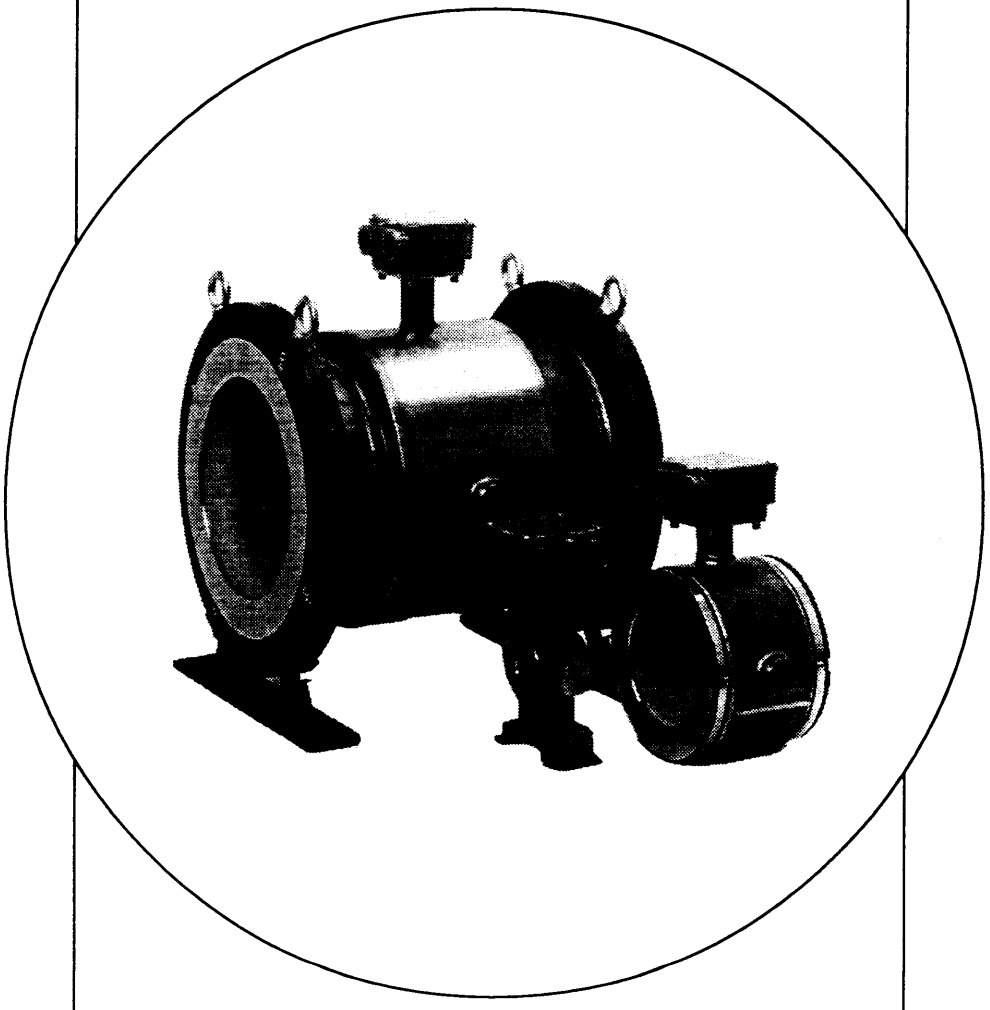
YAMATAKE

CM2-MGG100-2001

MagneW 3000 FLEX / MagneW 3000 Smart Electromagnetic Flowmeter Detector

(Watertight Model)	MGG11 Model
(Submersible Model)	MGG12 Model
(Flowswitch)	MGF11 Model
(Sanitary Model)	KID80/20 Models

User's Manual



Yamatake Corporation

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Preface

Thank you for purchasing the Yamatake Corporation MagneW 3000 FLEX/ MagneW 3000 Smart Electromagnetic Flowmeter. This product is a highly reliable, high performance electromagnetic flowmeter developed based on our extensive experience in the field.
The unique high-quality lining molding technique and many other special features make this product deliver outstanding flow rate measurement.

Unpacking and Inspection

Unpacking the MagneW 3000

This device is a precision instrument and should be handled with care to prevent damage or breakage.

After unpacking the device, verify that the following items are included:

- The detector itself
- Standard accessories
- Precautions for Installation sheet

If you have any questions regarding the specifications of your MagneW 3000,

Verifying specifications

The specifications of this device are written on its attached identification plate. Compare these specifications with those listed in the Appendix A, "Device Standard Specifications and Model Numbers," and verify that all specifications on the plate are correct, paying special attention to the following:

- Detector bore diameter
- Electrode material
- Flange rating
- Grounding ring material

Inquiries

If you have any questions regarding the specifications of this device, contact your nearest Yamatake Corporation office or Yamatake Corporation representative. When making an enquiry, be sure to provide the model number and product number of this device.

Storage precautions

When storing this device before use, observe these precautions:

- Store it indoors at room temperature and humidity, in a place safe from vibration or shock.
- Store it in the same condition as it was shipped.

When storing this device after use, follow these steps:

1. Rinse the inside of the detector with water to eliminate residual fluids, then allow to dry.
2. Firmly attach the terminal box cover and the electrode cover in order to keep out moisture.
3. Replace the detector in its original packaging.
4. Store the device indoors at room temperature and humidity, in a place safe from vibration or shock.

Safety Precautions

Introduction

Correct installation, correct operation and regular maintenance are essential to ensure safety during the use of this device. Read and understand the safety precautions described in this manual and be sure to follow the instructions on installation, operation and maintenance.

Signal words

Safety precautions in this manual are of two kinds —Warning and Caution. The meaning of these flags is as follows:

⚠ **Warning**	Potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **Caution**	Failure to observe these precautions may produce dangerous conditions that could result in injury to the user or in physical damage.

How this Manual is Organized and Used

Organization and method of use

This manual explains the use of the device and its associated devices in the following order:

Chapter 1

The configuration of measuring systems using this product, the structure of the detector, and the names and functions of the respective parts.

Chapter 2

Installation and wiring of the device. Persons installing this unit or the pipes or wiring should refer to this chapter.

Chapter 3

Maintenance and inspection procedures and troubleshooting. Items which require routine maintenance are explained here.

Detailed Table of Contents

Figures and Tables

MEMO

Chapter 1 - Configuration and Structure of the Measuring System

Introduction

This chapter explains the configuration of measuring systems using this unit.

- The structure of this unit and the names and functions of its respective parts are explained.

1-1 System Configuration

Measuring System

Introduction

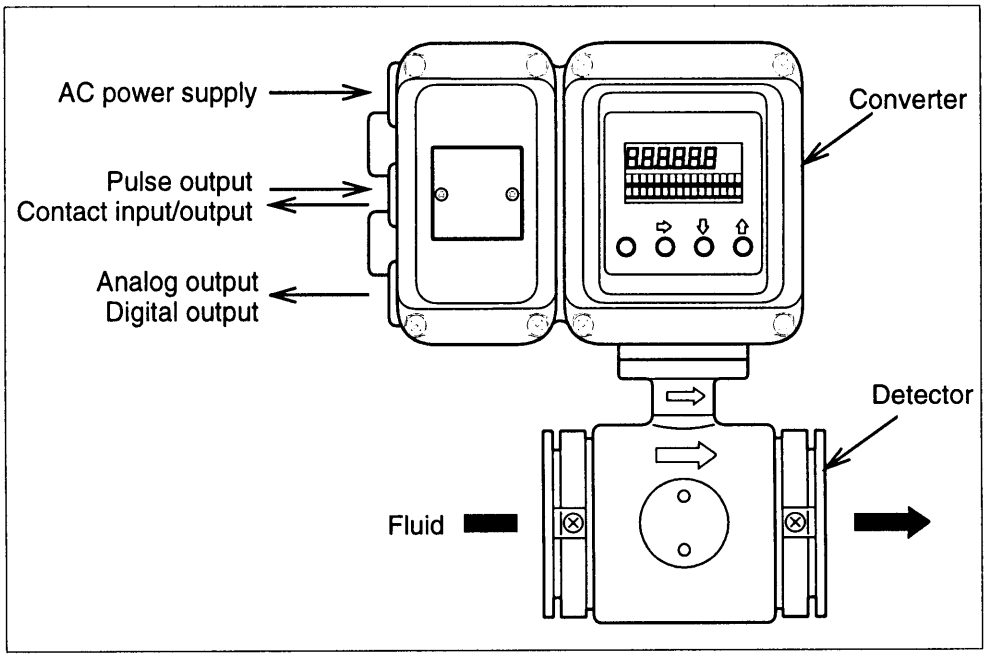
Depending on how it is combined with the converter, this product is available in two configurations, integral and remote.

- Integral: Detector and converter are installed as an integrated unit on a pipe.
- Remote: Detector and converter are installed connectly by cable.

Examples of flow measurement systems

Figures 1-1 and 1-2 show examples of measurement systems using the device.

Figure 1-1 Integral Configuration



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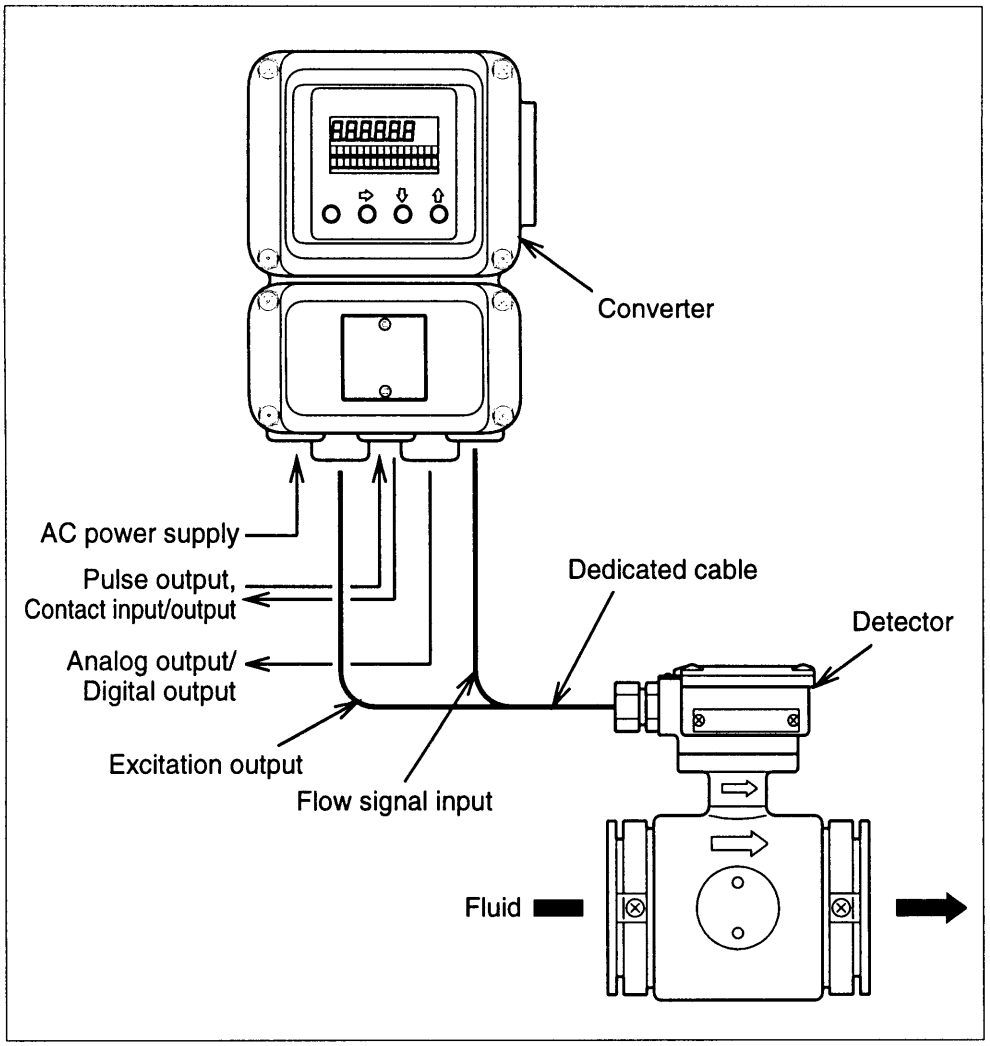
Examples of flow measurement systems
(Continued)

Figure 1-2 Remote Configuration



1-2 Structure of this Unit and Functions of Parts

Detector

Explanation

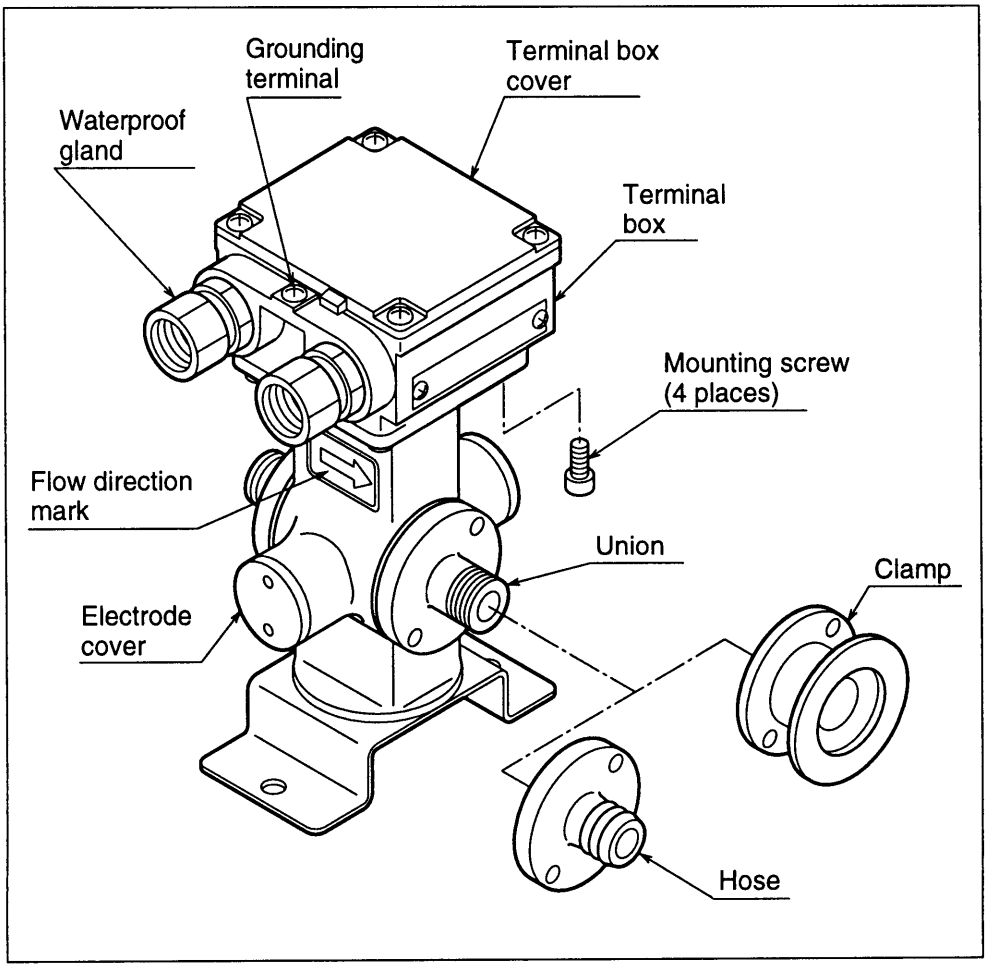
The functions and structure of the device are as follows.

- When a fluid passes through the detector, the detector generates an electromotive force signal proportional to the flow rate.
- The electrodes are both mounted horizontally.

Part names for a union, hose and clamp connected type detector

Figure 1-3 shows the structure of the detector and the names of the major parts.

Figure 1-3 Details of the Detector



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Detector

Detector parts and their functions
(Continued)

This table explains the major parts of the detector.

Name	Function
Flow direction mark	• Indicates the direction of fluid flow. • Mount the detector so that the measured fluid flows in the direction indicated by this mark.
Electrodes	• The electrodes generate an electromotive force signal proportional to the flow rate of the fluid passing through the detector. • The electrode material varies depending on the corrosion characteristics of the fluid to be measured.
Electrode cover	• Houses the electrodes. Do not remove the cover with the detector installed on a pipe.
Union (connected by screws) **Hose** **Clamp**	• The connection uses a union, hose, and clamp. The material is SUS316. • Applicable for detector bore diameters of 2.5 to 15 mm.
Terminal box (remote model only)	• Houses the connection terminals used to apply a standard voltage. • Houses excitation and signal terminals.
Terminal box cover (remote model only)	• Keep the terminal box cover on during operation.

⚠Warning

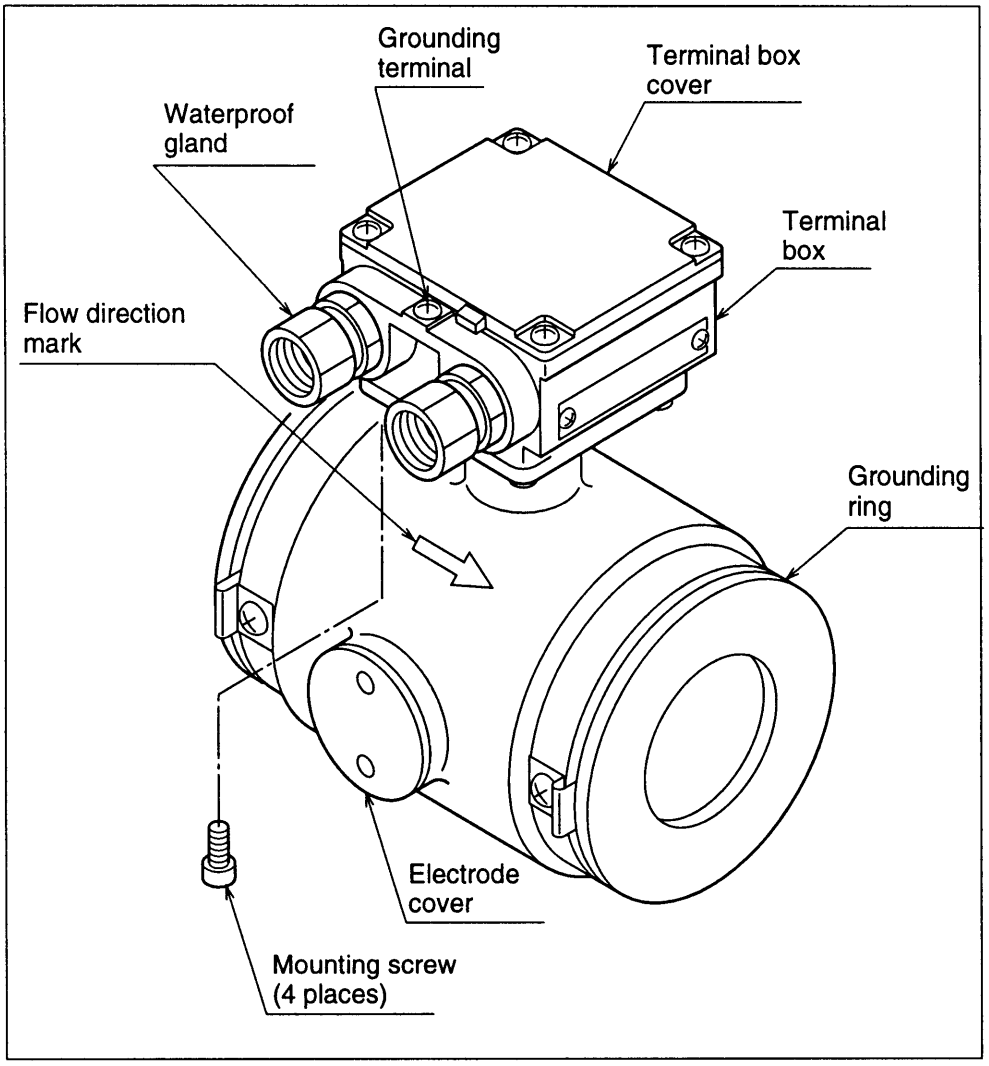
- To prevent the gas or liquid in the pipe from escaping do not remove the electrode cover or the electrodes when the detector is installed on a pipe.

Detector

Names of major parts of the wafer detector

Figure 1-4 shows the structure of the detector and the names of its major parts.

Figure 1-4 Details of the Wafer Detector



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Detector

Names and functions of parts
(Continued)

This table explains the major parts of the detector.

Name	Function
Flow direction mark	• Indicates the direction of fluid flow. • Mount the detector so that the measured fluid flows in the direction indicated by this mark.
Electrodes	• The electrodes generate an electromotive force signal proportional to the flow rate of the fluid passing through the detector. • The electrode material varies depending on the corrosion characteristics of the fluid to be measured.
Electrode cover	• Houses the electrodes. Do not remove the cover with the detector installed on a pipe.
Grounding ring	• The electrode material varies according to the corrosive characteristics of the fluid to be measured. Also, the structure varies with the material.
Terminal box (remote model only)	• Houses the connection terminals used to apply a standard voltage. • Houses excitation and signal terminals.
Terminal box cover (remote model only)	• Keep the terminal box cover on during operation.

⚠Warning

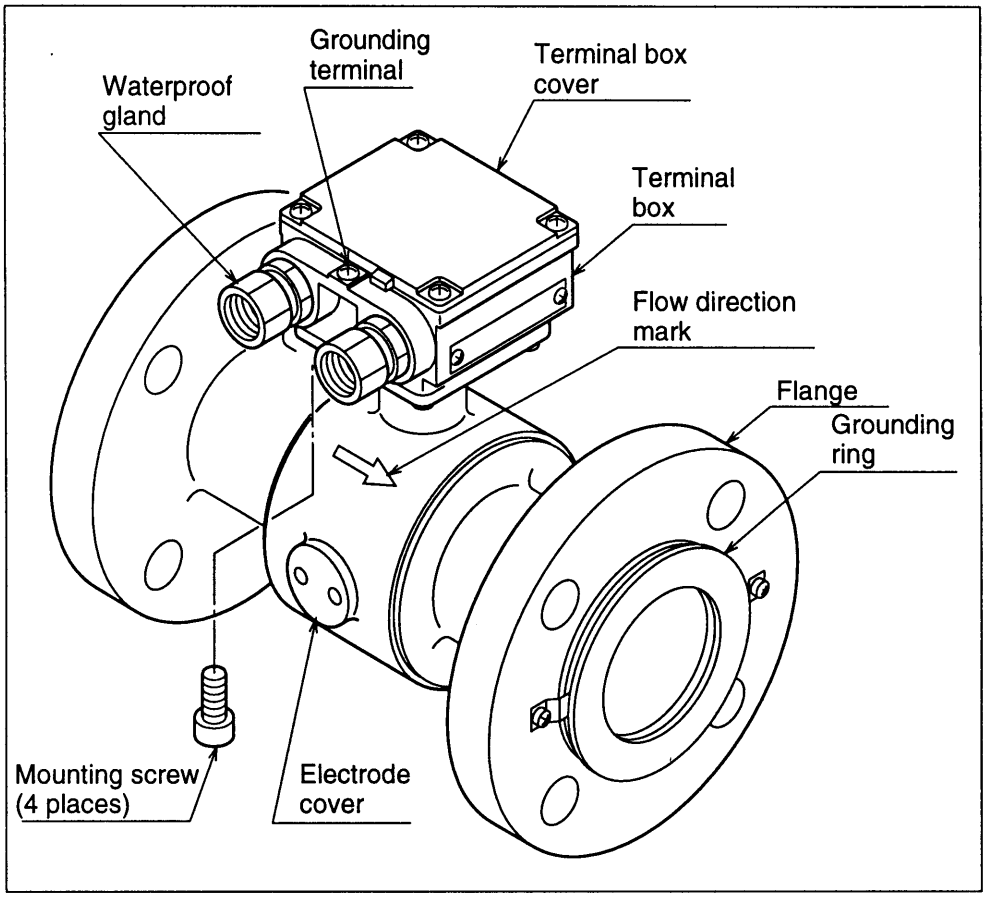
- To prevent the gas or liquid in the pipe from escaping do not remove the electrode cover or the electrodes when the detector is installed on a pipe.

Detector

Names of major parts of the flange type

Figure 1-5 shows the structure of the detector and the names of its major parts.

Figure 1-5 Details of the Flanged Detector



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Detector

Names and functions of parts
(Continued)

This table explains the major parts of the detector.

Name	Function
Flow direction mark	• Indicates the direction of fluid flow. • Mount the detector so that the measured fluid flows in the direction indicated by this mark.
Electrodes	• The electrodes generate an electromotive force signal proportional to the flow rate of the fluid passing through the detector. • The electrode material varies depending on the corrosion characteristics of the fluid to be measured.
Electrode cover	• Houses the electrodes. Do not remove the cover with the detector installed on a pipe.
Grounding ring	• The electrode material varies according to the corrosive characteristics of the fluid to be measured. Also, the structure varies with the material.
Terminal box	• Houses the connection terminals used to apply a standard voltage. • Houses excitation and signal terminals.
Flanges	• Flange structure varies according to the flanges of the pipes to which the detector is to be fitted. • It is easy to center the detector.
Terminal box cover (remote model only)	• Keep the terminal box cover on during operation.

⚠Warning

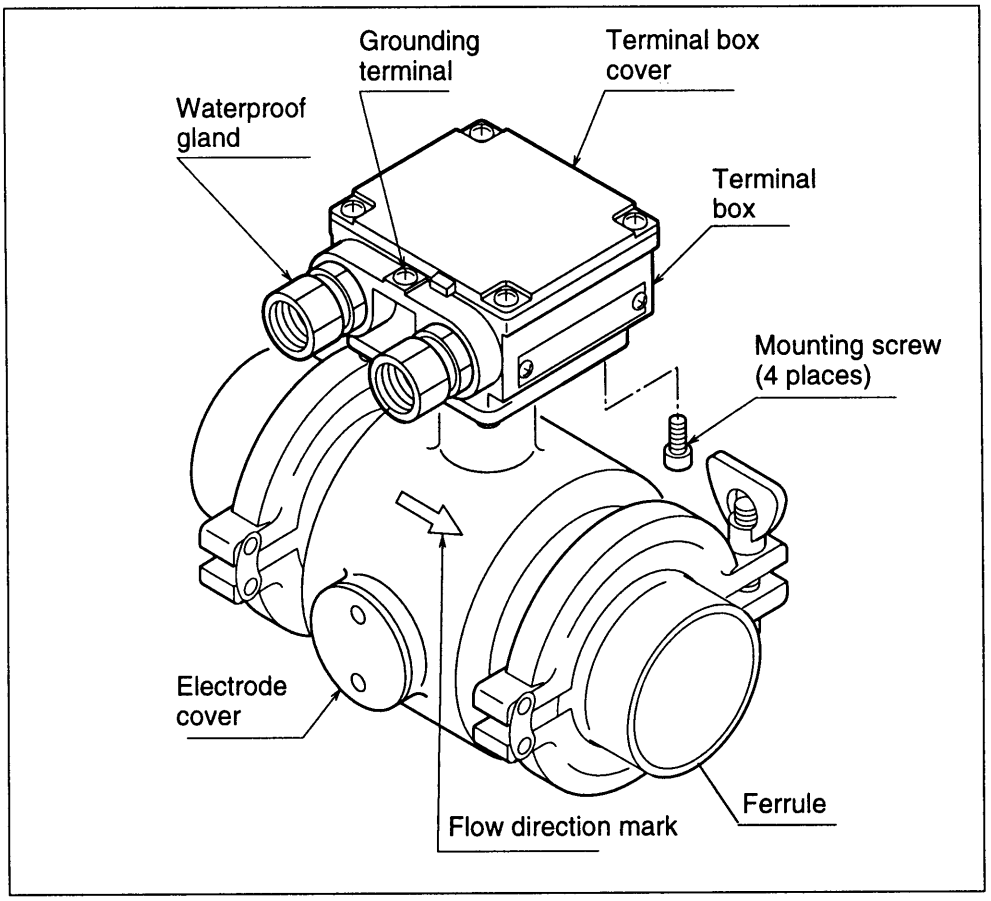
- To prevent the gas or liquid in the pipe from escaping do not remove the electrode cover or the electrodes when the detector is installed on a pipe.

Sanitary type detecter

Names of major parts of the clamp type

Figure 1-6 shows the structure of the detector and the names of its major parts.

Figure 1-6 Details of the clamp type detector



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Sanitary type detecter

Names and functions of parts
(Continued)

This table explains the major parts of the detector.

Name	Function
Flow direction mark	• Indicates the direction of fluid flow. • Mount the detector so that the measured fluid flows in the direction indicated by this mark.
Electrodes	• The electrodes generate an electromotive force signal proportional to the flow rate of the fluid passing through the detector. • The electrode material varies depending on the corrosion characteristics of the fluid to be measured.
Electrode cover	• Houses the electrodes. Do not remove the cover with the detector installed on a pipe.
Clamp	• Clamp strncture varies IDF Clamp and Tri Clamp.
Terminal box	• Houses the connection terminals used to apply a standard voltage. • Houses excitation and signal terminals.
Terminal box cover (remote model only)	• Keep the terminal box cover on during operation.

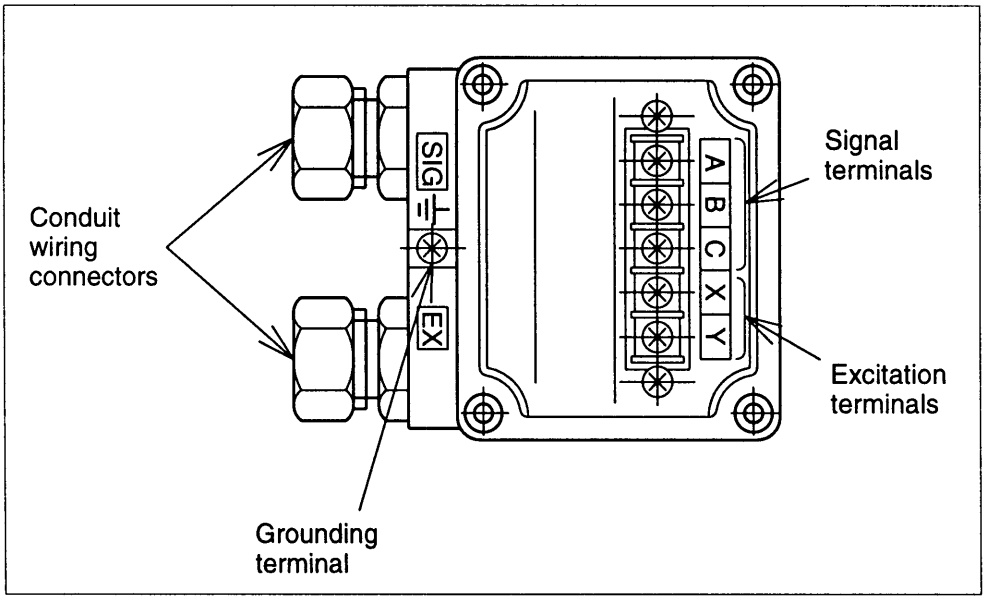
⚠Warning

- To prevent the gas or liquid in the pipe from escaping do not remove the electrode cover or the electrodes when the detector is installed on a pipe.

Detector Terminal Box

Names of parts

Figure 1-7 Detector Terminal Box



Names and explanations of parts

The table below explains the major parts of the detector terminal box.

Name	Explanation
Signal terminals	• These are marked A, B, and C.
Excitation terminals	• These are marked X and Y.
Conduit wiring connectors	• The excitation cable and the signal cable are wired through these connectors.
Grounding terminal	• This terminal is used to ground the detector (class 3 grounding).

⚠ Warning

- Turn off power to the converter side before wiring, to avoid electric shock.

⚠ Caution

- Be sure to ground the detector without fail (class 3 grounding). Insufficient grounding could cause output fluctuation, instability of the zero point, or output drift.

Chapter 2 - Installing the Device

Introduction

This section describes the installation and wiring of this Device .

The required parts and method for installing this device may vary slightly depending on the material of the wetting ring and the pipe.

Installation is explained in the following order:

- Criteria for selecting the installation environment
- An outline of the method of installing the device
- Detailed methods of installation depending on the material

Criteria for Selecting the Installation Site (1)

Introduction

In order to make full use of the functions of the device, select an optimal installation site by following the selection criteria below.

Environment

⚠ Caution

- Install the unit in a location with an ambient temperature of –25 to +65°C and a relative humidity of 5% to 100%. Failing to meet these requirements could cause output errors.
- Install the unit away from high-current power lines, motors and transformers to prevent damage from electromagnetic induction. Failing to meet this requirement could cause output errors.
- Do not install the unit in a location subject to severe vibration or a highly corrosive atmosphere. Failing to meet this requirement could break the neck of the detector or cause other damage.
- As far as possible, install the unit out of direct sunlight. Failing to meet this requirement could cause output errors.

Fluid to be measured

⚠ Caution

The location for your MagneW 3000 must satisfy the following conditions. Failing to meet these requirements could cause output errors and fluctuations.

- A location where the conductance of the fluid to be measured matches the stated specification (specs. vary according to the converter used) and is more or less constant.
- A location where the fluid to be measured can be regarded as electrochemically uniform. For example, if two fluids are mixed at an upstream point, the two fluids should be uniformly mixed by the time they reach the measurement point.
- A location where the distribution of suspended matter, if any, can be regarded as nearly uniform

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Criteria for Selecting the Installation Site (1)

Fluid to be measured *(continued)*

⚠ Caution

- The fluids listed below could cause measurement trouble. Do not use this device, therefore, even if their conductance, temperature, and pressure fall within the specifications of the device (see Appendix A, "Device Standard Specifications and Model Numbers.")
  (1) Fluids that have sufficient conductance at high temperatures but do not satisfy the conductance requirements at room temperature (about 20°C) (Examples: fatty acids and soap)
  (2) Certain fluids that contain surfactants (Examples: rinses, shampoos, and CWM)
  (3) Conductive adherents (Example: deposition of rosin + conductive material)
  (4) Insulating adherents (Examples: oil, kaolinite, kaolin, and calcium stearate)

Precautions to observe after installing

⚠ Caution

(1) After installing this unit, do not use it as a foothold as this can damage the unit.
(2) With the integrated detector, be careful not to break the glass in the detector window.

⚠ Warning

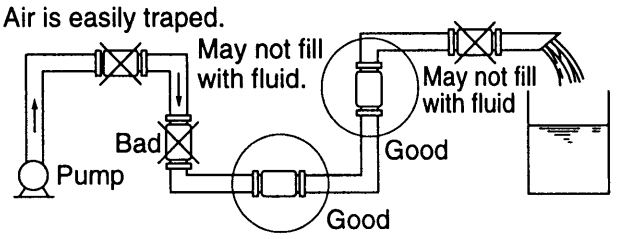
(1) When removing this unit, make sure there is no residual liquid or pressure inside the piping and the detector. Any residual liquid or pressure can cause injury.

Criteria for Selecting the Installation Site (2)

Detector position

- Position the detector so that its internal detector passage is continuously filled with the fluid being measured. Figure 2-1 shows examples of positions that fulfill this condition.

Figure 2-1 Proper Placement of the Detector

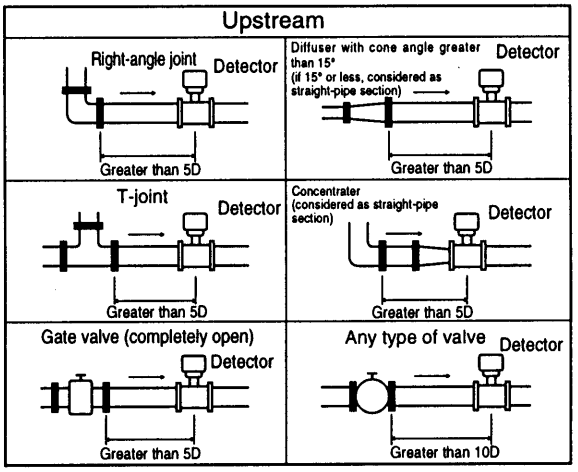


⚠Caution

- Fill the pipe with liquid and install the detector in a location that satisfies the conditions circled above. If the pipe is not filled it can cause an output error.

- When the fluid to be measured is of high viscosity, connecting the detector to a vertical pipe is recommended (in order to secure an axial symmetrical flow). The fluid must flow from the top down.
- Install a straight pipe section between the upstream and downstream positions. For the length of the straight pipe section, refer to the figure below.

Figure 2-2 Straight Pipe Section on the Upstream Side of the Detector (D: nominal bore diameter of the detector)



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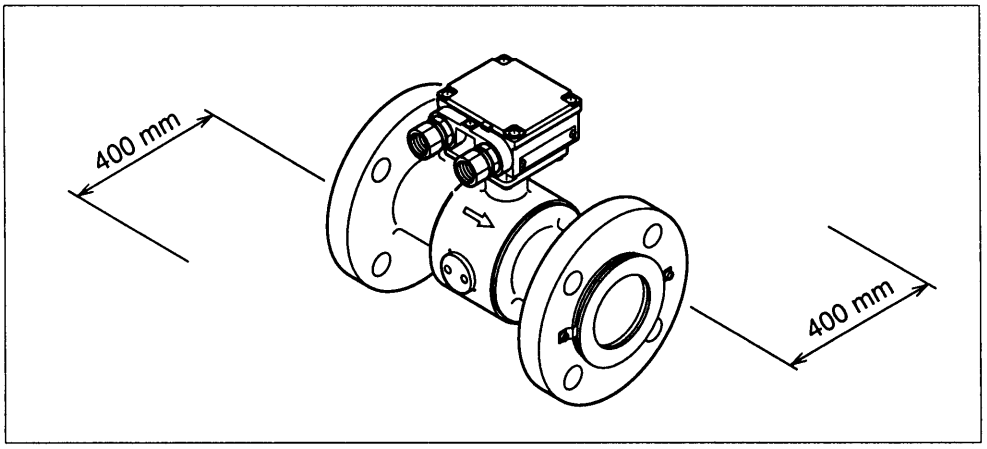
Criteria for Selecting the Installation Site (2)

Detector position
(continued)

- Although a pipe section is not necessary on the downstream side, secure a section of at least 2D if drift current or similar is likely.
- Select a place where there is no major pulse flow. (Install the detector in a location distant from a pump.)
- Secure the space required for inspection of the terminal box.

Figure 2-3 Space Allowance for Inspections



Directions of the Terminal Box and the Converter

Introduction

In some locations, the direction of the terminal box or the converter may be unsuitable if the detector is installed as it is shipped. In such a case, the terminal box or the converter can be repositioned.
After selecting a installation site, adjust the direction of the terminal box or the converter in advance by the two methods shown below.

Repositioning the terminal box or converter

The terminal box or the converter can be repositioned at right angles. Follow the procedure below.

Step	Procedure
1	Using an M5 hex wrench, remove the four screws securing the terminal box or converter.
2	Holding the detector, rotate the terminal box or converter horizontally to the desired position. **⚠Caution** • Do not rotate the unit more than 180° (one half rotation). Any greater rotation can break wiring parts. • If the terminal box or converter is removed, make sure that the O-ring, which provides an air-tight seal, is still fitted into the O-ring groove.
3	Using a hex wrench, re-tighten the four screws to secure the terminal box or converter.

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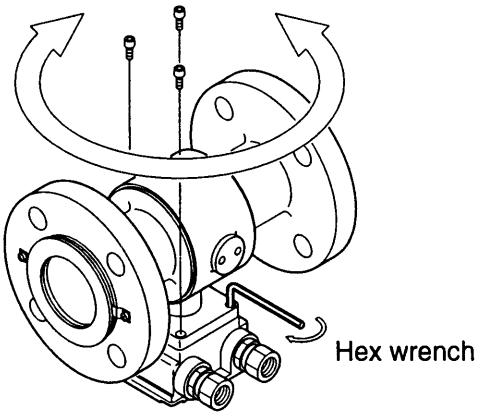
Directions of the Terminal Box and the Converter

Repositioning the terminal box or converter *(continued)*

Figure 2-4 Repositioning the Terminal Box or Converter



⚠ Caution

- After removing the screws, do not pull hard on the terminal box or converter. Otherwise, the lead wire inside can break.

2-2 Method of Installation

2-2-1 Installing a Wafer Detector

Basic Installation Method

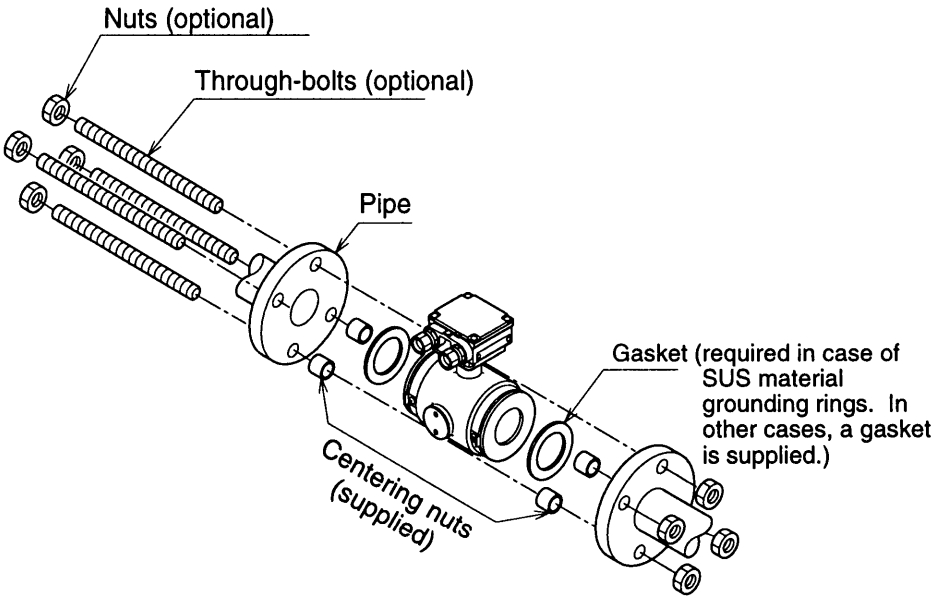
Introduction

The device can installed as a wafer, flange, union, hose, or clamp unit. Referring to the appropriate method of installation, install the unit properly.

Installation example

Figure 2-5 shows the basic method for installing the device.

Figure 2-5 Device Installation Example



⚠ Caution

- Be careful in handling this unit. It is heavy, dropping it accidentally could cause injury.

Basic Installation Method

Fastening torque

⚠ Caution

- Table 2-1 shows the fastening torque for each pipe bore. Using centering hardware, apply the prescribed fastening torque to prevent any liquid leak from the pipe.

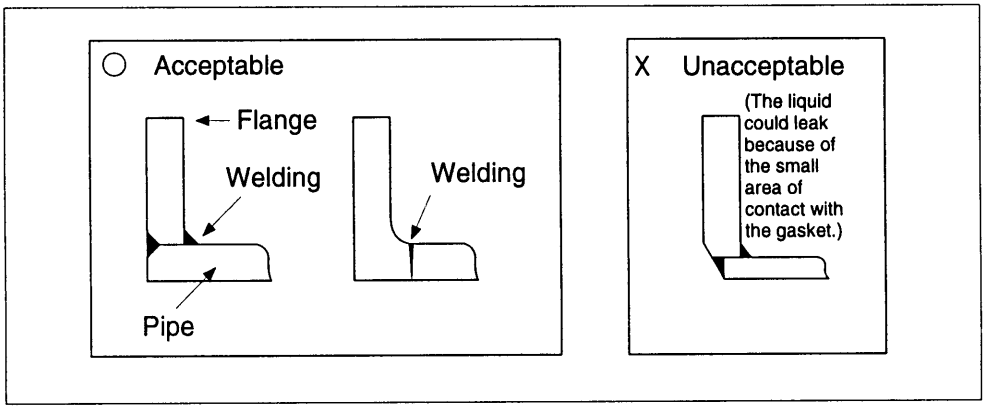
Table 2-1 Fastening Torque Levels

Nominal Detector Bore	Fastening Torque
2.5 - 15A	13-18N•m (130-180kgf•cm)
25A	20-30N•m (200-300kgf•cm)
40A 50A 65A 80A	30-50N•m (300-500kgf•cm)
100A	50-70N•m (500-700kgf•cm)
125A 150A	80-100N•m (800-1000kgf•cm)
200A	90-100N•m (900-1000kgf•cm)

Flange shape

The flanges used should be such that the area of contact with the gasket is maximized, as shown in Figure 2-6.

Figure 2-6 Flange Shape



⚠ Caution

- Before installing the detector be sure to flush out any foreign matter that may be present in interior passage of the detector. Residual foreign matter could cause output fluctuations.
- Do not touch the electrodes or allow oil or fat to come into contact with them. It could cause output fluctuations.
- Align the flow direction mark on the detector with the direction of the liquid flow. Misalignment could result in a negative output.

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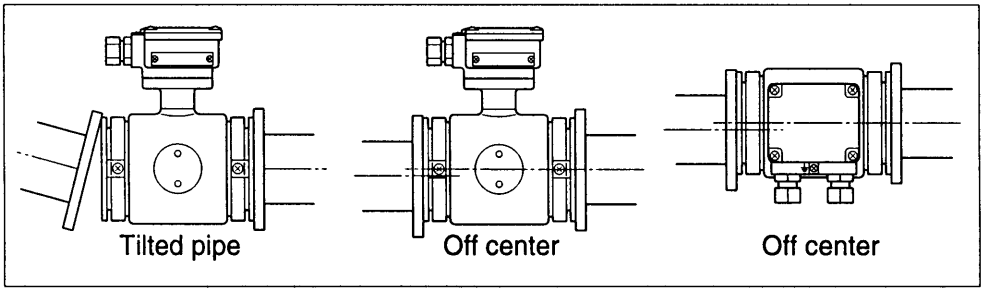
Flange shape
(continued)

⚠Warning

- Before installing the detector make sure that the pipe is exactly straight and centered. Any irregularity in these respects could cause leakage or other hazards.

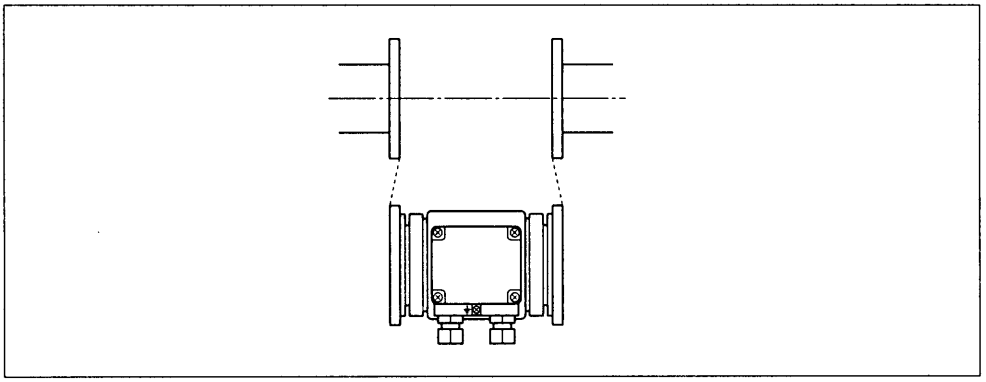
Figure 2-7 Examples of Unacceptable Installations (1)



⚠Caution

- Never force the device between two flanges when the space is too narrow. It can damage the unit.

Figure 2-8 Example of Unacceptable Installation (2)



⚠Warning

- Ensure the bore diameters of the pipe and the detector are exactly the same, install the detector so that the gasket does not protrude into the inner bore of the pipe, as this could result in leakage or other hazards.

⚠Caution

- Tighten each bolt a little at a time and apply uniform pressure to all the bolts while fastening them. If leakage does not stop on completion of fastening, make sure that the pipe is not off center, then tighten the bolts little by little. Install the detector carefully so that the fastening torque does not exceed the prescribed limit; otherwise the unit could be damaged.

Parts Necessary for Installation

Introduction

The following parts are necessary for the installation of the detector:

- Centering nuts (four supplied)
- Connecting bolts and nuts (available separately)
- Gaskets: Required when using grounding rings made of SUS material. Not required when using grounding rings made of hastelloy, titanium, tantallum, or platinum.
- Protective plate: Required when connecting the detector to polyvinyl chloride (PVC) piping.

Centering nuts

To install the detector, use centering nuts to ensure the exact alignment of the pipe and the detector.

Slip the centering bolts onto the through-bolts, and set the detector on top of the nuts so that the nuts are on four sides of the detector.

The positions of the centering nuts depend on the direction in which the detector is installed.

For the positions of the centering nuts, refer to Figures 2-9 and 2-10.

Figure 2-9 Horizontal Centering of the Detector (Position two centering nuts against each flange.)

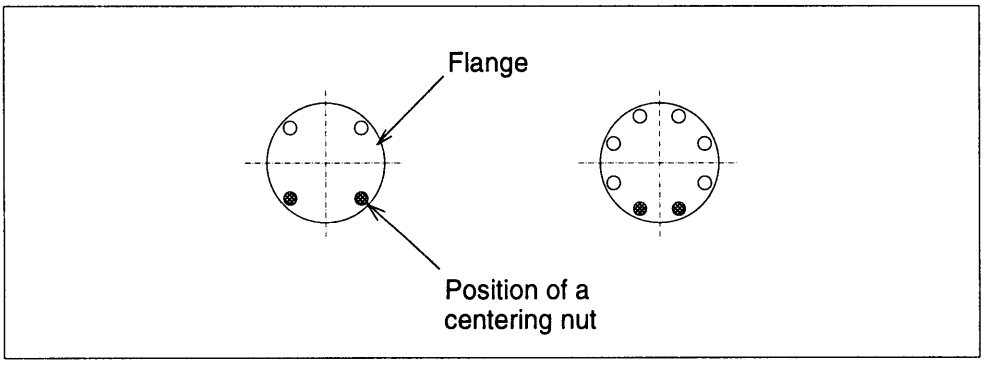
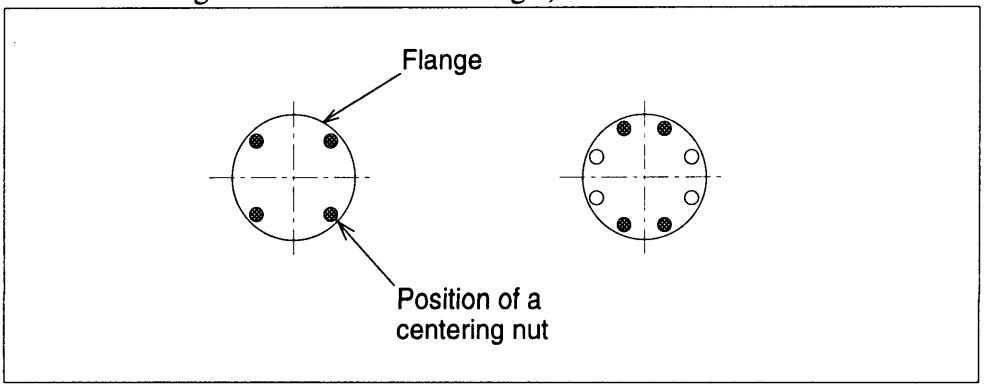


Figure 2-10 Vertical Centering of the Detector (Position the four centering nuts on the bottom flange.)



Parts Necessary for Installation

Gaskets

Gaskets are supplied with the grounding ring, except when it is made of SUS material. Secure gaskets when you use a grounding ring made of SUS material. We recommend gasket material such as joint sheet or PTFE. For the bore diameters of the gaskets, refer to Table 2-2. We do not recommend the use of rubber gaskets. Observe the precautions below.

⚠Caution

- Too small a gasket diameter may affect the flow velocity distribution resulting in inaccurate measurements.
- Too large a gasket diameter may cause leakage. Also, any solid substance in the fluid to be measured could accumulate between the gasket and the flange, resulting in inaccurate measurements.

Table 2-2 Recommended Inner Diameters of Gaskets

(Unit: mm)

Bore dia. / Dimensions	2.5A	5A	10A	15A	25A	40A	50A	65A	80A	100A	125A	150A	200A
Inner diameter	6 ±1	6 ±1	11 ±1	16 ±1	25 ±1	40 ±1	51 ±1	64 ±1	76 ±1	101 ±1	124 ±1	148 ±1	196 ±1

If you install the detector at a lower torque level using rubber gaskets, you must use gaskets with the bore and outside diameters shown in Table 2-5 for the respective pipe bore. Depending on the grounding ring material, two gaskets of different thicknesses may be required. (See Figure 2-16 on page 2-23 and Figure 2-19 on page 2-25.)

Table 2-3 Inner and Outside Diameters of Rubber Gaskets (0.5 to 1 mm thick)

(Unit: mm)

Bore dia. / Dimensions	2.5A	5A	10A	15A	25A	40A	50A	65A	80A	100A	125A	150A	200A
Inner diameter	6 ±1	6 ±1	11 ±1	16 ±1	25 ±1	40 ±1	51 ±1	64 ±1	76 ±1	101 ±1	124 ±1	148 ±1	196 ±1
Outside diameter	34 ±1	34 ±1	34 ±1	34 ±1	50 ±1	75 ±1	91 ±1	111 ±1	121 ±1	146 ±1	177 ±1	207 ±1	257 ±1

Table 2-4 Inner and Outside Diameters of Rubber Gaskets (3 to 4 mm thick)

(Unit: mm)

Bore dia. / Dimensions	2.5A	5A	10A	15A	25A	40A	50A	65A	80A	100A	125A	150A	200A
Inner diameter	6 ±1	6 ±1	11 ±1	16 ±1	25 ±1	39 ±1	51 ±1	64 ±1	76 ±1	101 ±1	124 ±1	148 ±1	196 ±1
Outside diameter	34	34	34	34	50	68	84	104	114	139	166	190	240

Selecting an Installation Method

⚠ Caution

- The necessary materials and the installation method vary according to the material of the ring and that of the pipe on which the detector is to be installed. Select the appropriate method of installation after confirming the specifications of the detector to be installed and the conditions of installation. Improper installation may result in leakage or damage to the pipe flanges.

Installation method according to materials

Select the appropriate installation method from the table below.

Pipe material	Grounding Ring Material	See Page
Metal	SUS material	2-18
	Non-SUS material	2-19
PVC	SUS material	2-21
	Non-SUS material	2-24

Installation on Horizontal Pipe

> **⚠ Caution**
>
> • Improper installation may result in leakage or damage to the pipe flanges.

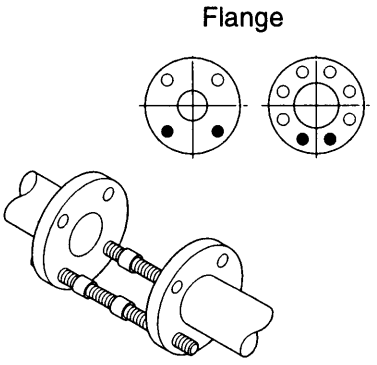
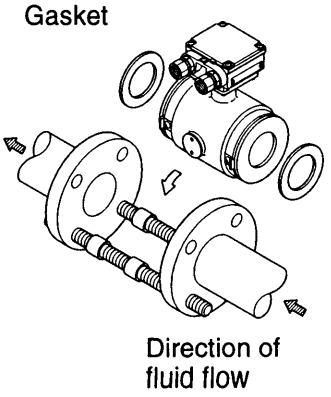
Parts required

The following parts are required:

- Through-bolts and nuts
- Centering nuts
- Gaskets: The required gasket material will vary according to the material of the pipe on which the detector is to be installed. See the installation procedures for different pipe materials described on pages 2-18 to 2-25.

Procedure

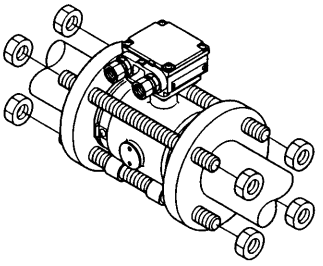
Follow this procedure to install the detector on a horizontal pipe.

Step	Action	Drawing
1	Insert through-bolts in the flange holes shown by black dots in the drawing. Slip two centering nuts onto each through-bolt before inserting the bolts.	
2	• Turn the detector so that the direction mark on the detector matches the direction of fluid flow. • Insert the detector and gaskets between the pipe flanges. • Position the detector so that it sits on top of the centering.	

Continued on next page

Installation on Horizontal Pipe

Procedure
(continued)

Step	Action	Drawing
3	• Make sure that the detector remains properly centered. • Make sure that the gaskets do not protrude beyond the edges of the pipe flanges. • When you have checked these items, insert the remaining through-bolts into the flange holes and tighten the bolts evenly using the appropriate fastening torque given on page 2-8.	

Installation on Vertical Pipe

> **⚠ Caution**
>
> - Improper installation may result in leakage or damage to the pipe flanges.

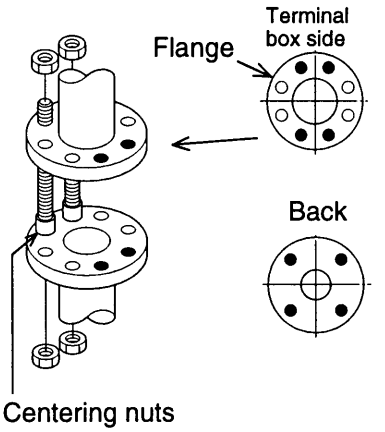
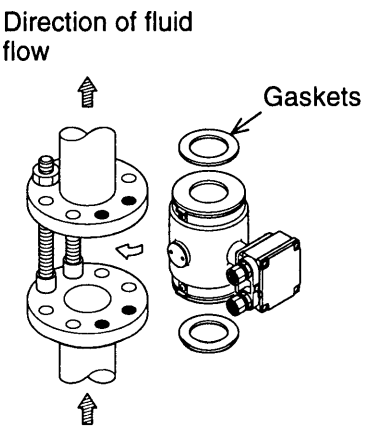
Parts required

The following parts are required:

- Through-bolts and nuts
- Centering nuts
- Gaskets: The required gasket material will vary according to the material of the pipe on which the detector is to be installed. See the installation procedures for different pipe materials described on pages 2-18 to 2-25.

Procedure

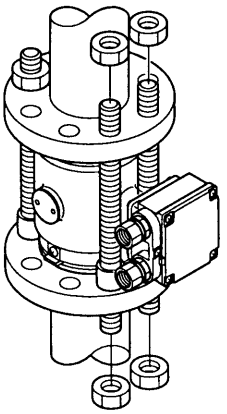
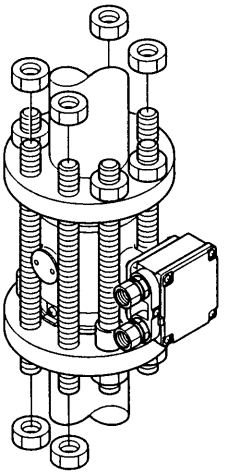
Follow this procedure to install the detector on a horizontal pipe.

Step	Action	Drawing
1	Of the flange holes shown by black dots in the drawing, insert through-bolts into the two holes at the back and fasten them lightly with nuts. Slip one centering nut onto each through bolt before inserting the bolts.	
2	• Turn the detector so that the direction mark on the detector matches the direction of fluid flow. • Insert the detector and gaskets between the pipe flanges.	

Continued on next page

Installation on Vertical Pipe

Procedure
(continued)

Step	Action	Drawing
3	Insert through-bolts fitted with one centering nut each into the remaining two flange holes shown by black dots in Steps 1 and 2.	
4	• Make sure that the detector remains properly centered. • Make sure that the gaskets do not protrude beyond the edges of the pipe flanges. • When you have checked these items, insert the remaining through-bolts into the flange holes and tighten the bolts evenly using the appropriate fastening torque given on page 2-9.	

Installation on Metal Pipe (1)

Introduction

The installation method described in this section corresponds to the following combination of pipe and grounding ring materials. For the installation method corresponding to any other combination, refer to the table on page 2-13.

Pipe material: Metal
Grounding ring material: SUS material

Required parts

The following parts are required:

- Through-bolts and nuts
- Centering nuts
- Gaskets: We recommend non-rubber gaskets such as those made of joint sheet or PTFE.
  For recommended bore diameters, refer to Table 2-2 on page 2-12. Although rubber gaskets may be used, it is not possible to reduce the fastening torque.

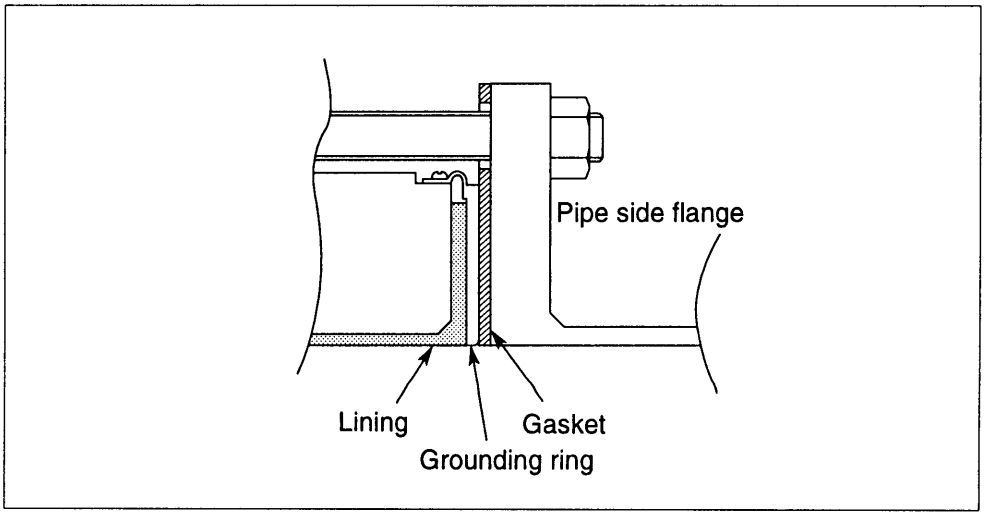
Installation procedure

- Install the detector as shown in Figure 2-11. The torque level for tightening the bolts is not related to the gasket material. See Table 2-1 on page 2-9 for the appropriate torque. For the inner diameter of the gaskets, see Table 2-2 on page 2-12.
- To use rubber gaskets for a low fastening torque, refer to page 2-23.

⚠ Caution

- Please note that the use of rubber gaskets and a lower fastening torque may result in insufficient surface pressure between the lining and the grounding ring, resulting in leakage.

Figure 2-11 Installation Using SUS Material Grounding Ring and Metal Pipe



Installation on Metal Pipe (2)

Introduction

The installation method described in this section corresponds to the following combination of pipe and grounding ring materials. For the installation method corresponding to any other combination, refer to the table on page 2-13.

Pipe material: metal
Grounding ring material: other than SUS material

Required parts

The following parts are required. No gaskets are necessary since PTFE gaskets are provided.

- Through-bolts and nuts
- Centering nuts

Installation on Metal Pipe (2)

Installation procedure

- Install the detector as shown in Figure 2-12. See Table 2-1 on page 2-9 for the appropriate fastening torque.
- To use rubber gaskets for a low fastening torque, refer to page 2-25.

⚠ Caution

- Please note that the use of an additional gasket besides the existing PTFE gasket may result in leakage (see Figure 2-13).

Figure 2-12 Installation Using Non-SUS Material Grounding Ring and Metal Pipe

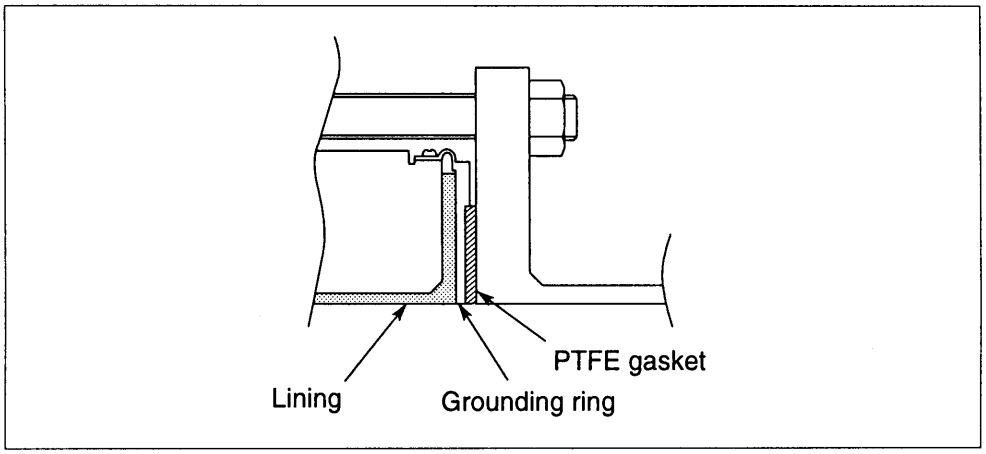
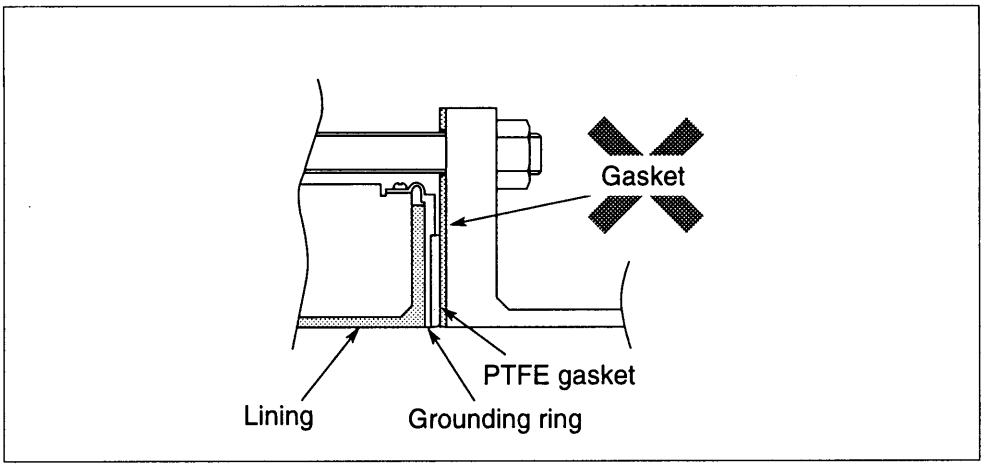


Figure 2-13 Example of Incorrect Installation



Installation on PVC Pipe (1)

Introduction

The installation method described in this section corresponds to the following combination of pipe and grounding ring materials. For the installation method corresponding to any other combination, refer to the table on page 2-13.

Pipe material: PVC
Grounding ring material: SUS material

Required parts

The following parts are required:

- Through-bolts and nuts
- Centering nuts
- Gaskets: Non-rubber gaskets are recommended (i.e. joint sheet or PTFE). See Table 2-2 on page 2-12 for the recommended bore diameters. When using rubber gaskets, another gasket of the same material and with a thickness of 0.5 to 1.0 mm is required. See Table 2-3 on page 2-12 for the appropriated dimensions.
- Protective plate: Use the protective plate if bolt tightening at the specified torque threatens to warp or damage the PVC pipe. See Figure 2-15 for an illustration of the protective plate.

Installation on PVC Pipe (1)

Installation procedure

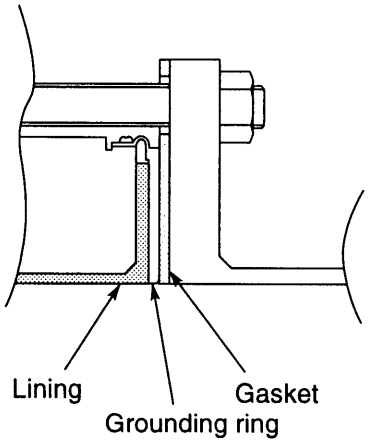
The installation procedure varies with such conditions as the fastening torque and the need for a protective plate. Choose one of the following three methods as applicable.

1. Use this method to install the detector with a specified fastening torque. Install the detector as shown in Figure 2-14. The torque level for tightening the bolts is not related to the gasket material. See Table 2-1 on page 2-9 for the appropriate torque. For the inner diameter of the gaskets, see Table 2-2 on page 2-12.

⚠ Caution

- Please note that the use of rubber gaskets and a lower fastening torque may result in insufficient surface pressure between the lining and the grounding ring, resulting in leakage.

Figure 2-14 Installation Using SUS Material Grounding Ring



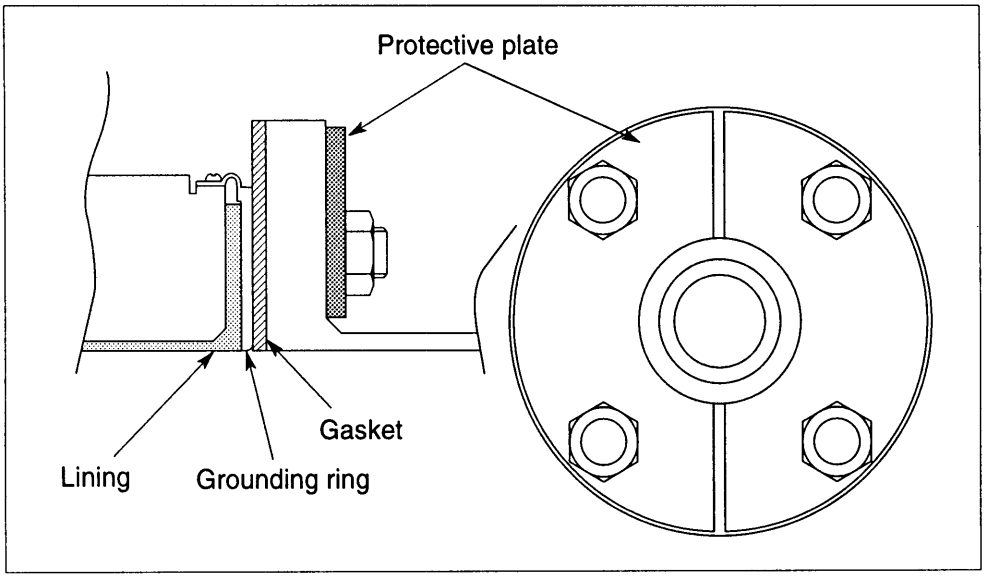
Continued on next page

Installation on PVC Pipe (1)

Installation procedure *(continued)*

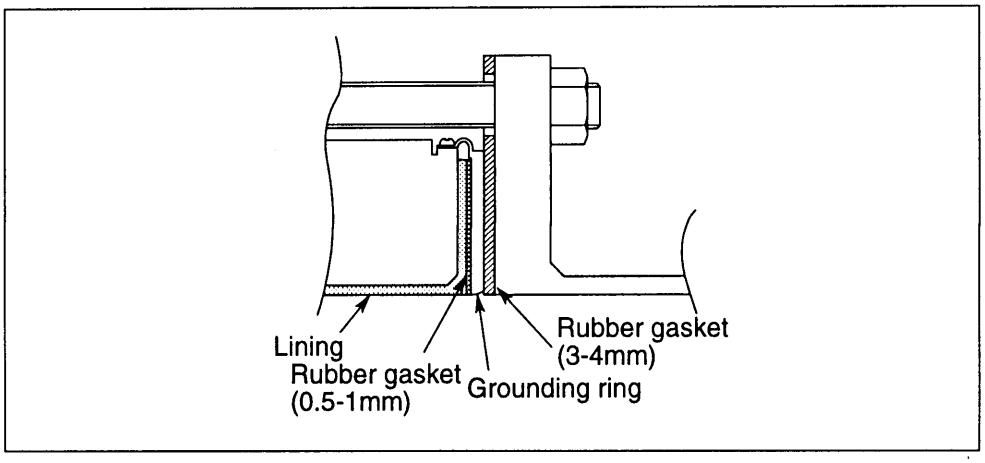
2. Use this method to install the detector using a protective plate to prevent the PVC pipe from being deformed or damaged when the bolts are tightened with the specified torque.
   Install the protective plate between the outer side of the PVC flange and the detector, as shown in Figure 2-15. The protective plate protects the PVC pipe from deformation or damage when secured at the specified torque. The torque level is unrelated to the pipe or grounding ring material. See Table 2-1 on page 2-9 for the appropriate torque.

Figure 2-15 Installation Using SUS Material Grounding Ring (with protective plate)



3. Use this method to install the detector using a low fastening torque and rubber gaskets.
   Remove the grounding ring from the detector, insert a rubber gasket 0.5 to 1.0 mm thick, then reinsert the grounding ring on top of the rubber gasket. With the rubber gasket in the position shown in Figure 2-16, attach the detector to the pipe. Fasten the bolts with a torque that provides a leakproof joint. In this case, use the two kinds of rubber gaskets made of the same material.

Figure 2-16 Installation Using SUS Material Grounding Ring (with rubber gasket)



Installation on PVC Pipe (2)

Introduction

The installation method described in this section corresponds to the following combination of pipe and grounding ring materials. For the installation method corresponding to any other combination, refer to the table on page 2-13.

Pipe material: PVC
Grounding ring material: Other than SUS material

Required parts

The following parts are required:

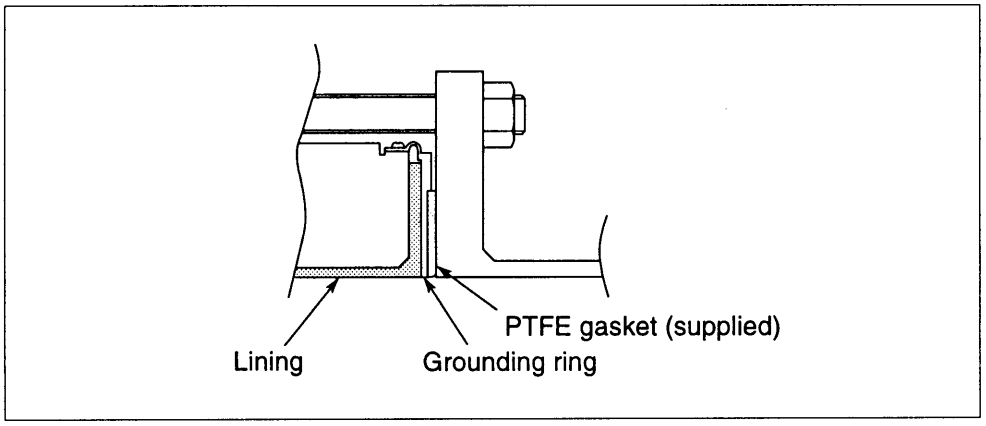
- Through-bolts and nuts
- Centering nuts
- Gaskets: No gaskets are necessary due to the provision of a PTFE gasket. When using a rubber gasket, gaskets of the same material and of two thicknesses, 0.5 to 1.0 mm and 3.0 to 4.0 mm, are required. See Table 2-3 and 2-4 on pages 2-12 for the appropriate dimensions.
- Protective plate: A protective plate is required if tightening the bolts to the specified torque may deform or damage the PVC pipe. Use stainless steel or similar hard metal 1 mm thick or over. For the shape, see Figure 2-18.

Installation procedure

The installation procedure varies with such conditions as the fastening torque and the need for a protective plate. Choose one of the following three methods as applicable.

1. Use this method to install the detector with the specified fastening torque. Install the detector as shown in Figure 2-17. See Table 2-1 on page 2-9 for the appropriate fastening torque.

Figure 2-17 Installation Using the Grounding Ring of Non-SUS Material



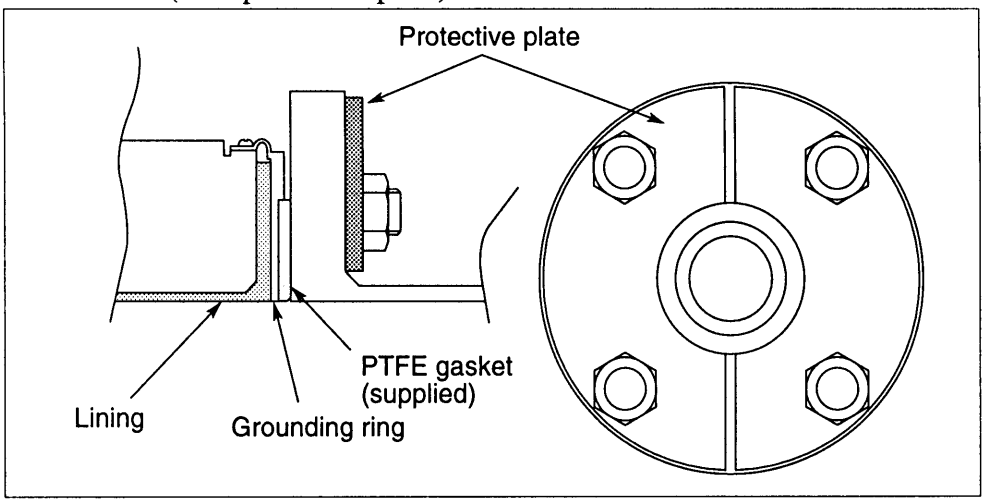
Continued on next page

Installation on PVC Pipe (2)

Installation procedure *(continued)*

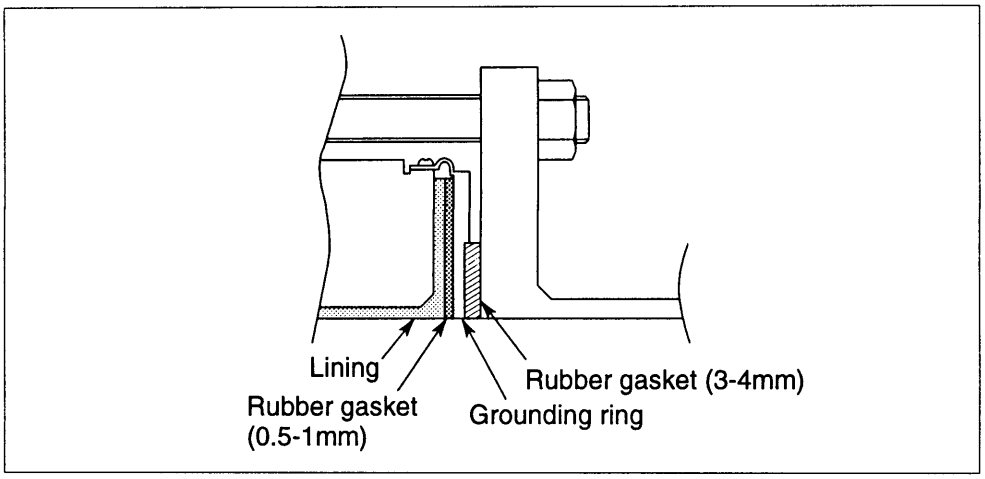
2. Use this method to install the detector along with a protective plate to prevent PVC pipe from being deformed or damaged when the bolts are tightened to the specified torque.
   Insert a protective plate between the outer side of the PVC flange and the detector as shown in Figure 2-18. The protective plate protects the PVC pipe from deformation or damage when it is secured to the specified torque. For the appropriate torque, see Table 2-1 on page 2-9.

Figure 2-18 Installation Using the Grounding Ring of Non-SUS Material (with protective plate)



3. Use this method to install the detector using a low fastening torque and rubber gaskets
   First, remove the grounding ring from the detector, then insert a rubber gasket with a thickness of 0.5 to 1.0 mm. Then reinsert the grounding ring on top of the rubber gasket.
   Next, remove the PTFE gasket and insert a rubber gasket 3.0 to 4.0 mm thick to replace it. Under these conditions, install the detector on the pipe as shown in Figure 2-19. Tighten the bolts to the torque required to achieve a fluid seal for the rubber gasket. In this case, the two kinds of rubber gaskets that are used should be made of the same material. For the dimensions of the rubber gaskets, refer to Table 2-3 and Table 2-4 on page 2-12.

Figure 2-19 Installation Using the Grounding Ring of Non-SUS Material (with rubber gasket)



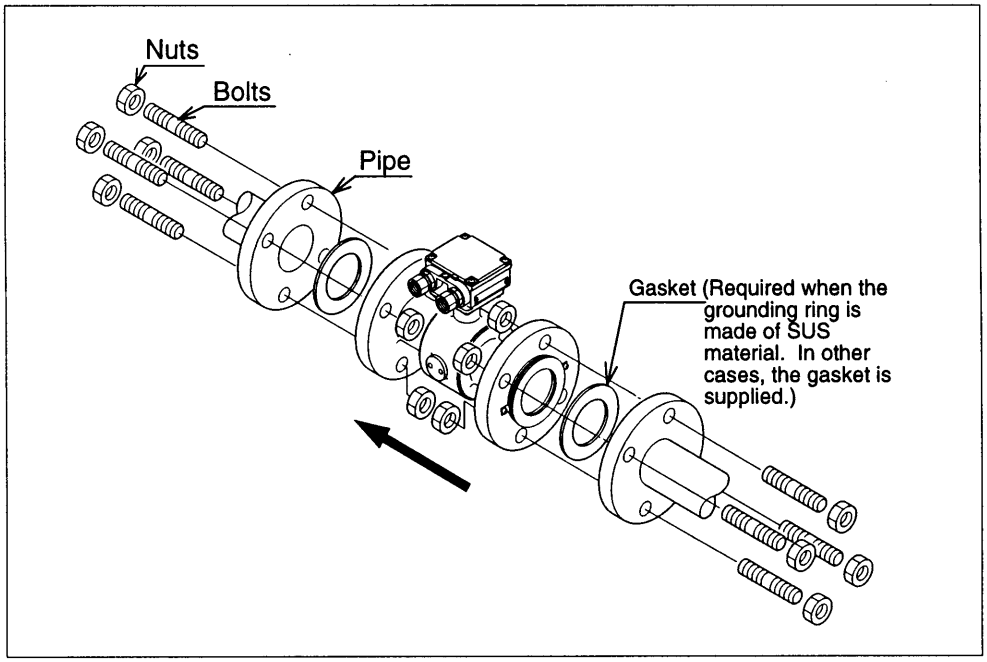
2-2-2 Installing a Flanged Detector

Basic Installation Method

Installation example

Figure 2-20 shows the basic method for installing the device.

Figure 2-20 Installation Example



Fastening torque

⚠ Caution

- Be careful in handling flanged detectors. Dropping it could cause injury.

⚠ Warning

- Table 2-5 shows the fastening torque for each pipe bore. Apply the prescribed fastening torque to prevent leakage.

Continued on next page

Fastening torque
(continued)

Table 2-5 Fastening Torque (1)

Bore and Flange Ratings		Fastening Torque N•m (kgf•cm)	
2.5-15mm	JIS10K	6-9	(82-132)
	JIS20K	6-9	(82-132)
	JIS30K	18-31	(184-316)
	ANSI150	6-9	(82-132)
	ANSI300	6-9	(82-132)
	DIN10/16	6-9	(82-132)
	DIN25/40	9-14	(92-143)
25mm	JIS10K	21-31	(214-316)
	JIS20K	21-32	(214-326)
	JIS30K	23-36	(234-367)
	ANSI150	11-17	(112-173)
	ANSI300	22-34	(224-347)
	DIN10/16	10-14	(102-143)
	DIN25/40	12-18	(122-184)
40mm	JIS10K	22-32	(224-326)
	JIS20K	22-34	(224-347)
	JIS30K	41-65	(418-663)
	ANSI150	13-18	(132-184)
	ANSI300	36-57	(367-581)
	DIN10/16	22-32	(224-326)
	DIN25/40	25-38	(255-388)
50/65mm	JIS10K	24-34	(245-347)
	JIS20K	19-31	(194-316)
	JIS30K	22-34	(224-347)
	ANSI150	23-32	(235-326)
	ANSI300	20-32	(204-326)
	DIN10/16	24-34	(245-347)
	DIN25/40	28-42	(286-428)
80mm	JIS10K	20-31	(204-316)
	JIS20K	37-61	(377-622)
	JIS30K	42-66	(428-673)
	JIS G3451 F12	18-37	(184-377)
	ANSI150	26-35	(265-357)
	ANSI300	37-57	(377-581)
	DIN10/16	20-31	(204-316)
	DIN25/40	25-39	(255-398)

Continued on next page

Fastening torque
(continued)

Table 2-5 Fastening Torque (2)

Bore and Flange Ratings		Fastening Torque N•m (kgf•cm)	
100mm	JIS10K	22-33	(224-337)
	JIS20K	41-66	(418-673)
	JIS30K	61-95	(622-969)
	JIS G3451 F12	21-41	(214-418)
	ANSI150	21-31	(214-316)
	ANSI300	43-66	(439-673)
	DIN10/16	22-33	(224-337)
	DIN25/40	48-74	(490-755)
125mm /150mm	JIS10K	47-67	(479-683)
	JIS20K	58-91	(592-928)
	JIS30K	80-123	(816-1254)
	JIS G3451 F12	23-45	(235-459)
	ANSI150	42-60	(428-612)
	ANSI300	50-74	(510-755)
	DIN10/16	47-67	(479-683)
	DIN25/40	97-145	(989-1479)
200mm	JIS10K	44-65	(449-663)
	JIS20K	66-102	(673-1040)
	JIS30K	94-142	(959-1448)
	JIS G3451 F12	24-44	(245-449)
	ANSI150	42-59	(428-602)
	ANSI300	81-120	(826-1224)
	DIN10/16	47-68	(479-694)
	DIN25/40	123-189	(1255-1928)
250mm	JIS10K	51-63	(520-643)
	JIS20K	81-99	(826-1010)
	JIS G3451 F12	73-89	(745-908)
	ANSI150	69-85	(704-867)
	ANSI300	82-97	(840-990)
	DIN10/16	57-69	(581-704)
	DIN25	108-127	(1100-1300)

Continued on next page

Fastening torque
(continued)

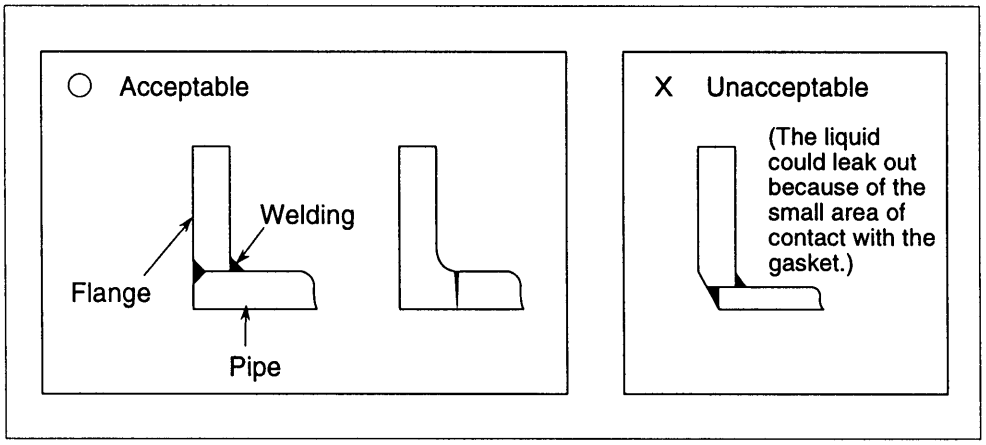
Table 2-5 Fastening Torque (3)

Bore and Flange Ratings		Fastening Torque N•m (kgf•cm)	
300mm	JIS10K	50-62	(510-632)
	JIS20K	79-97	(806-989)
	JIS G3451 F12	49-59	(500-602)
	ANSI150	56-68	(592-694)
	ANSI300	116-136	(1180-1390)
	DIN10/16	45-55	(459-561)
	DIN25	105-122	(1070-1250)
350mm	JIS10K	54-66	(551-673)
	JIS20K	143-167	(1460-1710)
	JIS G3451 F12	66-80	(673-816)
	ANSI150	80-98	(816-1000)
	ANSI300	116-136	(1180-1390)
	DIN10/16	42-52	(428-530)
	DIN25	160-189	(1640-1930)
400mm	JIS10K	72-88	(734-898)
	JIS20K	160-189	(1640-1930)
	JIS G3451 F12	69-85	(704-867)
	ANSI150	80-98	(816-1000)
	ANSI300	166-195	(1690-1990)
	DIN10/16	72-88	(734-898)
	DIN25	199-234	(2030-2390)
450mm	JIS10K	93-110	(948-1122)
	JIS20K	166-196	(1693-1999)
	JIS G3451 F12	101-123	(1030-1254)
	ANSI150	117-143	(1193-1459)
	DIN10/16	89-108	(907-1101)
	DIN25	206-242	(2101-2468)
500mm	JIS10K	114-133	(1160-1360)
	JIS20K	173-204	(1770-2080)
	JIS G3451 F12	133-161	(1350-1640)
	ANSI150	155-189	(1580-1930)
	DIN10/16	106-129	(1080-1320)
	DIN25	214-251	(2180-2560)
600mm	JIS10K	184-216	(1880-2210)
	JIS20K	267-315	(2730-3220)
	JIS G3451 F12	127-154	(1300-1570)
	ANSI150	214-262	(2180-2670)
	DIN10/16	153-185	(1560-1890)
	DIN25	292-343	(2980-3500)

Flange shape

Use flanges that will maximize the area of contact with the gasket, as shown in Figure 2-21.

Figure 2-21 Flange Shape



⚠Caution

- Before installing the detector, make sure any foreign matter is flushed from the interior passage of the detector. Residual foreign matter could cause output fluctuations.
- Do not touch the electrodes or allow oil or fat to come into contact with them. This could cause output fluctuations.
- Align the flow direction mark on the detector in the direction of the liquid flow. Misalignment could result in a negative output.

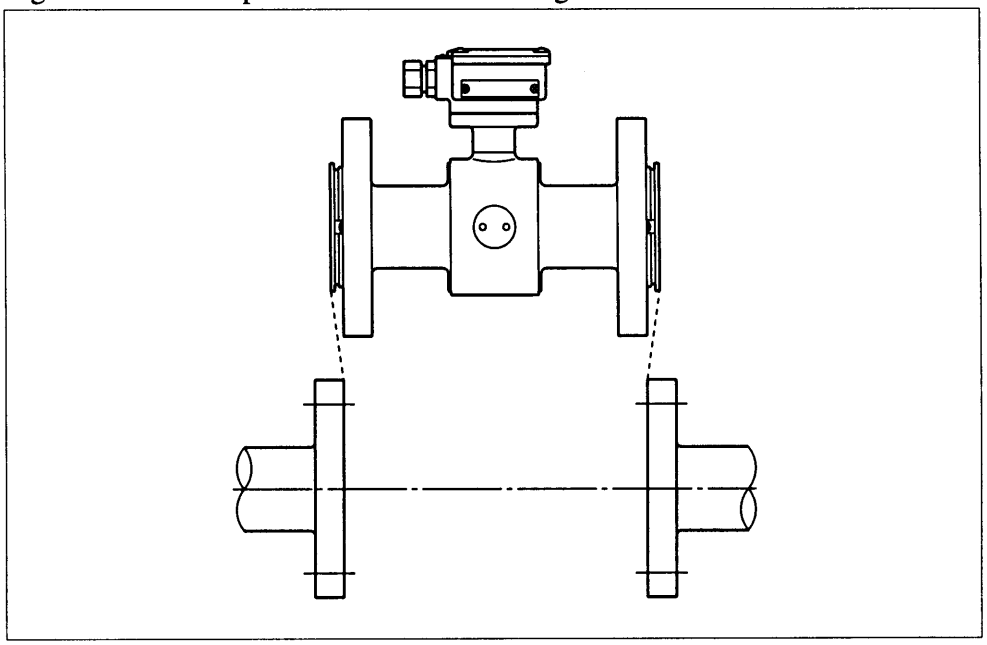
Continued on next page

Flange shape
(continued)

⚠Caution

- Never force the device between two flanges when the space is too narrow.

Figure 2-22 Example of Incorrect Mounting



⚠Warning

- After ensuring that the bore diameter of the pipe and that of the detector are the exactly the same, install the detector so that the gasket does not protrude into the inner bore of the pipe. Failing to do so could result in leakage or other hazards.

⚠Caution

- Tighten each bolt a little at a time, apply uniform pressure to all the bolts while fastening them. If leakage does not stop on completion of fastening, make sure that the pipe is not off center, then tighten the bolts little by little. Install the detector carefully so that the fastening torque does not exceed the prescribed limit. Otherwise, the unit could be damaged.

Parts Necessary for Installation

Introduction

The following Parts are necessary for the installation of the device:

- Gaskets: Gaskets are required when using grounding rings made of SUS material. Gaskets are supplied when using grounding rings made of other material.

Gaskets

Gaskets are supplied with the grounding ring, except when it is made of SUS material. Supply the gaskets when you use a grounding ring made of SUS material. We recommend a non-rubber gasket material such as joint sheet or PTFE.

For the bore diameters of the gaskets, refer to Table 2-6.

⚠ Caution

- Too small a gasket diameter may affect the flow velocity distribution, resulting in inaccurate measurements.
- Too large a gasket diameter may cause leakage. Also, if there are any solids in the fluid to be measured, these may build up between the gasket and the flange, resulting in inaccurate measurements.

Table 2-6 Recommended Inner Diameters of Gaskets

Bore diameter (mm)	Inner diameter (mm)
2.5	11±1
5	11±1
10	11±1
15	16±1
25	25±1
40	40±1
50	51±1
65	64±1
80	76±1
100	101±1
125	124±1
150	148±1
200	196±1
250	246±1
300	296±1
350	346±1
400	396±1
450	446±1
500	496±1
600	596±1

Selecting an Installation Method

Caution

⚠ Caution

- The necessary materials and the method of installation vary depending on the material of the grounding ring and the material. Select the applicable method of installation after checking the specifications of the detector to be installed and the conditions of installation. Improper installation may result in leakage or damage to the pipe flanges.

Installation method according to material

Select the appropriate installation method from the table below.

Pipe material	Grounding Ring Material	See Page
Metal	SUS material	2-34
	Other than SUS material	2-35
PVC	SUS material	2-37
	Other than SUS material	2-38

Installation on Metal Pipe (1)

Introduction

The installation method described in this section is to be used with the following grounding ring material. For the installation method used for any other grounding ring material, refer to the table on page 2-35.

Pipe material: Metal
Ground ring material: SUS material

Required parts

The following parts are required:

- Nuts and bolts
- Gaskets: We recommend non-rubber gaskets such as those made of joint sheet or PTFE. For the recommended bore diameters, refer to Table 2-6 on page 2-6.
  For the recommended inner diameters of the gaskets, see Table 2-2 on page 2-32.

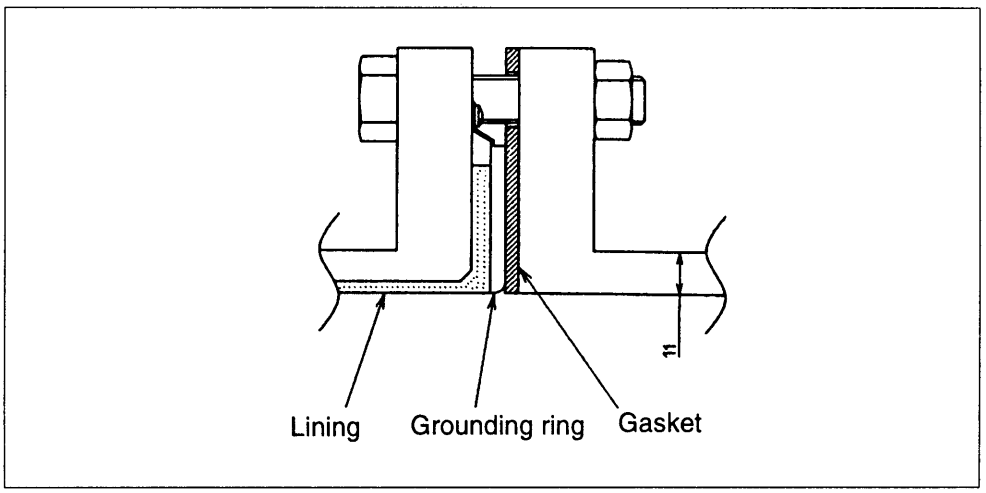
Installation procedure

Install the detector as shown in Figure 2-23. The torque level for tightening the bolts is not related to the gasket material. See Table 2-5 on pages 2-27 to 2-29 for the appropriate torque. For the inner diameter of the gaskets, see Table 2-2 on page 2-12.

⚠ Caution

- A lower fastening torque may result in insufficient surface pressure between the lining and the grounding ring, resulting in leakage.

Figure 2-23 Installation Using Grounding Rings of SUS Material



Installation on Metal Pipe (2)

Introduction

The installation method described in this section is to used with the following grounding ring materials. For the installation method used with grounding rings of SUS material, refer to the table on page 2-33.

Pipe material: Metal
Grounding ring material: other than SUS material

Required parts

The following parts are required. No gaskets are necessary since PTFE gaskets are provided.

- Bolts and nuts

Installation on Metal Pipe (2)

Installation procedure

Install the device as shown in Figure 2-24. See Table 2-5 on pages 2-27 to 2-29 for the appropriate fastening torque.

⚠ Warning

- Please note that the use of an additional gasket besides the existing PTFE gasket may result in leakage (see Figure 2-25).

Figure 2-24 Installation Using Grounding Ring Made of Non-SUS Material

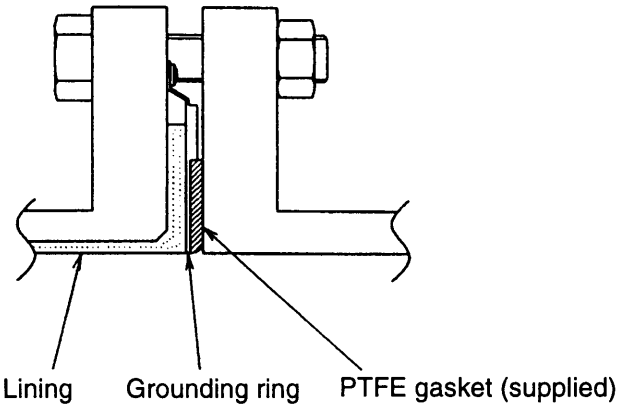
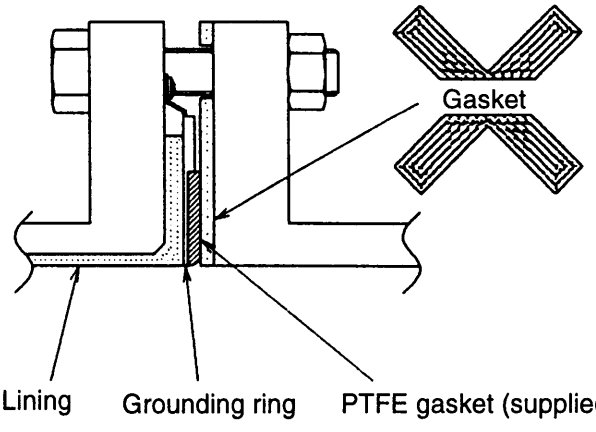


Figure 2-25 Example of Incorrect Installation



Installation on PVC Pipe (1)

Introduction

The installation method described in this section is used for the following combination of pipe and grounding ring materials. For the installation method used for any other combination, refer to the table on page 2-33.

Pipe material: PVC
Grounding ring material: SUS material

Required parts

The following parts are required:

- Through-bolt and nuts
- Centering nuts
- Gaskets: Non-rubber gaskets are recommended (i.e. joint sheet or PTFE). See Table 2-6 on page 2-32 for the recommended bore diameters. When using rubber gaskets, another gasket of the same material and with a thickness of 0.5 to 1.0 mm is required. See Table 2-3 on page 2-12 for the appropriate dimensions.
- Protective plate: Use a protective plate if bolt tightening to the specified torque threatens to warp or damage the PVC pipe. The plate material must be metal (such as stainless steel at least 6 mm thick) that will not deform when the nuts are tightened. For the shape of the protective plate, see Figure 2-27.

Installation on PVC Pipe (1)

Installation procedure

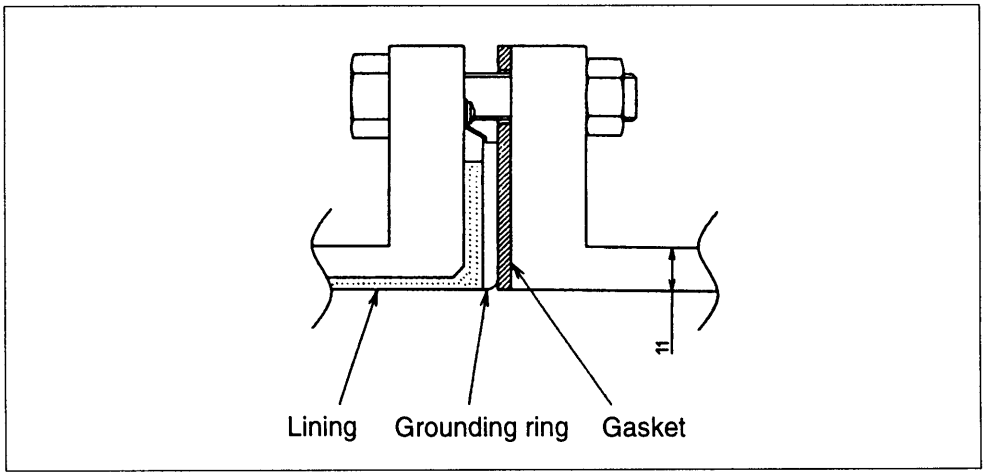
The installation procedure varies depending on conditions such as the fastening torque and the need for a protective plate. Choose one of the following three methods, as applicable.

1. Use this method to install the detector to the specified fastening torque. Install the detector as shown in Figure 2-26. The torque level for tightening the bolts is not related to the gasket material. See Table 2-5 on pages 2-27 to 2-29 for the appropriate torque. For the inner diameter of the gaskets, see Table 2-2 on page 2-12.

⚠Caution

- Please note that the use of rubber gaskets and a lower fastening torque may result in insufficient surface pressure between the lining and the grounding ring, resulting in leakage.

Figure 2-26 Installation Using SUS Material Grounding Ring



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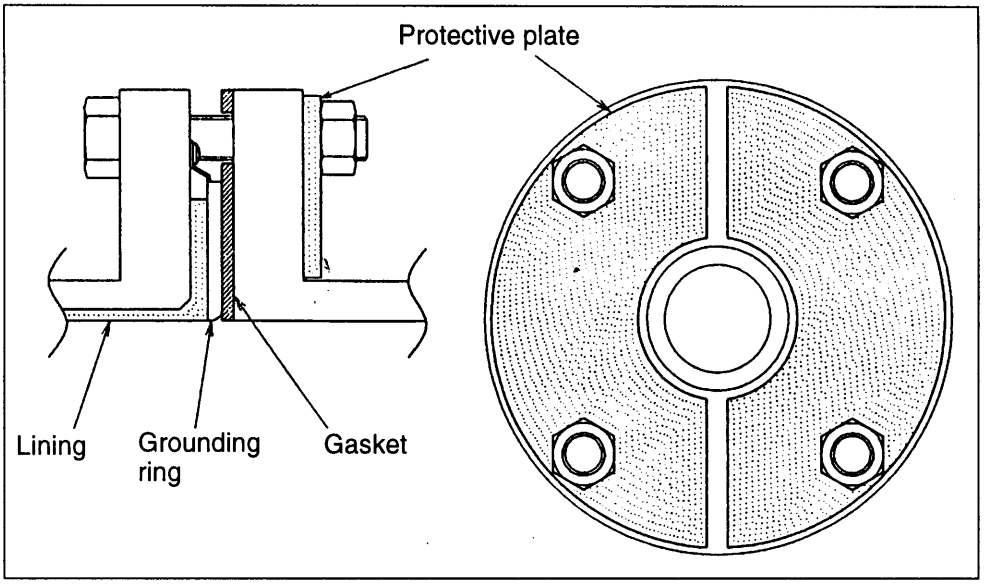
Installation on PVC Pipe (1)

Installation procedure
(continued)

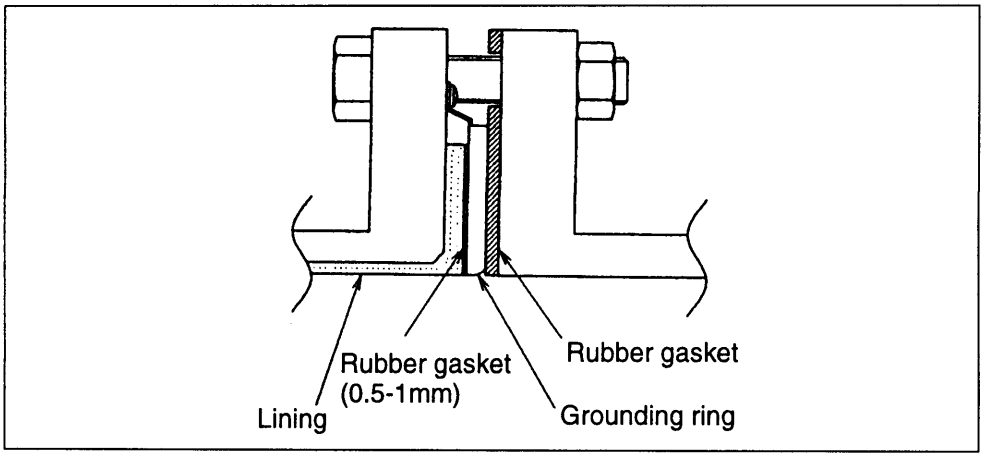
2. Use this method to install the detector using a protective plate to prevent PVC pipe from being deformed or damaged when the bolts are tightened to the specified torque.
   Install the protective plate between the outer side of the PVC flange and the detector, as shown in Figure 2-27. The protective plate protects the PVC pipe from deformation or damage when secured at the specified torque. The torque level is unrelated to the pipe or grounding ring material. See Table 2-5 on page 2-27 to 2-29 for the appropriate torque. For the inner diameters of the gaskets, see Table 2-6 on page 2-32.

Figure 2-27 Detector Installation Using SUS Material Grounding Ring (with protective plate)



3. Use this method to install the detector using a low-fastening torque and rubber gaskets.
   Remove the grounding ring from the detector, insert a rubber gasket 0.5 to 1.0 mm thick between the lining and the grounding ring, then reinsert the grounding ring.
   Then remove the PTFE gasket, and attach a gasket 3 to 4 mm thick instead. Under these conditions, attach the detector to the pipe as shown in Figure 2-28. Fasten the bolts to a torque that provides a leakproof joint.

Figure 2-28 Detector Installation Using SUS Material Grounding Ring (with rubber gasket)



Installation on PVC Pipe (2)

Introduction

The installation method described in this section is to be used for the following combination of pipe and grounding ring materials. For the installation method used for any other combination, refer to the table on page 2-33.

Pipe material: PVC
Grounding ring material: Other than SUS material

Required parts

The following parts are required.

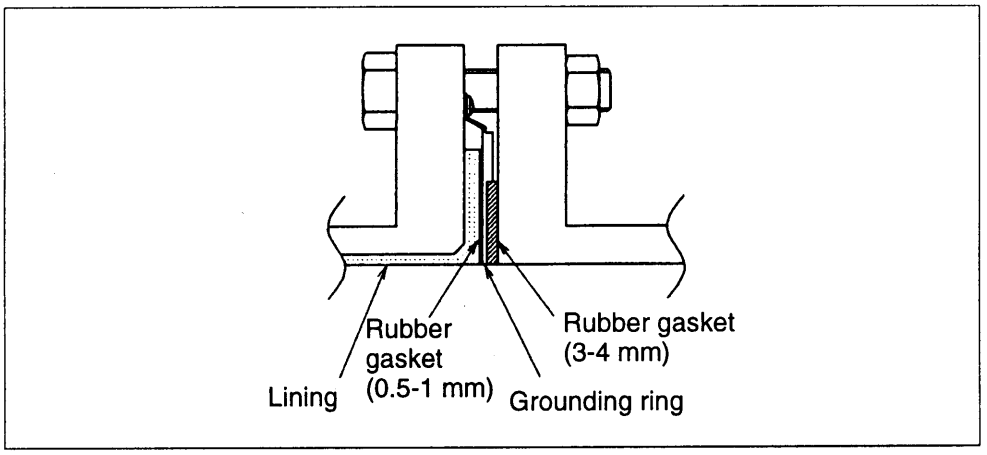
- Through-bolts and nuts
- Centering nuts
- Gaskets: No gaskets are necessary due to the provision of a PTFE gasket. When using a rubber gasket, gaskets of the same material and of two thicknesses, 0.5 to 1.0 mm and 3.0 to 4.0 mm, are required. See Table 2-3 and 2-4 on page 2-12 for the appropriate dimensions.
- Protective plate: A protective plate is required if tightening the bolts to the specified torque may deform or damage the PVC pipe. Use stainless or a hard metal material 1 mm thick or more. For the shape of the metal, see Figure 2-30.

Installation procedure

The installation procedure varies depending on conditions such as the fastening torque and the need for a protective plate. Choose one of the following three methods, as applicable.

1. Use this method to install the detector to the specified fastening torque. Install the detector as shown in Figure 2-29. See Table 2-5 on pages 2-27 to 2-29 for the appropriate fastening torque. For the dimensions of the rubber gaskets, see Table 2-3 and Table 2-4 on page 2-12.

Figure 2-29 Detector Installation Using Non-SUS Material Grounding Ring



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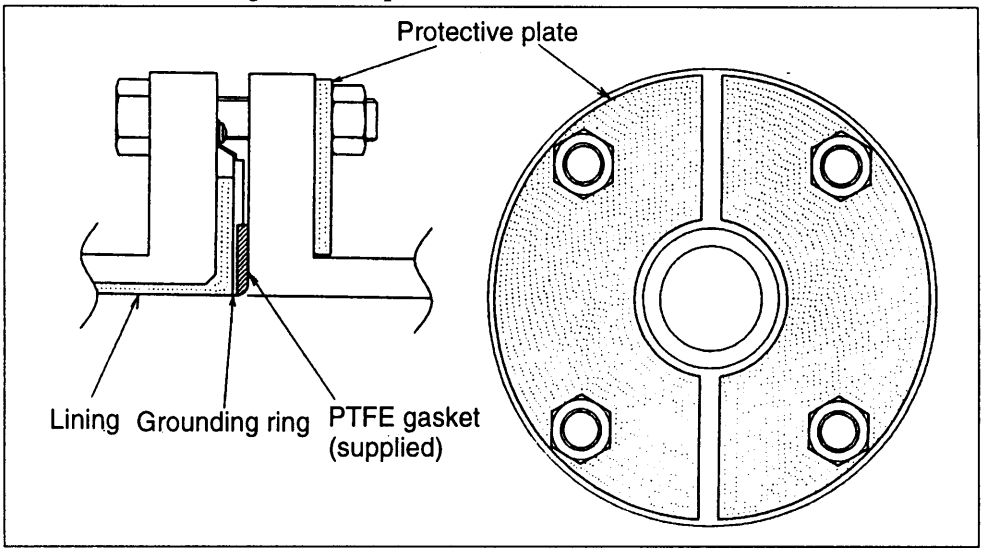
Installation on PVC Pipe (2)

Installation procedure *(continued)*

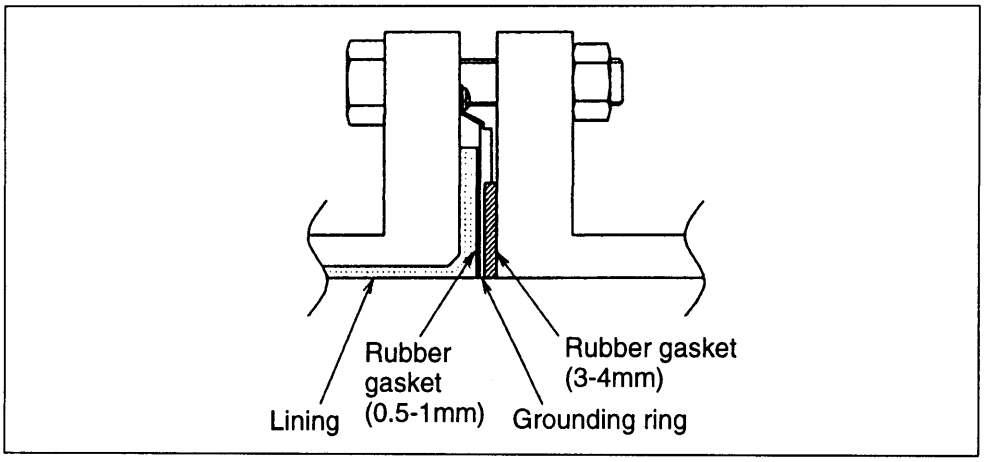
2. Use this method to install the detector along with a protective plate to prevent the PVC pipe from being deformed or damaged when the bolts are tightened to the specified torque.
   Insert a protective plate between the outer side of the PVC flange and the detector as shown in Figure 2-30. The protective plate protects the PVC pipe from deformation or damage when it is secured to the specified torque. For the appropriate torque, see Table 2-5 on pages 2-27 to 2-29.

Figure 2-30 Detector Installation Using Non-SUS Material Grounding Ring (with protective plate)



3. Use this method to install the detector using a low fastening torque and rubber gaskets
   First, remove the grounding ring from the detector, then insert a rubber gasket with 0.5 to 1.0 mm thick. Then reinsert the grounding ring on top of the rubber gasket.
   Next, remove the PTFE gasket and insert a rubber gasket 3.0 to 4.0 mm thick to replace it. Under these conditions, install the detector on the pipe as shown in Figure 2-31. Tighten the bolts to the torque required to achieve a fluid seal on the rubber gasket. In this case, the two kinds of rubber gaskets used should be made of the same material. For the dimensions of the rubber gaskets, refer to Table 2-3 and Table 2-4 on page 2-12.

Figure 2-31 Detector Installation Using Non-SUS Material Grounding Ring (with rubber gasket)

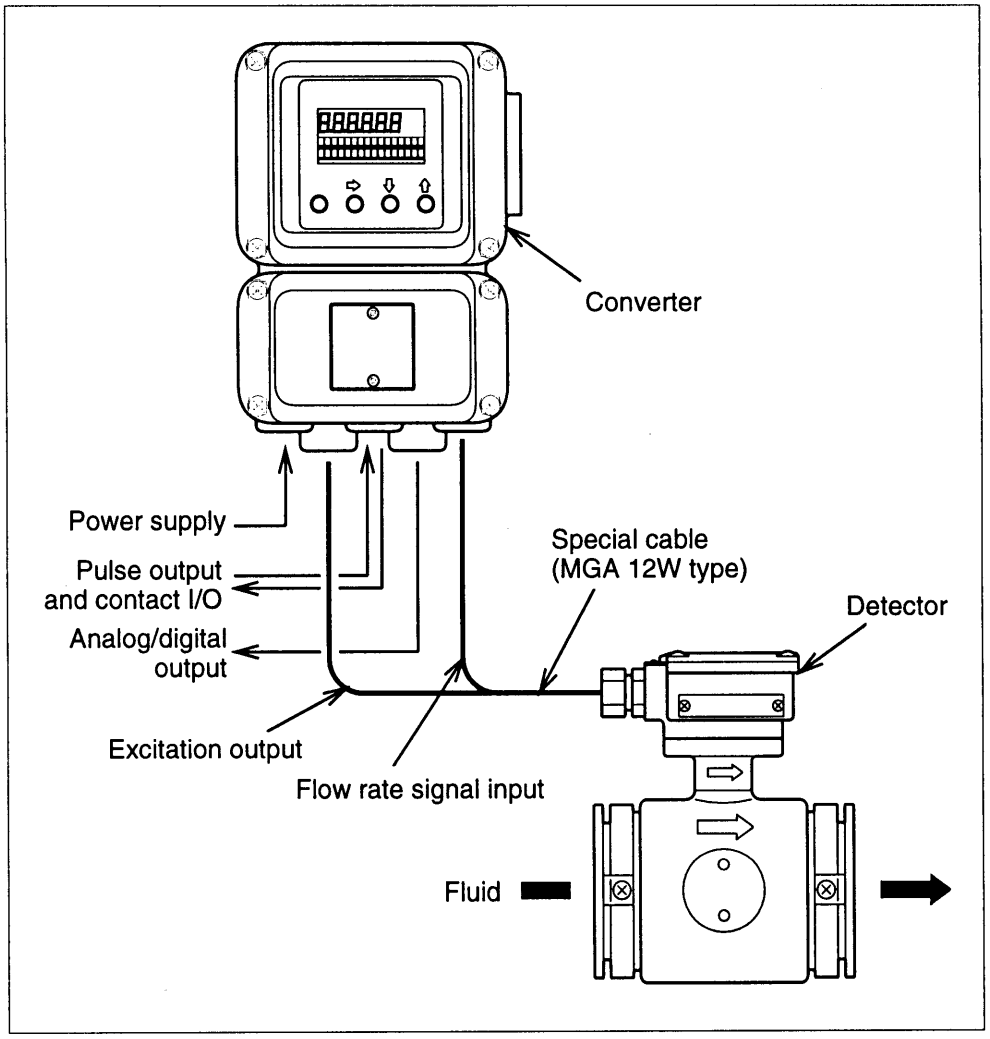


Electrical Wiring (1)

Connection of the detector and the converter (remote models)

The use of a special purpose cable (MGA 12W) is recommended for the connection of the detector and the converter. For the details of the electrical wiring (including the special purpose cable), see the Instruction Manual for the converter that is to be used in combination with the detector.

Figure 2-32 Connection Using a Special Cable



Note for the installation of the special cable

- Although the special purpose cable is shielded, install it away from any possible sources of noise, such as a large capacity transformer, motors, or motor power supplies.

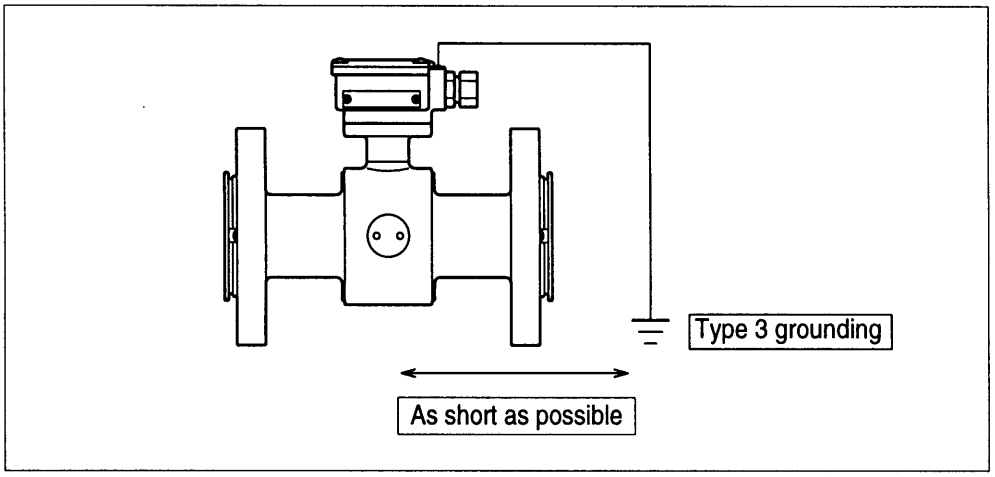
Electrical Wiring (2)

Grounding (remote models)

Attach a type 3 grounding (with a grounding resistance of 100Ω or less) to the ground terminal.

The grounding should be a single-point grounding at as short a distance as possible from the detector.

Figure 2-33 Grounding Via the External Grounding Terminal



⚠ Caution

- Insufficient grounding can cause output fluctuations, instability of the zero point, or output drift. Secure single-point type 3 grounding is recommended.
- Do not ground a welder to the detector. It can cause damage to the detector.

2-2-3 Installation of Union and Hose Assemblies

Basic Installation Method

Direction of installation

Match the flow direction of the fluid to be measured to that of the flow direction mark on the electromagnetic flowmeter. If they cannot be matched, the direction can be changed on the terminal box or the converter. Refer to the section "Direction of Terminal Box/Converter."

Position of the detector

Position the detector so that the center of the pipe aligns with that of the measuring pipe of the electromagnetic flowmeter. Be sure to fasten the electromagnetic flowmeter on a stand.

Pipe connection

For union assembly, mount the union joint nuts (supplied by the customer) on the process pipe. Connect the pipe by screwing it into the connection hole of the electromagnetic flowmeter using the union joint nuts. For hose assembly, screw in the hose, and fasten it with a fastening band, etc. (supplied by the customer).

Nut tightening (union assembly)

Use a torque wrench to tighten the union joint nuts. Do not tighten them fully to the specified fastening torque one at a time. Instead, tighten the upstream and downstream joint nuts alternately little by little over three or four turns. For the fastening torque, see Table 2-7.

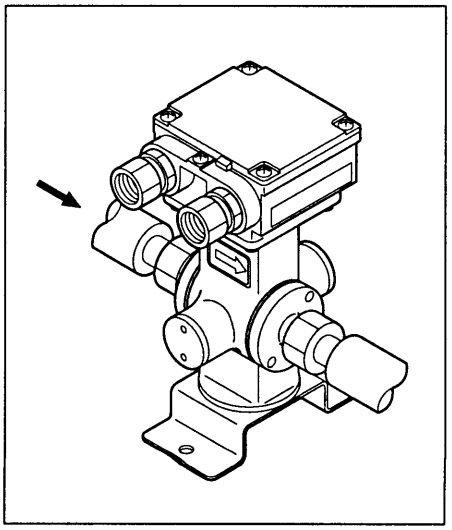
⚠Caution

- Fasten the detector using the specified fastening torque to prevent leakage.

Table 2-7 Fastening Torque

Size (mm)	Fastening Torque N·m {kgf·cm}
2.5	Max. 12{120}
5	Max. 12{120}
10	Max. 18{180}
15	Max. 18{180}

Figure 2-34 Example of Installation (union assembly)

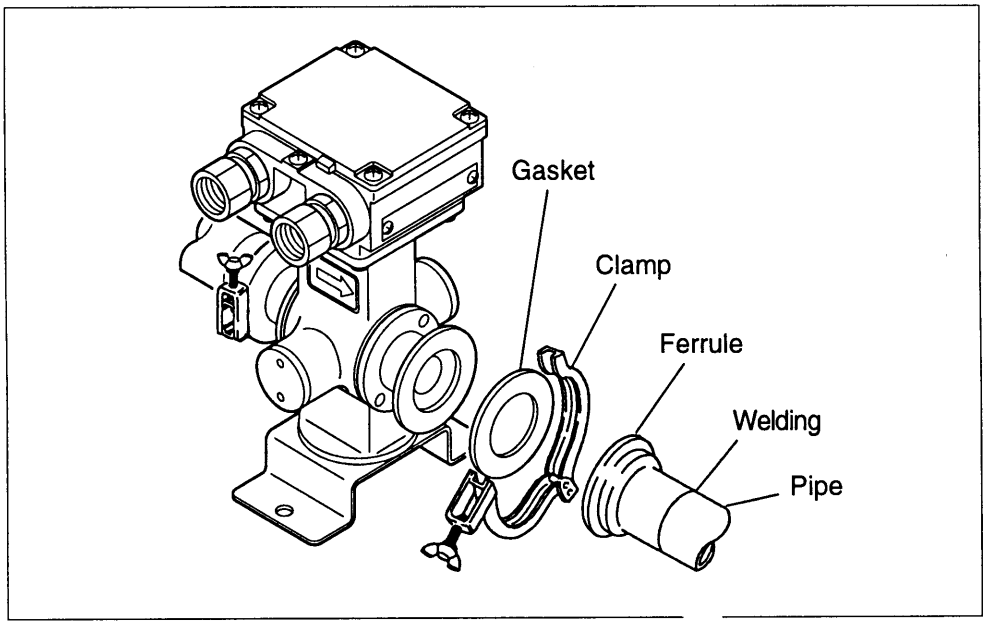


2-2-4 Installation of IDF-Clamp Assemblies

Basic Installation Method

Example of clamp assembly

Figure 2-35 Example of Installation



Welding a ferrule to the pipe

Weld the supplied ferrule onto the pipe. In the welding process, pay special attention to the taper processing, butting stages, welding current, etc. When welding ensure that there is no residual fluid in the meter and that the clamp section does not become distorted.

Mounting of the special gasket

Mount the supplied special clamp gasket so that it fits into the groove of the gasket.

⚠Warning

- Mount it carefully into the groove so that there is no misalignment of the gasket. Misalignment can cause leakage or other hazards. Gaskets and clamps are attached to Sanitary model KID80.

Direction of installation

Match the flow direction of the measured fluid to that of the flow direction mark of the detector, and insert the detector between the ferrules.

IDF-clamp/Tri-clamp tightening

Mount the clamp so that it will cover the detector and the tapered section of the ferrule, and screw it tightly.

2.2.5Installation of large-size detector, flange model Basic installation (700 - 1100 mm diameter)

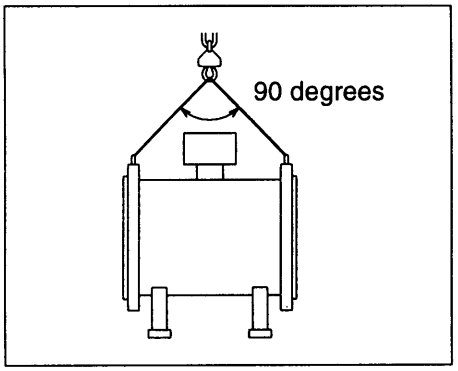
Installation instructions:

Make sure that the direction of flow to be measured matches the arrow on the detector body. It is easier to match flow direction before placing the detector in the pit, doing it afterwards may be awkward.

Transport:

When hoisting the detector, use eye bolts or shackles. To ensure safety, the suspension angle of the slings should be within 90 degrees.
(Refer to Fig. 2-36)
When placing the detector on a bracket, lower it slowly to prevent shocks. Abrupt lowering may damage the bracket.

Fig. 2-36 Angle of suspension



Detector Positioning

Place the detector on the bracket and adjust the height with a jack. Apply the jack claws close to the support. When the position is fixed, insert a liner made of net. Under no circumstance, should water be used. While the jack provides vertical height adjustment, it cannot adjust horizontally. Ensure horizontal positioning is done before bringing the detector in.

• Foundation dimensions for 700-1000 mm detector

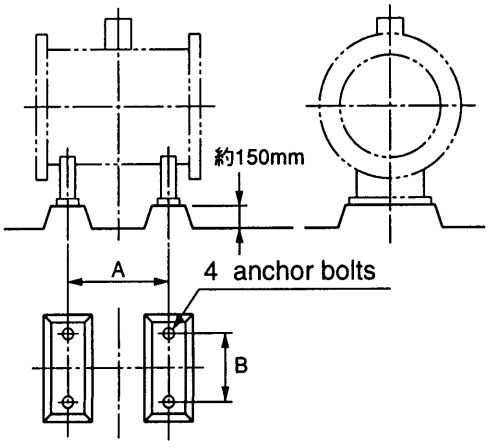


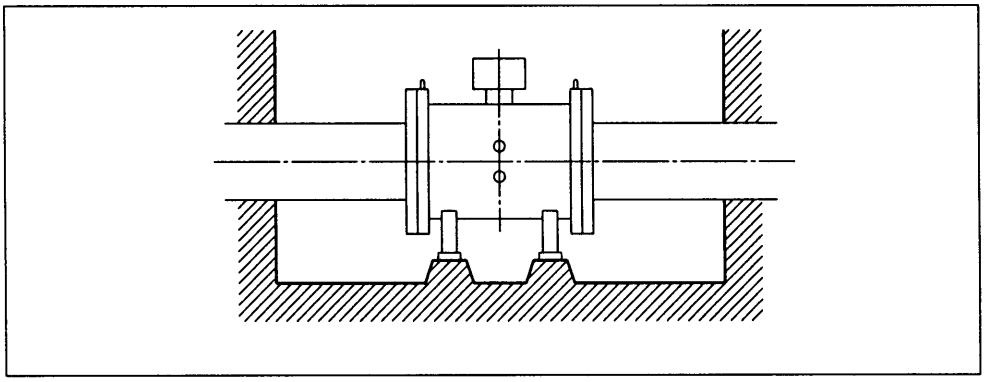
Table 2.8
Foundation dimensions (mm)

Location/ Size (mm)	A	B
700	700	500
800	800	550
900	850	650
1000	1000	700
1100	1050	800

Connecting and fixing the detector

When the position of the detector has been fixed, connect it to the pipe with bolts. Tighten the bolts evenly, along diagonals. The bracket should have a mortar finish applied. If the detector liner protrudes, it may cause rusting and malfunctioning. Ensure the lining is sealed by mortar.

Fig. 2-37 Detector installed on a pipe



2.2.6 Cutting the End of the Special-purpose Cable

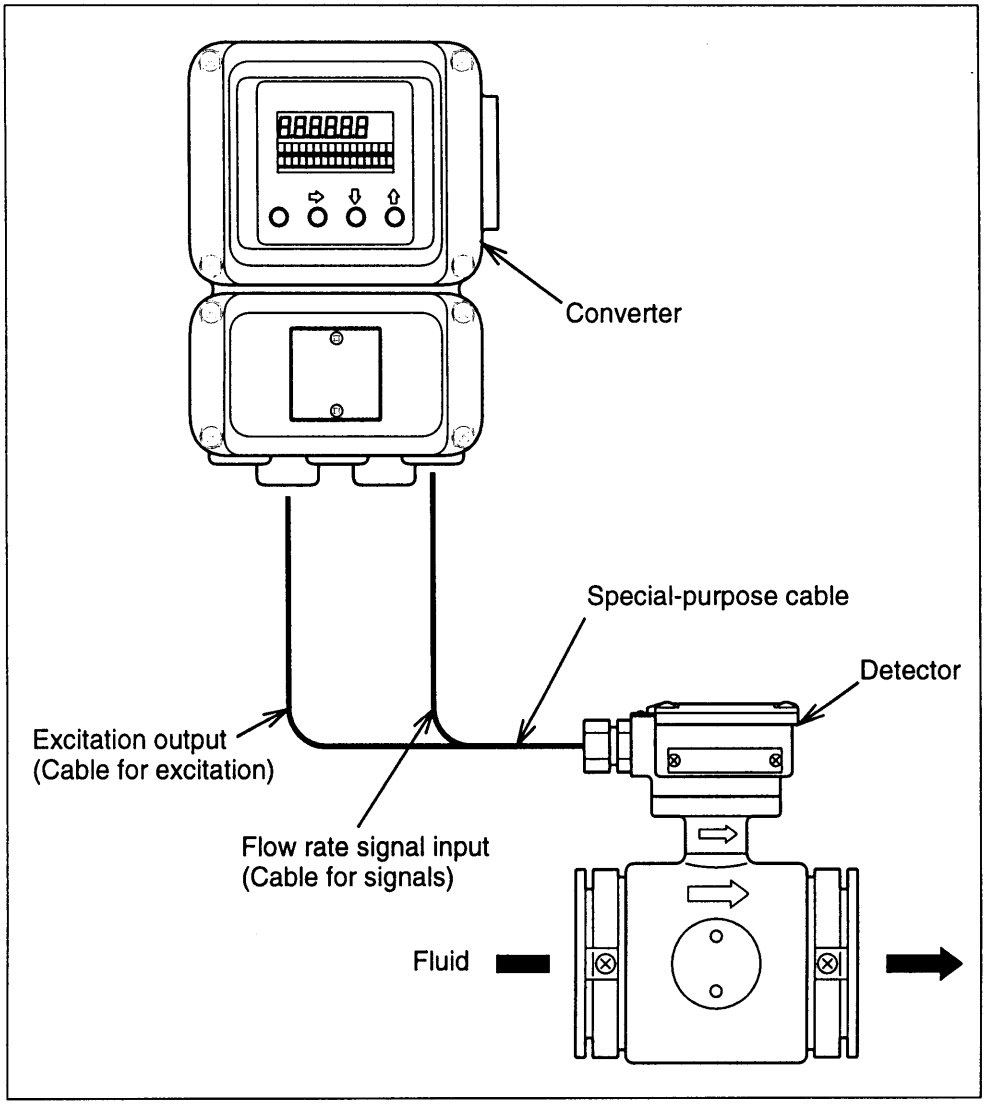
Overview

The converter and remote detector are connected using a special-purpose cable. You can cut the end of the special-purpose cable according to the procedure shown below:

What is the special-purpose cable?

The special-purpose cable is used to connect the detector to the remote converter and transmits either the flow-rate proportional signal or the excitation current.

Fig. 2-38 Connecting the detector to the converter

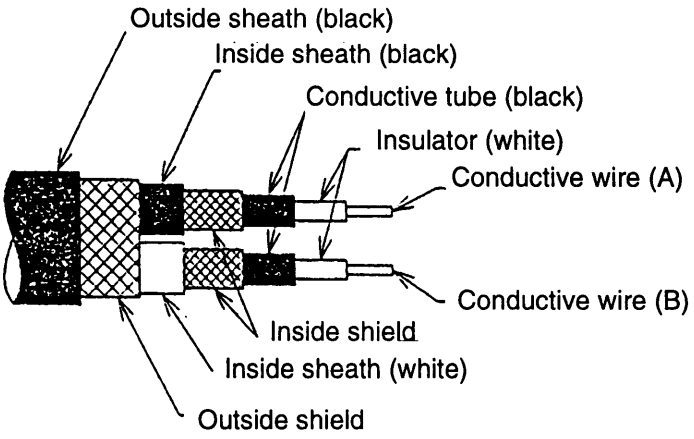


Cutting the end of the signal cable

This section describes the procedure for cutting the end of the signal cable, based on Yamatake-Honeywell specifications.

Structure of the signal cable

The structure of the signal cable is shown as follows. Caution must be exercised to avoid incorrectly cutting the end of the signal cable.

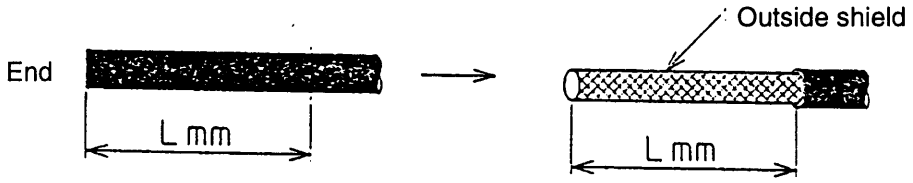


Note:
The conductive tubing (black) for conductive wires (A) and (B) is to be removed up to the end of the inside shield.

Procedure for cutting the end of the signal cable

(1) Peel off the outside sheath.
Scribe (cut) a line in the designated position, and peel off and remove the specified length of outside sheathing (black). (The length will vary depending on the model No. of the cable.)
After the specified length of the outside sheath has been removed, the outside shield will be visible.
The length "L" should be made slightly longer than necessary at first and then adjusted to the specified length in step (8).

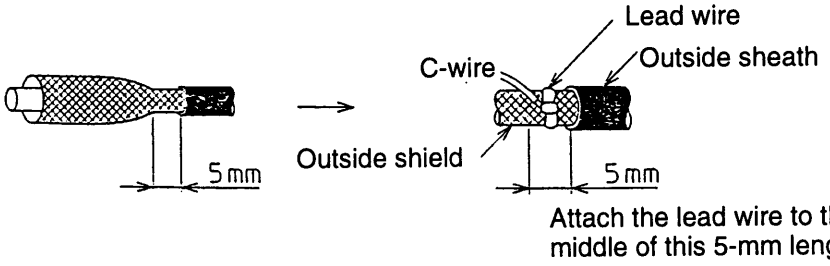
Note:
Be extra careful not to cut into the outside shield, which is right beneath the inside sheath.



Procedure for cutting the end of a signal cable

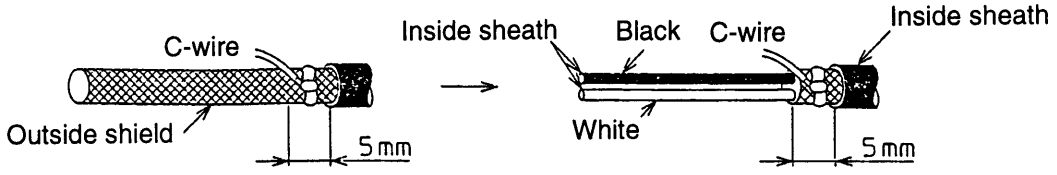
(2) Solder the lead wire to the outside shield.
Solder the lead wire (C-wire) to the middle of this 5-mm length. First, be careful to wind once the lead wire around the outside shield. Then, using adequate solder, connect so that contact failure will not occur between the lead wire and outside shield. To do this, it is necessary to bend the outside shield.
Make the length of the lead wire a little longer than necessary by referring to the operating manuals for the product, and adjust it to the specified length in step (8).

Notes:
1. If the soldered connection is insecure, noise will be generated due to contact resistance.
2. This lead wire need not be fitted if the terminal of the converter is designed not to use a shield drive (in this case, the outside shield must be cut off in step (1)).
3. If the outside shield is not allowed to bend during soldering, in some cases the conductive tube cannot be peeled off, due to the heat of the solder.



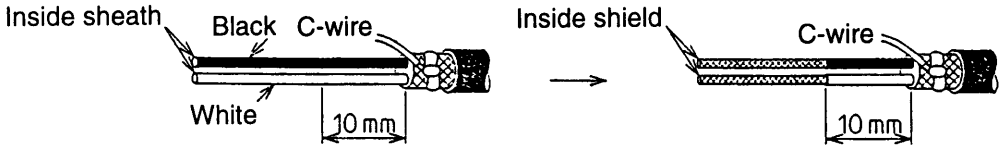
(3) Cut the outside shield.
Cut the outside shield off at a point 5 mm from the outside sheath, leaving the specified length from the end of the outside shield.

Note:
Be extra careful not to cut into the inside sheath right beneath the inside shield.



(4) Peel off the inside sheath.
Peel off the inside sheath so that a 10-mm portion remains.

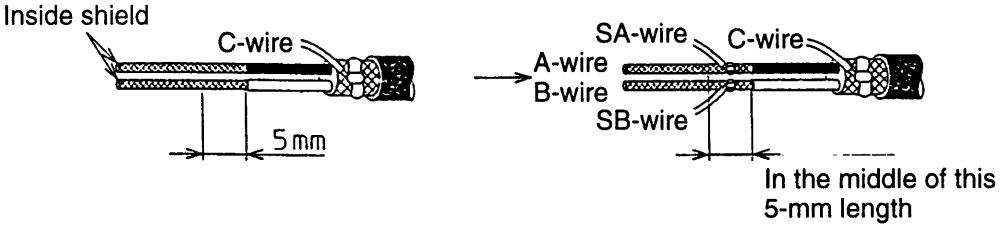
Note:
Be extra careful not to cut into the inside shield right beneath the inside sheath.



Procedure for cutting the end of the signal cable

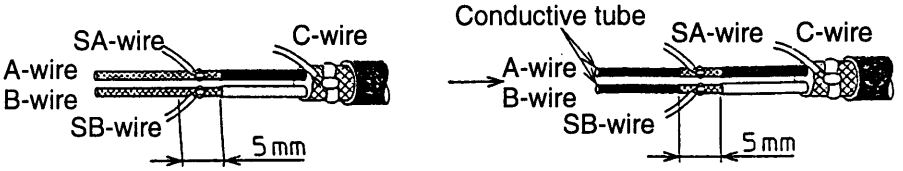
(5) Solder the lead wires to the inside shield.
Solder lead wires (SA and SB) to the middle of this 5-mm length. First, wind each lead wire around the inside shield once. Apply adequate solder, so that contact failure will not occur between the lead wires and inside shields. Keep the two inside shields separate from each other to prevent them from being bonded by mistake during soldering.
The length of this lead wire is to be measured from this soldered point.
Make the length of the lead wire a little longer than necessary by referring to the operating manuals for the products and adjust it to the specified length in step (8).

Notes:
1. If the soldering connection is insecure, noise will be generated due to contact resistance.
2. Refer to the operation manuals of the product to find out whether or not this lead wire is required.



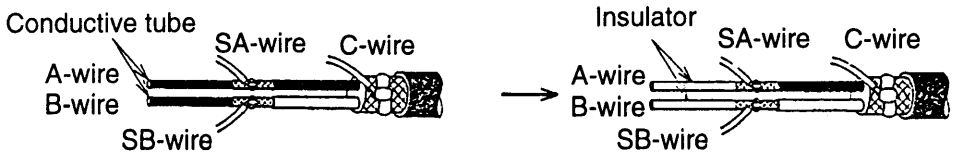
(6) Cut the inside shield.
Cut the inside shield off at a point 5 mm from the inside sheath.

Note:
Be extra careful not to cut into the insulator right beneath this conductive tube.



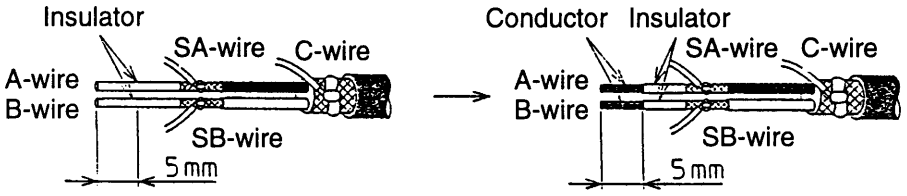
(7) Peel off the conductive tube.
Peel off the conductive tube (black) completely up to the inside shield.

Note:
Remove this tube completely.



Procedure for cutting the end of the signal cable

(8) Peel the insulator off.
Peel the insulator by 5 mm from its end. At this time, adjust the other lead wires (soldered to the shield sections) to the specified lengths so that each conductor is exposed by 5 mm.



(9) Insulate the shield and soldered parts.
First, wind insulating tape around each inside shield and then around each outside shield. Arrange them so that they are neat and tidy.

(10) Attach markers.
Attach markers to the lead wires.

(11) Crimp terminals.
Crimp terminals onto each lead wire.
In some cases, the C-wire must be crimped together with either the SA or SB lead wire, depending on the type of signal cable. For further information, refer to the appropriate operation manuals.

Note:
After the terminals are crimped, pull them by hand to make sure that they do not come off.

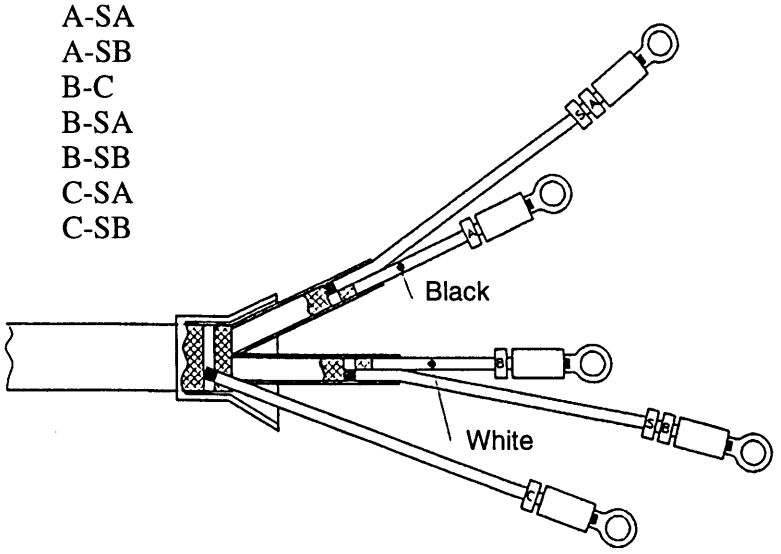
Continuity test

The continuity between the terminals of fabricated cables must be tested.
Judgment: A-A: about 0 Ω for each terminal
B-B
C-C

Insulation test

The insulation between the terminals is to be tested using an insulation resistance tester.

Judgment: A-B: more than 100 MΩ, 500VDC for each terminal
A-C
A-SA
A-SB
B-C
B-SA
B-SB
C-SA
C-SB



MEMO

Chapter 3 - Maintenance of the Device

Introduction

For the device loop diagrams for troubleshooting and maintenance, refer to the Converter user manual .

MEMO

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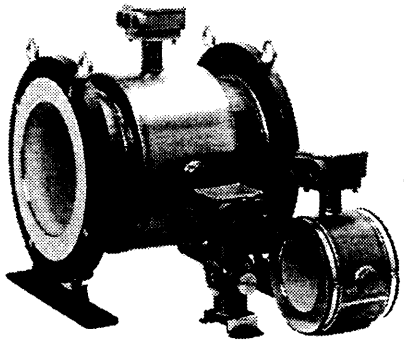
MEMO

YAMATAKE **Specification**

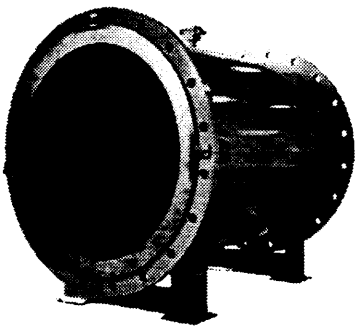
MagneW 3000 FLEX Smart Electromagnetic Flowmeter Detector (General Model) MGG11 (Watertight model, Integral/Remote) MGG12 (Submersible model, Remote)

Introduction

The MagneW 3000 FLEX electromagnetic flowmeter detector is a high performance, highly reliable flowmeterdeveloped with Yamatake Corporation's proven MagneW 3000 flow measurement technologies. MGG11 and MGG12 models for watertight and submerged use offer superior flowrate and process measurement when couple a with one of our MagneW 3000 FLEX converters.



(Diameter 2.5 to 600mm)



(Diameter 700 to 1100mm)

Special features

(1) High performance lining
- A new, exclusive high quality lining technology and a special, mirror-finish PFA lining offer higher antiadhesive properties than existing models.
- The specular 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 2.5mm to 600mm available, making selection of the best lining easy for a wide variety of applications.

(2) Replacement interfacing detector (optional)
- This detector can replace the detector interfaces of our existing models and those of other manufacturers. Please consult your Yamatake Corporation representative for details.

(3) Rugged detector structure
- A stainless steel case has been adopted for diameters of 2.5mm to 200mm.
- A watertight structure effective for environments where moisture condensation tends to occur is used for the water-tight model (MGG11).

(4) A wide variety of piping connections
- A hose or union joint or clamp can be selected for very small diameter models (diameters of 2.5 to 15mm).
- A flange structure is used for all diameters (diameters of 2.5 to 600mm).
- A wafer construction can be also selected (diameters of 2.5 to 200mm).
- Diameters of 65 and 125mm have been added to our existing product lineup.

(5) Interchangeability
- Remote model converters can be used in combination with our conventional converters. Please consult your Yamatake Corporation representative for details.

Wide variety of 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:

Alumina 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.

Detector Specifications (standard)

Equipment specifications

Structure:

MGG11: JIS C 0920 water-tight model
NEMA ICS6-110 TYPE4X
IEC PUBL 529 IP67

MGG12: JIS C 0920 submersible model
NEMA ICS6-110 TYPE6
IEC PUBL 529 IP68

Finish:

MGG11: Corrosion-preventive acrylic resin (remote model, diameter 2.5 to 200mm, terminal box only)
Corrosion-preventive polyurethane resin (diameter 250 to 600mm, terminal box of remote model and case of remote/integral model)
Corrosion-preventive acrylic resin (diameter 700 to 1100mm, terminal box and case of remote/integral model)

MGG12: Corrosion-preventive tar epoxy (diameter 15 to 200mm, terminal box only; and diameter: 250 to 600mm, terminal box and case)

Color:

MGG11: Light beige (Munsell 4Y7.2/1.3)

MGG12: Black

Main body material:

Measuring pipe materials: SUS304 stainless steel

Flange: SUS304 stainless steel
(diameter: 2.5 to 65mm)
Carbon steel + corrosion-preventive coating
(diameter 80 to 600mm)
Carbon steel
(diameter 700 to 1100mm)

Case: SCS13 stainless steel
(diameter 2.5 to 15mm)
SUS304 stainless steel
(diameter 25 to 200mm)
SS400 carbon steel (diameter 250 to 1100mm)

Terminal box: Aluminum alloy (remote model)

Material of parts in contact with liquid:

Lining: PFA (diameter: 2.5 to 600mm)
Polyurethane rubber
(diameter 25 to 200mm)
Chloroprene rubber
(diameter 250 to 1100mm)

Electrode: SUS316L, Hastelloy C, titanium, zirconium, tantalum, tungsten-carbide, platinum/iridium

Ground ring: SUS316, Hastelloy C, titanium,zirconium, tantalum, platinum

Union joint: SUS316 (diameter 2.5 to 15mm)

Hose: SUS316 (diameter 2.5 to 15mm)

IDF Clamp : SUS316

Tri Clamp : SUS316

Material of parts in contact with liquid:

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

O-ring: Viton rubber (with union joints)

Structure of electrode:

MGG11: External insertion
(electrode can be removed)

MGG12: External insertion
(electrode cannot be removed)

Installation specifications

Ambient temperature:

-25 to +60°C (integral model)
-30 to +80°C (remote model, PFA lining)
-30 to +60°C (remote model, polyurethane rubber lining/ chloroprene rubber lining)

Ambient humidity : 5 to 100% RH

Cable connection port:

Integral model; Connected 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 (models 2.5 to 200mm in diameter)
Flange (models 2.5 to 1100mm in diameter)
Union (models 2.5 to 15mm in diameter)
Hose (models 2.5 to 15mm in diameter)
IDF Clamp(models 2.5 to 15mm in diameter)
Tri Clamp(models 2.5 to 15mm in diameter)

Nuts and bolts (for models of wafer construction):

S20C carbon steel, SUS304 stainless steel

Flange rating:

JIS10K, JIS20K, JIS30K,
JPI150, JPI300,ANSI150, ANSI300,
DIN PN10, DIN PN16, DIN PN25,
DIN PN40 (diameter 2.5 to 50mm)

JIS10K, JIS20K, JIS30K,
JPI150, JPI300,ANSI150, ANSI300,
DIN PN10, DIN PN16, DIN PN25,
DIN PN40, JIS G3451 F12
(diameter 80 to 200mm)

JIS10K, JIS20K, JPI150, JPI300,
ANSI150, ANSI300, DIN PN10,
DIN PN16, DIN PN25, JIS G3451 F12
(diameter 250 to 600mm, PFA lining)

JIS10K, JPI150, ANSI150, DIN PN10
JIS G3451 F12(diameter 250 to 1100mm,
chloroprene rubber lining)

Grounding: Category 3
(Grounding resistance: lower than 100 Ω)

Mounting : Horizontally-mounted electrode

Length of straight pipe:

Upstream side;
Five (5) times or longer than the diameter. However, 10 times or longer than the diameter if a diffuser, valve, pump, etc., are installed.

Downstream side;
Not required. However, 2 times or longer than the diameter if influence exists from drift current of such equipment as a valve.

Cable (between remote detector and converter):

Maximum length:	300m (depending on fluid conductivity)
Outer diameter:	10 to 12 mm
Signal cable:	Dedicated cable (11.4mm, 0.75mm² diameter) or equivalent (CVVS, CEEV, etc.)
Excitation cable:	Dedicated cable (10.5mm, 2mm² diameter) or equivalent (CVV and others)

Additional specifications (optional)

Test report:

Test result based on repair of electromagnetic flowmeter for actual flow.

Certification of traceability:

From 3 sources: configuration of measuring management system for electromagnetic flowmeter, repair certification, and test report.

Mill sheet:

Data sheet describing materials and charge numbers of electrodes and grounding rings.

Moisture treatment:

When shipped, condensation is removed from wetted surfaces.

Oil removal treatment:

When shipped, oil is removed from wetted surfaces.

Gasket for resin pipe (for general use):

When installing the detector on a resin pipe, attach this gasket between the PFA lining and the grounding ring, and between the grounding ring and the pipe flange.

Attaching the tag number to the terminal box:

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

Attaching the tag number on the neck section:

Mark the tag number specified and attach it to the neck section of the detector. The maximum number of characters in the tag number is 16.

For additional specifications, please contact your Yamatake Corporation representative.

Performance (standard)

Accuracy (in combination with the MGG10C converter)

Table 1

<diameter 2.5 to 15mm> Upper limit value of Vs=set velocity range

Vs(m/s)	Velocity during measurement≧Vs×40%	Velocity during measurement≦Vs×40%
1.0≦Vs≦10	±0.5% of indicated value	±0.2% of Vs
0.1≦Vs≦1.0	±(0.1/Vs+0.4)% of the indicated value	±0.4(0.1/Vs+0.4)% of Vs

<diameter 25 to 600mm> Upper limit value of Vs=set velocity range

Vs(m/s)	Velocity during measurement≧Vs×20%	Velocity during measurement≦Vs×20%
1.0≦Vs≦10	±0.5% of indicated value	±0.1% of Vs
0.1≦Vs≦1.0	±(0.1/Vs+0.4)% of the indicated value	±0.2(0.1/Vs+0.4)% of Vs

<diameter 700 to 1100mm> Upper limit value of Vs=set velocity range

Vs(m/s)	Velocity during measurement≧Vs×50%	Velocity during measurement≦Vs×50%
1.0≦Vs≦10	±1.0% of indicated value	±0.5% of Vs
0.1≦Vs≦1.0	±(0.2/Vs+0.8)% of the indicated value	(0.1/Vs+0.4)% of Vs

Liquid to be measured/temperature range:

PFA lining

Diameter (mm)	Temperature of the liquid to be measured (℃)	
	Integral model	Remote model
2.5 to 10	-40 to +100	-40 to +100
15 to 200	-40 to +120	-40 to +160
250 to 600	-40 to +120	-40 to +120

Polyurethane rubber lining

Diameter (mm)	Tempreature of the liquid to be measured (℃)
	Integral /Remote model
25 to 200	-40 to +50

Chloroprene rubber lining

Diameter (mm)	Tempreature of the liquid to be measured (℃)
	Integral /Remote model
250 to 1100	-10 to +70

Measurable electrical conductivity:

Combined with MGG10C converter
3μS/cm or more (consult your Yamatake-Honeywell engineer when conditions are 3μS/cm or less)

Measurement flow range:

Refer to the minimum/maximum set ranges shown in Table 2.

Measurement flow range: 0m/s to 10m/s

Table 2

Diameter (mm)	Minimum set range(m^3/h) (Minimum constant flow speed of 0 to 0.1m/s)	Maximum set range(m^3/h) (Maximum constant flow speed of 0 to 10m/s)	Flow conversion factor K
2.5	0 to 0.00177	0 to 0.177	56.59
5	0 to 0.00707	0 to 0.707	14.15
10	0 to 0.0283	0 to 2.83	3.537
15	0 to 0.0636	0 to 6.36	1.572
25	0 to 0.177	0 to 17.7	0.5659
40	0 to 0.452	0 to 45.2	0.2210
50	0 to 0.707	0 to 70.7	0.1415
65	0 to 1.19	0 to 119	0.08375
80	0 to 1.81	0 to 181	0.05526
100	0 to 2.83	0 to 283	0.03537
125	0 to 4.42	0 to 442	0.02264
150	0 to 6.36	0 to 636	0.01572
200	0 to 11.31	0 to 1,131	0.008842
250	0 to 17.67	0 to 1,767	0.005659
300	0 to 25.45	0 to 2,545	0.003930
350	0 to 34.64	0 to 3,464	0.002887
400	0 to 45.24	0 to 4,524	0.002210
450	0 to 57.26	0 to 5,726	0.001747
500	0 to 70.70	0 to 7,070	0.001415
600	0 to 101.79	0 to 10,179	0.0009824
700	0 to 138.54	0 to 13,854	0.0007221
800	0 to 180.96	0 to 18,096	0.0005529
900	0 to 229.02	0 to 22,902	0.0004368
1000	0 to 282.74	0 to 28,274	0.0003538
1100	0 to 311.02	0 to 31,102	0.0002924

Flow conversion : Velocity V(m/s)=K×Q

$$K=\text{Flow conversion factor}=\frac{1}{3600}\times\frac{4}{\pi D^2}$$

Q=Flow rate (m^3/h)

Contents of Model Number Tables

Detector(General Model)

PFA lining

Rubber lining

MagneW3000 FLEX (General Model) (Union/Hose/Clamp assemblies 2.5~15mm) PFA lining

Basic Model No.	Selections										Optional selections	Options
MGG11U –											–	–

Diameter	2.5mm	002											
	5mm	005											
	10mm	010											
	15mm	015											
Lining	PFA		P										
Pipe connection	Union joint R1/2 (PT1/2) external thread			U1									
	Union joint 1/2NPT external thread			U2									
	Union joint R1/2 (PT1/2) internal thread			U3									
	Union joint 1/2NPT internal thread			U4									
	Hose joint			H1									
	IDF clamp			C1									
	Tri clamp			C2									
	Others			□									
Elecrodes	SUS316L				L								
	Hastelloy C				C								
	Titanium				K								
	Zirconium				H								
	Tungsten carbide				W								
	Others				□								
Union / Hose / Clamp material	SUS316					S S							
Wiring connection/ Watertight gland	Integral model						1						
	Remote model	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					5						
		CM20 internal thread/Without watertight gland					6						
		Pg13.5 internal thread/Without watertight gland					7						
		Others					□						
Face to face	Standard							A					
Installation/ Wiring direction	Integral model								H				
	Remote model	Upstream side							A				
		Downstream side							B				
		Horizontal piping mounting/Left side viewed from upstream							C				
		Horizontal piping mounting/Right side viewed from upstream							D				
Calibration/ Approval	Standard calibration									A			
	Others									□			

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TGA number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Wafer detector 2.5~10mm) PFA lining

Basic Model No. MGG11D – Selections – Optional selections – Options

Diameter	2.5mm	002	
	5mm	005	
	10mm	010	
Lining	PFA		P
Pipe connection	Wafer JIS10K for 15mm flange	11	
	Wafer JIS20K for 15mm flange	12	
	Wafer JIS30K for 15mm flange	13	
	Wafer JIS16/20K for 10mm flange	14	
	Wafer JIS30K for 10mm flange	15	
	Wafer ANSI150 for 15mm flange	21	
	Wafer ANSI300 for 15mm flange	22	
	Wafer DIN PN10 for 15mm flange	41	
	Wafer DIN PN16 for 15mm flange	42	
	Wafer DIN PN25 for 15mm flange	43	
	Wafer DIN PN40 for 15mm flange	44	
	Wafer DIN PN10/16/25/40 for 10mm flange	45	
	Wafer JPI150 for 15mm flange	61	
	Wafer JPI300 for 15mm flange	62	
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model: G1/2 internal thread/Without watertight gland		2
	Remote model: G1/2 internal thread/With brass (Ni-plated) watertight gland		3
	Remote model: G1/2 internal thread/With plastic watertight gland		4
	Remote model: 1/2NPT internal thread/Without watertight gland		5
	Remote model: CM20 internal thread/Without watertight gland		6
	Remote model: Pg13.5 internal thread/Without watertight gland		7
	Remote model: Others		□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model: Upstream side		A
	Remote model: Downstream side		B
	Remote model: Horizontal piping mounting/Left side viewed from upstream		C
	Remote model: Horizontal piping mounting/Right side viewed from upstream		D
Calibration/ Approval	Standard calibration		A
	Others		□

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

X	Bolt/nuts	No option
1		Carbon steel
2		SUS304

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Wafer detector 15~200mm) PFA lining

Basic Model No. **MGG11D** – Selections – Optional selections – Options

Diameter	15mm	015	
	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	PFA		P
Pipe connection	Wafer JIS10K		11
	Wafer JIS20K		12
	Wafer JIS30K		13
	Wafer ANSI150		21
	Wafer ANSI300		22
	Wafer JIS G3451 F12 (Diameter 80mm or more)		31
	Wafer DIN PN10		41
	Wafer DIN PN16		42
	Wafer DIN PN25		43
	Wafer DIN PN40		44
	Wafer JPI150		61
	Wafer JPI300		62
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote detector)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

X	Bolt/nuts	No option
1		Carbon steel
2		SUS304

MagneW3000 FLEX (General Model) (Flange detector 2.5~10mm) PFA Lining

Basic Model No.	Selections											Optional selections	Options
MGG11F	–											–	–

Diameter	2.5mm	002	
	5mm	005	
	10mm	010	
Lining	PFA		P
Pipe connection	Flange JIS10K for 15mm flange		J1
	Flange JIS20K for 15mm flange		J2
	Flange JIS30K for 15mm flange		J3
	Flange JIS10K for 10mm flange		J4
	Flange JIS20K for 10mm flange		J5
	Flange JIS30K for 10mm flange		J6
	Flange ANSI150 for 15mm flange		A1
	Flange ANSI300 for 15mm flange		A2
	Flange DIN PN10		D1
	Flange DIN PN16 for 15mm flange		D2
	Flange DIN PN25 for 15mm flange		D3
	Flange DIN PN40 for 15mm flange		D4
	Flange DIN PN10/16 for 10mm flange		D5
	Flange DIN PN25/40 for 10mm flange		D6
	Flange JPI150 for 15mm flange		P1
	Flange JPI300 for 15mm flange		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote detector)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

MagneW3000 FLEX (General Model) (Flange detector 15~200mm) PFA Lining

Basic Model No.	Selections											Optional selections	Options
MGG11F	–											–	–

Diameter	15mm	015	
	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	PFA		P
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flange JIS30K		J3
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12 (Diameter 80mm or more)		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange DIN PN40		D4
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

MagneW3000 FLEX (General Model) (Flange detector 250~600mm) PFA Lining

Basic Model No.: MGG11F - Selections: [ ][ ][ ][ ][ ][ ][ ][ ][ ] - Optional selections: [ ] - Options: [ ]

Diameter	250mm	250
	300mm	300
	350mm	350
	400mm	400
	450mm	450
	500mm	500
	600mm	600
Lining	PFA	P
Pipe connection	Flange JIS10K	J1
	Finage JIS20K	J2
	Flange ANSI150	A1
	Flange ANSI300	A2
	Finage JIS G3451 F12	G1
	Flange DIN PN10	D1
	Flange DIN PN16	D2
	Flange DIN PN25	D3
	Flange JPI150	P1
	Flange JPI300	P2
Flange material	Standard	1
	Others	□
Electrodes	SUS316L	L
	Hastelloy C	C
	Titanium	K
	Zirconium	H
	Tantalum	T
	Tungsuten carbide	W
	Platinum iridium	P
	Others	□
Grounding ring	SUS316	S
	Hastelloy C	C
	Titanium	K
	Others	□
Wiring connection/ Watertight gland	Integral model	1
	Remote model: G1/2 internal thread/Without watertight gland	2
	Remote model: G1/2 internal thread/With brass (Ni-plated) watertight gland	3
	Remote model: G1/2 internal thread/With plastic watertight gland	4
	Remote model: 1/2NPT internal thread/Without watertight gland	5
	Remote model: CM20 internal thread/Without watertight gland	6
	Remote model: Pg13.5 internal thread/Without watertight gland	7
	Remote model: Others	□
Face to face	Standard	A
	Others	□
Installation/ Wiring direction	Integral model	H
	Remote model: Upstream side	A
	Remote model: Downstream side	B
	Remote model: Horizontal piping mounting/Left side viewed from upstream	C
	Remote model: Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration	A
	Others	□

Optional selections

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

Options

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Wafer detector 25~200mm) Polyurethane rubber lining

Basic Model No. MGG11D – Selections – Optional selections – Options

Diameter	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	Polyurethane rubber lining		Q
Pipe connection	Wafer JIS10K	11	
	Wafer JIS20K	12	
	Wafer JIS30K	13	
	Wafer ANSI150	21	
	Wafer ANSI300	22	
	Wafer JIS G3451 F12 (Diameter 80mm or more)	31	
	Wafer DIN PN10	41	
	Wafer DIN PN16	42	
	Wafer DIN PN25	43	
	Wafer DIN PN40	44	
	Wafer JPI150	61	
	Wafer JPI300	62	
Electrodes	SUS316L		L
	Titanium		K
	Tungsten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model: G1/2 internal thread/Without watertight gland		2
	Remote model: G1/2 internal thread/With brass (Ni-plated) watertight gland		3
	Remote model: G1/2 internal thread/With plastic watertight gland		4
	Remote model: 1/2NPT internal thread/Without watertight gland		5
	Remote model: CM20 internal thread/Without watertight gland		6
	Remote model: Pg13.5 internal thread/Without watertight gland		7
	Remote model: Others		□
Face to face	Standard		A
Installation/ Wiring direction	Integral model		H
	Remote model: Upstream side		A
	Remote model: Downstream side		B
	Remote model: Horizontal piping mounting/Left side viewed from upstream		C
	Remote model: Horizontal piping mounting/Right side viewed from upstream		D
Calibration/ Approval	Standard calibration		A
	Others		□

Optional selections

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish
X	Bolt/nuts	No option
1		Carbon steel
2		SUS304

Options

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Flange detector 25~200mm) Polyurethane rubber lining

Basic Model No.			Selections										Optional selections	Options
MGG11F	–											–	–	

Diameter	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	Polyurethane rubber		Q
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flnage JIS30K		J3
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange DIN PN40		D4
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Titanium		K
	Tungsuten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

MagneW3000 FLEX (General Model) (Flange detector 250~600mm) Chloroprene rubber lining

Basic Model No.			Selections	Optional selections	Options
MGG11F	–			–	–

Diameter	250mm	250	
	300mm	300	
	350mm	350	
	400mm	400	
	450mm	450	
	500mm	500	
	600mm	600	
Lining	Chloroprene rubber lining		R
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Titanium		K
	Tungsuten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

MagneW3000 FLEX(General Model) (Flange type detector 700~1100mm)

Basic Model No.: MGG11F – Selections: □□□□□□□□□□ – Optional selections: □ – Options: □

Selections

Item	Selection		Code
Diameter	700mm		700
	800mm		800
	900mm		900
	1000mm		10H
	1100mm		11H
Lining	Chloroprene rubber		R
Pipe connection	Flange JIS10K		J1
	Flange ANSI150		A1
	Flange DIN PN10		D1
	Flange JPI150		P1
	Flange JIS G3451 F12		G1
Flange meterial	Standard		1
	Others		□
Electrodes	SUS316L		L
	Titannium		K
	Tungsten carbide		W
	Others		□
Grounding ring	SUS316		S
	Others		□
Wiring 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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral type		H
	Remote type	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

Optional selections

Code	Item	Selection
X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

Options

Code	Option
X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
K	Attaching the TAG number plate to the terminal box(remote type)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Submersible model/ Union/Hose/Clamp detector 15mm) PFA lining

Basic Model No. MGG12U – Selections – Optional selections – Options

Diameter	15mm		015	
Lining	PFA		P	
Pipe connection	Union joint R1/2 (PT1/2) external thread		U1	
	Union joint 1/2NPT external thread		U2	
	Union joint R1/2 (PT1/2) internal thread		U3	
	Union joint 1/2NPT internal thread		U4	
	Hose joint		H1	
	IDF clamp		C1	
	Tri clamp		C2	
	Others		□	
Elecrodes	SUS316L		L	
	Hastelloy C		C	
	Titanium		K	
	Zirconium		H	
	Tungsten carbide		W	
	Others		□	
Union / Hose /Clamp material	SUS316		S	
Wiring connection/ Watertight gland	Remote model	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	5	
		CM20 internal thread/Without watertight gland	6	
		Pg13.5 internal thread/Without watertight gland	7	
		Others	□	
Face to face	Standard		A	
Installation/ Wiring direction	Remote model	Upstream side	A	
		Downstream side	B	
		Horizontal piping mounting/Left side viewed from upstream	C	
		Horizontal piping mounting/Right side viewed from upstream	D	
Calibration/ Approval	Standard calibration		A	
	Others		□	

X	Finish	No option

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Submersible model/Wafer detector 15～200mm) PFA lining

Basic Model No.: MGG12D – Selections: □□□□□□□□□ – Optional selections: □□ – Options: □

Item		Selection	Code
Diameter		15mm	015
		25mm	025
		40mm	040
		50mm	050
		65mm	065
		80mm	080
		100mm	100
		125mm	125
		150mm	150
		200mm	200
Lining		PFA	P
Pipe connection		Wafer JIS10K	11
		Wafer JIS20K	12
		Wafer JIS30K	13
		Wafer ANSI150	21
		Wafer ANSI300	22
		Wafer JIS G3451 F12 (Diameter 80mm or more)	31
		Wafer DIN PN10	41
		Wafer DIN PN16	42
		Wafer DIN PN25	43
		Wafer DIN PN40	44
		Wafer JPI150	61
		Wafer JPI300	62
Electrodes		SUS316L	L
		Hastelloy C	C
		Titanium	K
		Zirconium	H
		Tantalum	T
		Tungsten carbide	W
		Platinum iridium	P
		Others	□
Grounding ring		SUS316	S
		Hastelloy C	C
		Titanium	K
		Zirconium	H
		Tantalum	T
		Platinum	P
		Others	□
Wiring connection/ Watertight gland	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face		Standard	A
		Others	□
Installation/ Wiring direction	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval		Standard calibration	A
		Others	□

Optional selections

Code	Item	Selection
X	Finish	No option
X	Bolt/nuts	No option
1		Carbon steel
2		SUS304

Options

Code	Option
X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model)(Submersible model/ Flange detector 15~200mm) PFA Lining

Basic Model No.	Selections											Optional selections	Options
MGG12F	–											–	–

Diameter	15mm	015	
	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	PFA		P
Pipe connection	Flange JIS10K		J1
	Flange JIS20K		J2
	Flange JIS30K		J3
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flange JIS G3451 F12 (Diameter 80mm or more)		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange DIN PN40		D4
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Watertight gland	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	No option

MagneW3000 FLEX (General Model) (Submersible model/ Flange detector 250~600mm) PFA Lining

Basic Model No. MGG12F –

Selections

Diameter	250mm	250	
	300mm	300	
	350mm	350	
	400mm	400	
	450mm	450	
	500mm	500	
	600mm	600	
Lining	PFA		P
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12 (Diameter 80mm or more)		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

Optional selections – –

X	Finish	No option

Options

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Submersible model/Wafer detector 25~200mm) Polyurethane rubber lining

Basic Model No. MGG12D –

Selections

Diameter	25mm	025	
	40mm	040	
	50mm	050	
	65mm	065	
	80mm	080	
	100mm	100	
	125mm	125	
	150mm	150	
	200mm	200	
Lining	Polyurethane rubber lining		Q
Pipe connection	Wafer JIS10K		11
	Wafer JIS20K		12
	Wafer JIS30K		13
	Wafer ANSI150		21
	Wafer ANSI300		22
	Wafer JIS G3451 F12 (Diameter 80mm or more)		31
	Wafer DIN PN10		41
	Wafer DIN PN16		42
	Wafer DIN PN25		43
	Wafer DIN PN40		44
	Wafer JPI150		61
	Wafer JPI300		62
Electrodes	SUS316L		L
	Titanium		K
	Tungsten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Integral model		1
	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
Installation/ Wiring direction	Integral model		H
	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

Optional selections

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish
X	Bolt/nuts	No option
1		Carbon steel
2		SUS304
□		Others

Options

X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote detector)
L	Attaching the TAG number plate to the neck section
□	Others

MagneW3000 FLEX (General Model) (Submersible model/ Flange detector 25~200mm) Polyurethane rubber lining

Basic Model No.: MGG12F - Selections - Optional selections - Options

Item	Selection		Code
Diameter	25mm		025
	40mm		040
	50mm		050
	65mm		065
	80mm		080
	100mm		100
	125mm		125
	150mm		150
	200mm		200
Lining	Polyurethane rubber		Q
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flnage JIS30K		J3
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12 (Diameter 80mm or more)		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange DIN PN40		D4
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Titanium		K
	Tungsuten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
Installation/ Wiring direction	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

Optional selections

Code	Item	Selection
X	Finish	No option

Options

Code	Option
X	No option
A	Test report
B	Certification of traceability
C	Mill sheet
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe (for general purposes)
K	Attaching the TAG number plate to the terminal box (remote)
L	Attaching the TAG number plate to the neck section
□	Others

Basic Model No.: MGG12F –

Selections: _ _ _ _ _ _ _ _ _ _ –

Optional selections: _ –

Options: _ _

Diameter	250mm	250	
	300mm	300	
	350mm	350	
	400mm	400	
	450mm	450	
	500mm	500	
	600mm	600	
Lining	Chloroprene rubber lining		R
Pipe connection	Flange JIS10K		J1
	Flnage JIS20K		J2
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flnage JIS G3451 F12		G1
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Titanium		K
	Tungsuten carbide		W
	Others		□
Grounding ring	SUS316		S
	Titanium		K
	Others		□
Wiring connection/ Watertight gland	Remote model	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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		Others	□
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Remote model	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D
Calibration/ Approval	Standard calibration		A
	Others		□

X	No option	
A	Test report	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	Attaching the TAG number plate to the terminal box (remote)	
L	Attaching the TAG number plate to the neck section	
□	Others	

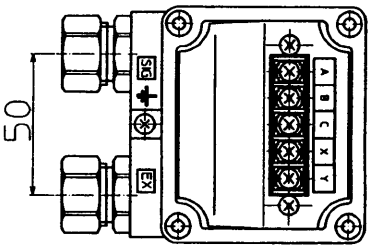
X	Finish	No option

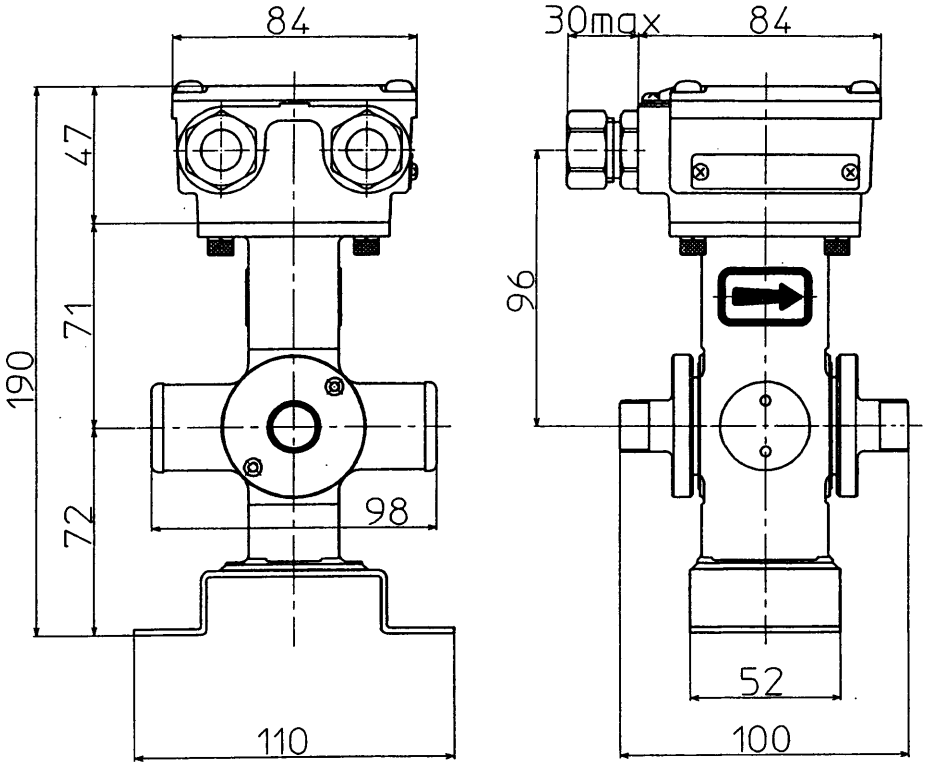
Dimension and terminal connection drawings

Union Joint
(Meter size 2.5 to 15mm)

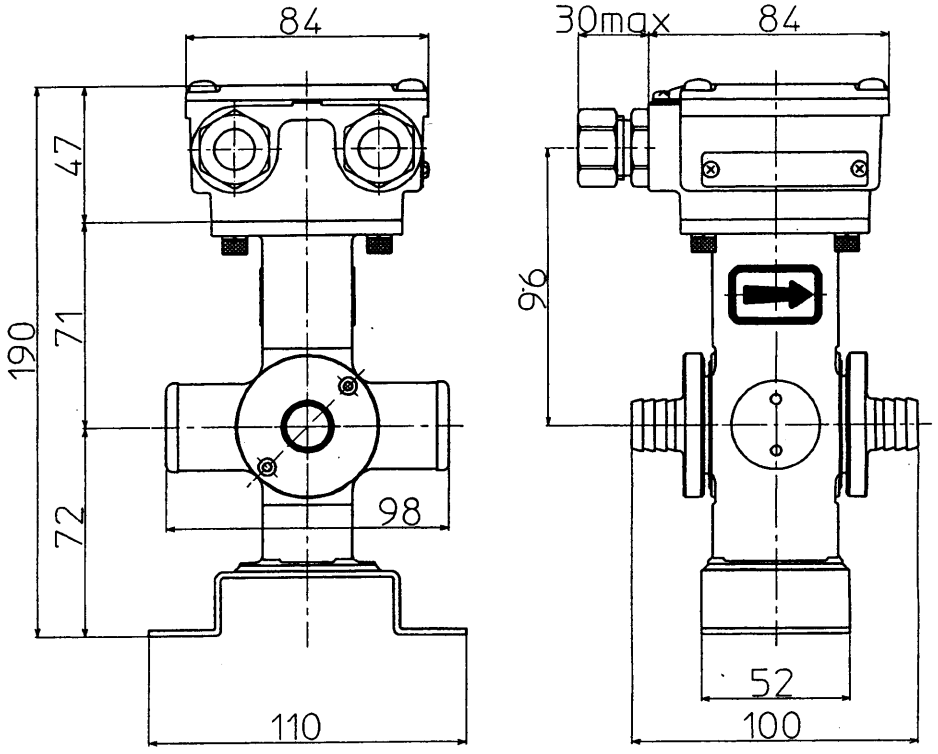
Terminal connection table

Symbol	Description
X	Excitation current input
Y	
A	Flow rate signal output
B	
C	

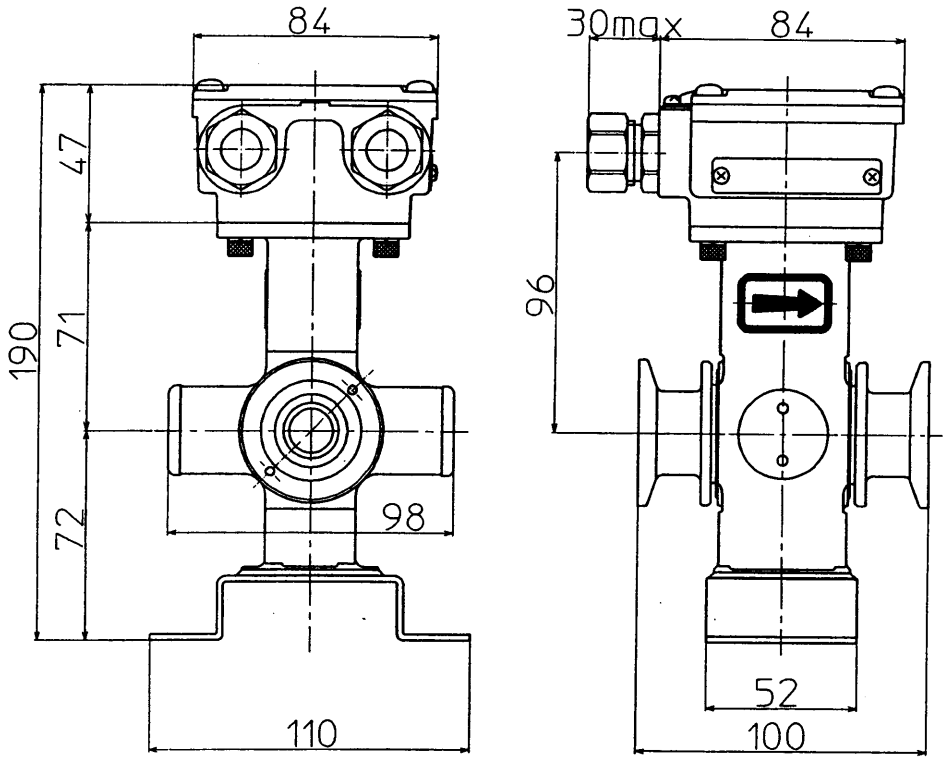




Hose Joint
(Meter size 2.5 to 15mm)

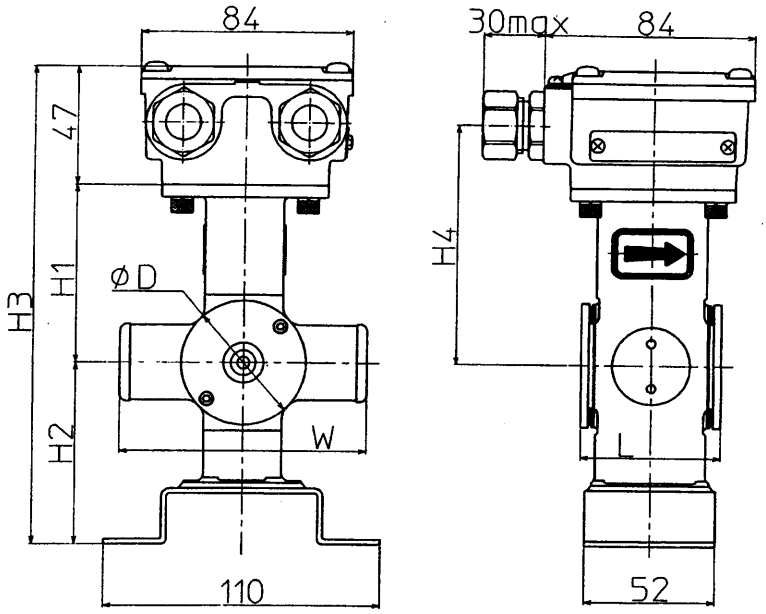


IDF/Tri Clamp
(Meter size 2.5 to 15mm)

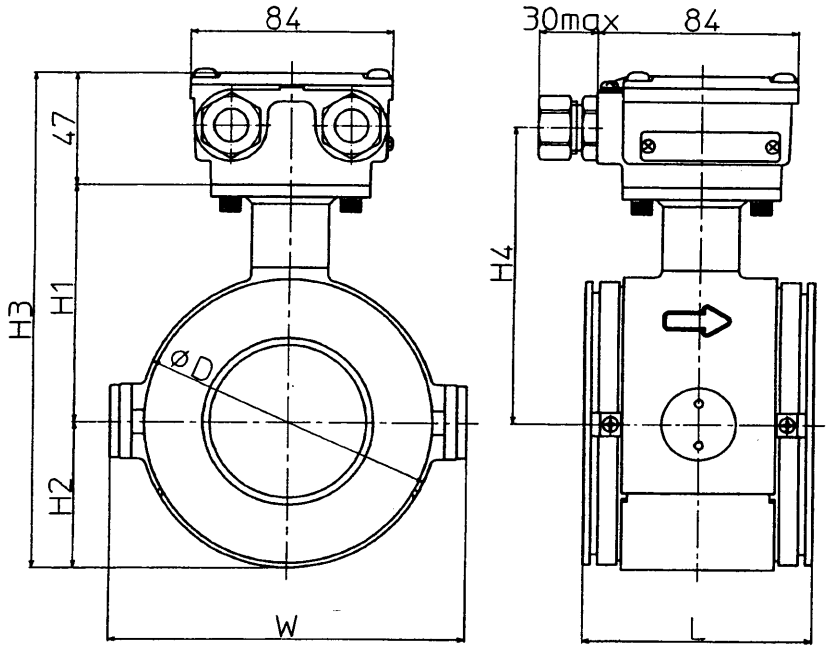


Note: 1) An integral detector includes an integral converter instead of a terminal box.
2) Clamp size : 1S

Wafer
(Meter size 2.5 to 15mm)



Wafer
(Meter size 25 to 200mm)

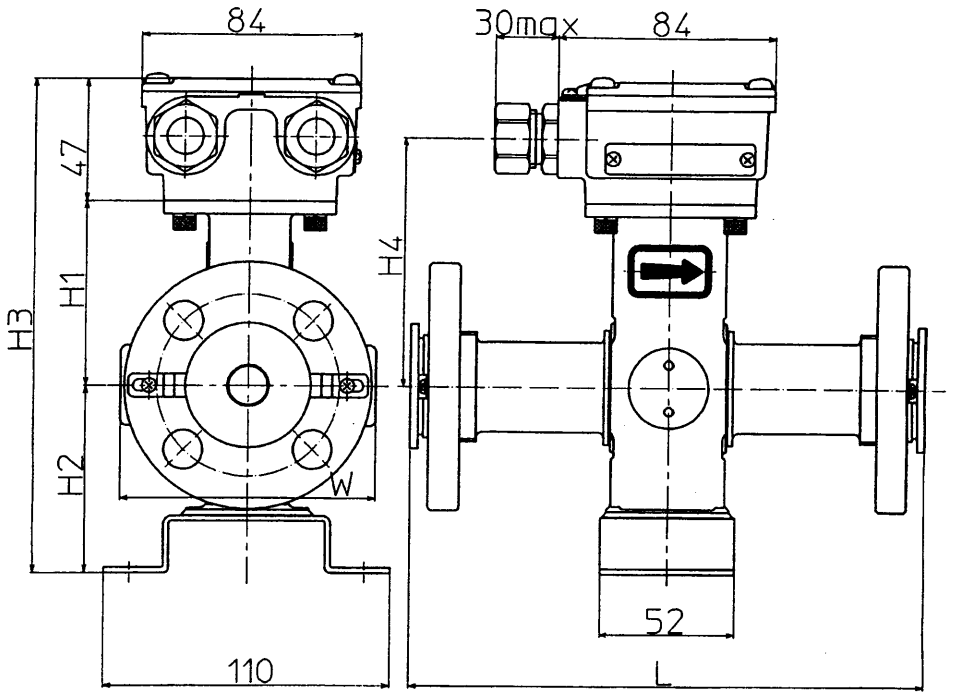


(Unit:mm)

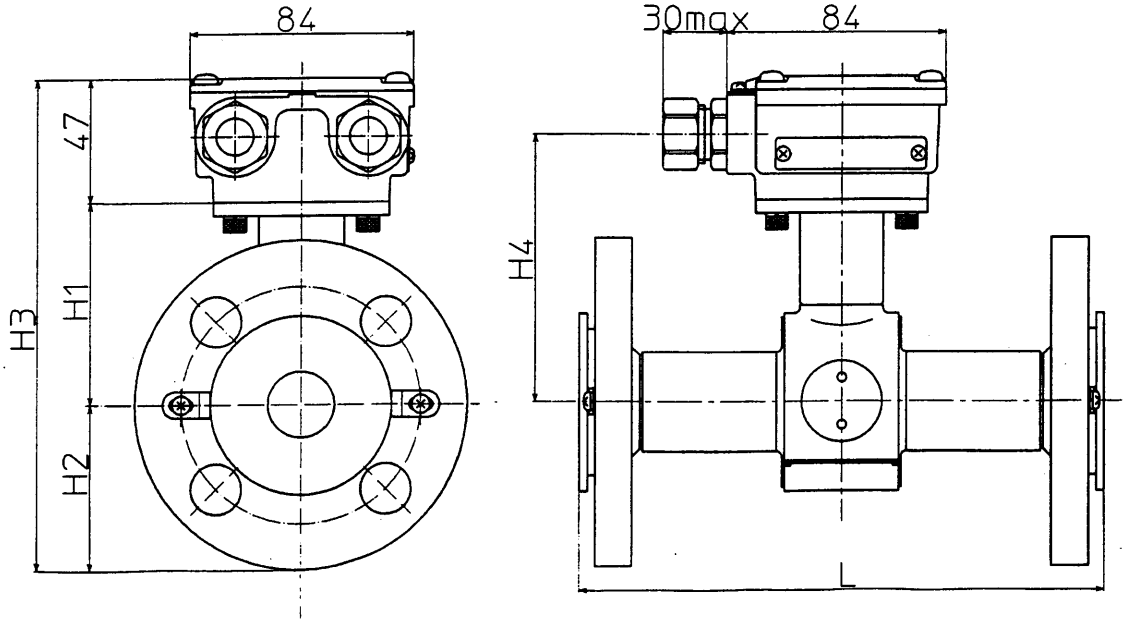
Detector diameter		2.5	5	10	15	25	40	50	65	80	100	125	150	200
Face to face dimension	L	56	56	56	56	56	80	86	96	106	120	140	160	200
Height	H1	71	71	71	71	77	84	93	100	108	120.5	133	160	185
	H2	72	72	72	72	34	43.5	52	62	67	79.5	95	110	135
	H3	190	190	190	190	158	174.5	192	209	222	247	275	317	367
	H4	96	96	96	96	102	109	118	125	133	145.5	158	185	210
Width	W	98	98	98	98	106	125	135	148	164	189	214	240	290
Outer diameter	ϕ D	49.5	49.5	49.5	49.5	68	87	104	124	134	159	190	220	270
Mass(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

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

Flange
(Meter size 2.5 to 15mm)



Flange
(Meter size 25mm)

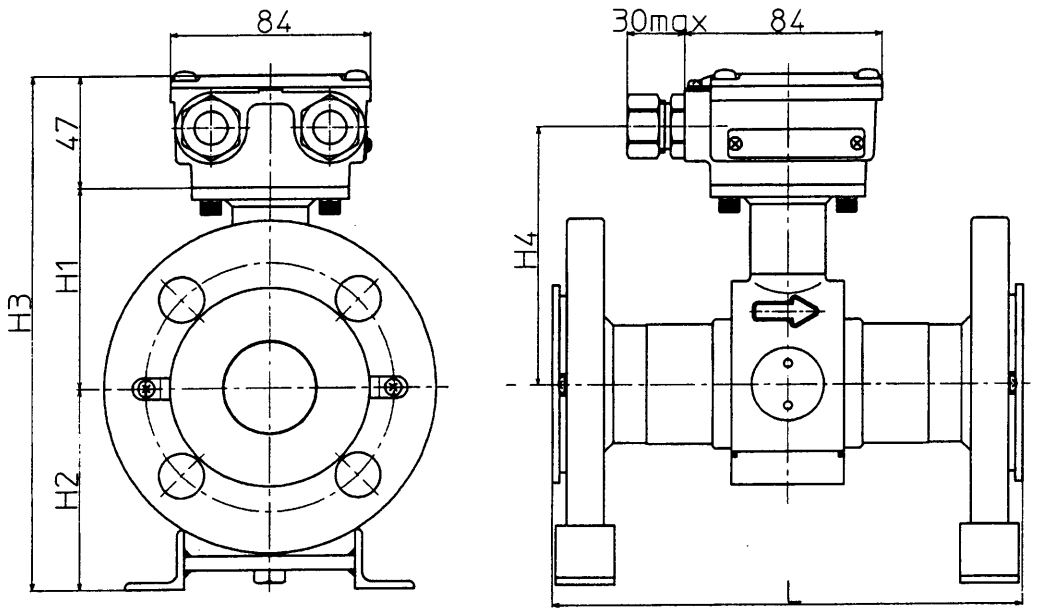


(Unit:mm)

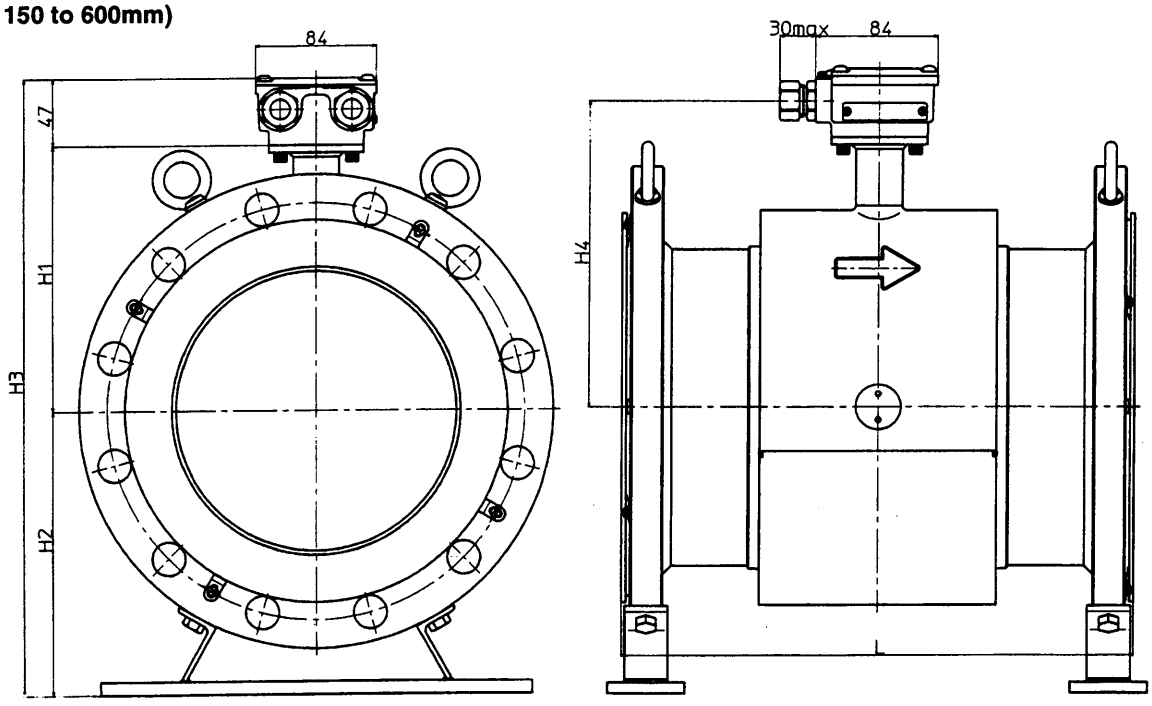
Detector diameter		2.5	5	10	15	25
Face to face dimension	L	160	160	160	160	200
Height	H1	71	71	71	71	77
	H2	70	70	70	70	63
	H3	188	188	188	188	187
	H4	96	96	96	96	96
Width	W	98	98	98	98	106
Mass(kg)		5.0	5.0	5.0	5.0	5.5

Note: 1) This table is for remote detectors .
2) An integral detector includes an integral converter instead of a terminal box.

Flange
(Meter size 40 to 100mm)



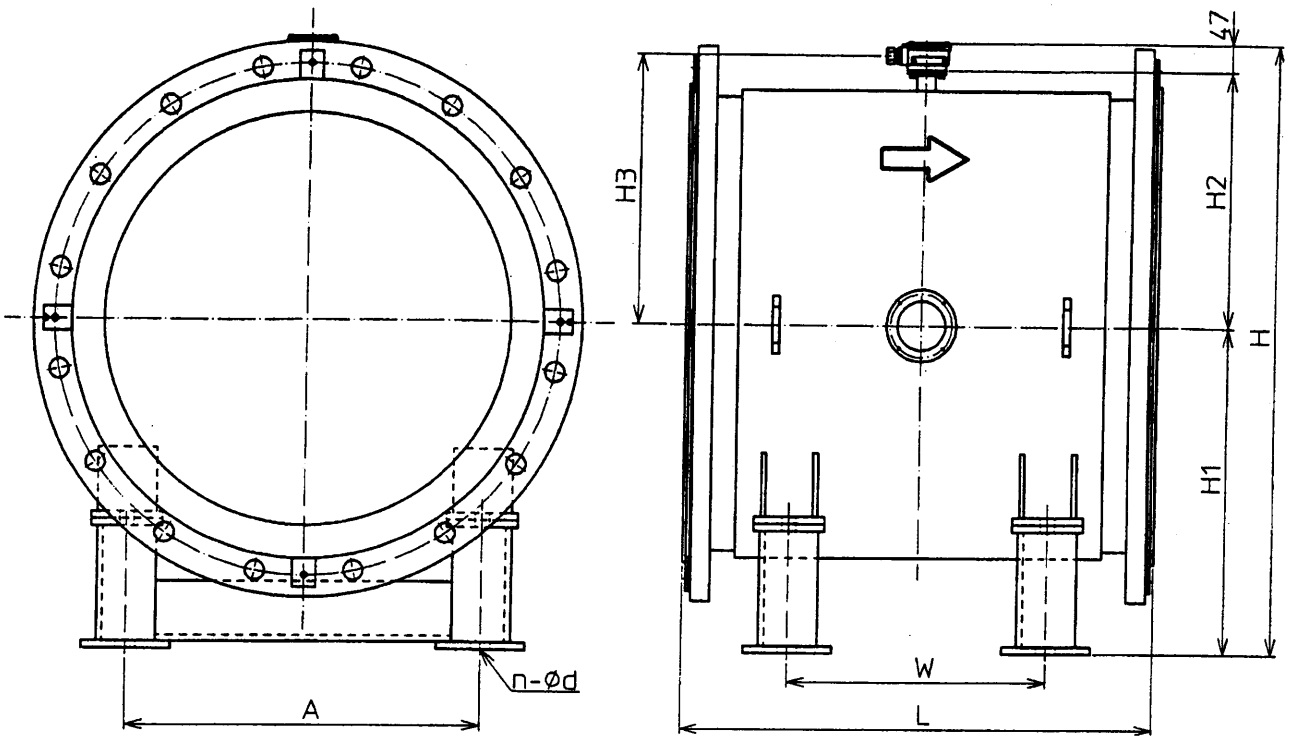
Flange
(Meter size 150 to 600mm)



Detector diameter		40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Face to face dimension	L	200	200	200	200	250	250	300	350	450	500	550	600	600	600	650
Height	H1	84	93	100	108	121	133	160	185	212	235	259	287	339	343	392
	H2	85	90	102	105	115	143	158	179	221	250	273	321	353	383	446
	H3	216	230	249	260	168	323	365	411	503	555	602	678	739	796	908
	H4	109	118	125	133	146	158	185	210	260	283	307	335	364	391	440
Mass(kg)		6.5	8.5	10.0	12.6	18.4	26.0	32.6	48.0	60.0	73.0	96.0	128.0	168.0	202.0	272.0

Note: 1) This table is for the remote detector .
2) An integral detector includes an integral converter instead of a terminal box.

Flange
(Meter size 700 to 1100mm)



Detector diameter		700A	800A	900A	1000A	1100A
Face to face dimension	L	1100	1200	1300	1500	1600
Height	H	1032	1137	1237	1337	1442
	H1	550	600	650	700	750
	H2	435	490	540	590	645
	H3	460	515	565	615	670
Feet length	W	700	800	850	1000	1050
Feet width	A	500	550	650	700	800
Feet halls*	n - ϕ d	4-ϕ24	4-ϕ24	4-ϕ24	4-ϕ24	4-ϕ30
Mass(kg)		630.0	720.0	1060.0	1320.0	1540.0

* : n = quantity、 ϕd = diameter

MEMO

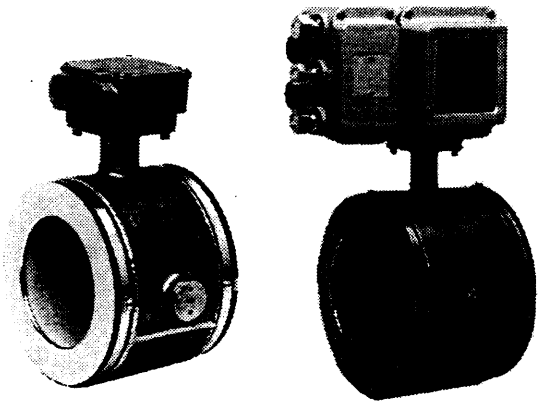
YAMATAKE

Specification

MagneW 3000 FLEX
Electromagnetic Flow Switch
Model MGF11/MGF10C

Introduction

This electromagnetic flow switch operates according to Faraday's law of electromagnetic induction. It detects the flow velocity of conductive fluids and outputs an alarm signal when the velocity falls below the setpoint.
The MGF Electromagnetic Flow Switch, in the MagneW 3000 FLEX series, is backed by Yamatake Corporation's long experience with MagneW 3000 Electromagnetic Flowmeters and Detectors. It is highly reliable, accurate and stable even when used with cooling water, slurries and corrosive fluids.



(Remote type) (Integral type)
(Diameter 15 to 250mm)

Special features

(1) Owing to the stability of the alarm contact outputs, re producibility is a high ±0.5%.

(2) Two contact outputs are available for precautionary and actual alarms.

(3) Contact rating is a robust 250VAC/220VDC, 1A.

(4) Variable hysteresis can be set in the range 1 to 20%. This feature is not available with standard electromagnetic flow switches.

(5) No internal obstructions or moving parts assures almost maintenance free service life. The structure is the same as the MagneW 3000 flowmeter.

(6) Wider application range with both integral and remote models now available.

(7) Display (liquid crystal back light) shows instantaneous flow rate as a percentage and as a real flow rate. The alarm setpoint is constantly displayed.

Application

(1) Monitoring of cooling water flow rates at a hydroelectric power station
- Management of turbine sealing water
- Management of generator cooler
- Management of generator thrust cooling

(2) Replacement for mechanical flow switches

(3) Management of equipment cooling water

(4) Monitoring of water, liquid medicine and slurry flow rates

Detector Specifications (standard)

Equipment specifications

Structure:

MGG1F: JIS C 0920 water-tight model
NEMA ICS6-110 TYPE4X
IEC PUBL 529 IP67

Finish:

MGF11: Corrosion-preventive acrylic resin (remote model, diameter 15 to 200mm, terminal box only)
Corrosion-preventive polyurethane resin (diameter 250 mm, terminal box of remote model and case of remote/integral model)

Color:

MGF11: Light beige (Munsell 4Y7.2/1.3)

Main body material:

Measuring pipe materials: SUS304 stainless steel

Flange: SUS304 stainless steel (diameter: 15 to 65mm)
Carbon steel + corrosion-preventive coating (diameter 80 to 250mm)

Case: SCS13 stainless steel (diameter 15mm)
SUS304 stainless steel (diameter 25 to 200mm)
SS400 carbon steel (diameter 250mm)

Terminal box: Aluminum alloy (remote model)

Material of parts in contact with liquid:

Lining: PFA (diameter: 15 to 250mm)

Electrode: SUS316L, Hastelloy C, titanium, tantalum, tungsten-carbide, platinum/iridium

Ground ring:
SUS316, Hastelloy C, titanium
tantalum, platinum

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

Structure of electrode:

MGF11: External insertion (electrode can be removed)

Installation specifications

Ambient temperature:
-25 to +60°C (integral model)
-30 to +80°C (remote model, PFA lining)

Ambient humidity : 5 to 100% RH

Cable connection port:

Integral model: Connected 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 (models 15 to 200mm in diameter)
Flange (models 15 to 250mm in diameter)

Nuts and bolts (for models of wafer construction):
S20C carbon steel, SUS304 stainless steel

Flange rating:
JIS10K, JIS16K, JIS20K, JIS30K,
JPI150, JPI300,ANSI150, ANSI300,
DIN PN10, DIN PN16, DIN PN25,
DIN PN40 (diameter 15 to 50mm)

JIS10K, JIS16K, JIS20K, JIS30K,
JPI150, JPI300,ANSI150, ANSI300,
DIN PN10, DIN PN16, DIN PN25,
DIN PN40 (diameter 80 to 200mm)

JIS10K, JIS20K, JPI150, JPI300,
ANSI150, ANSI300 (diameter 250mm)

Grounding: Category D
(Grounding resistance: lower than 100 Ω)

Mounting : Horizontally-mounted electrode

Length of straight pipe:

Upstream side;
Five (5) times or longer than the diameter. However, 10 times or longer than the diameter if a diffuser, valve, pump, etc., are installed.

Downstream side;
Not required. However, 2 times or longer than the diameter if influence exists from drift current of such equipment as a valve.

Cable (between remote detector and converter):

Maximum length: 300m (depending on fluid conductivity)

Outer diameter: 10 to 12 mm

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

Excitation cable: Dedicated cable (10.5mm, 2mm² diameter) or equivalent (CVV and others)

Additional specifications (optional)

Test report:

Test result based on repair of electromagnetic flowmeter for actual flow.

Certification of traceability:

From 3 sources: configuration of measuring management system for electromagnetic flowmeter, repair certification, and test report.

Moisture treatment:

When shipped, condensation is removed from wetted surfaces.

Oil removal treatment:

When shipped, oil is removed from wetted surfaces.

Gasket for resin pipe (for general use):

When installing the detector on a resin pipe, attach this gasket between the PFA lining and the grounding ring, and between the grounding ring and the pipe flange.

Attaching the tag number to the terminal box:

Mark the tag number specified and attach it to the neck section of the detector. The maximum number of characters in the tag number is 16.

Attaching the tag number on the neck section:

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

For additional specifications, please contact your Yamatake Corporation representative.

Converter specifications (standard)

Equipment specifications

Structure: JIS C 0920 Water-proof model
NEMA ICS6-110 TYPE4X
IEC PUBL 529 IP66

Finish: Acrylic resin

Color: Light beige (Munsell 4Y7.2/1.3)

Main body material:
Aluminum alloy

Display cover material:
Tempered glass, 5mm thick
Aluminum alloy

Main power supply: AC100V, 110V, 115/120V±10%
AC200V, 220V, 230/240V±10%
DC24V±10%
DC88 to 132V
Frequency: 50Hz or 60Hz

Power consumption: Within 13W (17VA)

Input signals:
Flow rate signals: Voltage signals proportional to the flow rate, sent from MGF11 Detector

Output signals:
Alarm contact outputs:
Contact rating Power 30W (62.5V)
Voltage 250VA, 220VDC
Current 1A
Reproducibility of alarm contact outputs:
±0.5%FS
Accuracy for setting alarm contacts:
±0.2%FS
Alarm hysteresis:
variable 1 to 20% in whole numbers
Accuracy for setting alarm hysteresis:
±0.2%FS
Indications:
Instantaneous flow rates in %
Real instantaneous flow rates
Alarm setpoints
Alarm occurrence

Data setter (optional):
Setting by means of infrared touch sensor
Infrared touch sensor: four key switches

Unit of flow indication:
Can be selected from between percentage, volume flow, mass flow, time.
Indication of volume flow: m^3, ℓ, cm^3
Indication of mass flow: t, kg, g
Indication of time: d, h, min, sInstallation specifications

Installation Specufucations

Ambient temperature: -25 to +60°C

Ambient humidity: 5 to 100% RH

Wiring connection port:
G1/2 (PF1/2) internal threads, 1/2 NPT internal threads, CM20 internal threads, Pg 13.5 internal threads

Installation: Integral detector / converter,
Wall mounting, 2B pipe mounting

Grounding: Category D(Grounding resistance: lower than 100 Ω)

Mass : 3.7kg

Additional specifications (optional)

Certification of traceability:

From 3 sources: Measuring management system the configuration for your electromagnetic flowmeter, a repair certification, and test reports.

Indication other than SI units:

Units to be exported other than SI units. Those units are as follows:

Volume unit:

B (barrel), kG (kilo-gallon), G (gallon), mG (milli-gallon)

Mass unit: ℓ b

Tag number on terminal box:

The designated tag numbers (maximum 16 characters) should be stamped on a plate, which is attached to the terminal box. One line can contain 8 characters, so if more characters must be written on two lines.

Characters can be upper-case English letters, numbers and hyphens (-).

For additional specifications, please contact your Yamatake Corporation representative.

Performance (standard)

Measurable electrical conductivity:

25μS/cm or over

Setting velocity range: 0.3 to 10m/s

Measurement flow range: 0m/s to 10m/s

Measurement flow range:

Refer to the minimum/maximum set ranges shown in Table 1.

Table 1

Diameter (mm)	Minimum set range(m^3/h) (Minimum constant flow speed of 0 to 0.3m/s)	Maximum set range(m^3/h) (Maximum constant flow speed of 0 to 10m/s)
15	0 to 0.191	0 to 6.36
25	0 to 0.531	0 to 17.7
40	0 to 1.356	0 to 45.2
50	0 to 2.121	0 to 70.7
65	0 to 3.57	0 to 119
80	0 to 5.43	0 to 181
100	0 to 8.49	0 to 283
125	0 to 13.26	0 to 442
150	0 to 19.08	0 to 636
200	0 to 33.93	0 to 1,131
250	0 to 53.01	0 to 1,767

Pressure ranges of the fluids to be measured (depending on the flange rating):

PFA lining: 0.098 to 2.94MPa

Liquid to be measured/temperature range:

Diameter (mm)	Temperature of the liquid to be measured (°C)	
	Integral model	Remote model
15 to 200	-40 to +120	-40 to +160
250	-40 to +120	-40 to +120

MagneW3000 FLEX(Flowswitch) (Wafer type detector 15~200mm)

Basic Model No. **MGF11D** – Selections – Optional selections – Options

Diameter	15mm			015								
	25mm			025								
	40mm			040								
	50mm			050								
	65mm			065								
	80mm			080								
	100mm			100								
	125mm			125								
	150mm			150								
	200mm			200								
Lining	PFA				P							
Pipe connection	Wafer JIS10K					11						
	Wafer JIS16/20K					12						
	Wafer JIS30K					13						
	Wafer ANSI150					21						
	Wafer ANSI300					22						
	Wafer DIN PN10					41						
	Wafer DIN PN16					42						
	Wafer DIN PN25					43						
	Wafer DIN PN40					44						
	Wafer JPI150					61						
	Wafer JPI300					62						
Electrodes	SUS316L						L					
	Hastelloy C						C					
	Titanium						K					
	Tantalum						T					
	Platinum iridium						P					
Grounding ring	SUS316							S				
	Hastelloy C							C				
	Titanium							K				
	Tantalum							T				
	Platinum							P				
Wiring 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							5			
		CM20 internal thread/Without watertight gland							6			
		Pg13.5 internal thread/Without watertight gland							7			
		G1/2 internal thread/With SUS304 watertight gland							8			
Face to face	Standard									A		
	Others									□		
Installation/ Wiring direction	Integral type										H	
	Remote type	Upstream side									A	
		Downstream side									B	
		Horizontal piping mounting/Left side viewed from upstream									C	
		Horizontal piping mounting/Right side viewed from upstream									D	

X	No option	
A	Test report	
B	Certification of traceability	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe(for general purposes)	
K	Attaching the TAG number plate to the terminal box(remote type detector)	
L	Attaching the TAG number plate to the neck section	
□	Others	

X	Finish	None
1		Corrosion-resistant finish
2		Corrosion-proof finish

X	Bolt/nuts	None
1		Carbon steel
2		SUS304

MagneW3000 FLEX(Flowswitch) (Flange type detector 15~250mm)

Basic Model No.: MGF11F – Selections: □□□□□□□□□ – Optional selections: □ – Options: □

Item	Selection		Code
Diameter	15mm		015
	25mm		025
	40mm		040
	50mm		050
	65mm		065
	80mm		080
	100mm		100
	125mm		125
	150mm		150
	200mm		200
	250mm		250
Lining	PFA		P
Pipe commection	Flange JIS10K		J1
	Flange JIS20K		J2
	Flange JIS30K		J3
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
	Tantalum		T
	Platinum iridium		P
Grounding ring	SUS316		S
	Hastelloy C		C
	Titanium		K
	Tantalum		T
	Platinum		P
Wiring 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	5
		CM20 internal thread/Without watertight gland	6
		Pg13.5 internal thread/Without watertight gland	7
		G1/2 internal thread/With SUS304 watertight gland	8
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	Integral type		H
	Remote type	Upstream side	A
		Downstream side	B
		Horizontal piping mounting/Left side viewed from upstream	C
		Horizontal piping mounting/Right side viewed from upstream	D

Optional selections

Code	Item	Selection
X	Finish	None
1		Corrosion-resistant finish
2		Corrosion-proof finish

Options

Code	Option
X	No option
A	Test report
B	Certification of traceability
E	Moisture treatment
F	Oil removal treatment
J	Gasket for resin pipe(for general purposes)
K	Attaching the TAG number plate to the terminal box (remote type detector)
L	Attaching the TAG number plate to the neck section
□	Others

Basic Model No. **MGF10C** – Selections [ ][ ][ ] – Optional selections [ ] – Options [ ]

Power supply	AC100V 50/60Hz		A
	AC110V 50/60Hz		B
	AC115/120V 50/60Hz		C
	AC200V 50/60Hz		D
	AC220V 50/60Hz		E
	AC230/240V 50/60Hz		F
	DC88 to 132V AC Noize filter 50Hz		K
	DC88 to 132V AC Noise filter 60Hz		L
Conduit connection/ Watertight gland	G1/2 internal thread/Without watertight gland		1
	G1/2 inetrnal thread/With brass(Ni-plated) watertight gland		2
	G1/2 internal thread/With plastic watertight gland		3
	1/2NPT internal thread/Without watertight gland		4
	CM20 internal thread/Without watertight gland		5
	Pg13.5 internal thread/Without watertight gland		6
	Others		□
Installation/ Wiring direction	Integral Type	Horizontal piping mounting/Upstream side	A
		Horizontal piping mounting/Downstream side	B
		Horizontal piping mounting/Left side viewed from stream	C
		Horizontal piping mounting/Right side viewed from stream	D
		Vertical piping mounting/Downstream side (Flow direction:Down stream to upstream)	E
		Vertical piping mounting/Downstream side (Flow direction:Up stream to downstream)	F
		Vertical piping mounting with elbow neck (Flow direction:Down stream to upstream)	T
		Vertical piping mounting with elbow neck (Flow direction:Upstream to downstream)	V
	Remote Type	Wall mounting/With standard bracket	G
		2 inch pipe mounting/With standard bracket	H
		Others	□

X	Finish	No option
1		Corrosion-resistant finish
2		Corrosion-proof finish

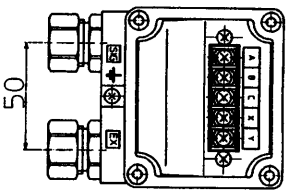
X	No Option
C	Certification of traceability
H	Indication other than SI units
J	Attachment of the TAG number to the terminal box
□	Others

Dimension and terminal connection drawings

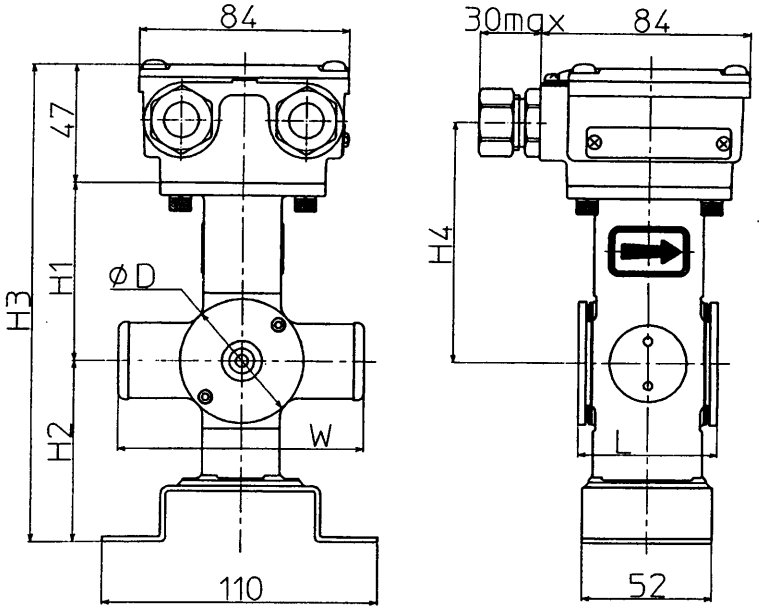
〈Detector〉

Terminal connection table

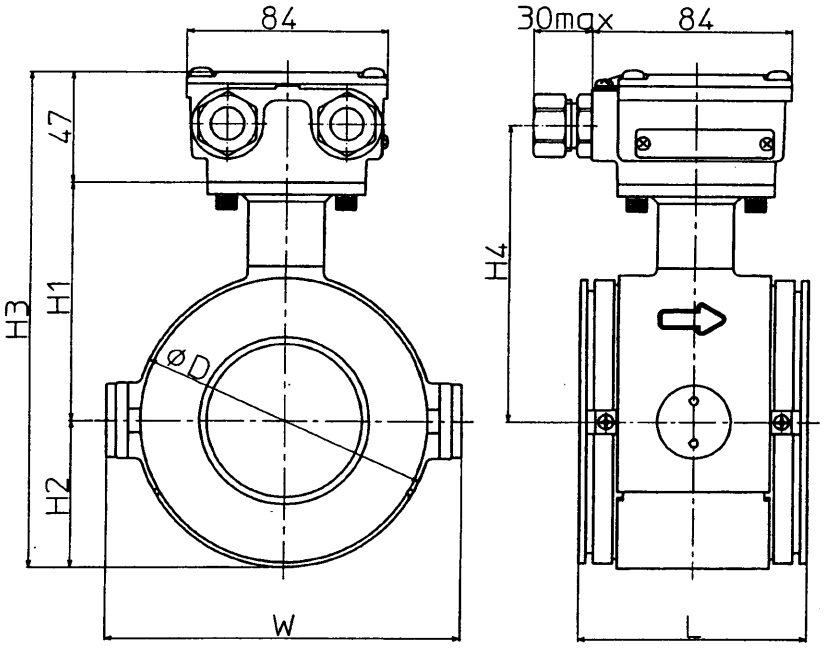
Symbol	Description
X	Excitation current input
Y	
A	Flow rate signal output
B	
C	



Wafer
(Meter size 15mm)



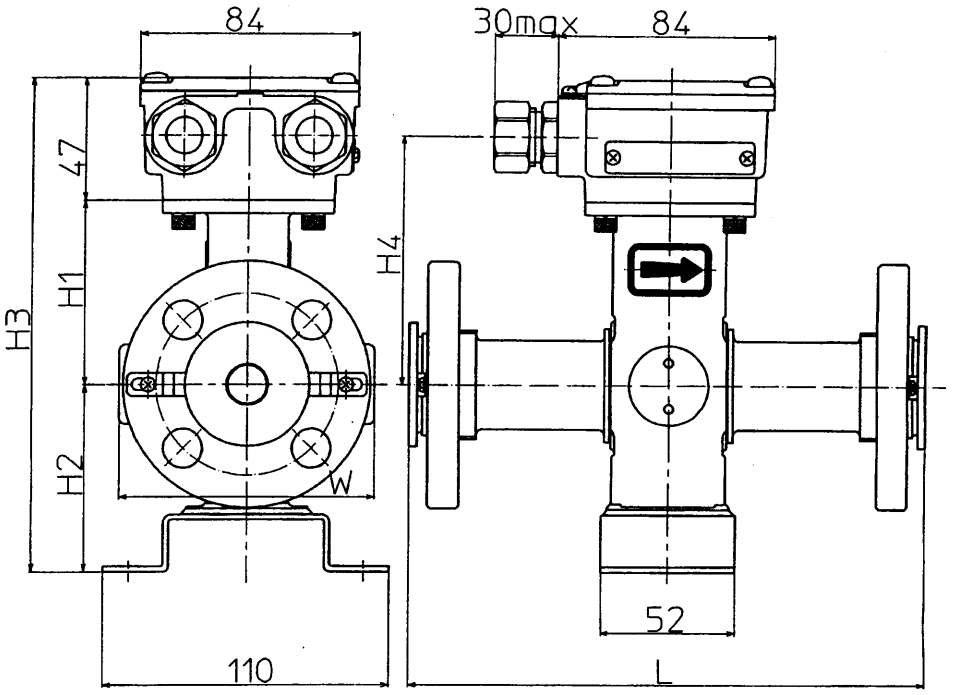
Wafer
(Meter size 25 to 200mm)



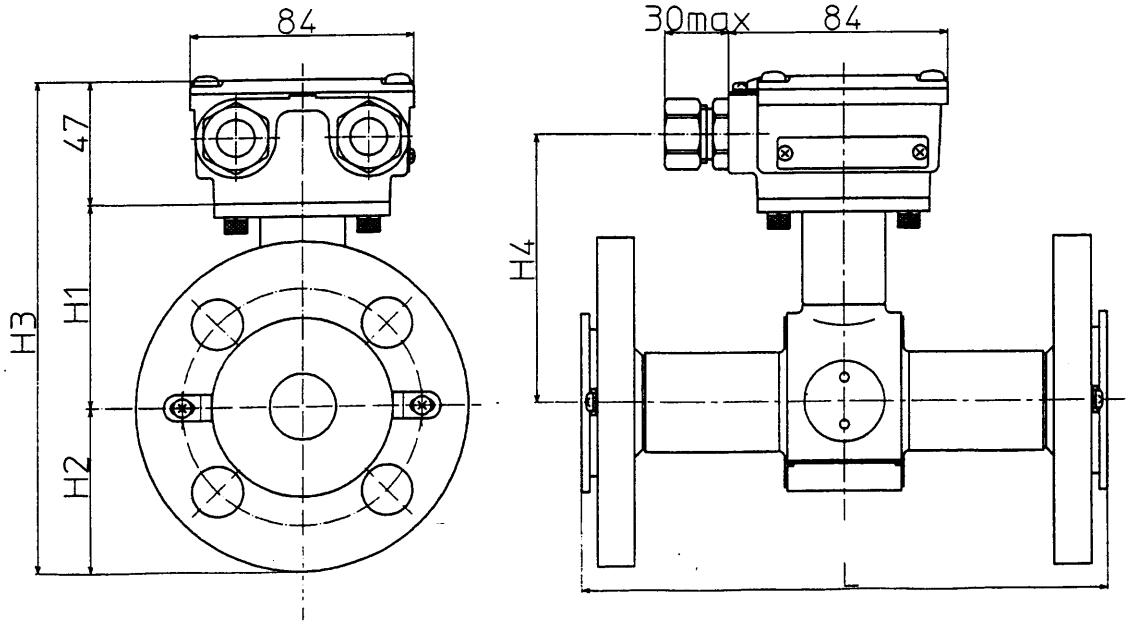
Detector diameter		15	25	40	50	65	80	100	125	150	200
Face to face dimension	L	56	56	80	86	96	106	120	140	160	200
Height	H1	71	77	84	93	100	108	121	133	160	185
	H2	72	34	43.5	52	62	67	79.5	95	110	135
	H3	190	158	175	192	209	222	247	275	317	367
	H4	96	102	109	118	125	133	146	158	185	210
Width	W	98	106	125	135	148	164	189	214	240	290
Outer diameter	ϕ D	49.5	68	87	104	124	134	159	190	220	270
Mass(kg)		2.3	2.6	2.8	3.4	4.5	5.2	6.7	10.0	13.6	22.0

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

Flange
(Meter size 15mm)



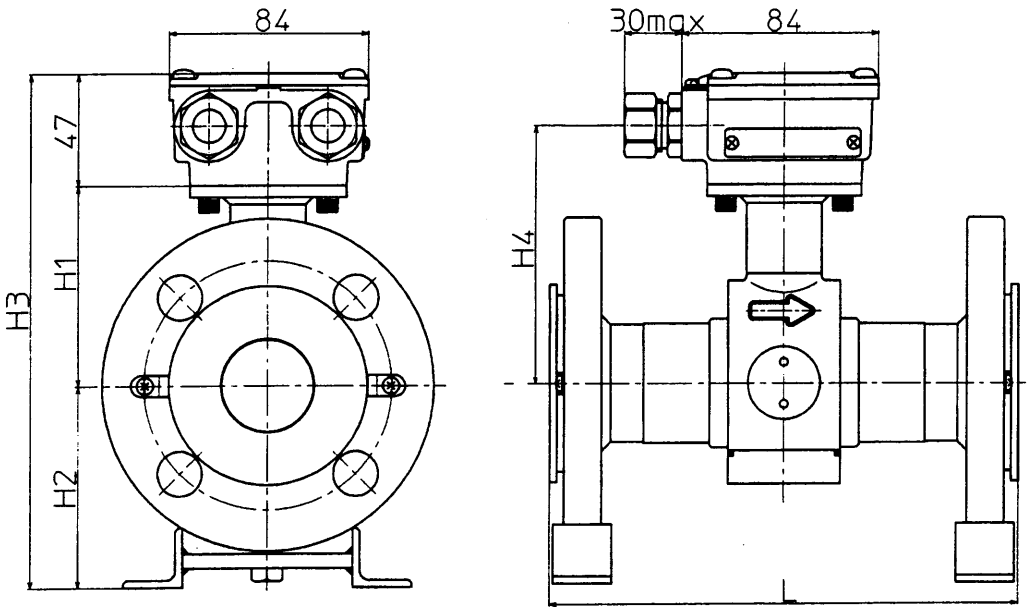
Flange
(Meter size 25mm)



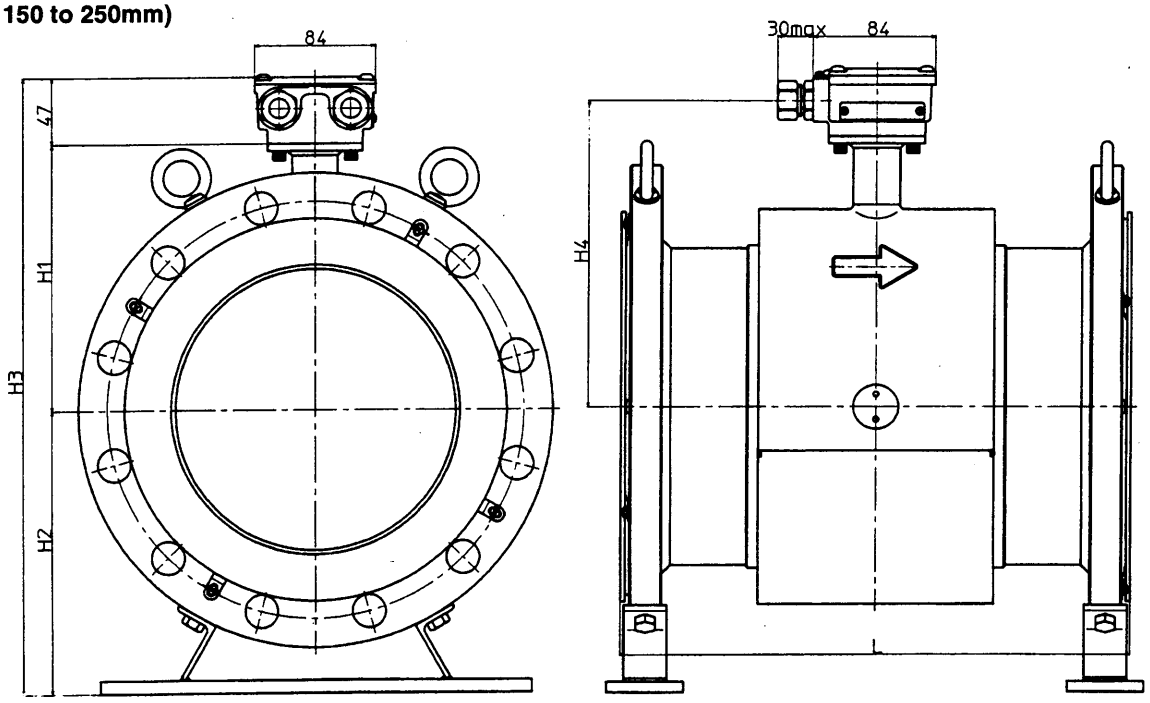
Detector diameter		15	25
Face to face dimension	L	160	200
Height	H1	71	77
	H2	70	63
	H3	188	187
	H4	96	96
Width	W	98	106
Mass(kg)		5.0	5.5

Note: 1) This table is for remote detectors .
2) An integral detector includes an integral converter instead of a terminal box.

Flange
(Meter size 40 to 100mm)



Flange
(Meter size 150 to 250mm)



Detector diameter		40	50	65	80	100	125	150	200	250
Face to face dimension	L	200	200	200	200	250	250	300	350	450
Height	H1	84	93	100	108	121	133	160	185	235
	H2	85	90	102	110	120	143	175	196	221
	H3	216	230	249	265	288	323	365	411	503
	H4	109	118	125	133	146	158	185	210	260
Mass(kg)		6.5	8.5	10.0	12.6	18.4	26.0	32.6	48.0	60.0

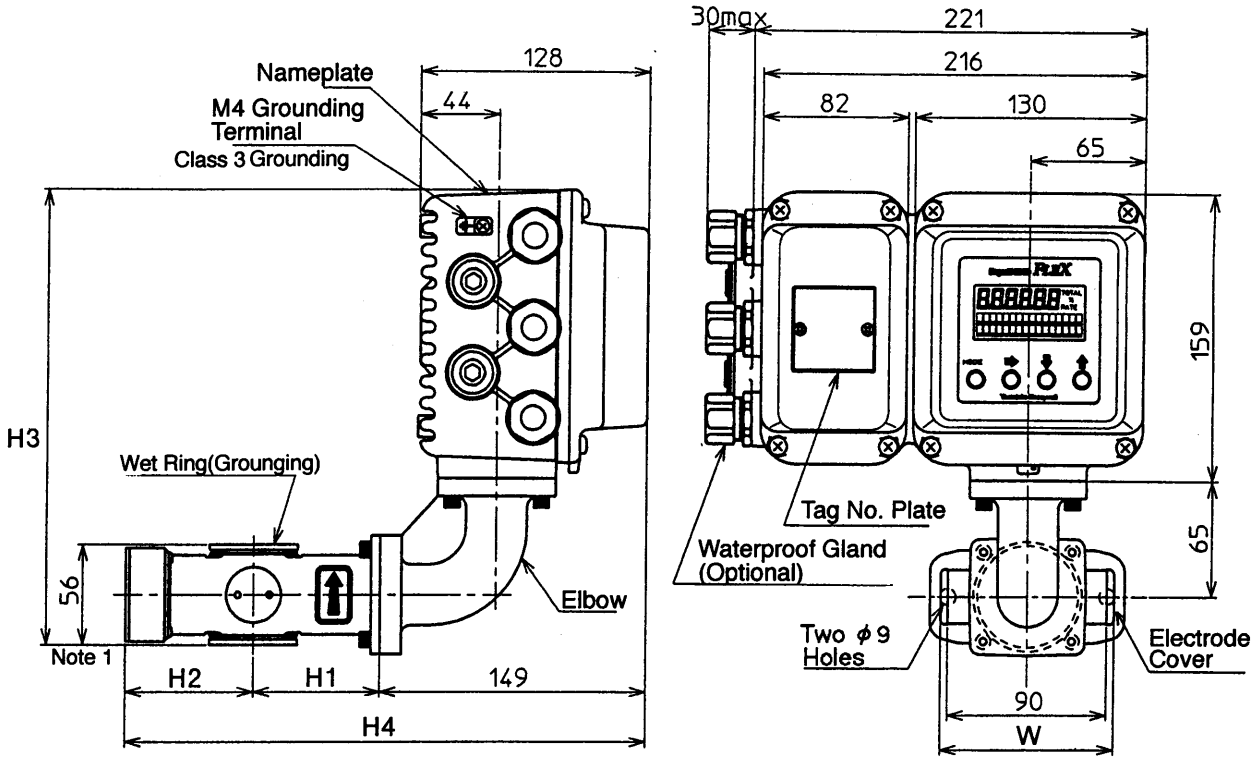
Note: 1) This table is for the remote detector .
2) An integral detector includes an integral converter instead of a terminal box.

〈Detector and Converter〉

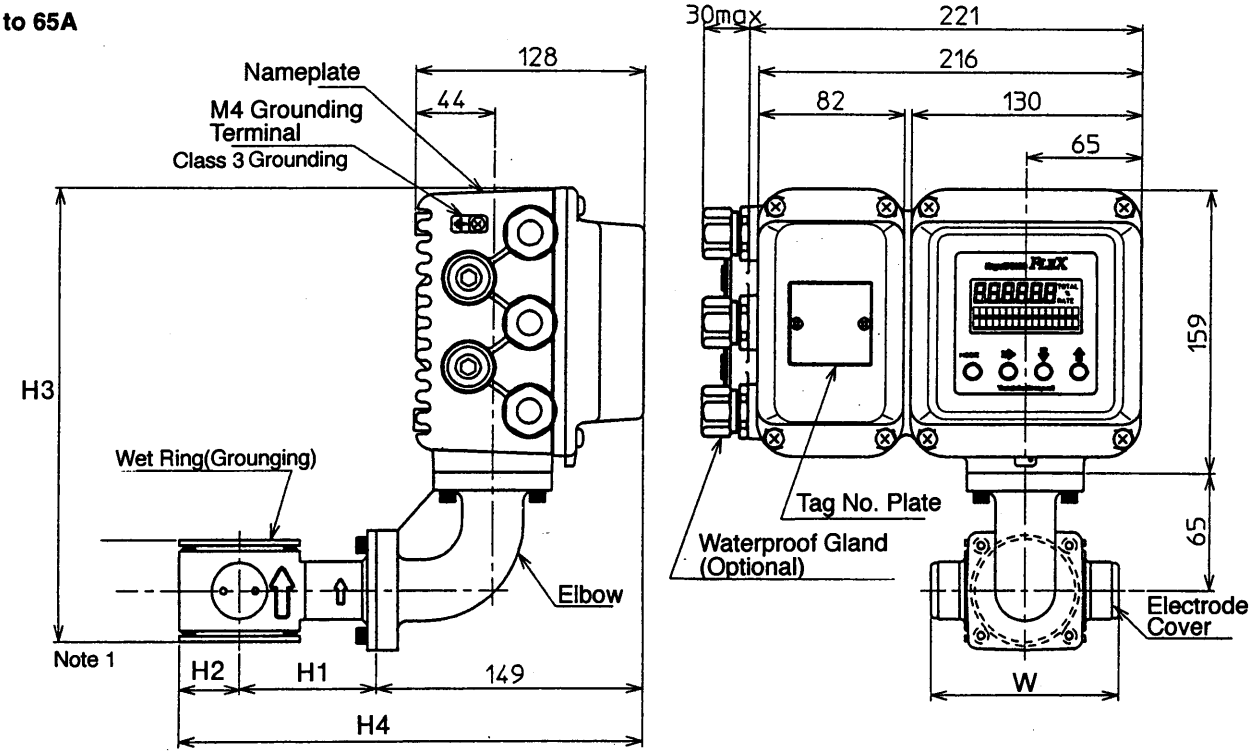
(Unit:mm)

Integral model with elbow (Wager type)

15A



25A to 65A

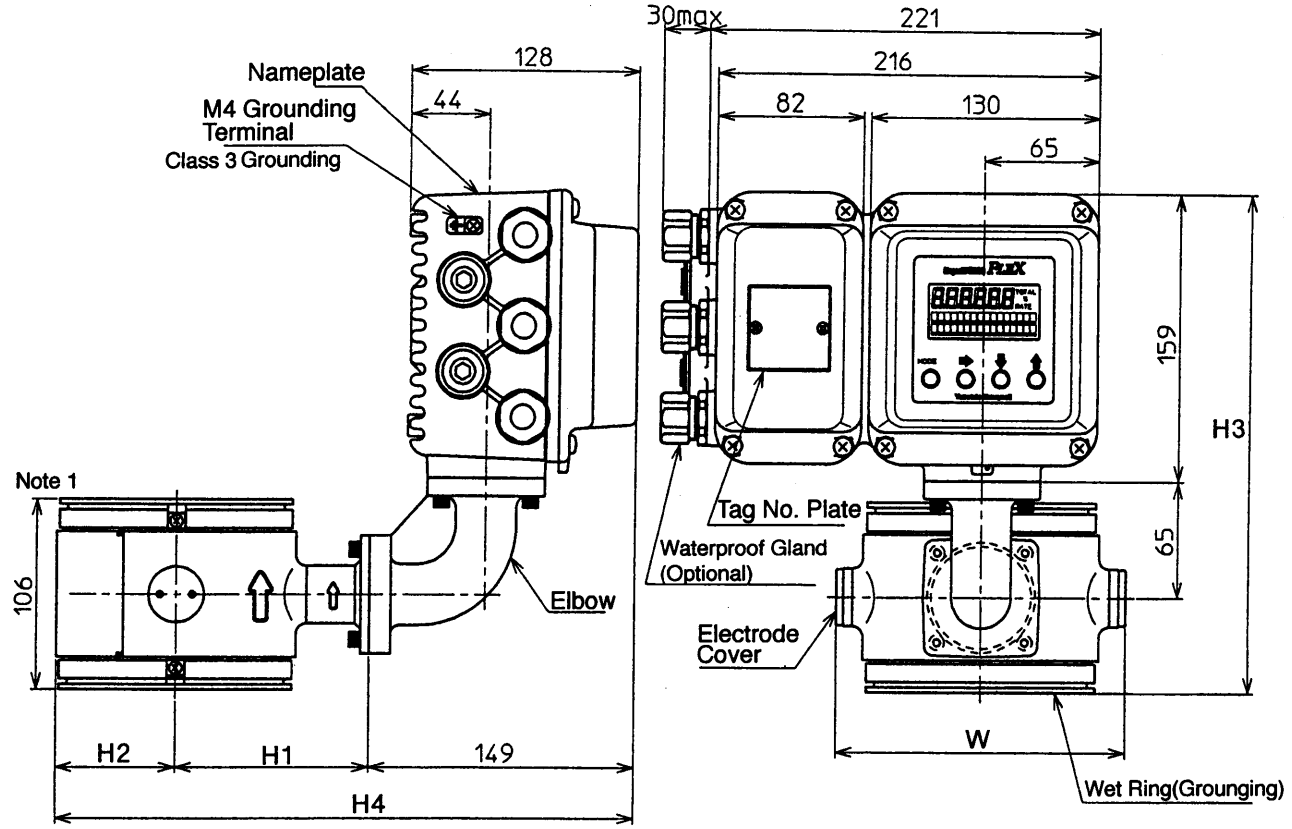


Detector diameter		15	25	40	50	65
Face to face dimension	L	56	56	80	86	96
Height	H1	71	77	84	93	100
	H2	72	34	43.5	52	62
	H3	252	252	264	267	272
	H4	292	260	277	294	311
Width	W	98	106	125	135	148
Mass(kg)		5.3	5.5	5.6	6.2	7.3

Integral model with Elbow (Wager type)

(Unit:mm)

80 to 200A



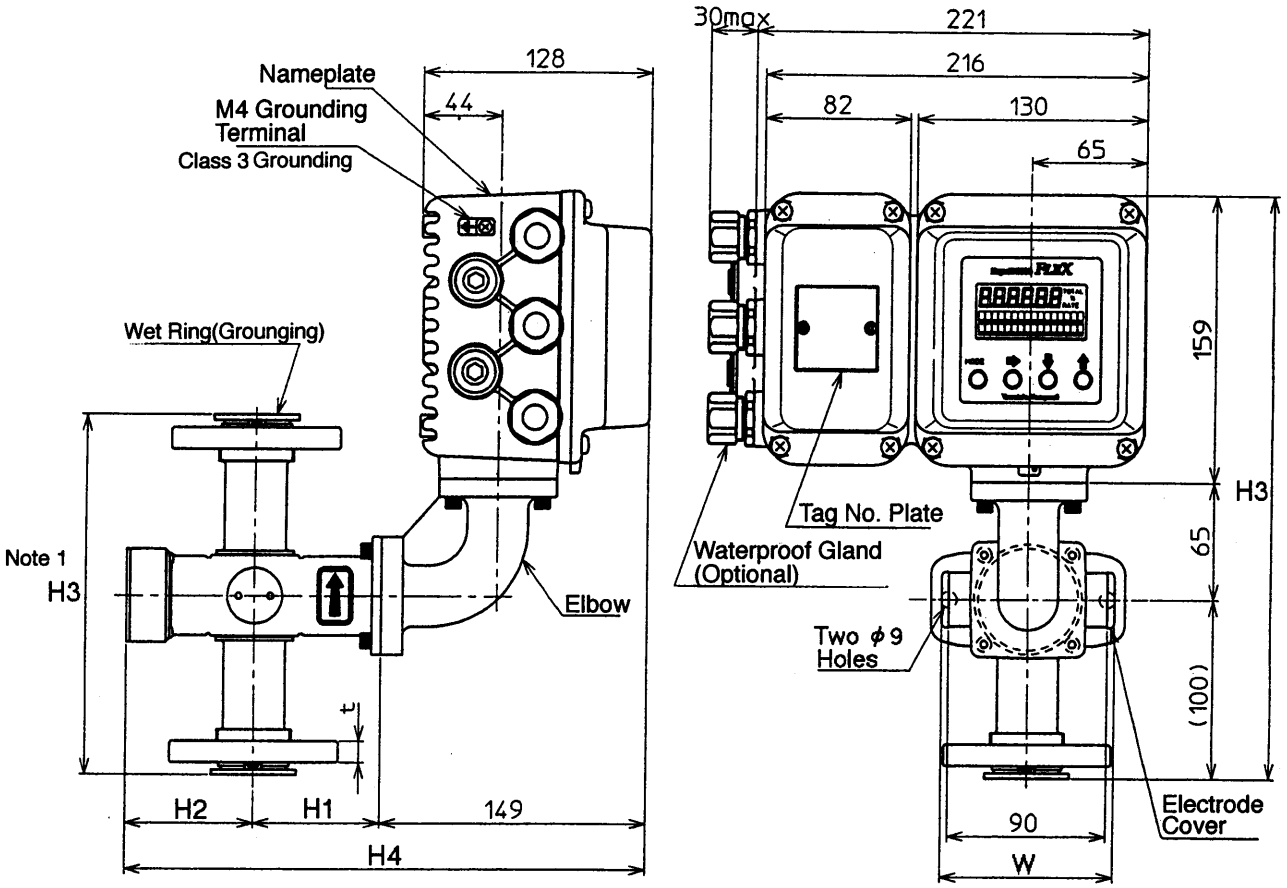
Note 1:
When the wet ring is made of SUS316, a gasket is not used. This dimension of 106mm, therefore, denotes the wet ring dimension only.
When the wet ring is made of any material other than SUS316, the dimension includes Teflon gasket thickness of 3mm.
(When a resin gasket is used, the dimension includes the gasket thickness.)

Detector diameter		80	100	125	150	200
Face to face dimension	L	106	120	140	160	200
Height	H1	108	121	133	160	185
	H2	67	79.5	95	110	135
	H3	277	284	294	304	324
	H4	324	349	377	419	469
Width	W	164	189	214	240	290
Mass(kg)		8.2	10.0	13.4	17.1	28.6

Integral model with elbow (Flange type)

(Unit:mm)

15A



Note 1:
When the wet ring is made of SUS316, a gasket is not used. This dimension of 106mm, therefore, denotes the wet ring dimension only.
When the wet ring is made of any material other than SUS316, the dimension includes Teflon gasket thickness of 3mm.
(When a resin gasket is used, the dimension includes the gasket thickness.)

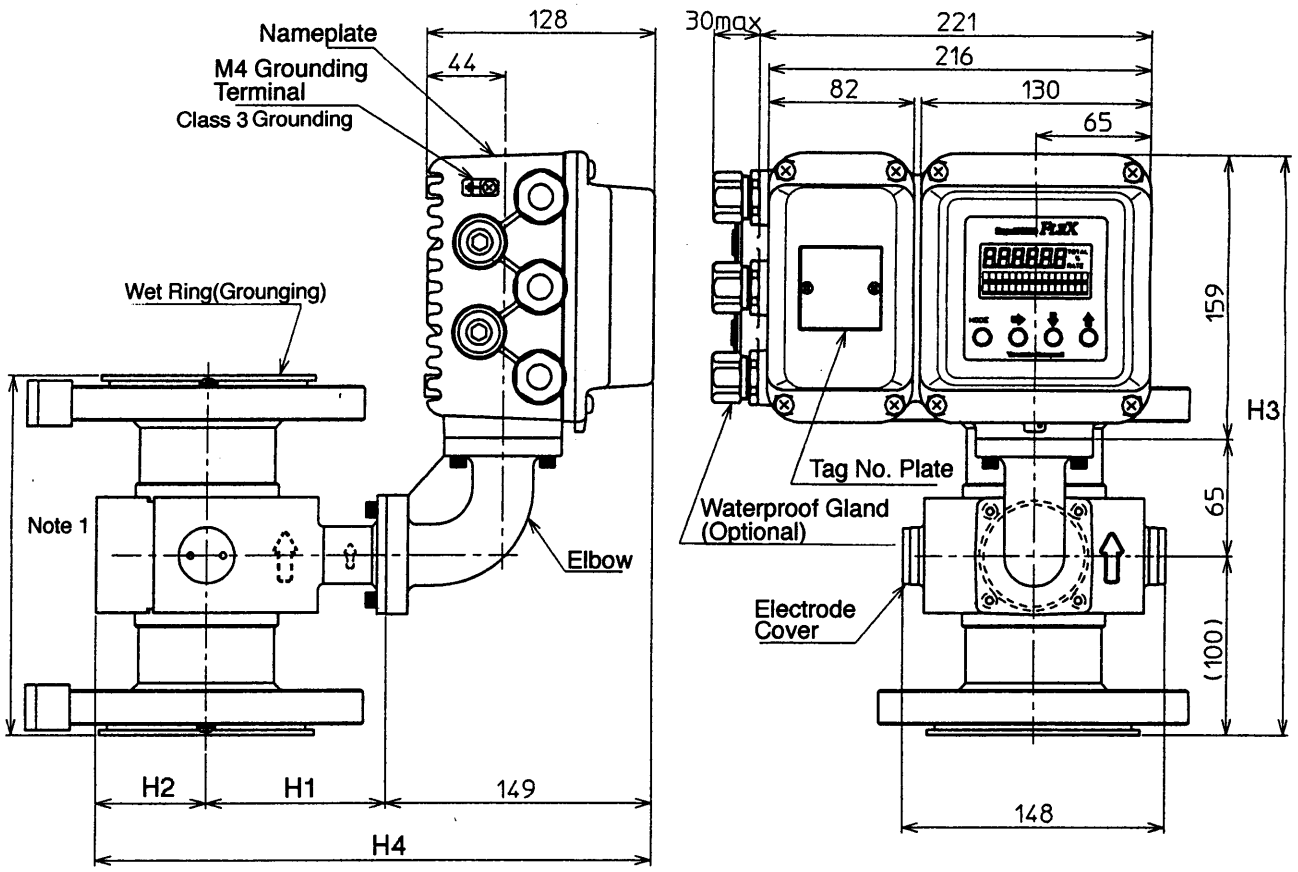
Detector diameter		15
Face to face dimension	L	160
Height	H1	71
	H2	72
	H3	324
	H4	292
Width	W	98
Mass(kg)		8.6

Flanges of JIS10K are used.

Integral model with elbow (Flange type)

(Unit:mm)

25 to 200A



Note 1:
When the wet ring is made of SUS316, a gasket is not used. This dimension of 106mm, therefore, denotes the wet ring dimension only.
When the wet ring is made of any material other than SUS316, the dimension includes Teflon gasket thickness of 3mm.
(When a resin gasket is used, the dimension includes the gasket thickness.)

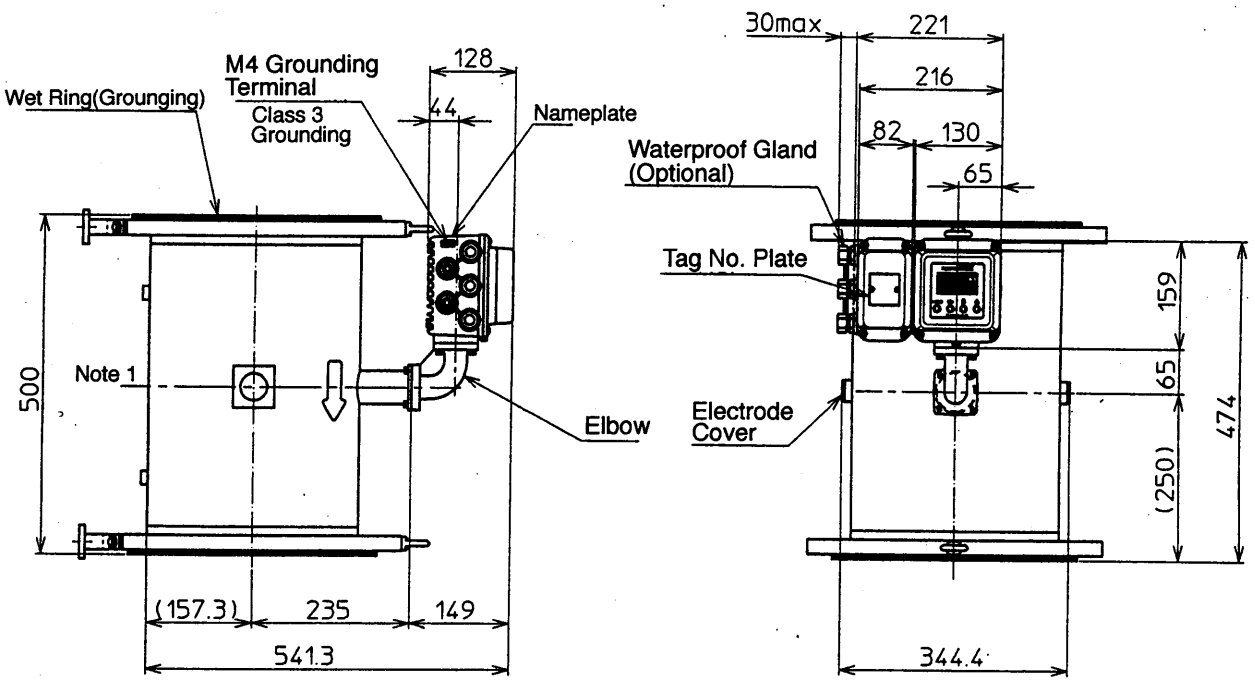
Detector diameter		25	40	50	65	80	100	125	150	200
Face to face dimension	L	200	200	200	200	200	250	250	300	350
Height	H1	77	84	93	100	108	121	133	160	185
	H2	34	43	52	62	66.5	79.5	95	110	135
	H3	324	324	324	324	324	349	349	374	399
	H4	260	276	294	311	324	349	377	419	469
Width	W	106	125	134.97	148	164	189	214	240	290
Mass(kg)		11.0	10.1	13.7	15.7	16.2	22.0	29.6	36.2	51.6

Flanges of JIS10K are used.

Integral model with elbow (Flange type)

(Unit:mm)

250A

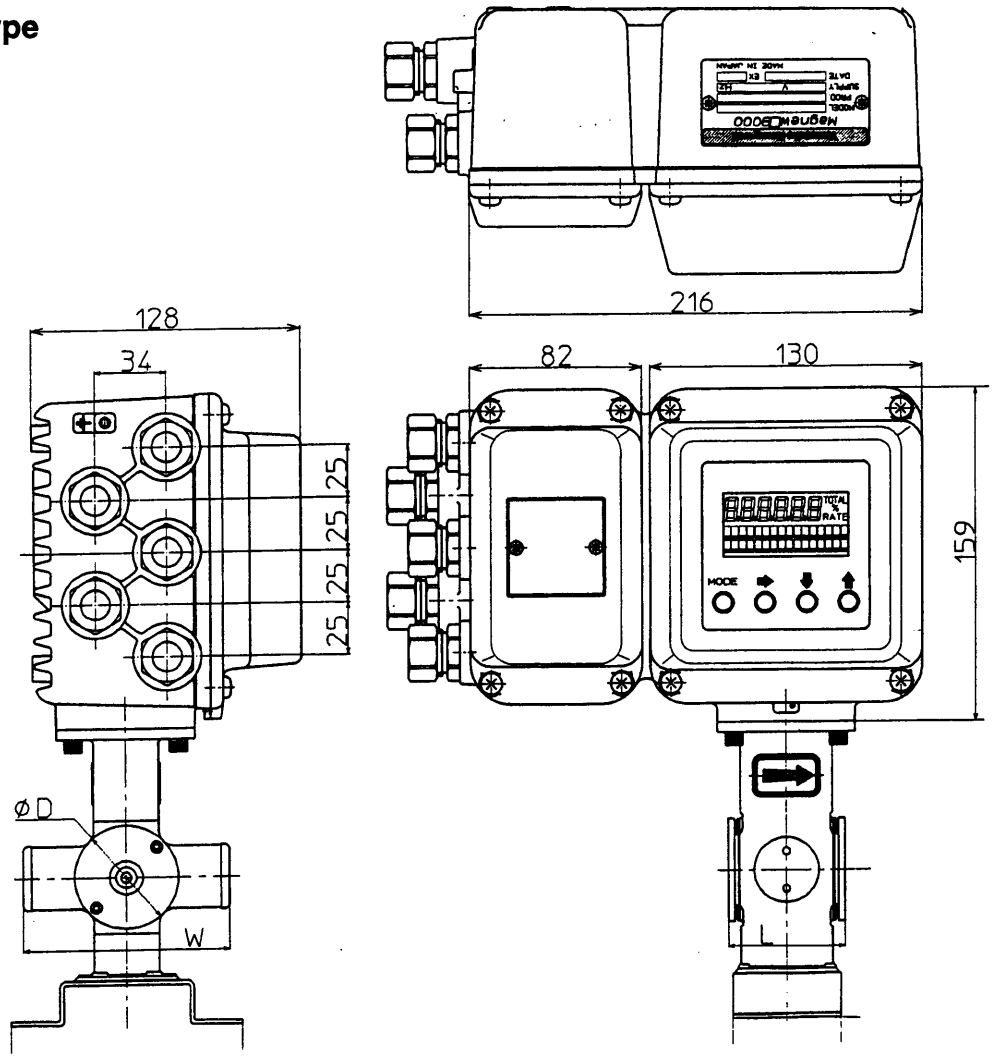


Note 1:
When the wet ring is made of SUS316, a gasket is not used. This dimension of 106mm, therefore, denotes the wet ring dimension only.
When the wet ring is made of any material other than SUS316, the dimension includes Teflon gasket thickness of 3mm.
(When a resin gasket is used, the dimension includes the gasket thickness.)

Detector diameter		250
Face to face dimension	L	500
Height	H1	235
	H2	157.3
	H3	474
	H4	541.3
Width	W	344.4
Mass(kg)		63.0

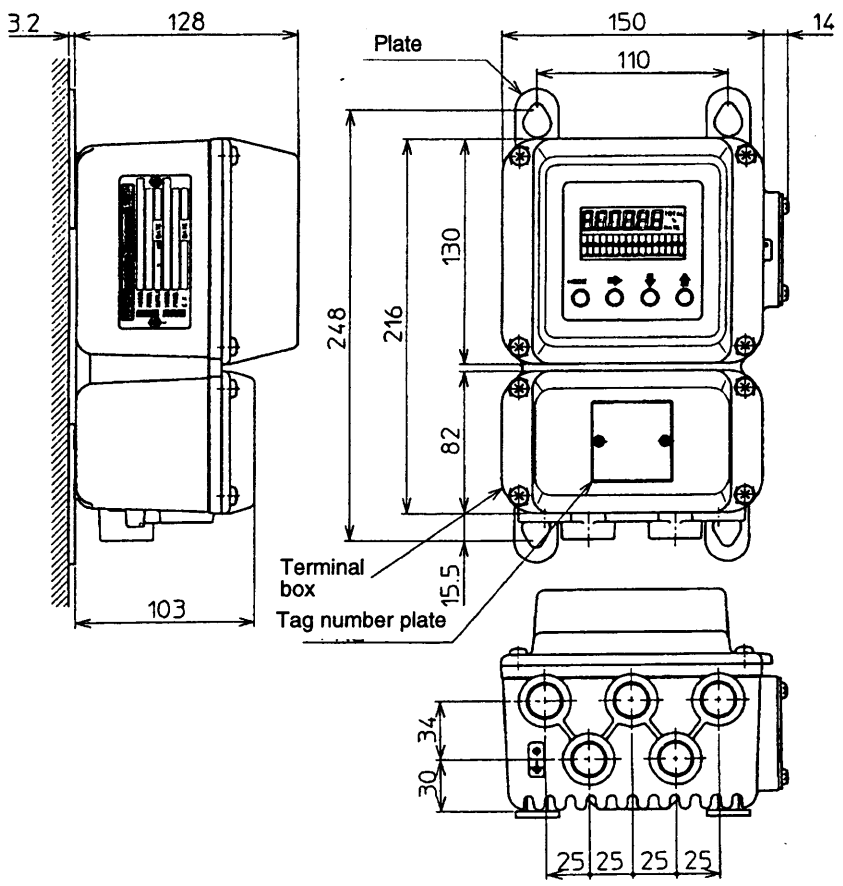
〈Converter〉

Integral Type

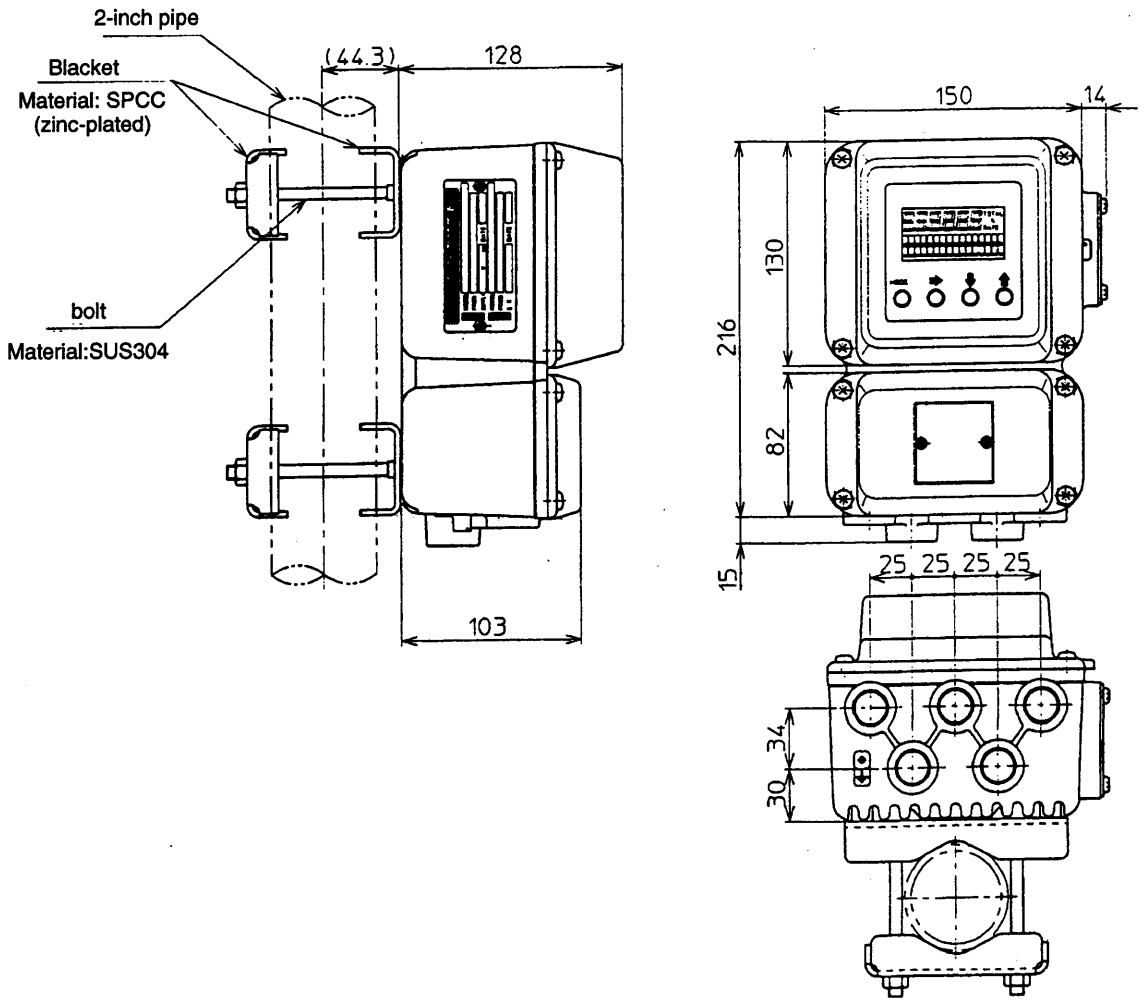


Note: The mass of an integral detector is 100g less than the mass of remote detectors.

Wall mounting



2-inch pipe mounted



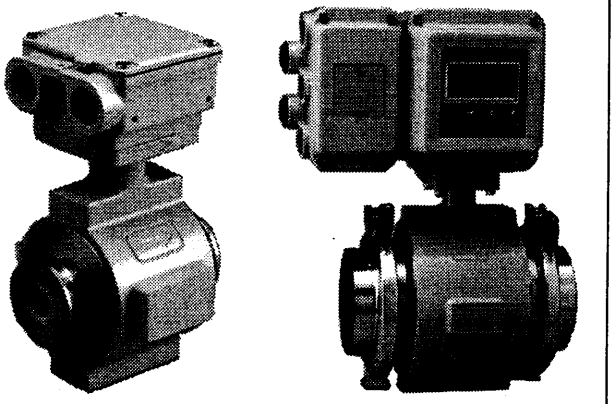
YAMATAKE **Specification**

MagneW 3000 Smart Electromagnetic Flowmeter Sanitary Model KID80 (integral/Remote Models)

Introduction

The MagneW3000 Smart Electromagnetic Flowmeter Sanitary model offers high performance and reliability, backed by Yamatake-Honeywell's long expertise in electromagnetic flowmeter applications.

The MagneW3000 sanitary model features internal electrodes which prevent the build-up of measurement-liquid residue in the detector. The flowmeter is easy to remove for servicing, and its clamp connection conforms to IDF Standards.



(Remote model) (Integral model)

(Diameter 15 to 125mm)

Features

(1) A clamp connector facilitates installation to and removal from piping, making servicing easier.

(2) The MagneW3000 sanitary model has been approved for the measurement of alcoholic beverage flow for taxation purposes. It is also suitable for custody transfer applications.

(3) There are no moving parts, or obstructions to flow, inside the flowmeter, making it suitable for IP cleaning.

(4) Internal electrodes eliminate the build-up of flow-me -dium residue.

(5) Connector sizes from 15 to 125 mm (0.5s - 5s) ensure broad applicability.

(6) The converter for the detector is the MGG10C. A remote model can be used in combination with Yamatake-Honeywell's existing converters. Please contact your Yamatake-Honeywell representative for information.

Applications

Wide range of applications:

Potable water mineral water, soy sauce, miso, jam, beer, juices, sake, milk, yogurt, tea, industrial and waste water.

Detector Specifications (standard)

Equipment specifications

Structure:

KID80: JIS C 0920 water-proof model
NEMA ICS6-110 TYPE4
IEC PUBL 529 IP66

Finish:

KID80: Corrosion-preventive acrylic resin
(Diameter 2.5 to 200mm, terminal box only)

Color:

KID80: Light beige (Munsell 4Y7.2/1.3)

Wetting main body material:

Measuring pipe materials:
SUS304 stainless steel

Case: Aluminum alloy (diameter 15 to 125mm)

Terminal box: Aluminum alloy (remote model)

Material of parts in contact with liquid:

Lining: PFA (diameter: 15 to 125mm)

Electrode: SUS316L, Hastelloy C, Titanium

Ferrule for welding: SUS304, SUS316

Gasket: Silicone rubber(the pass in the food hygiene test)

Structure of electrode:

KID80: Internal insertion
(electrode can not be removed)

Installation specifications

Ambient temperature:

-25 to +60°C (integral model)
-30 to +80°C (remote model, PFA lining)

Ambient humidity : 5 to 100% RH

Cable connection port:

Integral model; Connected 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;
IDF Clamp(models 15 to 125mm in diameter)

Grounding: Category 3
(Grounding resistance: lower than 100 Ω)

Mounting : Horizontally-mounted electrode

Length of straight pipe:

Upstream side;
Five (5) times or longer than the diameter. However, 10 times or longer than the diameter if a diffuser, valve, pump, etc., are installed.

Downstream side;
Not required. However, 2 times or longer than the diameter if influence exists from drift current of such equipment as a valve.

Cable (between remote detector and converter):

Maximum length:	300m (depending on fluid conductivity)
Outer diameter:	10 to 12 mm
Signal cable:	Dedicated cable (11.4mm, 0.75mm² diameter) or equivalent (CVVS, CEEV, etc.)
Excitation cable:	Dedicated cable (10.5mm, 2mm² diameter) or equivalent (CVV and others)

Additional specifications (optional)

Test report:

Test result based on repair of electromagnetic flowmeter for actual flow.

Certification of traceability:

From 3 sources: configuration of measuring management system for electromagnetic flowmeter, repair certification, and test report.

Attaching the tag number on the neck section:

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

Attaching the tag number to the terminal box:

Mark the tag number specified and attach it to the neck section of the detector. The maximum number of characters in the tag number is 16.

Attaching the two spare silicone gaskets:

When changing the gaskets, use these gaskets for IDF clamp.

For additional specifications, please contact your Yamatake-Honeywell representative.

Performance (standard)

Accuracy (in combination with the MGG10C converter)

Table 1

<diameter 15 to 125mm> Upper limit value of Vs=set velocity range

Vs(m/s)	Velocity during measurement≧Vs×20%	Velocity during measurement≦Vs×20%
1.0≦Vs≦10	±0.5% of indicated value	±0.1% of Vs
0.1≦Vs≦1.0	±(0.1/Vs+0.4)% of the indicated value	±0.2(0.1/Vs+0.4)% of Vs

Liquid to be measured/temperature range:

Diameter (mm)	Temperature of the liquid to be measured (℃)	
	Integral model	Remote model
15 to 125	-40 to +120	-40 to +160

Note) Steam sterilization is to 150 (℃)

Measurable electrical conductivity:

Combined with MGG10C converter
3μS/cm or more (consult your Yamatake-Honeywell engineer when conditions are 3μS/cm or less)

Measurement flow range:

Refer to the minimum/maximum set ranges shown in Table 2.

Table 2

Diameter (mm)	Minimum set range(m^3/h) (Minimum constant flow speed of 0 to 0.1m/s)	Maximum set range(m^3/h) (Maximum constant flow speed of 0 to 10m/s)
15	0 to 0.0636	0 to 6.36
25	0 to 0.177	0 to 17.7
40	0 to 0.452	0 to 45.2
50	0 to 0.707	0 to 70.7
80	0 to 1.81	0 to 181
100	0 to 2.83	0 to 283
125	0 to 4.42	0 to 442

Measurement flow velocity range: 0m/s to 10m/s

Measurement pressure range:

-0.098 to +0.098Mpa {-1 to +10kgf/cm^2}

MagneW3000 Sanitary model (IDF clamp detector 15~125mm)

Basic Model No. KID80A –

Selections

Diameter	15mm (0.5S)	015	
	25mm (1S)	025	
	40mm (1.5S)	040	
	50mm (2S)	050	
	80mm (3S)	080	
	100mm (4S)	100	
	125mm (5S)	125	
Lining	PFA		P
Pipe connection	IDF clamp		C1
Electrodes	SUS316L		L
	Hastelloy C		C
	Titanium		K
Ferrule for welding	SUS304		E
	SUS316		S
Wiring connection/ Watertight gland	Integral model		1
Installation/ Wiring direction	Integral model		H
Calibration/Approval	Standard calibration		A

Optional selections

X	Finish	Standard finish

Options

X	No option
A	Test report
B	Certification of traceability
K	Attaching the TAG number plate to the terminal box (remote)
L	Attaching the TAG number plate to the neck section
V	Attaching the two spare silicone gaskets

MagneW3000 Sanitary model (IDF clamp detector 15~125mm)

Basic Model No.			Selections									Optional selections	Options
KID80B	–										–		–

Diameter	15mm	(0.5S)	015						
	25mm	(1S)	025						
	40mm	(1.5S)	040						
	50mm	(2S)	050						
	80mm	(3S)	080						
	100mm	(4S)	100						
	125mm	(5S)	125						
Lining	PFA			P					
Pipe connection	IDF clamp				C1				
Electrodes	SUS316L					L			
	Hastelloy C					C			
	Titanium					K			
Ferrule for welding	SUS304						E		
	SUS316						S		
Wiring connection/ Watertight gland	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							5	
	CM20 internal thread/Without watertight gland							6	
	Pg13.5 internal thread/Without watertight gland							7	
Installation/ Wiring direction	Remote model	Upstream side							A
		Downstream side							B
		Horizontal piping mounting/Left side viewed from upstream							C
		Horizontal piping mounting/Right side viewed from upstream							D
Calibration/Approval	Standard calibration								A

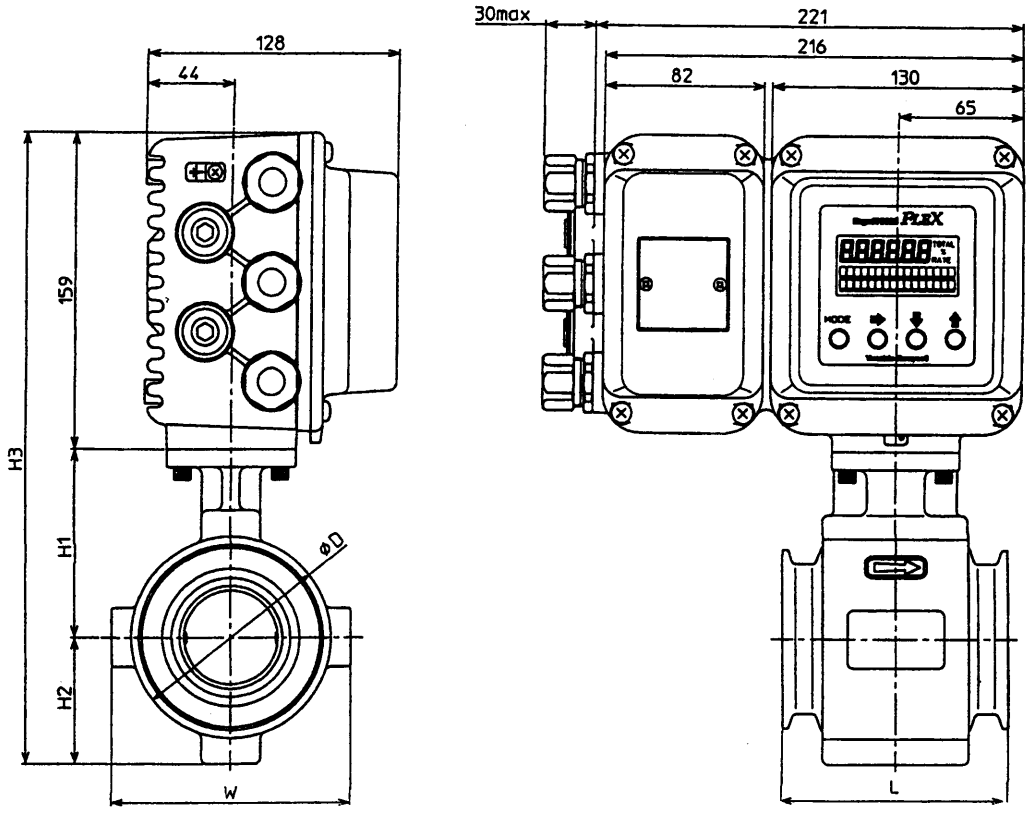
X	Finish	Standard finish

X	No option
A	Test report
B	Certification of traceability
K	Attaching the TAG number plate to the terminal box (remote)
L	Attaching the TAG number plate to the neck section
V	Attaching the two spare silicone gaskets

Dimension and terminal connection drawings

(Unit: mm)

KID80A



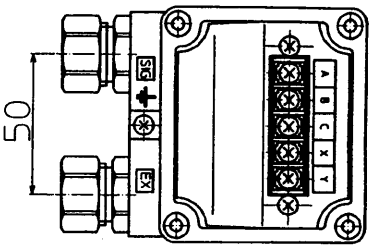
Detector diameter		15	25	40	50	80	100	125
Face to face dimension	L	193	169	169	175	197	211	328
Height	H1	88	88	88	95	109	121	146
	H2	55	55	55	64	78	90	120
	H3	302	302	302	318	346	370	425
Width	W	104	104	104	114	144	168	222
Outer diameter	ϕ D	86	86	86	102	132	156	216
Mass(kg)		6.2	6.2	6.2	6.8	9.5	10.1	21.8

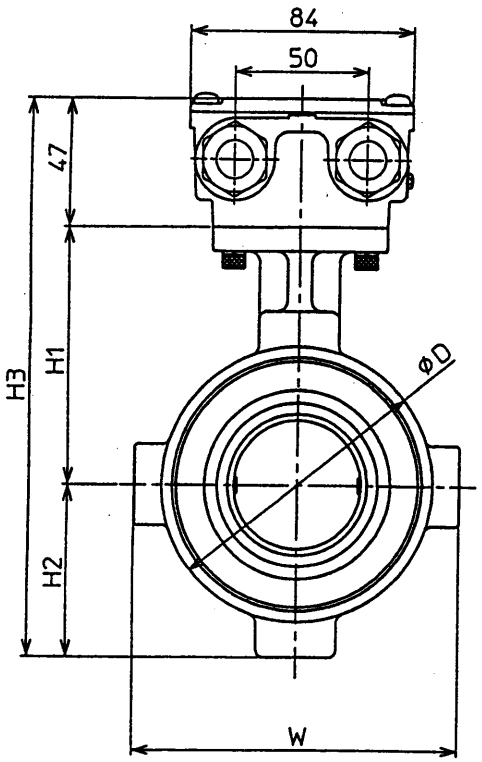
(Unit:mm)

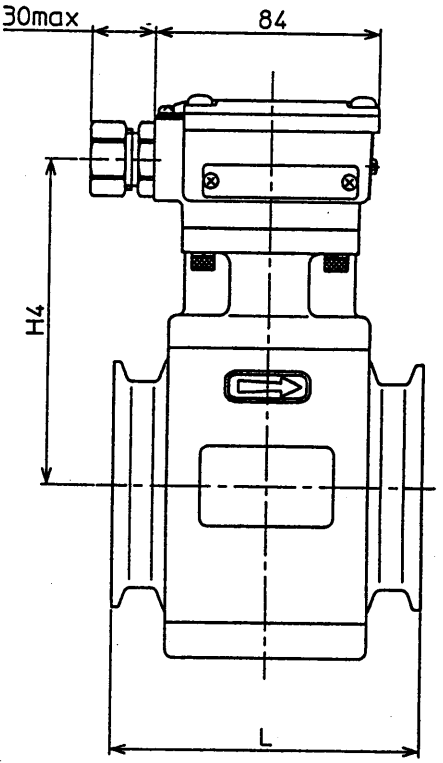
KID80B

Terminal connection table

Symbol	Description
X	Excitation current input
Y	
A	Flow rate signal output
B	
C	







Detector diameter		15	25	40	50	80	100	125
Face to face dimension	L	193	169	169	175	197	211	328
Height	H1	88	88	88	95	109	121	146
	H2	55	55	55	64	78	90	120
	H3	190	190	190	206	234	258	313
	H4	113	113	113	120	134	146	171
Width	W	104	104	104	114	144	168	222
Outer diameter	ϕ D	86	86	86	102	132	156	216
Mass(kg)		2.6	2.8	2.8	3.4	6.1	6.7	18.4

YAMATAKE **Specification**

MagneW 3000
Electromagnetic Flowmeter Detector (Remote Type)
Model KID20B (Sanitary model)

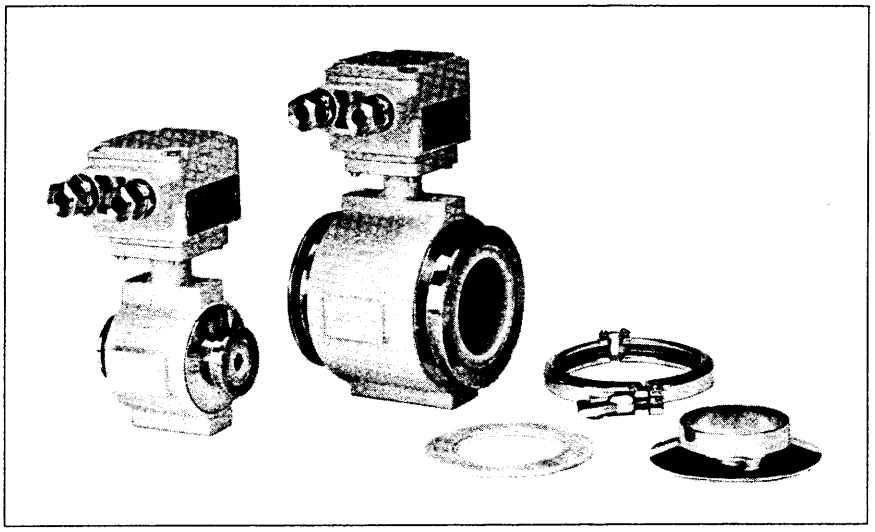
Introduction

The MagneW3000 Electromagnetic Flowmeters are extremely compact and light, and can lay claim to being a new generation instrument. They render high measuring accuracy and stability. Model KID20B sanitary-type detector, a key component of the flowmeter, is designed to fully satisfy applications requiring high-level sanitary standards in dairy, fermentation, and other industries.

Features

The features of electromagnetic flowmeters in general (quoted from JIS Z 8764) are as follows:

1) Volumetric measurement of a liquid flow can be done without being influenced by changes in temperature, pressure, density, or viscosity of the liquid being measured.
2) Measurement is not affected by conductivity change, provided that conductivity is above a minimum level. Therefore, irrespective of the type of liquid measured, calibration can be done with the actual flow of water at normal temperature.
3) Liquids which contain solid suspensions can also be measured.
4) Pressure loss caused by measurement is practically zero.
5) The output signal is linearly proportional to the actual flow, starting from zero flow.
6) Only a short length of straight pipe is required at the upstream side of the detector as compared with those required by other types of flowmeters.
7) Structure without moving parts assures fast response.



Features of the MagneW3000 Sanitary Model Detector

The outstanding features of the MagneW3000 Sanitary Type Detectors are as follows:

1) The MagneW3000 employs a square wave excitation system, thereby providing excellent zero-point stability and eliminating zero-point shift that could be caused by stain of electrodes.
2) The practical measuring range accuracy is ±0.5% of rate.
3) The detectors are extremely compact and light, and provide a very high magnetizing efficiency — all products of their design which employs a Finite Element Method magnetic field analysis (concentrated magnetic field system).
4) Adopted for piping connection are IDF clamps highly facile for mounting or demounting.
5) The compact and light detectors are very convenient for installation and maintenance.
6) Pipe interior structure is completely free from moving mechanical parts or other items that obstruct liquid flow, thus being ideal for CIP washing applications.
7) The MagneW3000 is available either in an integral type or remote type. Conversion between the two is possible.
8) The lining is made of PFA and embedded with an integral punched plate structure (patent No. 129514), making the MagneW3000 highly resistant to sharp changes in heat, stream, and vacuum pressures.

Measurable Liquids

Any liquids, provided that their electrical conductivity is 3μS/cm or higher, can be measured irrespective of their properties or states (viscosity, temperature, pressure, or slurry).

Water:	Tap water, mineral water
Foods:	Beer, milk, juice, sauce, wine
Viscous liquids:	Jam, yogurt

Instrument Specifications

Item	Specifications
Size (Diameter)	15 (0.5"S), 25 (1"S), 40 (1.5"S), 50 (2"S), 80 (3"S), 100 (4"S) mm
Materials	Case: Aluminum alloy Lining (Noncolored): PFA Electrodes (Internal insertion type): SUS316L
Case structure	Equivalent to NEMA4, IEC IP66, JIS C 0920 water-proof type
Finish	Acryl baked finish (Corrosion-resistant finish)
Finish color	Light beige (Munsell 4Y7.2/1.3)
Pipe connection parts	Welded type ferrule: SUS304 (#400 mirror surface finish for wet-part) Clamp band: IDF standard Gasket: Silicone rubber (Product that satisfactorily passed foods sanitation tests)

Installation Specifications

Ambient temperature	-30 to +80°C
Ambient humidity	10 to 90% RH
Pipe connection	IDF clamp
Cable connection	G½, CM20, ½NPT internal thread
Cables **(Between detector and converter)**	Signal cable: 2-core individually double-shielded cable (Yamatake-Honeywell standard KIW 0.75mm^2, outside dia. 11.4mm), or equivalent cable (CVVS, CEEV, etc.) Cable for excitation current: Chloroprene cabtire cable 2RNCT, JIS C 3327 (2mm^2, outside dia. 11.4mm) or equivalent cable (vinyl-sheathed cable CVV JIS C 3401, etc.)
Cable length	Up to 300 meters (Cable length is limited by detector size and electrical conductivity of measured liquid. For details, refer to specification sheet for the dedicated cables for MagneW SS2-5662-0100.)
Mounting angle	The two electrodes to be in mutually horizontal position
Ground	JIS Class 3 ground (Ground resistance not greater than 100 ohms)

Fluid Specifications

Fluid temperature	-40 to +160°C (Up to +150°C for steam disinfection)
Fluid pressure	-1 to +10kgf/cm^{2}G {-0.098 to +0.98 MPa}
Flow velocity ranges	0 - 0.1m/s to 0 - 10m/s (as combination with KIX or MGG10C/14C converter)
Electrical conductivity of fluid	3μS/cm or over

Performance Specification

Accuracy	±0.5% of rate (For more information, refer to the spec. sheets of the converter)

Flow Conversion Table

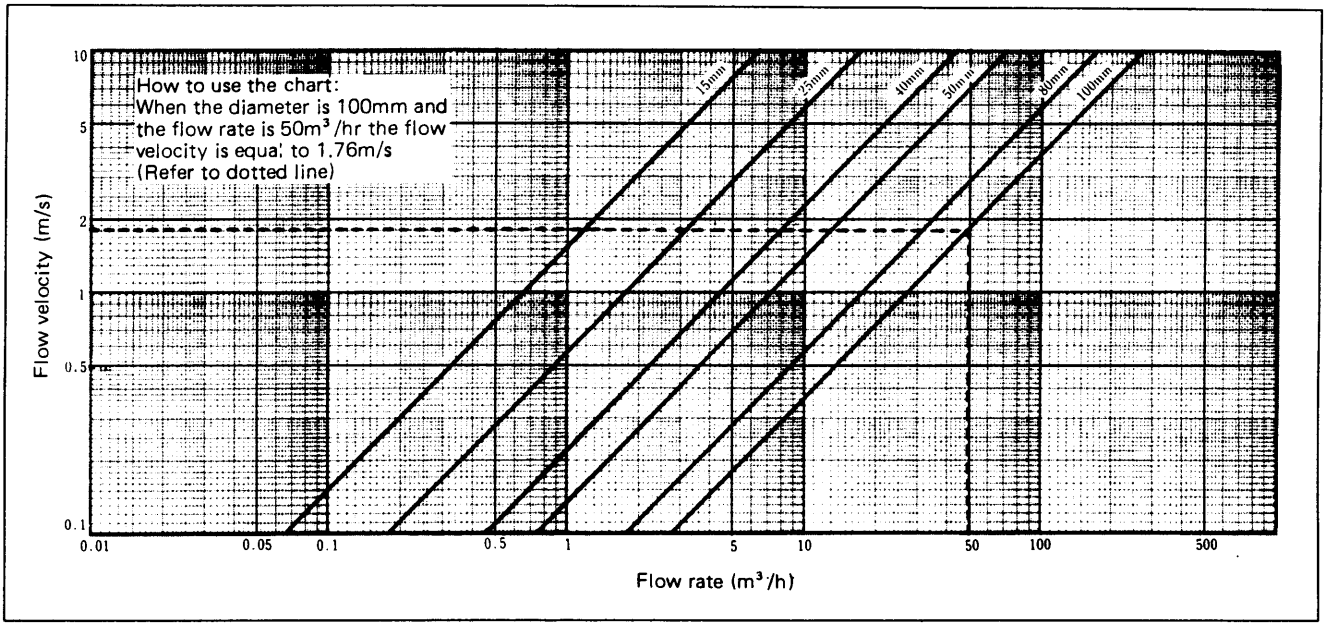
$V = K \times Q$ [V: Flow velocity (m/s); Q: Flow rate (m^3/h)

K: Flow conversion factor $\frac{1}{3600} \times \frac{4}{\pi D^2}$]

Example: When size is 50mm and flow rate is $20m^3/h$
$V = 0.1415 \times 20 = 2.830$ [m/s]

Size (mm)	Flow conversion factor K	Flow span (m^3/h) Q	Flow velocity (m/s) V
15 (0.5"S)	1.572	0.0636 to 6.36	0.1 to 10
25 (1"S)	0.5659	0.177 to 17.7	
40 (1.5"S)	0.2210	0.452 to 45.2	
50 (2"S)	0.1415	0.707 to 70.7	
80 (3"S)	0.05526	1.81 to 181.0	
100 (4"S)	0.03537	2.83 to 283.0	

Maximum Flow Velocity Conversion Chart



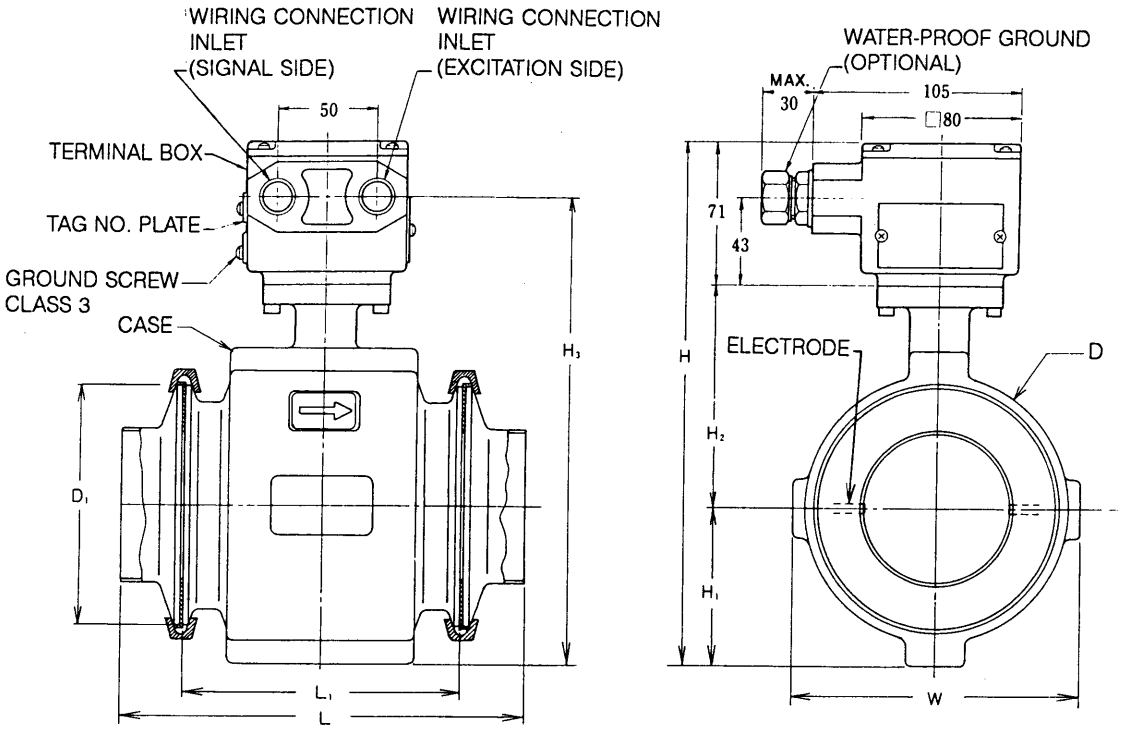
Model Number Table

Ex: KID20B-0050PL51XV-1

Basic Model No.	Selections							Description	
	Size	Lining	Electrode	Piping Connection	Grounding Ring	Conduit Connection	Additional Specifications		
	I	II	III	IV	V	VI	VII		
KID 20B								Sanitary model detector	
	-0015							15mm (0.5"S)	
	-0025							25mm (1"S)	
	-0040							40mm (1.5"S)	
	-0050							50mm (2"S)	
	-0080							80mm (3"S)	
	-0100							100mm (4"S)	
		P						Teflon PFA	
			L					SUS316L	
				51				IDF clamp	
					X			None	
						V		G ½ internal thread	
						W		CM20 internal thread	Type with water-tight gland cannot be selected.
						Y		½NPT internal thread	
							-X	None	
							-1	SUS304 water-tight gland	
							-2	Plastic water-tight gland	

Dimension Drawing

(Unit: mm)



Size (Diameter)		15 (0.5"S)	25 (1"S)	40 (1.5"S)	50 (2"S)	80 (3"S)	100 (4"S)
Face-to-face	L	193	169	169	175	197	211
	L_1	110	110	110	116	138	197
Height	H	214	214	214	230	258	282
	H_1	55	55	55	64	78	90
	H_2	88	88	88	95	109	121
	H_3	186	186	186	202	230	254
Case width	W	104	104	104	114	144	168
Case OD	D	86	86	86	102	132	156
	D_1	50.5	77.5	77.5	91	119	130
Weight (kg)		3.7	4.5	4.4	5.4	8.4	9.2

Note: The above dimensions are applicable to unit body only (welded type ferrule, clamp band, and gasket are excluded).

YAMATAKE **Specification**

MagneW 3000
Electromagnetic Flowmeter (Integral Type)
Model KID20A/KIX20A (Sanitary Model)

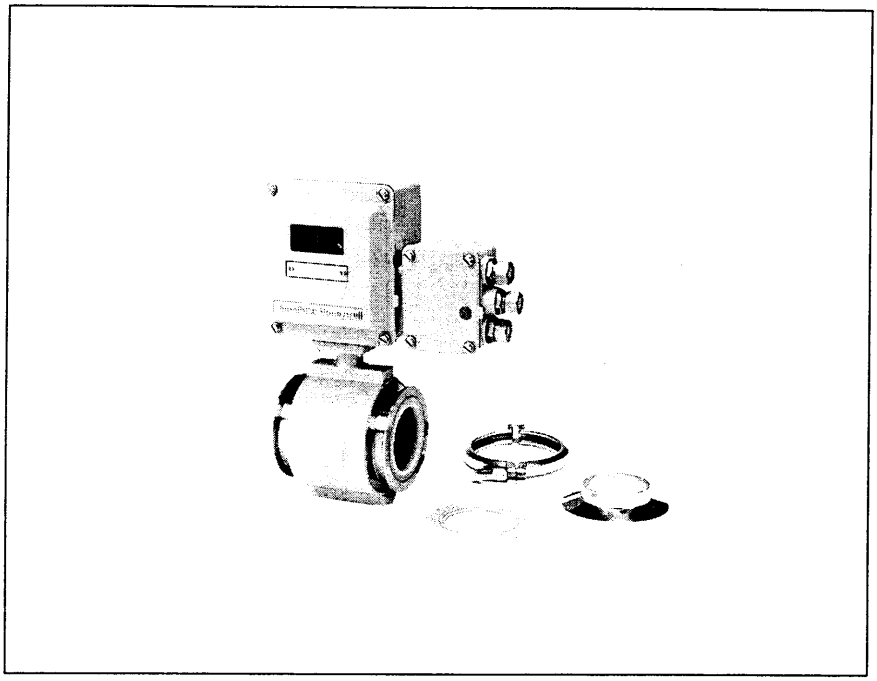
Introduction

The MagneW3000, incorporating a microprocessor, is an integral-type electromagnetic flowmeter which has remote communication capability. This remote communication is effected by the Smart Communicator (S-SFC) Models KID20A/KIX20A are electromagnetic flowmeters designed to fully satisfy applications requiring high-level sanitary standards in dairy, fermentation and other industries.

Features

The outstanding features of the MagneW3000 are as follows:

1) By using Smart Communicator (S-SFC), communications are possible including calibration, setting, or self-diagnoses remotely.
2) Stabilized measurement can be realized for various fluid noise through application of digital signal processing technique on auto spike cut or others.
3) The MagneW3000 employs a square-wave excitation system, thereby providing excellent zero-point stability and eliminating zero-point shift that could be caused by stain of electrodes.
4) The accuracy is ±0.5% of rate.
5) No adjustments are required. Can be operated at the instant the power is turned on.
6) Easily detachable IDF clamps are adopted for conduit connection.
7) Conduit interior structure is completely free from moving mechanical parts or other items that obstruct liquid flow, thus being ideal for CIP washing applications.
8) The detectors are extremely compact and light, and provide a very high magnetizing efficiency-all products of their design which employs a Finite Element Method magnetic field analysis (concentrated magnetic field system).
9) The lining is made of PFA and embedded with an integral punched plates structure (patent No. 129514), making the MagneW3000 highly resistant to sharp changes in heat, steam, and vacuum pressures.



Measurable Liquids

Any liquids, provided that their electrical conductivity is 3μS/cm or higher, can be measured irrespective of their properties or states (viscosity, temperature, pressure, or slurry).

Water:	Tap or mineral water
Foods:	Beer, milk, juice, sauce, and liquor
Viscous liquids:	Jam, paste, and yogurt

Functions

Ranging functions
- Single range
- Automatic-switching dual range
- External-switching dual range
- Direct/reverse automatic-switching range
- Direct/reverse external-switching range

Built-in totalizer functions
- Totalizer
- Totalizer with presetting
- Direct/reverse differential flow rate integration

Contact input functions
- External 0% lock
- External automatic zero adjusting
- Built-in totalizer resetting
- External range switching

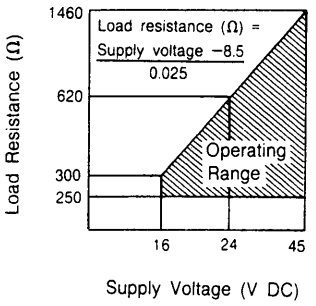
Contact output functions
- Alarm (flow rate alarm, self-diagnosis, empty-status detection)
- Range switching
- Preset counter

Flow rate display functions
- %
- Engineering unit (m^3/h, *l*/min, cc/min, or others)
- Totalizer

Lightning arresting functions

Built-in lightning arrestors (12kV, 1,000A) at each terminal for power supply, excitation, analog output, pulse output, and contact input/output.

Instrument Specifications

Item	Specifications
Size (Diameter)	15(0.5"S), 25(1"S), 40(1.5"S), 50(2"S), 80(3"S), 100(4"S)mm
Power requirements	100, 110, 120V AC±10%, 50Hz or 60Hz±2Hz 200, 220, 240V AC±10%, 50Hz or 60Hz±2Hz 24V DC±10%
External power supply for SFC communication	Refer to the figure. (Load resistance of 250 ohms minimum is required to enable communications with SFC. When SFC communication function is not used, external power supply is not required. In this case, load resistance of current output is 0 to 600 ohms.) 
Power consumption	14W (22VA including detector and converter)
Input signal	Flow rate signal: Flow rate proportionate signal from detector Contact input: Any one point of the following signals among semiconductor contacts or no-voltage contacts. • 0% signal lock signal • Automatic zero adjust signal • Direct/reverse flow direction switching signal • Dual range switching signal • Totalizer preset signal
Output signal	Excitation current: Output to detector excitation coil Current output: 4 to 20mA DC Contact output: Any one point among the following under open collector external load of 30V DC max. 200mA max. (in case of resistance load) • Upper/lower limit alarm, self-diagnosis alarm, empty-status detection • Direct/reverse flow direction discrimination • Dural range discrimination • Totalizer preset status Pulse output: • Open-collector output 0 to 2,000Hz, pulse widths 0.3, 0.5, 1, 7, 10, 15, 30, 50, 100ms External load 30V DC max., 200mA max. • Electromagnetic totalizer 0 to 20Hz, pulse widths 30, 50, 100ms External load 24V DC, 210ohms • Mercury relay 0 to 20Hz, pulse widths 30, 50, 100ms External load 30V DC max., 300mA max.
Display	Display card: 7-segments LED, 6 digits Local setting card: LED, 7 segment LED, 6 digits, 16 digits / 2 lines Instant flow rate percentage display: % Instant actual flow rate display: Cubic-volumetric units; m^3, *l*, cc, B (barrel), KG (kilogallon), G (gallon), mG (milligallon) Time units; day, hour, min., sec. Scaled pulse integration display: m^3/p, *l*/p, cc/p, B/p, KG/p, G/p, mG/p.
Setting method	Local setting card: 5 key-switches Remote setting by S-SFC
Flow velocity range	0 – 0.1m/s to 0 – 10m/s
Damping time constant	0, 0.5, 1, 2, 3, 4, 5, 10, 50, 100 sec.
Dropout	2 to 10% FS of pulse output (variable integers)
Low flow cutoff	0 to 10% FS of current output (variable integers)

Structure

Item		Specifications
Materials		Detector Case: Aluminium alloy Lining (unpainted): PFA Electrodes (integral insertion type): SUS316L Converter Case: Aluminium alloy
Case	**Structure**	JIS C0920 Water-proof type NEMA4 and IEC IP66 equivalent
	Finish	Detector: Baked acryl paint (corrosion-resistant finish) Converter: Acryl paint
	Finish color	Light beige (Munsell 4Y7.2/1.3)
Conduit connection parts		Welding-use ferrule material: SUS304 (#400 mirror surface finish for wetted parts) Clamp band: IDF standard product Gasket material: Silicone rubber (Product that satisfactorily passed foods sanitation tests)

Installation Specifications

Ambient temperature	–10 to +50°C
Relative humidity	10 to 90% RH
Installation	IDF clamp
Electrical conduit connection	G$^1/_2$, CM20, $^1/_2$NPT internal thread
Mounting angle	The two electrodes to be in mutually horizontal position
Ground	JIS Class 3 ground (Ground resistance not greater than 100 ohms)

Liquid Flow Specifications

Liquid flow temperature	–40 to +120°C (to +120°C also for steam disinfection)
Liquid flow pressure	–1 to +10kgf/cm^{2}G {–0.098 to +0.98MPa}
Flow velocity ranges	0 – 0.1m/s to 0 – 10m/s
Electrical conductivity of liquid	3 μS/cm

Performance Specification

	Span (Vs)	Flow rate ≧ 25%	Flow rate ≦ 25%
Accuracy (Reference operating conditions)	Vs=1.0 to 10m/s	±0.5% of rate	±0.125% FS
	Vs=0.1 to less than 1.0m/s	$\pm\left(\frac{0.1}{Vs}+0.4\right)$% of rate	$\pm\frac{1}{4}\left(\frac{0.1}{Vs}+0.4\right)$% FS

Semi-standard Specification

Corrosion-resistant finish (Y 138A, B)	Corrosion-resistant finish (Y138A): Baked acryl finish Corrosion-proof finish (Y138B): Baked epoxy finish

Flow Conversion Table

V = K x Q [V: Flow velocity (m/s); Q: Flow rate (m^3/h)

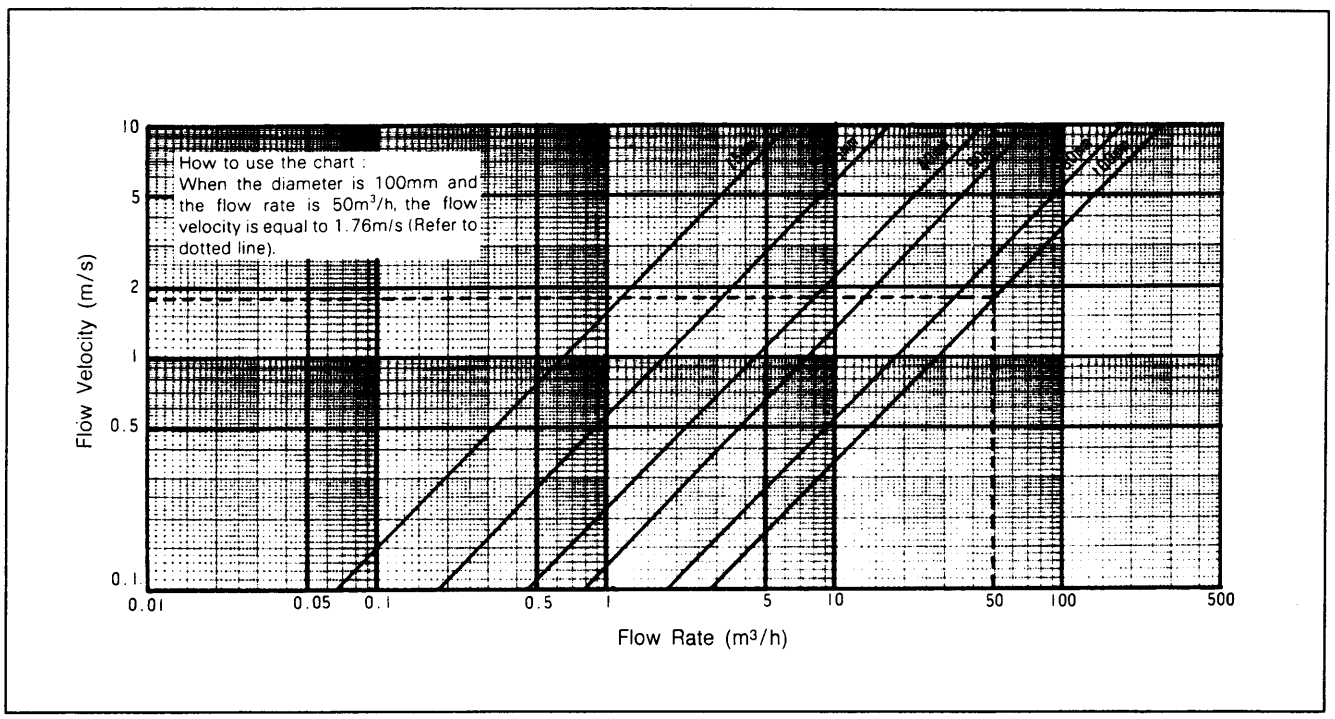
K: Flow conversion factor $\frac{1}{3600} \times \frac{4}{\pi D^2}$]

Example: When size is 50mm and flow rate is 20m^3/h

V = 0.1415 x 20 = 2.830 [m/s]

Size (mm)	Flow conversion factor K	Flow span (m^3/h) Q	Flow velocity (m/s) V
15 (0.5"S)	1.572	0.0636 to	0.1 to 10
25 (1"S)	0.5659	0.171 to 17.7	
40 (1.5"S)	0.2210	0.452 to 45.2	
50 (2"S)	0.1415	0.707 to 70.7	
80 (3"S)	0.05526	1.81 to 181	
100 (4"S)	0.03537	2.83 to 283	

Maximum Flow Velocity Conversion Chart



Model Number Table

Detector

Ex: KID20A-0025PL51XX-X

Basic Model No.	Selections							Description
	Flowmeter Size	Lining	Electrodes	Piping connection	Ground Ring	Conduit Connection	Option	
	I	II	III	IV	V	VI	VII	
KID 20A								Integral type detector
	- 0015							15mm (0.5"S)
	- 0025							25mm (1"S)
	- 0040							40mm (1.5"S)
	- 0050							50mm (2"S)
	- 0080							80mm (3"S)
	- 0100							100mm (4"S)
		P						PFA
			L					SUS316L
				51				IDF clamp
					X			None
						X		None
							- X	None

Converter

Ex: KIX20A-A12X2XV-XXX
KIX20A-A1102XV-XSF2A31

Basic Model No.	Selections							Options			Description	
		Output Signal										
	Power Supply	Analog	Display	Pulse	Terminal Box / Lightning Arrester	Installation	Conduit Connection	Water-tight Galnd	Communication	Function Designation		
	I	II	III	IV	V	VI	VII	VIII	IX	X		
KIX 20A											Integral type converter	
	- A										100V AC, 50Hz or 60 Hz	
	- C										110V AC, 50Hz or 60 Hz	
	- E										120V AC, 50Hz or 60 Hz	
	- G										200V AC, 50Hz or 60 Hz	
	- I										220V AC, 50Hz or 60 Hz	
	- K										240V AC, 50Hz or 60 Hz	
	- M										24V DC	
		1									4 to 20 mA DC	
			X								w/o display card	(Note 1)
			1								w/ display card	(Note 1)
			2								w/ local setting card	
				X							None	
				O							Open-collector pulse output	
				P							Electromagnetic totalizer drive pulse output	
				Q							Mercury relay contact pulse output (Note 2)	
					2						Terminal box and lightning arrestor provided	
						X					Integral type	
							V				$G^1/_2$ internal thread	
							W				CM20 internal thread	Water-tight gland is not available
							Y				$^1/_2$ NPT internal thread	Water-tight gland is not available
								- X			Without water-tight gland	
								- 1			With brass (plating Ni) water-tight gland	
								- 2			With plastic water-tight gland	
									X		Communication function not provided	
									S		Communication by S-SFC	
										X	None (Note 3)	
										F□□□□	Provided (used according to function designation table)	

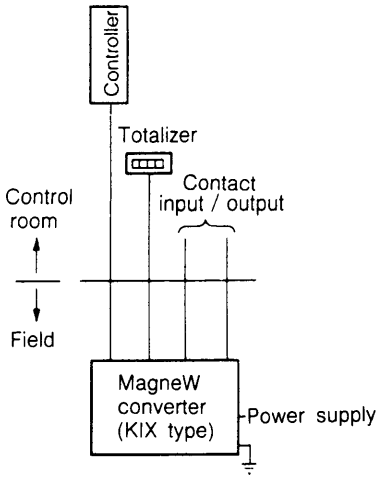
Notes:
1) Effect data setting or changes under communication mode by S-SFC.
2) This output cannot be selected when the converter is installed for vertical conduit.
3) Function types (default value)
   - Ranging function → Single range
   - Built-in totalizer → Not provided
   - Contact input function → Not provided
   - Contact output function → Not provided

   F0XXX: When pulse card is not provided.
   F0AXX: When pulse card is provided.

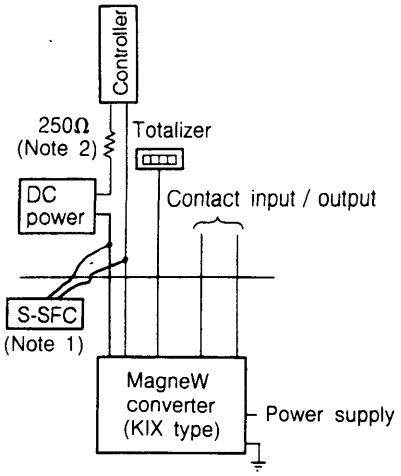
Configuration of MagneW3000

KIX-type MagneW converter, mounted with a microprocessor, can conduct remote setting of various parameters by external communications with S-SFC.

1) No communication function provided



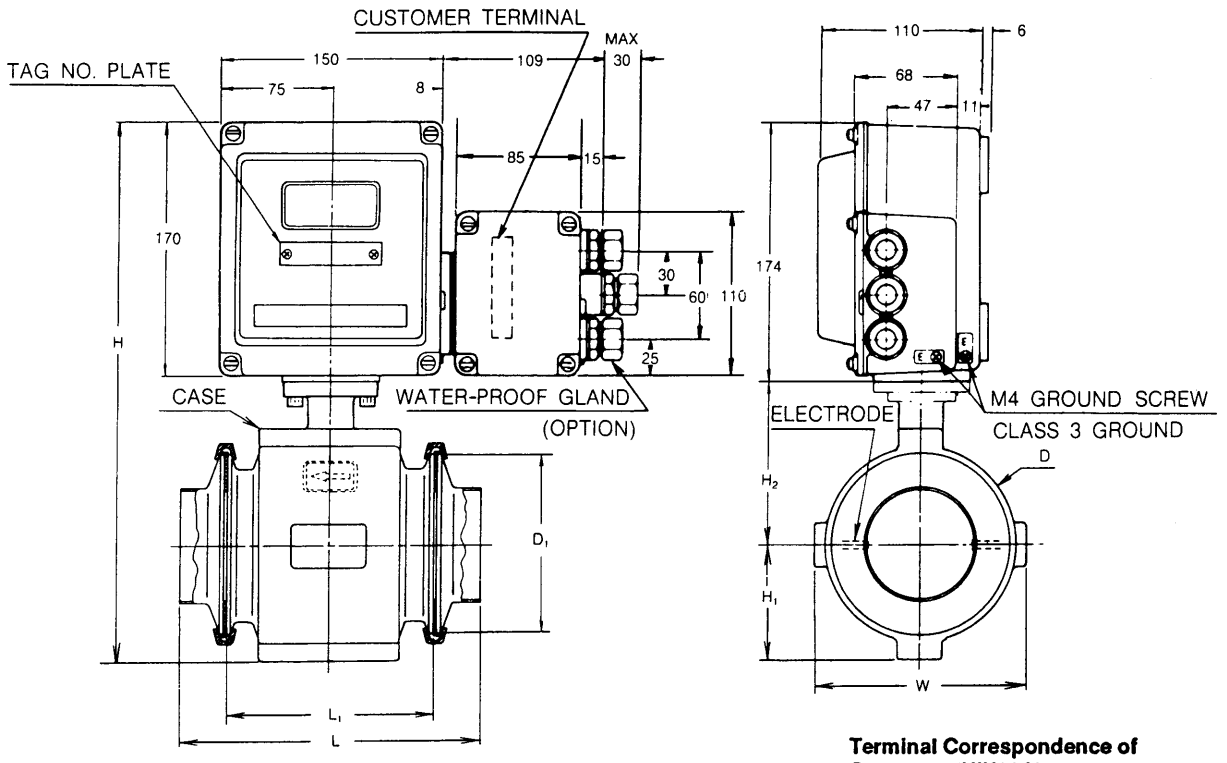
2) Communication by S-SFC



Notes 1) Under configuration of "communication by S-SFC," DC power supply for loop and resistance of over 250 ohms are required on the current output line.
2) Wire connection of S-SFC is effected only when communications are made.

Dimension Drawings

(Unit: mm)



Size (Diameter)		15(0.5"S)	25(1"S)	40(1.5"S)	50(2"S)	80(3"S)	100(4"S)
Face-to-face	L	193	169	169	175	197	211
	L_1	110	110	110	116	138	197
Height	H	317	317	317	333	361	385
	H_1	55	55	55	64	78	90
	H_2	88	88	88	95	109	121
Case width	Q	104	104	104	114	144	168
Case CD	D	86	86	86	102	132	156
	D_1	77.5	77.5	77.5	91	119	130
Weight (kg)		5.6	5.6	6.4	6.3	10.3	11.1

Terminal Correspondence of Converter (KIX20A)

Mark	Description
I +	Current output +
I –	Current output –
P+	Pulse output +
P–	Pulse output –
STATUS OUT +	Contact output
STATUS OUT –	
STATUS IN +	Contact input
STATUS IN –	

H (+)	Power supply
N (–)	
E	Case earth

Ordering Information

When ordering, please specify:

1) Model number
2) Conduit of fluid being measured.
   • Name of fluid • Temperature range • Pressure range • Conductivity
3) For span
   • Flow velocity m/s or Flow rate m^3/h
4) For pulse output
   • Pulse width and weight

Document Number :	CM2-MGG100-2001
Document Name :	MagneW 3000 FLEX / MagneW 3000 Smart Electromagnetic Flowmeter General Type Detector MGG11,MGG12,MGF,KID80/20 Models User's Manual
Date :	July., 1998 Rev.3
Issued / Edited by :	Yamatake Corporation

YAMATAKE

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