A	1		
171	Cantoration		ate calibration (Size 40 to 200 mm (1 1/2 to 8 i	inches))								U	1		
		Other		//									1		
	1	1											_		
															1
Y	Finish	Standard												l X	1
X	Finish	Standard Corrosion-resi	istant finish											X 1	-
X	Finish	Corrosion-resi												1	-
		Corrosion-resi Corrosion-pro												_	X
X	Finish Bolt / nut	Corrosion-resi												1	X 1

Su	Azbil Corporation version (must be selected)	Y
tio	Traceability certificate for detector	В
Options	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for FM NI approval

- 2. Must be selected for Tag no. requirement
- 3. This option code cannot be selected with Electrical connection code "5".

No. SS2-MGG200-0100 Azbil Corporation

## Flange type (250 to 600 mm (10 to 24 inches)) Chloroprene rubber lining

Model MGG18F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

	Basic model no.		_	Selection	ıs			,	,	Optio	onai	select	ions
	MGG1	8F	-										-
	1												
I	Line size	250 mm	(10 inches)	250									
		300 mm	(12 inches)	300									
		350 mm	(14 inches)	350									
		400 mm	(16 inches)	400									
		450 mm	(18 inches)	450									
		500 mm	(20 inches)	500									
		600 mm	(24 inches)	600									
II	Lining	Chloropre		R									
III	Piping	Flange JIS			J1								
	connection	Flange AN			A1								
			G3443-2 F12		G1								
		Flange DIN			D1								
		Flange JPI	150		P1								
IV	Flange material	Standard				1							
		Other				_							
V	Electrode	SUS316L					L						
		Titanium					K						
		Tungsten c	carbide				W						
		Other											
VI	Grounding ring	SUS316						S					
		Titanium		K									
		Other		_									
VII	Electrical	Integral typ	Integral type										
	connection / watertight gland	Remote	G1/2 internal thread / without						2				
	watertight giand	type	type G1/2 internal thread / with brass (Ni-plated) watertight gland 3										
			G1/2 internal thread / with pla						4				
			1/2NPT internal thread / with		Note 1)				5				
			CM20 internal thread / without						6				
			Pg 13.5 internal thread / without						7				
			G1/2 internal thread / with SU	JS304 watertight gland	1				8				
VIII	Face-to-face	Standard								A			
	dimensions	Other								_			
IX	Installation /	Integral typ									Н	_	
	wiring direction	Remote	Upstream side (horizontal / ve		-						A		
		type	Downstream side (horizontal								В	_	
			Horizontal piping mounting /								С		
			Horizontal piping mounting /	right side viewed from	n upstre	am					D		
X	Calibration	Standard										A	
		+/- 0.35 %	of rate calibration (Size 250 to 35	50 mm (10 to 14 inche	s))							U	
		Other										_	
	1												
XI	Finish	Standard						-			-		
			-resistant finish										
	1	Corrosion-	-proof finish										

suo	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
0	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 2)	K
	Attachment of the TAG number plate to the neck section for detector (Note 2) (Note 3)	L
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for FM NI approval

 $2. \ Must \ be \ selected \ for \ Tag \ no. \ requirement$ 

3. This option code cannot be selected with Electrical connection code "5".

## Flange type (700 to 1100 mm (28 to 44 inches)) Chloroprene rubber lining

Model MGG11F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

ine size  ining iping onnection  lange material lectrode	700 mm 800 mm 900 mm 1000 mm 1100 mm Chloropren Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN Uafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	0K I 150 3443-2 F12 PN10 50	700 800 900 10H 11H	J1 A1 G1 D1 P1	1	L						-				
ining iping onnection  lange material lectrode	800 mm 900 mm 1000 mm 1100 mm Chloropren Wafer JIS 1 Wafer ANS Wafer DIN Wafer DIN Usafer JIS G Wafer DIN Usafer JIS G Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN Usafer JIS G Usafer DIN U	(32 inches) (36 inches) (40 inches) (44 inches) e rubber 0K I 150 3443-2 F12 PN10 50	800 900 10H 11H	J1 A1 G1 D1	1	L										
ining iping onnection  lange material lectrode	800 mm 900 mm 1000 mm 1100 mm Chloropren Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN User JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	(32 inches) (36 inches) (40 inches) (44 inches) e rubber 0K I 150 3443-2 F12 PN10 50	800 900 10H 11H	J1 A1 G1 D1	1	L										
iping onnection lange material lectrode	900 mm 1000 mm 1100 mm Chloropren Wafer JIS 1 Wafer ANS Wafer JIS G Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	(36 inches) (40 inches) (44 inches) e rubber 0K I 150 83443-2 F12 PN10	900 10H 11H	J1 A1 G1 D1	1	L										
iping onnection lange material lectrode	1000 mm 1100 mm Chloropren Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	(40 inches) (44 inches) te rubber 0K I 150 (3443-2 F12 PN10	10H 11H	J1 A1 G1 D1	1	L										
iping onnection lange material lectrode	Chloropren Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN Wafer DIN Standard SUS316L Titanium Tungsten ca Other SUS316	(44 inches) ee rubber 0K I 150 3443-2 F12 PN10	11H	J1 A1 G1 D1	1	L										
iping onnection lange material lectrode	Chloropren Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	e rubber 0K I 150 3443-2 F12 PN10 50		J1 A1 G1 D1	1	L										
iping onnection lange material lectrode	Wafer JIS 1 Wafer ANS Wafer JIS C Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	0K I 150 3443-2 F12 PN10 50	R	J1 A1 G1 D1	1	L										
lange material lectrode Grounding ring	Wafer ANS Wafer JIS C Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	I 150 3443-2 F12 PN10 50		A1 G1 D1	1	L										
lange material lectrode Grounding ring	Wafer JIS C Wafer DIN Wafer JPI I Standard SUS316L Titanium Tungsten ca Other SUS316	93443-2 F12 PN10 50		G1 D1	1	L										
lectrode Grounding ring	Wafer DIN Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	PN10 50		D1	1	L										
lectrode Grounding ring	Wafer JPI 1 Standard SUS316L Titanium Tungsten ca Other SUS316	50		_	1	L										
lectrode Grounding ring	Standard SUS316L Titanium Tungsten ca Other SUS316			P1	1	L										
lectrode Grounding ring	SUS316L Titanium Tungsten ca Other SUS316	arbide			1	L										
Grounding ring	Titanium Tungsten ca Other SUS316	arbide				L		i								
	Tungsten ca Other SUS316	arbide			ranium K											
	Other SUS316	arbide				K										
	Other SUS316					W										
				-			-									
	Other						S									
	Other _															
lectrical	Integral typ	e						1								
onnection /	Remote	G1/2 internal thread / without wat	ertight gland	-		-		2	-							
watertight gland	type	G1/2 internal thread / with brass (I	3													
		G1/2 internal thread / with plastic	4													
		1/2NPT internal thread / without v	5													
		CM20 internal thread / without wa	6	-												
		Pg 13.5 internal thread / without w	7	-												
		G1/2 internal thread / with SUS304		1				8								
ace-to-face	Standard								A							
imensions	Other									1						
nstallation /	Integral typ	e								Н						
riring direction	Remote		al piping mountin	g)						A	1					
	type									В	1					
					m	-			-		-					
Calibration	Standard	Troise and Fried mounting / 11811		upotr							A	ł				
ound ution											11					
	Julier									_		J				
inish	Standard															
		resistant finish														
in nst vir	eallation / ing direction ibration	nensions Other Italiation / Integral type In	e-to-face Standard Other  Integral type ing direction  Remote type Downstream side (horizontal / vertical points) Horizontal piping mounting / left Horizontal piping mounting / righ ibration  Standard Other	e-to-face Standard Other  tallation / Integral type Integral type Ing direction  Remote Type Downstream side (horizontal / vertical piping mounting / horizontal piping mounting / left side viewed from Horizontal piping mounting / right side viewed from Horizontal piping mounting / other  Standard Other  Standard Corrosion-resistant finish	e-to-face   Standard	e-to-face   Standard	e-to-face   Standard   Other   Integral type   Integral type   Downstream side (horizontal / vertical piping mounting)   Horizontal piping mounting / left side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Other    Standard   Other    Standard   Corrosion-resistant finish	e-to-face   Standard   Other   Integral type   Integral type   Downstream side (horizontal / vertical piping mounting)   Horizontal piping mounting / left side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Standard   Other    Standard   Corrosion-resistant finish	e-to-face   Standard   Other   Integral type   Integral type   Downstream side (horizontal / vertical piping mounting)   Horizontal piping mounting / left side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Other    Standard   Other    Standard   Corrosion-resistant finish	e-to-face   Standard   A   Integral type   Integral type   Downstream side (horizontal / vertical piping mounting)   Horizontal piping mounting / left side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Horizontal piping mounting / right side viewed from upstream   Standard   Other    Standard   Corrosion-resistant finish	e-to-face enensions    Other	e-to-face enensions				

suc	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
0	Material certificate (only for electrodes and ground rings)	С
	Attachment of the TAG number to the terminal box for detector (Note 1)	K
	Attachment of the TAG number plate to the neck section for detector (Note 1)	L
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for Tag no. requirement

## Wafer type (15 to 200 mm (1/2 to 8 inches)) PFA / ETFE lining

Model MGG19D - I II III IV V VI VII VIII IX - X XI - Y / Options (some options can be selected per each model)

	Basic model no.			Selecti	ions			Optional			sel	ection	ıs		
	MGG19D	1	1 .										-		
			•												
I	Line size	15 mm	(1/2 inch)	015											
1		25 mm	(1 inch)	025								i			
		40 mm	(1½ inches)	040											
		50 mm	(2 inches)	050								i			
		65 mm	(2½ inches)	065											
		80 mm	(3 inches)	080								i			
		100 mm	(4 inches)	100											
		125 mm	(5 inches)	125											
		150 mm	(6 inches)	150								i			
		200 mm	(8 inches)	200											
II	Lining	ETFE (Size 80	to 200 mm (3 to 8 inches))		Е										
		PFA			P							i i			
III	Piping connection	Wafer JIS 10K				11									
		Wafer JIS 20K				12						İ			
		Wafer JIS 30K				13									
		Wafer ANSI 15	50			21									
		Wafer ANSI 30	00			22									
		Wafer JIS G34	43-2 F12 (line size 80 mm or larger)			31									
		Wafer DIN PN				41									
		Wafer DIN PN	116			42									
		Wafer DIN PN	125			43									
		Wafer DIN PN	140			44									
		Wafer JPI 150				61									
		Wafer JPI 300				62									
IV	Electrode	SUS316L					L	1							
		ASTM B574 (I	Hastelloy C-276 equivalent)				С	1							
		Titanium					K	1							
		Zirconium					Н	1							
		Tantalum					Т	1							
		Tungsten carb	ide				W	1							
		Platinum iridi					P	1							
		Other						1							
V	Grounding ring	SUS316						S							
'	orounumg ring	ASTM B575 (I	Hastelloy C-276 equivalent)					С				i			
		Titanium						K							
		Zirconium						Н				i			
		Tantalum						Т							
		Platinum						P							
		Other										i			
VI	Electrical connection	Remote type	G1/2 internal thread / with brass (Ni-p	plated) watertight	gland				3	1					
V 1	/ watertight gland	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	G1/2 internal thread / with SUS304 wa		Simila				8	-					
3777	Face-to-face	Standard	G1/2 internal tilleau / witti 505504 Wa	ici tigiit gidiiu						Α					
VII	dimensions	Other								A	-				
* ****		-	The transmitted by the state of												
VIII	Installation / wiring	Remote type	Upstream side (horizontal / vertical pi Downstream side (horizontal / vertical		~)						A				
	direction		·	110	·						В				
			Horizontal piping mounting / left side Horizontal piping mounting / right sid								С				
IV	Calibration	Standard	Tiorizontal piping mounting / right sid	e viewed from up	sueam	1					D	A			
IX	Calibration		ate calibration (Size 40 to 200 mm (1 1/2	to 9 in abas))								U			
			ate campration (Size 40 to 200 mm (1 1/2	ю о шспея))								U			
		Other													
_	I														
X	Finish	Standard												X	
XI	Bolt / nut	None													X
		Carbon steel													1
		SUS304	_												2
	1				7										
Suc	Azbil Corporation version		d)	Y	1										
Options	Traceability certificate for o			В	1										
O	Material certificate (only fo		ground rings)	C	4										
	With gasket for plastic pipi			J	1										
		mber to the tern	ninal box for detector (Note 1)	K	4										
	Water free treatment			E	1										
	Oil free treatment			F	]										

## Flange type (15 to 200 mm (1/2 to 8 inches)) PFA / ETFE lining

Model MGG19F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

	Basic model no.		_	Select	ions						Optio	onal	select	ions	
	MGG19F													-	
			•											'	
I	Line size	15 mm	(1/2 inch)	015											
		25 mm	(1 inch)	025											
		40 mm	(1½ inches)	040											
		50 mm	(2 inches)	050											
		65 mm	(2½ inches)	065											
		80 mm	(3 inches)	080											
		100 mm	(4 inches)	100											
		125 mm	(5 inches)	125											
		150 mm	(6 inches)	150											
		200 mm	(8 inches)	200											
II	Lining	ETFE (Size 80	to 200 mm (3 to 8 inches))		Е										
		PFA			P										
III	Piping connection	Flange JIS 10K				J1									
		Flange JIS 20K				J2									
		Flange JIS 30K				J3									
		Flange ANSI 1	50			A1									
		Flange ANSI 3	00			A2									
		Flange JIS G34	43-2 F12 (line size 80 mm or larger)			G1									
		Flange DIN PN	V10			D1	1								
		Flange DIN PN	N16			D2									
		Flange DIN PN	J25			D3									
		Flange DIN PN	J40			D4									
IV	Flange material	Standard					1								
		Other					_								
V	Electrode	SUS316L						L							
		ASTM B574 (F	Hastelloy C-276 equivalent)					С							
		Titanium						K							
		Zirconium						Н							
		Tantalum						T							
		Tungsten carbi	de					W							
		Platinum iridiu	ım					P							
		Other						_							
VI	Grounding ring	SUS316							S						
		ASTM B575 (F	Hastelloy C-276 equivalent)						С						
		Titanium							K						
		Zirconium							Н						
		Tantalum							T						
		Platinum							P						
		Other							_						
VII	Electrical connection	Remote type	G1/2 internal thread / with brass (Ni-plate	d) watertigh	t gland					3					
	/ watertight gland		G1/2 internal thread / with SUS304 watert							8					
VIII	Face-to-face	Standard	1				-				A				
	dimensions	Other									_	1			
IX	Installation / wiring	Remote type	Upstream side (horizontal / vertical piping	g mounting)								A			
	direction	'*	Downstream side (horizontal / vertical pip	ing mountin	ıg)							В			
			Horizontal piping mounting / left side view									С			
			Horizontal piping mounting / right side vi-			1						D			
X	Calibration	Standard											A		
		+/- 0.35 % of ra	ate calibration (Size 40 to 200 mm (1 1/2 to 8	8 inches))									U		
		Other													
	1														
XI	Finish	Standard													Х
	1					-									

su	Azbil Corporation version (must be selected)	Y
ţi.	Traceability certificate for detector	В
Options	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 1)	K
	Water free treatment	Е
	Oil free treatment	F

Note) 1. Must be selected for Tag no. requirement

## Flange type (250 to 600 mm (10 to 24 inches)) PFA / ETFE lining

Model MGG19F - I II III IV V VI VII VIII IX X - XI - Y / Options (some options can be selected per each model)

	Basic model no.		_	Selec	tions						Optio	onal	select	ions	
	MGG19F		-											-	
	T		(10.1.1.)												
Ι	Line size	250 mm	(10 inches)	250											
		300 mm	(12 inches)	300											
		350 mm	(14 inches)	350											
		400 mm	(16 inches)	400											
		450 mm	(18 inches)	450											
		500 mm	(20 inches)	500											
		600 mm	(24 inches)	600											
II	Lining	ETFE		,	Е	1									
		PFA			P	1									
III	Piping connection	Flange JIS	10K			J1									
		Flange JIS				J2									
		Flange AN				A1									
		_	SI 300 (Size 16 inches or small	ler)		A2									
			G3443-2 F12	- /		G1									
		Flange DIN				D1									
		Flange DIN				D2									
		Flange DIN				D3									
IV	Flange material	Standard	N FIN23			D3	,	-							
1 V	Flange material	Other					1	-							
V	Electrode						_	т	-						
V	Electrode	SUS316L	14 (TT + 11 C 2004 + 1 +	`				L							
			4 (Hastelloy C-276 equivalent	:)				C	-						
		Titanium						K	-						
		Zirconium						Н							
		Tantalum						T							
		Tungsten c						W							
		Platinum ii	ridium					P							
		Other													
VI	Grounding ring	SUS316							S						
		ASTM B57	5 (Hastelloy C-276 equivalent	:)					С						
		Titanium							K						
		Other							_	1					
VII	Electrical connection	Remote	G1/2 internal thread / with	brass (Ni-plated)	water	tight g	gland			3					
	/ watertight gland	type	G1/2 internal thread / with	SUS304 watertig	ht glar	nd				8					1
VIII	Face-to-face	Standard									A	1			
	dimensions	Other										1			
IX	Installation / wiring	Remote	Upstream side (horizontal /	vertical piping n	nounti	ng)						A			
-	direction	type	Downstream side (horizont				)				,	В	-		
		Horizontal piping mounting / left side viewed from upstream  C													
			Horizontal piping mounting									D			
X	Calibration	Standard	110112011an Piping mountin	5, 11511t side viev	, cu 11 (	ııı ups	, ci caili	-					A		
Λ	Calibration		of rate calibration (Cine 250 to	250 mm (10 t - 1	4 ;1-	100))				-	-			1	
			of rate calibration (Size 250 to	330 mm (10 to 1	4 INCI	ies))							U	1	
		Other											_	]	
37.1	E: 1	0. 1 1													+
XI	Finish	Standard													1

ns	Azbil Corporation version (must be selected)	Y
Options	Traceability certificate for detector	В
Ор	Material certificate (only for electrodes and ground rings)	С
	With gasket for plastic piping	J
	Attachment of the TAG number to the terminal box for detector (Note 1)	K
	Water free treatment	E
	Oil free treatment	F

Note) 1. Must be selected for Tag no. requirement

## Wafer type (25 to 200 mm (1 to 8 inches)) Polyurethane rubber lining

Model MGG19D - I II III IV V VI VII VIII IX - X XI - Y / Options (some options can be selected per each model)

	Basic model no.			Selec	tions						Optio	onal	se	lection	18
	MGG19D	)	1 -										-		
			•												
I	Line size	25 mm	(1 inch)	025	1										
		40 mm	(1½ inches)	040	1										
		50 mm	(2 inches)	050	1										
		65 mm	(2½ inches)	065	-										
		80 mm	(3 inches)	080	-										
		ļ			-										
		100 mm	(4 inches)	100	-										
		125 mm	(5 inches)	125	-										
		150 mm	(6 inches)	150	-										
		200 mm	(8 inches)	200											
II	Lining	Polyurethan			Q										
III	Piping connection	Wafer JIS 1				11									
		Wafer JIS 2	0K			12									
		Wafer JIS 3	0K			13									
		Wafer ANS	I 150			21									
		Wafer ANS	I 300			22									
		Wafer JIS G	3443-2 F12 (line size 80 mm or	larger)		31									
		Wafer DIN	PN10			41									
		Wafer DIN	PN16			42									
		Wafer DIN	PN25			43									
		Wafer DIN				44									
		Wafer JPI 1				61									
		Wafer JPI 3				62									
IV	Electrode	SUS316L	00			02	L	ł							
1 V	Electrode							-							
		Titanium	1:1 ( 1 6 : 10 )				K	-							
			arbide (only for size 10 mm)				W	-							
		Other					_	_							
V	Grounding ring	SUS316						S							
		Titanium						K							
		Other													
VI	Electrical connection		G1/2 internal thread / with bra				land		3						
	/ watertight gland	type	G1/2 internal thread / with SU	S304 watertig	ht glar	nd			8						
VII	Face-to-face dimensions	Standard								A					
VIII	Installation / wiring	Remote	Upstream side (horizontal / ve	rtical piping i	nounti	ing)					A	i i			
	direction	type	Downstream side (horizontal /								В				
			Horizontal piping mounting /								С				
			Horizontal piping mounting /								D				
IX	Calibration	Standard	Tronzontar piping mounting /	Tight side vie		m upo	rtreum					A			
171	Cantration		of rate calibration (Size 40 to 200	1 mm (1 1/2 to	0 incl	200))						U			
		Other	of rate cambration (Size 40 to 200	7 111111 (1 1/2 to	0 11101	168))									
		Other										_			
X	Finish	Standard			-									X	
XI	Bolt / nut	None												1	X
211	2011 / Hut	Carbon stee													1
		SUS304	v1								,				2
	1	300304													
ns	Azbil Corporation version	(must be selecte	ed)	Y											
Options	Traceability certificate for o			В											
O	Material certificate (only fo		d ground rings)	С	4										
	With gasket for plastic pipi			J	_										
		moer to the terr	minal box for detector (Note 1)	K E	_										
	Water free treatment			E	-										

Note) 1. Must be selected for Tag no. requirement

Oil free treatment

F

## **DIMENSIONS**

(Unit:mm (inch))

## Union joint (size 2.5 to 15 mm (0.1 to 1/2 inch))

Terminal connection table

Symbol Description

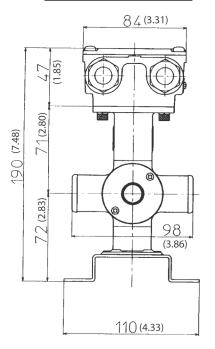
X Excitation

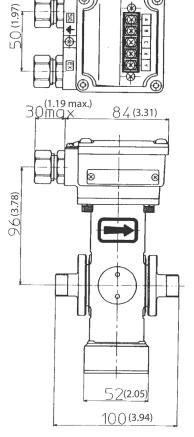
Y current input

A Flow rate

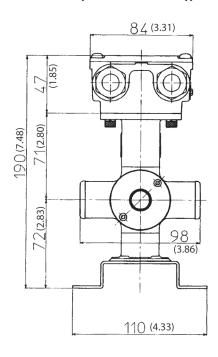
B signal output

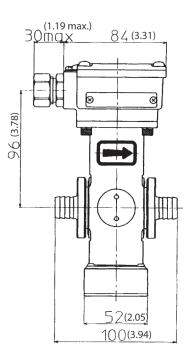
C Case ground





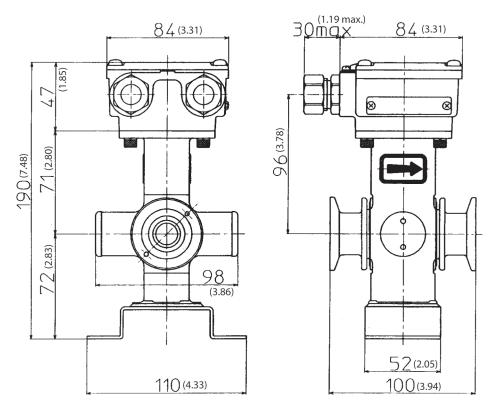
## Hose joint (size 2.5 to 15 mm (0.1 to 1/2 inch))





## IDF / Tri clamp (size 2.5 to 15 mm (0.1 to 1/2 inch))

(Unit:mm (inch))

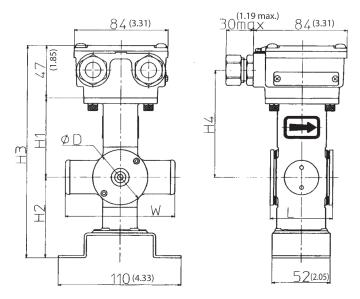


Note) 1. An integral detector includes an integral converter instead of a terminal box.

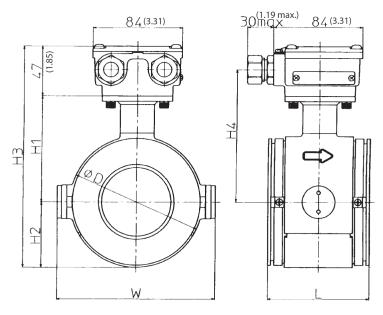
2. Clamp size: 1S

## Wafer type (size 2.5 to 15 mm (0.1 to 1/2 inch))

(Unit:mm (inch))



## Wafer type (size 25 to 200 mm (1 to 8 inches))

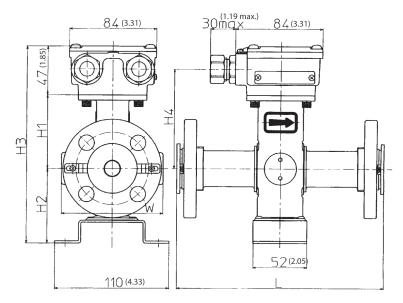


Size		mm	2.5	5	10	15	25	40	50	65	80	100	125	150	200
Size		(inches)	(0.1)	(0.2)	(3/8)	(1/2)	(1)	(1½)	(2)	(21/2)	(3)	(4)	(5)	(6)	(8)
Face to face	L	mm	56	56	56	56	56	80	86	96	106	120	140	160	200
dimension	L	(inches)	(2.20)	(2.20)	(2.20)	(2.20)	(2.20)	(3.15)	(3.39)	(3.78)	(4.17)	(4.72)	(5.51)	(6.30)	(7.87)
	H1	mm	71	71	71	71	77	84	93	100	108	121	133	160	185
	пі	(inches)	(2.80)	(2.80)	(2.80)	(2.80)	(3.03)	(3.31)	(3.66)	(3.94)	(4.25)	(4.76)	(5.24)	(6.30)	(7.28)
	H2	mm	72	72	72	72	34	43.5	52	62	67	79.5	95	110	135
Haiaht	П2	(inches)	(2.83)	(2.83)	(2.83)	(2.83)	(1.34)	(1.71)	(2.05)	(2.44)	(2.64)	(3.13)	(3.74)	(4.33)	(5.31)
Height	Н3	mm	190	190	190	190	158	175	192	209	222	247	275	317	367
	ПЭ	(inches)	(7.48)	(7.48)	(7.48)	(7.48)	(6.22)	(6.89)	(7.56)	(8.23)	(8.74)	(9.72)	(10.83)	(12.48)	(14.45)
	H4	mm	96	96	96	96	102	109	118	125	133	146	158	185	210
	114	(inches)	(3.78)	(3.78)	(3.78)	(3.78)	(4.02)	(4.29)	(4.65)	(4.92)	(5.24)	(5.75)	(6.22)	(7.28)	(8.27)
Housing	W	mm	98	98	98	98	106	125	135	148	164	189	214	240	290
width	\ vv	(inches)	(3.86)	(3.86)	(3.86)	(3.86)	(4.17)	(4.92)	(5.31)	(5.83)	(6.46)	(7.44)	(8.43)	(9.45)	(11.42)
Housing		mm	49.5	49.5	49.5	49.5	68	87	104	124	134	159	190	220	270
outer diameter	φD	(inches)	(1.95)	(1.95)	(1.95)	(1.95)	(2.68)	(3.43)	(4.09)	(4.88)	(5.28)	(6.26)	(7.48)	(8.66)	(10.63)
Weight		kg	2.6	2.6	2.6	2.3	2.6	2.8	3.4	4.5	5.2	6.7	10.0	13.6	22.0
vveigiit		(lb)	(5.7)	(5.7)	(5.7)	(5.1)	(5.7)	(6.2)	(7.5)	(9.9)	(11.5)	(14.8)	(22.0)	(30.0)	(48.5)

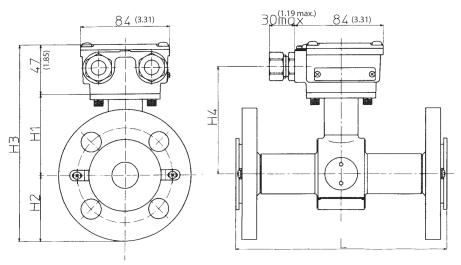
Note) 1. An integral detector includes an integral converter instead of a terminal box.

## Flange type (size 2.5 to 15 mm (0.1 to 1/2 inch))

(Unit:mm (inch))



## Flange type (size 25 to 150 mm (1 to 6 inch))



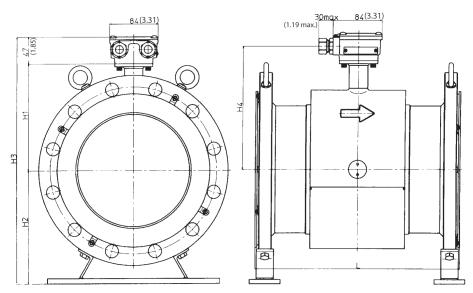
Size		mm	2.5	5	10	15	25	40	50	65	80	100	125	150
		(inches)	(0.1)	(0.2)	(3/8)	(1/2)	(1)	(1½)	(2)	(21/2)	(3)	(4)	(5)	(6)
Face to face dimension	L	mm	160	160	160	200	200	200	200	200	200	250	250	300
		(inches)	(6.30)	(6.30)	(6.30)	(7.87)	(7.87)	(7.87)	(7.87)	(7.87)	(7.87)	(9.84)	(9.84)	(11.81)
Height	H1	mm	71	71	71	71	77	84	93	100	108	121	133	160
		(inches)	(2.80)	(2.80)	(2.80)	(2.80)	(3.03)	(3.31)	(3.66)	(3.94)	(4.25)	(4.74)	(5.24)	(6.30)
	H2	mm	72	72	72	72	63	70	78	88	93	105	125	140
		(inches)	(2.83)	(2.83)	(2.83)	(2.83)	(2.48)	(2.76)	(3.05)	(3.44)	(3.64)	(4.13)	(4.92)	(5.51)
	Н3	mm	190	190	190	190	187	201	218	235	248	273	305	347
		(inches)	(7.48)	(7.48)	(7.48)	(7.48)	(7.36)	(7.91)	(8.56)	(9.23)	(9.74)	(10.73)	(12.01)	(13.66)
	H4	mm	96	96	96	96	102	109	118	125	133	146	158	185
		(inches)	(3.78)	(3.78)	(3.78)	(3.78)	(4.02)	(4.29)	(4.65)	(4.92)	(5.24)	(5.73)	(6.22)	(7.28)
Weight		kg	5.0	5.0	5.0	5.0	7.4	6.5	10.1	12.1	12.6	18.4	26.0	30.6
Weight		(lb)	(11.0)	(11.0)	(11.0)	(11.0)	(16.3)	(14.3)	(22.3)	(26.7)	(27.8)	(40.6)	(57.3)	(67.5)

*Note)* 1. This table is for remote detectors.

- 2. An integral detector includes an integral converter instead of a terminal box.
- ${\it 3. The table indicates dimensions for ANSI~150 flange.}$

## Flange type (size 200 to 600 mm (8 to 24 inches))

(Unit:mm (inch))



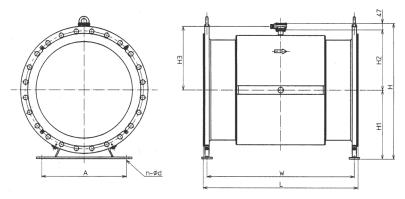
Ciao		mm	200	250	300	350	400	450	500	600
Size		(inches)	(8)	(10)	(12)	(14)	(16)	(18)	(20)	(24)
Face to face	Ţ	mm	350	450	500	550	600	600	600	650
dimension	L	(inches)	(13.78)	(17.72)	(19.69)	(21.65)	(23.62)	(23.62)	(23.62)	(25.59)
Height	H1	mm	185	235	258	282	310	339	366	415
		(inches)	(7.28)	(9.25)	(10.16)	(11.10)	(12.20)	(13.35)	(14.41)	(16.34)
	H2	mm	196	221	250	273	321	353	383	446
		(inches)	(7.72)	(8.70)	(9.84)	(10.75)	(12.64)	(13.90)	(15.08)	(17.56)
	Н3	mm	428	503	555	602	678	739	796	908
		(inches)	(16.85)	(19.80)	(21.85)	(23.70)	(26.69)	(29.09)	(31.34)	(35.75)
	H4	mm	210	260	283	307	335	364	391	440
		(inches)	(8.27)	(10.24)	(11.14)	(12.09)	(13.19)	(14.33)	(15.39)	(17.32)
Weight (kg)		kg	48.0	60.0	73.0	96.0	128.0	168.0	202.0	272.0
		(lb)	(105.8)	(132.3)	(160.9)	(211.6)	(282.2)	(370.4)	(445.3)	(599.7)

Note) 1. This table is for remote detectors.

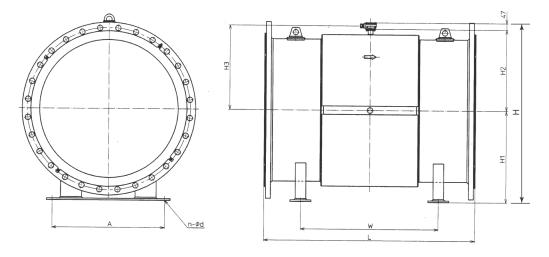
- $2. \ An \ integral \ detector \ includes \ an \ integral \ converter \ instead \ of \ a \ terminal \ box.$
- ${\it 3. The table indicates dimensions for ANSI~150 flange.}$

## Flange type (size 700 to 900 mm (28 to 36 inches))

(Unit:mm (inch))



## Flange type (size 1000, 1100 mm (40, 44 inches))



C:	mm	700	800	900	1000	1100	
Size	(inches)	(28)	(32)	(36)	(40)	(44)	
T t. f 1:	т т	mm	1100	1200	1300	1500	1500
Face to face dimension	L	(inches)	(43.31)	(47.24)	(51.18)	(59.06)	(59.06)
	Н	mm	967	1081	1185	1278	1399
	п	(inches)	(38.07)	(42.56)	(46.65)	(50.31)	(55.08)
	H1	mm	491	554	608	650	720
II ai alat	пі	(inches)	(19.33)	(21.81)	(23.94)	(25.59)	(28.35)
Height	112	mm	429	480	530	581	632
	H2	(inches)	(16.89)	(18.90)	(20.87)	(22.87)	(24.88)
	112	mm	454	505	555	606	657
	H3	(inches)	(17.87)	(19.88)	(21.85)	(23.86)	(25.87)
East langth	W	mm	1049	1147	1245	980	1000
Feet length	VV	(inches)	(41.30)	(45.16)	(49.02)	(38.58)	(39.37)
Feet width	Α.	mm	600	600	600	800	800
reet width	A	(inches)	(23.62)	(23.62)	(23.62)	(31.50)	(31.50)
East hallo *	1.1	mm	4-φ33	4-φ33	4-φ33	4-φ33	4-φ33
Feet halls *	n-φd	(inches)	(1.30)	(1.30)	(1.30)	(1.30)	(1.30)
Weight		kg	394	476.0	566	823	930
		(lb)	(15.51)	(18.74)	(22.28)	(32.40)	(36.61)

<sup>\*:</sup> n = number, d = diameter

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## **Azbil Corporation**

**Advanced Automation Company** 

1-12-2 Kawana, Fujisawa Kanagawa 251-8522 Japan URL: https://www.azbil.com/