

# MagneW 3000 FLEX

## Smart Electromagnetic Flowmeter Detector (TIIS Explosion-protected Apparatus) MGG15 (Remote type )

### Introduction

The MagneW 3000 FLEX electromagnetic flowmeter detector is a high performance, highly reliable flowmeter developed with Azbil Corporation's proven MagneW 3000 flow measurement technologies. The model MGG15 for TIIS Explosion-proof offers superior process flowrate measurement, combined with MagneW 3000 FLEX converters.

### Special features

- (1) Maximum measurable process fluid temperature is 125°C.
- (2) Provided with a built in zener barrier
- (3) Ex de [ia] II CT4 approved explosion-proof structure.
- (4) High performance lining
  - Azbil Corporation's unique lining technology enables special mirror finish PFA lining which offers superior anti-adhesion lining surface and realizes longer cycle between maintenance.
  - The PFA lining is particularly applicable for the measurement of sticky pulp and gypsum slurries.
  - Pure white PFA with no additives forms new linings.
  - The embedded punch plate offers proven performance under conditions such as frequent thermal change and negative pressure.
- (5) Flexible face-to-face dimension (optional)
  - This detector can be use to replace the detector interfaces of our existing models and those of other manufacturers. Please consult an Azbil Corp. representative for details.
- (6) All-welded stainless steel construction
  - Corrosion-resistant all-welded stainless steel flowtube minimizes frequency of replacement.
- (7) A wide variety of piping connections
  - Remote type model MGG15 detectors can be combined with Azbil Corporation's conventional converters (model MG[ ], KIX, KIC). Please consult an Azbil Corp. representative for details.



### Table of a pass number in explosion-proof official examination

Nominal size(mm)	MGG15D/15F
2.5 - 15	TC15518
25	TC15519
40	TC15520
50	TC15521
65	TC15522
80	TC15523
100	TC15524
125	TC15525
150	TC15526
200	TC15527
250	TC15528
300	TC15529

## **Wide variety of applications**

### **Petroleum/petrochemical/chemicals:**

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

### **Electric power:**

Corrosive liquids, cooling water, industrial water, waste-water, etc.

### **Gas:**

Circulating water for air conditioning, etc.

## **Detector Specifications (standard)**

### **Equipment specifications**

#### **Structure:**

Explosion-proof structure; Ex de[ia] IICT4

#### **Finish:**

Corrosion-preventive acrylic resin  
(model, diameter 2.5 to 200mm, terminal box only)

Corrosion-preventive polyurethane resin  
(diameter 250 to 300mm, terminal box and case)

#### **Color:**

**Light beige (Munsell 4Y7.2/1.3)**

#### **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 300mm)

##### **Case:**

SCS13 stainless steel  
(diameter 2.5 to 15mm)

SUS304 stainless steel  
(diameter 25 to 200mm)

SS400 carbon steel  
(diameter 250 to 300mm)

##### **Terminal box:**

Aluminum alloy (remote model)

#### **Process wetted materials:**

**Lining:** PFA (diameter: 2.5 to 300mm)

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

##### **Ground ring:**

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

**Gasket:** PTFE

(if the grounding ring is not made of SUS316)

#### **Structure of electrode:**

External insertion  
(electrode can be removed)

#### **Ship classification:**

Approved by NK (Nippon Kaiji Kyokai)

Approval No.: 11A008

*Note: The MGG15D/15F cannot be installed on the bridge or deck of the ship.*

*In the case of a remote model, the cables between the converter and detector must be covered with a flexible metal conduit.*

## **Installation specifications**

### **Ambient temperature:**

-10 to +50°C

### **Ambient humidity :**

5 to 100% RH

### **Cable connection port:**

G1/2 (PF1/2) internal thread

### **Pipe connection:**

Wafer (models 2.5 to 200mm in diameter)

Flange (models 2.5 to 300mm 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 (diameter 80 to 200mm)

JIS10K, JIS20K, JPI150, JPI300,  
ANSI150, ANSI300, DIN PN10,  
DIN PN16, DIN PN25 (diameter 250 to 300mm)

### **Flange standards:**

JIS: **JIS B 2210 (1984)**  
ANSI: ANSI B 16.5 (1988)  
(Diameter 2.5 to 200mm)  
ANSI B 16.5 (1981)  
(Diameter 250 to 300mm)  
JPI: JPI-7S-15-93

**Grounding:** Grounding resistance: lower than 100Ω

**Mounting :** Horizontally-mounted electrode

### **Straight pipe length:**

#### **Upstream side;**

A minimum five straight pipe diameters.

A minimum 10 straight pipe diameter is required if a diffuser/valve/pump is installed.

#### **Downstream side;**

Two straight pipe diameters is recommended.

### **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, 0.75mm<sup>2</sup> diameter) or equivalent  
(CVVS, CEEV, etc.)

#### **Excitation cable:**

Dedicated cable (10.5mm, 2mm<sup>2</sup> diameter)  
or equivalent (CVV and others)

## **Additional specifications (optional)**

### **Certification of traceability:**

The following three documents are included.

Traceability system chart

Traceability certificate

Test report

### **Material certificate:**

Material certificate for electrode/grounding.

### **Water free treatment:**

Condensation is removed from wetted surfaces.

### **Oil free treatment:**

When removed from wetted surfaces.

### **Gasket for resin pipe (for general use):**

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

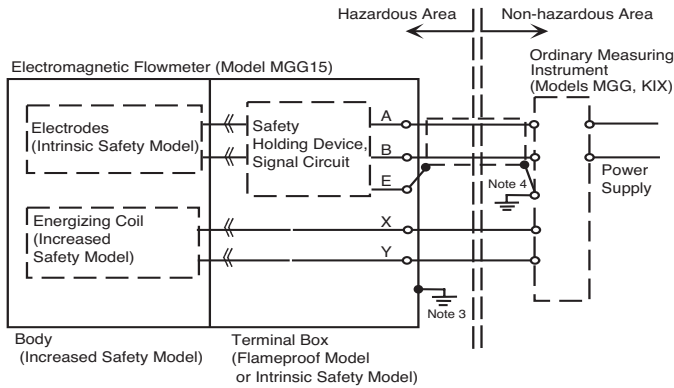
### **Attaching the tag number to the terminal box:**

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

For additional specifications, please contact an Azbil Corp. representative.

## Installation for Nonincendive model

This flowmeter is of flameproof structure and exhibits the specified explosion-proof capability only when it is used strictly in accordance with the following installation specifications:



Note 1. Neither input power supply voltage to ground, nor voltage inside the ordinary measuring instruments should exceed 250V ac (50/60 Hz) or 250V dc during normal or abnormal operation.

The energizing voltage should not exceed 45V dc, and the energizing current should not exceed 200mA.

- Ambient temperature for the flowmeter should be 50°C.
- Category D Grounding should be employed.
- Category A Grounding should be employed.

## Performance (standard)

### Accuracy (in combination with the MGG10C/MGG14C converter)

Table 1

Diameter 2.5 to 15mm		Upper limit value f Vs= set velocity range	
Vs(m/s)	Velocity during measurement > Vs x 40 %	Velocity during measurement < Vs x 40 %	
1.0 < Vs < 10	±0.5% of indicated value	±0.2% of indicated value	
0.1 < Vs < 1.0	±(0.1/Vs+0.4%) of indicated value	±0.4(0.1/Vs+0.4%) of indicated value	

Diameter 25 to 300mm		Upper limit value f Vs= set velocity range	
Vs(m/s)	Velocity during measurement > Vs x 20 %	Velocity during measurement < Vs x 20 %	
1.0 < Vs < 10	±0.5% of indicated value	±0.1% of indicated value	
0.1 < Vs < 1.0	±(0.1/Vs+0.4%) of indicated value	±0.2(0.1/Vs+0.4%) of indicated value	

### Liquid to be measured/temperature range:

#### PFA lining

Diameter (mm)	Temperature of the liquid to be measured (°C)	
	Remote model	
2.5 to 10	-40 to +100	
15 to 200	-40 to +160	
250 to 400	-40 to +120	

### Measurable electrical conductivity:

Combined with MGG10C or MGG14C converter  
3μS/cm or more

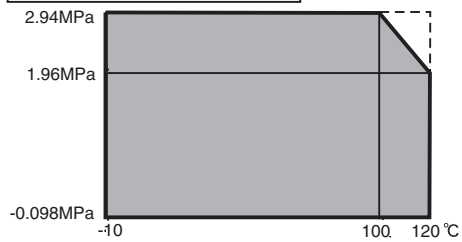
### Measurement flow range:

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

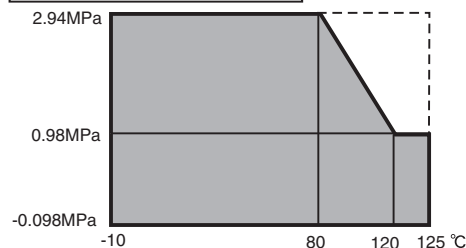
Measurement flow range: 0m/s to 10m/s

## Temperature and pressure range of process fluid

Size 2.5 to 10mm (0.1 to 3/8 inch)



Size 15 to 200mm (1/2 to 8 inches)



Size 250 to 300mm (10 to 14 inches)

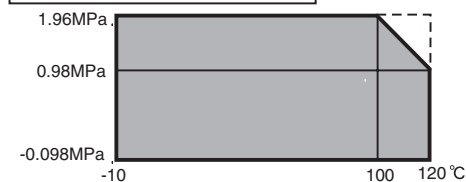


Table 2

Diameter (mm)	Minimum set range (Minimum constant flow speed of 0 to 0.1m/s)		Maximum set range (Maximum constant flow speed of 0 to 10m/s)		Conversion factor K
	m³/h	l/min	m³/h	l/min	
	2.5	0 to 0.00177	0 to 0.02946	0 to 0.17671	
5	0 to 0.00707	0 to 0.11781	0 to 0.70685	0 to 11.780	14.15
10	0 to 0.02828	0 to 0.47124	0 to 2.8274	0 to 47.123	3.537
15	0 to 0.06362	0 to 1.0603	0 to 6.3617	0 to 106.02	1.572
25	0 to 0.17671	0 to 2.9453	0 to 17.671	0 to 294.52	0.5659
40	0 to 0.45239	0 to 7.5400	0 to 45.238	0 to 753.98	0.2210
50	0 to 0.70690	0 to 11.781	0 to 70.685	0 to 1,178.0	0.1415
65	0 to 1.1946	0 to 19.910	0 to 119.45	0 to 1,990.9	0.08371
80	0 to 1.8096	0 to 30.160	0 to 180.95	0 to 3,015.9	0.05526
100	0 to 2.8275	0 to 47.124	0 to 282.74	0 to 4,712.3	0.03537
125	0 to 4.4179	0 to 73.632	0 to 441.78	0 to 7,363.1	0.02264
150	0 to 6.3618	0 to 106.03	0 to 636.17	0 to 10,602	0.01572
200	0 to 11.310	0 to 188.50	0 to 1,130.9	0 to 18,849	0.008842
250	0 to 17.672	0 to 294.53	0 to 1,767.1	0 to 29,452	0.005659
300	0 to 25.447	0 to 424.12	0 to 2,544.6	0 to 42,411	0.003930











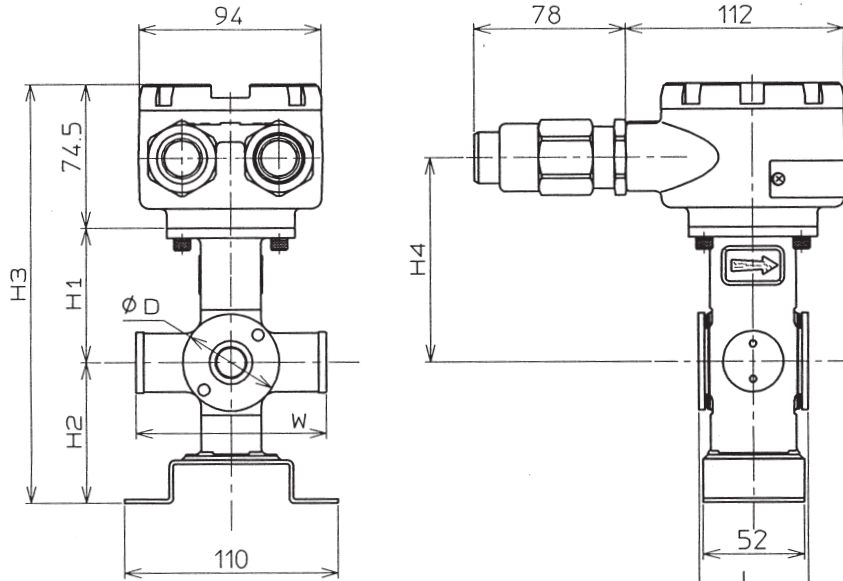
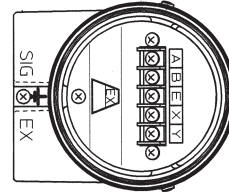


# Dimension and terminal connection drawings

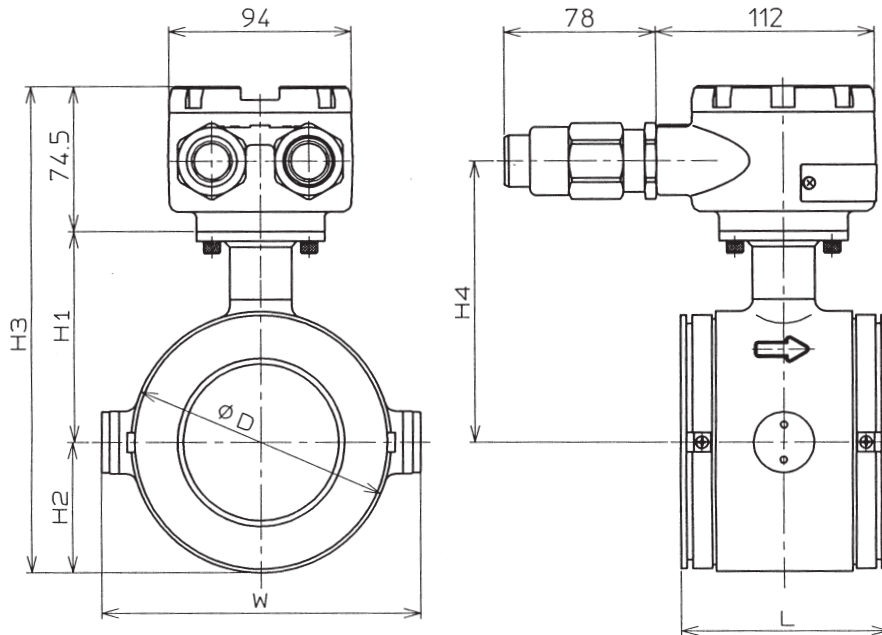
(Unit : mm)

## Wafer

2.5 to 15 mm



25 to 200 mm

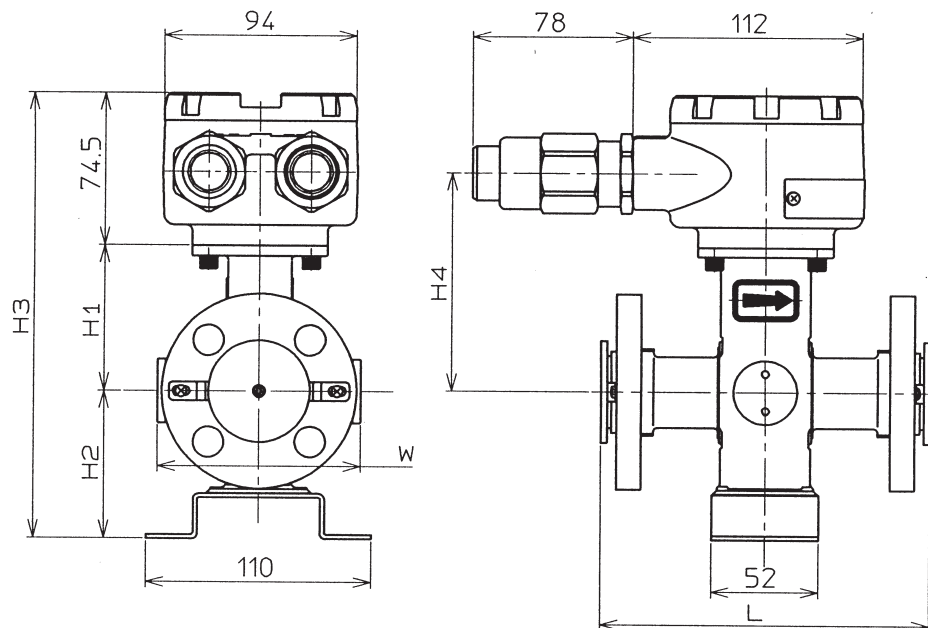
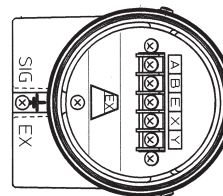


Detector diameter		2.5	5	10	15	25	40	50	65	80	100	125	150	200
Face to face dimension	L	56	56	56	56	56	80	86	96	106	120	140	160	200
Height	H1	71	71	71	71	77	84	93	100	108	120.5	133	160	185
	H2	72	72	72	72	34	43.5	52	62	67	79.5	95	110	135
	H3	190	190	190	190	158	174.5	192	209	222	247	275	317	367
	H4	96	96	96	96	102	109	118	125	133	145.5	158	240	210
Width	W	98	98	98	98	106	125	135	148	164	189	214	240	290
Outer diameter	Ø D	49.5	49.5	49.5	49.5	68	87	104	124	134	159	190	220	270
Mass (kg)		2.5	2.5	2.5	2.5	2.6	3.0	3.6	4.5	5.2	7.0	9.6	12.8	22.0

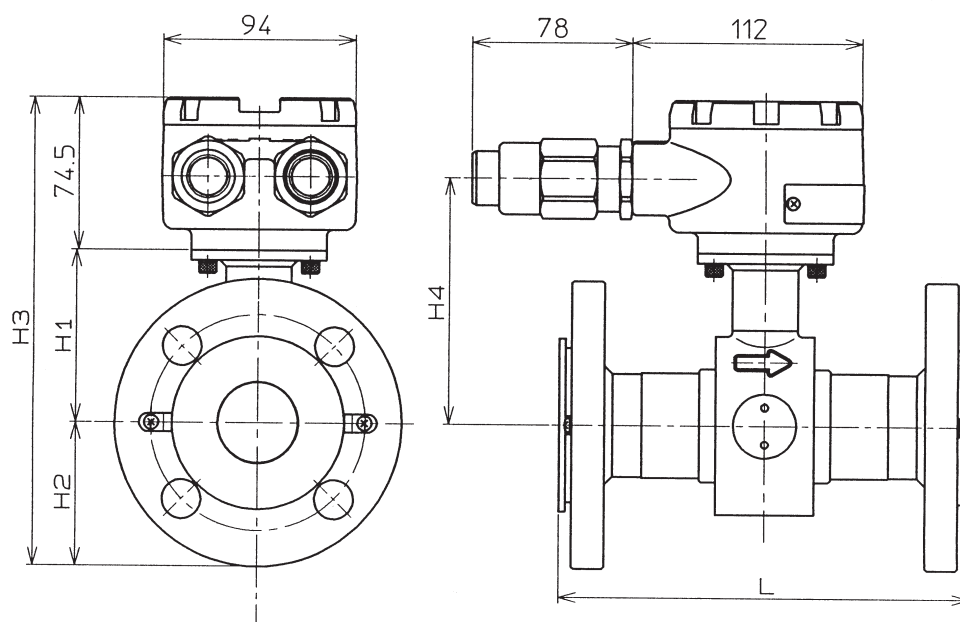
Note: Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets.  
For other material grounding rings than SUS316, gaskets are included. (Gasket thickness: 3 mm)

### Flange

2.5 to 15 mm



25 mm

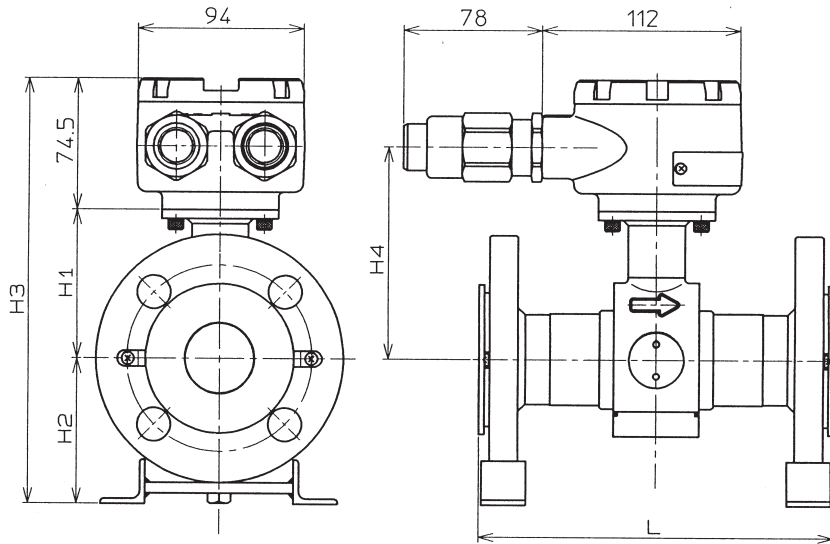


Detector diameter		2.5	5	10	15	25
Face to face dimension	L	160	160	160	160	200
	Height					
	H1	71	71	71	71	77
	H2	70	70	70	70	63
	H3	188	188	188	188	187
	H4	96	96	96	96	96
Width	W	98	98	98	98	106
Mass		5.7	5.7	5.7	5.7	8.1

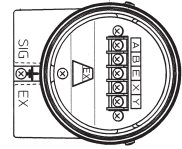
Note: - The table indicates dimensions for ANSI 150 Flange.  
 - Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets.  
 For other material grounding rings than SUS316 , gaskets are included. (Gasket thickness: 3 mm )

## Flange

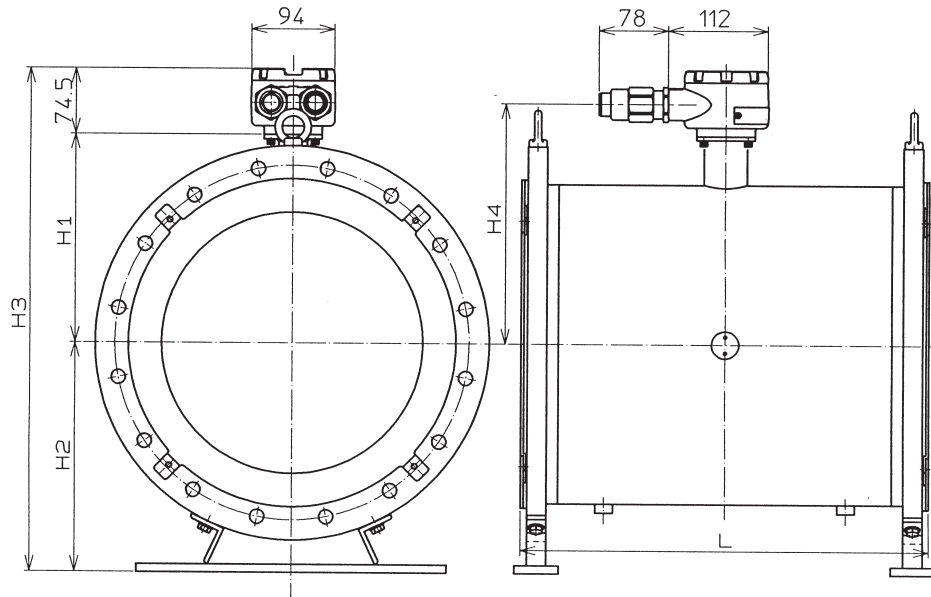
40 to 100mm



(Unit : mm)



150 to 300mm



Detector diameter		40	50	65	80	100	125	150	200	250	300
Face to face dimension	L	200	200	200	200	250	250	300	350	450	500
	H1	84	93	100	108	121	133	160	185	235	258
Height	H2	85	90	102	110	120	143	175	197	221	250
	H3	243.5	257.5	276.5	292.5	315.0	350.5	409.5	456.5	530.5	582.5
	Mass (kg)	7.2	9.2	10.7	13.3	19.1	26.7	33.3	48.7	60.7	73.7

- Note:
- The table indicates dimensions for JIS 10K Flange.
  - Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets. For other material grounding rings than SUS316, gaskets are included. (Gasket thickness: 3mm)

Please, read 'Terms and Conditions' from following URL before the order and use.

<http://www.azbil.com/products/bi/order.html>

Specifications are subject to change without notice.

**azbil**

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