YAMATAKE **Specification**

MagneW 3000 PLUS Smart Electromagnetic Flowmeter
Model MGG16
Detector (LCIE/CENELEC Approval)

OVERVIEWS

The MagneW 3000 PLUS electromagnetic flowmeter detector is a high performance, highly reliable flowmeter developed with Yamatake's proven MagneW 3000 flow measurement technologies. MGG16 models for CENELEC Explosion-protection use offer superior flowrate and process measurement and couple with a wide range of MagneW 3000 PLUS converters.

Wafer type Flange type

(Diameter 2.5 to 400mm)

FEATURES

High performance lining

- A new, exclusive high quality lining technology and a special, mirror-finish PFA lining offer higher anti-adhesive properties than existing models.
- The mirror-finish PFA lining is particularly applicable for measurement of sticky pulp and gypsum slurries.
- Only pure white PFA with no additives is used to make new linings.
- The successful embedded punch plate that offers proven performance under conditions such as rapid thermal change and negative pressure.
- PFA linings with diameter ranges from 2.5mm to 400mm available, making selection of the best lining easy for a wide variety of applications.

Replacement interfacing detector (optional)

- This detector can replace the detector interfaces of our existing models and those of other manufacturers. Please consult your Yamatake representative for details.

Rugged detector structure

- A stainless steel case has been adopted for diameters of 2.5mm to 200mm.

A wide variety of piping connections

- A flange structure is used for all diameters (diameters of 2.5 to 400mm).
- 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.

Compatibility

- Remote model converters can be used in combination with our conventional converters(MG□,KIC). Please consult your Yamatake representative for details.

Type of protection

- The pass in LCIE/CENELEC mixed type of protection for EEx de [ia] IIC T4.

With a built-in zener barrier

APPLICATIONS

Petroleum/petrochemical/chemicals

Corrosive liquids, dyestuffs, chemicals, 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.

Electric power

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

Gas

Circulating water for air conditioning, etc.

FUNCTIONAL SPECIFICATIONS

Type of protection

LCIE/CENELEC mixed type of protection for EEx de[ia]ia IIC T4

Excitation coil : Increased safety “e”

Electrodes : Intrinsically safe “ia” being able to be used in Zone 0 areas

Terminal box : Flameproof enclosure “d”, in which an encapsulated zener barrier is equipped, “[ia]”

Complete detector : Equipment group “IIC” enables the unit to be used in atmospheres including hydrogen, acetylene and carbon disulfide

Temperature class “T4” declares the maximum surface temperature of the unit not to exceed 135°C

EEx : Hazardous area equipment certified to European standards(LCIE/CENELEC)

Temperature range of liquid to be measured

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 MGG14C converter

3μS/cm or more

Measurement flow range

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

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 0.1m/s)
2.5	0 to 0.00177	0 to 0.176
5	0 to 0.00707	0 to 0.706
10	0 to 0.0283	0 to 2.82
15	0 to 0.0637	0 to 6.36
25	0 to 0.177	0 to 17.6
40	0 to 0.453	0 to 45.2
50	0 to 0.707	0 to 70.6
65	0 to 1.20	0 to 119
80	0 to 1.81	0 to 180
100	0 to 2.83	0 to 282
125	0 to 4.42	0 to 441
150	0 to 6.37	0 to 636
200	0 to 11.31	0 to 1,131
250	0 to 17.68	0 to 1,767
300	0 to 25.45	0 to 2,544
350	0 to 34.64	0 to 3,463
400	0 to 45.24	0 to 4,524

Measurement flow velocity range

0m/s to 10m/s

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 400mm)

Ambient temperature limits

-10 to +60°C

Ambient humidity limits

5 to 100% RH

Optional specifications

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 representative.

PERFORMANCE SPECIFICATIONS

Accuracy

(in combination with the MGG14C converter)

<Diameter 2.5 ~ 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 ~ 400mm> 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

PHYSICAL SPECIFICATIONS

Finish

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

Corrosion-preventive polyurethane resin (diameter 250 to 400mm, 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 400mm)

Case

SCS13 stainless steel (diameter 2.5 to 15mm)

SUS304 stainless steel (diameter 25 to 200mm)

SS400 carbon steel (diameter 250 to 400mm)

Terminal box

Aluminum alloy (remote model)

Material of parts in contact with liquid

Lining

PFA (diameter 2.5 to 400mm)

Electrode

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

Ground ring

SUS316, Hastelloy C, titanium, zirconium, tantalum, platinum

Gasket

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

O-ring

Viton rubber (with union joints)

Structure of electrode

External insertion (electrode can be removed)

INSTALLATION

Electrical connection

G1/2 (PF1/2) internal thread with two flameproof packing cable adaptors

Pipe connection

Wafer (models 2.5 to 200mm in diameter)

Flange (models 2.5 to 400mm in diameter)

Nuts and bolts (for models of wafer construction)

S20C carbon steel, SUS304 stainless steel

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 in stalled.

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

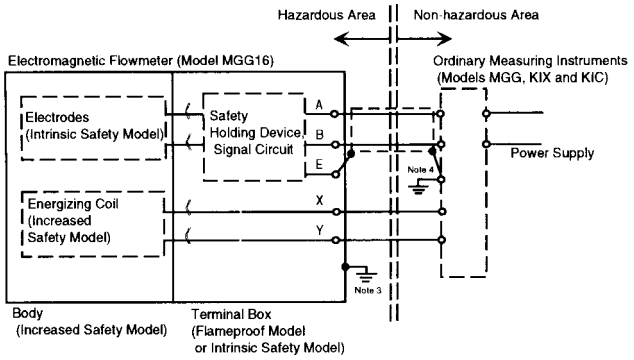
Dedicated cable (11.4mm, 0.75mm^2 diameter) or equivalent (CVVS, CEEV, etc.)

Excitation cable

Dedicated cable (10.5mm, 2mm^2 diameter) or equivalent (CVV and others)

For Hazardous location use

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



Note

- 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 60°C.
- Classification 3 Grounding should be employed.
- Classification 4 Grounding should be employed.

MODEL SELECTION

MagneW3000 PLUS(LCIE /CENELEC Mixed type of protection approval)

(Wafer detector 2.5~10mm) PFA lining

Basic Model No.	Selections											Optional selections			Options	
MGG16D	–											–			–	

Diameter	2.5mm	002														X	No option
	5mm	005														A	Test report
	10mm	010														B	Certification of traceability
Lining	PFA		P													C	Mill sheet
Pipe connection	Wafer JIS10K			11												E	Moisture treatment
	Wafer JIS20K			12												F	Oil removal treatment
	Wafer JIS30K			13												J	Gasket for resin pipe (for general purposes)
	Wafer JIS10/20K for 10mm flange			14												K	Attaching the TAG number plate to the terminal box (remote detector)
	Wafer JIS30K for 10mm flange			15												L	Attaching the TAG number plate to the neck section
	Wafer ANSI150			21												☐	Others
	Wafer ANSI300			22													
	Wafer DIN PN10			41													
	Wafer DIN PN16			42													
	Wafer DIN PN25			43													
	Wafer DIN PN40			44													
	Wafer DIN PN10/16/25/40 for 10mm flange			45													
	Wafer JPI150			61													
	Wafer JPI300			62													
Pipe combine	Wafer				X												
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						☐										
Electrical connection/ Watertight gland	Remote model	G1/2 (PF1/2) internal thread with two flameproof packing cable adapters						5									
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	Finish	Standard
1		Corrosion-resistant finish
2		Corrosion-proof finish

X	Bolt/nuts	None
1		Carbon steel
2		SUS304

MagneW3000 PLUS(LCIE /CENELEC Mixed type of protection approval)

(Wafer detector 15~200mm) PFA lining

Basic Model No.		Selections										Optional selections		Options
MGG16D	–										–		–	

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
Pipe combine	Wafer		X
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		□
Electrical connection/ Watertight gland	Remote model	G1/2 (PF1/2) internal thread with two flameproof packing cable adapters	5
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 detector)	
L	Attaching the TAG number plate to the neck section	
□	Others	

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

X	Bolt/nuts	None
1		Carbon steel
2		SUS304

MagneW3000 PLUS (LCIE /CENELEC Mixed type of protection approval) (Flange detector 2.5~10mm) PFA Lining

Basic Model No.		Selections											Optional selections	Options
MGG16F	–											–		–

Diameter	2.5mm	002	
	5mm	005	
	10mm	010	
Lining	PFA		P
Pipe connection	Flange JIS10K		J1
	Flange JIS20K		J2
	Flange JIS30K		J3
	Flange JIS10K for 10mm flange		J4
	Flange JIS20K for 10mm flange		J5
	Flange JIS30K for 10mm flange		J6
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flange DIN PN10		D1
	Flange DIN PN16		D2
	Flange DIN PN25		D3
	Flange DIN PN40		D4
	Flange DIN PN10/16 for 10mm flange		D5
	Flange DIN PN25/40 for 10mm flange		D6
	Flange JPI150		P1
	Flange JPI300		P2
Flange material	Standard		1
	Others		□
Pipe combine	Flange		1
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		□
Electrical connection/ Watertight gland	Remote model	G1/2 (PF1/2) internal thread with two flameproof packing cable adapters	5
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 detector)
L	Attaching the TAG number plate to the neck section
□	Others

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

MagneW3000 PLUS (LCIE /CENELEC Mixed type of protection approval) (Flange detector 15~200mm) PFA Lining

Basic Model No.		Selections											Optional selections	Options
MGG16F	–										–		–	

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		□
Pipe combine	Flange		1
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		□
Electrical connection/ Watertight gland	Remote model	G1/2 (PF1/2) internal thread with two flameproof packing cable adapters	5
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 detector)
L	Attaching the TAG number plate to the neck section
□	Others

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

MagneW3000 PLUS (LCIE /CENELEC Mixed type of protection approval) (Flange detector 250~400mm) PFA Lining

Basic Model No.		Selections											Optional selections	Options
MGG16F	–											–		–

Diameter	250mm	250	
	300mm	300	
	350mm	350	
	400mm	400	
	500mm	500	
	600mm	600	
Lining	PFA		P
Pipe connection	Flange JIS10K		J1
	Flange JIS20K		J2
	Flange ANSI150		A1
	Flange ANSI300		A2
	Flange 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		□
Pipe combine	Flange		1
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		□
Electrical connection/ Watertight gland	Remote model: G1/2 (PF1/2) internal thread with two flameproof packing cable adapters		5
Face to face	Standard		A
	Others		□
Installation/ Wiring direction	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	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	

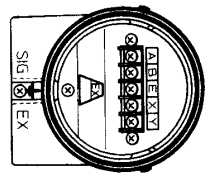
X	Finish	Standard
1		Corrosion-resistant finish
2		Corrosion-proof finish

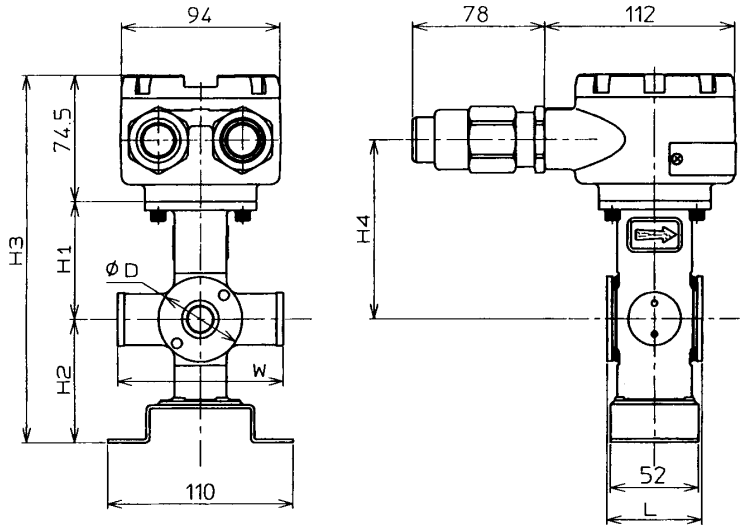
DIMENSIONS

(Unit:mm)

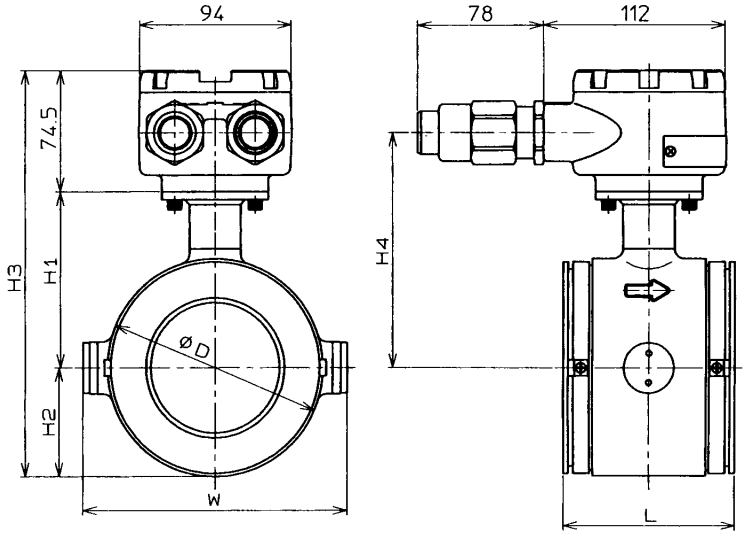
Wafer

2.5 to 15mm





25 to 200mm



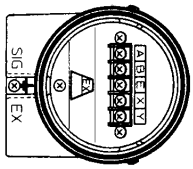
Nominal diameter		2.5	5	10	15	25	40	50	65	80	100	125	150	200
Face to face dimension	L	56	56	56	56	56	80	86	96	106	120	140	160	200
Height	H1	71	71	71	71	77	84	93	100	108	120.5	133	160	185
	H2	72	72	72	72	34	43.5	52	62	67	79.5	95	110	135
	H3	190	190	190	190	158	174.5	192	209	222	247	275	317	367
	H4	96	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	ϕD	49.5	49.5	49.5	49.5	68	87	104	124	134	159	190	220	270
Weight(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

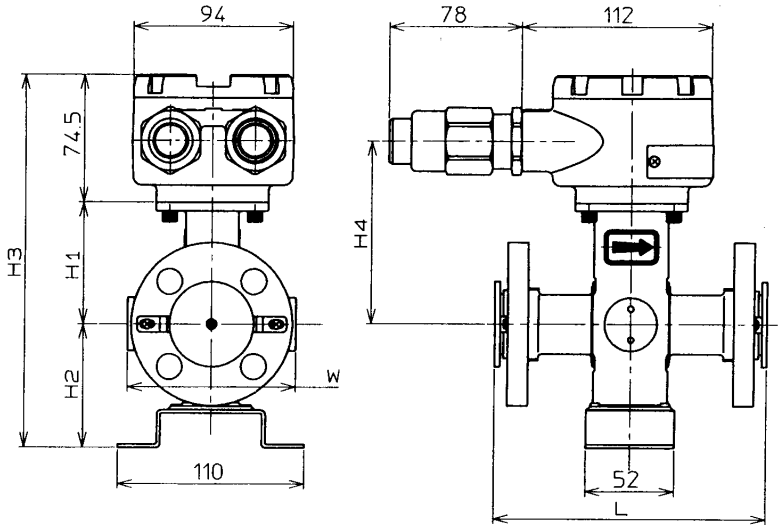
Note: Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets.
For other material grounding rings than SUS316 , gaskets are included. (Gasket thickness: 3mm)

(Unit:mm)

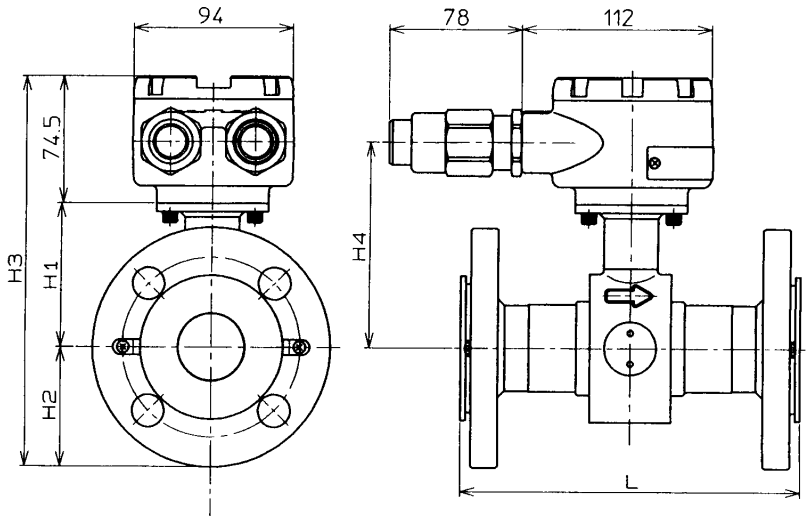
Flange

2.5 to 15mm





25mm



Nominal 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
Weight		5.7	5.7	5.7	5.7	8.1

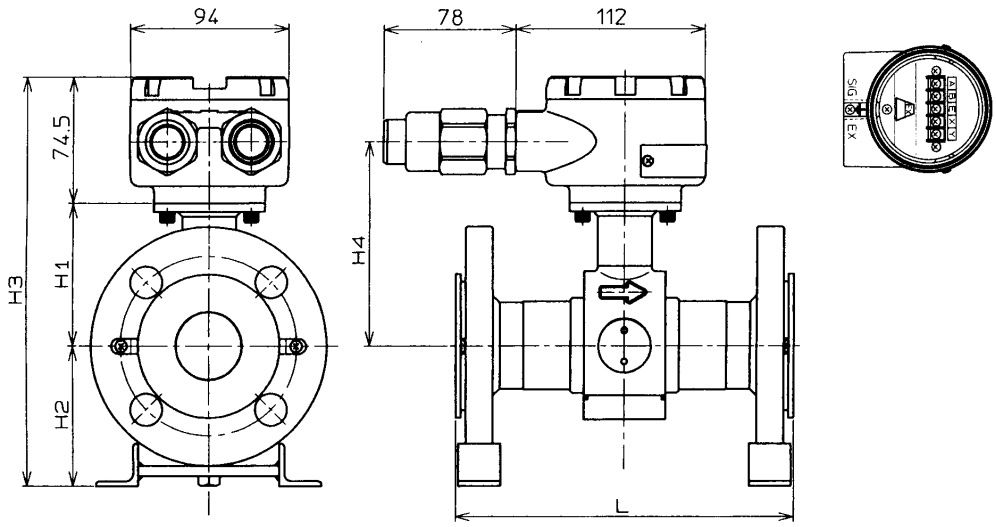
Note:- The table indicates dimensions for ANSI 150 Flange.

- 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: 3mm)

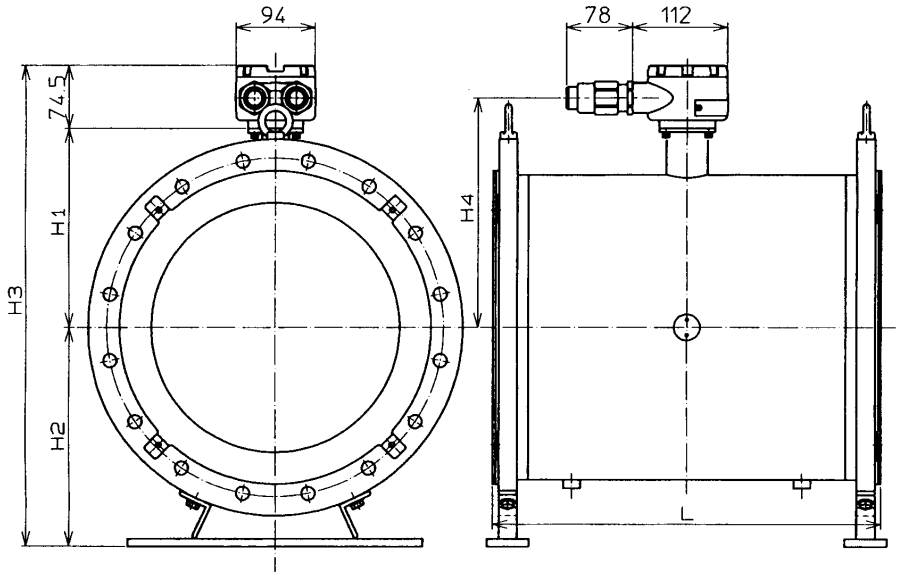
(Unit : mm)

Flange

40 to 100mm



150 to 400mm



Nominal diameter		40	50	65	80	100	125	150	200	250	300	350	400
Face to face dimension	L	200	200	200	200	250	250	300	350	450	500	550	600
Height	H1	84	93	100	108	120.5	133	160	185	212	235	259	287
	H2	85	90	102	105	115	143	158	179	221	250	273	321
	H3	216	230	249	260	167.5	323	365	411	480	532	579	655
	H4	109	118	125	133	145.5	158	185	210	237	260	298	312
Weight(kg)		7.2	9.2	10.7	13.3	19.1	26.7	33.3	48.7	60.7	73.7	96.7	128.7

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: 3mm)

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