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 Yamatake'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
- Yamatake'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 your Yamatake Corporation 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 Yamatake's conventional converters (model MG[ ] ,KIX, KIC). Please consult your Yamatake Corporation representative for details.

Wafer type Flange type

(Diameter 2.5 to 300mm)

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)

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 100 Ω

Mounting : Horizontally-mounted electrode

Straight pipe length:

Upstream side;

A minimum five straight pipe diameters.
A minimum 10 straight pipe diameter is required it 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^2 diameter) or equivalent (CVVS, CEEV, etc.)

Excitation cable:

Dedicated cable (10.5mm, 2mm^2 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.

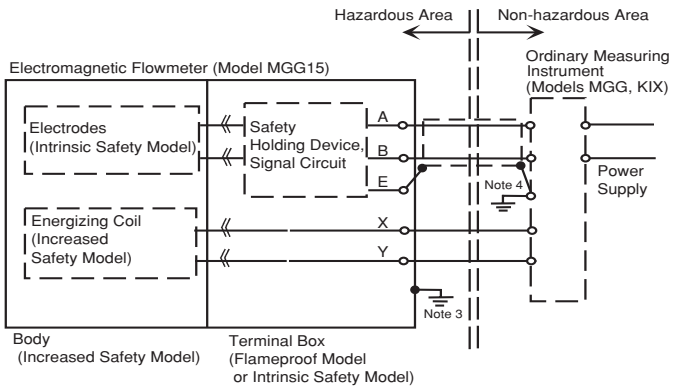
Attaching the tag number to the terminal box:

Stamp he 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 your Yamatake Corporation 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.

2. Ambient temperature for the flowmeter should be 50°C.
3. Category D Grounding should be employed.
4. 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 rang

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 rang

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

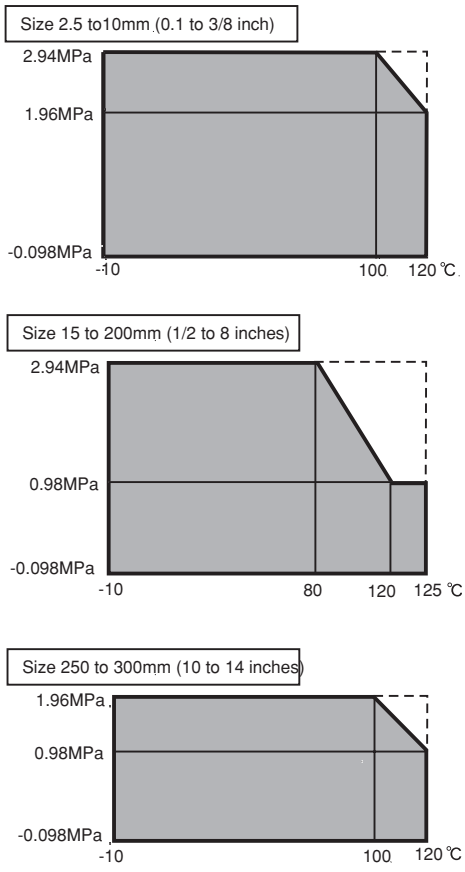


Table 2

Diameter (mm)	Minimum set range (Minimum constant flow speed of 0 to 0.1m/s)		Miximum set range (Miximum constant flow speed of 0 to 10m/s)		Conversion factor K
	m^3/h	l/min	m^3/h	l/min	
2.5	0 to 0.00177	0 to 0.02946	0 to 0.17671	0 to 2.9452	56.59
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

Contents of Model Number Tables

MagneW3000 FLEX (JIS Explosion-proof Model) (Wafer detector 2.5 to 10mm)　　PFA lining

Basic Model No.	Selections										Optional selections		Options(Maximum selsection:5)
MGG15D	-										-		-

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 JIS10/20K 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
Pipe combine	Wafer		X
Electrodes	SUS316L		L
	ASTM B574(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	ASTM B575(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Cable adapter	G1/2 internal thread/With flame-proof cable gland		1
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	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	TAG number plate attached to the terminal box (remote detector)	
□	Others	

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

X	Bolt/nuts	None
1		Carbon steel
2		SUS304

MagneW3000 FLEX (JIS Explosion-proof Model) (Wafer detector 15 to 200mm) PFA lining

Basic Model No.	Selections											Optional selections		Options(Maximum selsection:5)
MGG15D	-											-	-	

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					
	ASTM B574(Hastelloy C-276 equivalent)					C					
	Titanium					K					
	Zirconium					H					
	Tantalum					T					
	Tungsten carbide					W					
	Platinum iridium					P					
	Others					□					
Grounding ring	SUS316						S				
	ASTM B575(Hastelloy C-276 equivalent)						C				
	Titanium						K				
	Zirconium						H				
	Tantalum						T				
	Platinum						P				
	Others						□				
Wiring connection/ Cable adapter	G1/2 internal thread/With flame-proof cable gland							1			
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	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	TAG number plate attached to the terminal box (remote detector)	
□	Others	

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

X	Bolt/nuts	None
1		Carbon steel
2		SUS304

MagneW3000 FLEX (JIS Explosion-proof Model) (Flange detector 2.5 to 10mm) PFA Lining

Basic Model No.	Selections										Optional selections		Options(Maximum selsection:5)
MGG15F	-									-		-	

Diameter	2.5mm	002	
	5mm	005	
	10mm	010	
Lining	PFA	P	
Pipe connection	Flange JIS10K for 15mm flange	J1	
	Flnage 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 for 15mm flange	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	
Pipe combine	Flange		1
Electrodes	SUS316L		L
	ASTM B574(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	ASTM B575(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Cable adapter	G1/2 internal thread/With flame-proof cable gland		1
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	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	TAG number plate attached to the terminal box (remote detector)	
□	Others	

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

X	Bolt/nuts	None

MagneW3000 FLEX (JIS Explosion-proof Model) (Flange detector 15 to 200mm) PFA Lining

Basic Model No.	Selections										Optional selections		Options(Maximum selsection:5)
MGG15F	-									-		-	

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
Pipe combine	Flange		1
Electrodes	SUS316L		L
	ASTM B574(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Tungsuten carbide		W
	Platinum iridium		P
	Others		□
Grounding ring	SUS316		S
	ASTM B575(Hastelloy C-276 equivalent)		C
	Titanium		K
	Zirconium		H
	Tantalum		T
	Platinum		P
	Others		□
Wiring connection/ Cable adapter	G1/2 internal thread/With flame-proof cable gland		1
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	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	TAG number plate attached to the terminal box (remote detector)	
□	Others	

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

X	Bolt/nuts	None

MagneW3000 FLEX (JIS Explosion-proof Model) (Flange detector 250 to 300mm) PFA Lining

Basic Model No.	Selections											Optional selections		Options(Maximum selsection:5)
MGG15F	-										-		-	

Diameter	250mm		250										
	300mm		300										
	350mm		350										
Lining	PFA			P									
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								
Pipe combine	Flange					1							
Electrodes	SUS316L						L						
	ASTM B574(Hastelloy C-276 equivalent)						C						
	Titanium						K						
	Zirconium						H						
	Tantalum						T						
	Tungsuten carbide						W						
	Platinum iridium						P						
	Others						□						
Grounding ring	SUS316							S					
	ASTM B575(Hastelloy C-276 equivalent)							C					
	Titanium							K					
	Others							□					
Wiring connection/ Cable adapter	G1/2 internal thread/With flame-proof cable gland								1				
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											□	

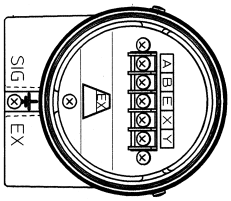
X	No option	
B	Certification of traceability	
C	Mill sheet	
E	Moisture treatment	
F	Oil removal treatment	
J	Gasket for resin pipe (for general purposes)	
K	TAG number plate attached to the terminal box (remote detector)	
□	Others	

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

X	Bolt/nuts	None

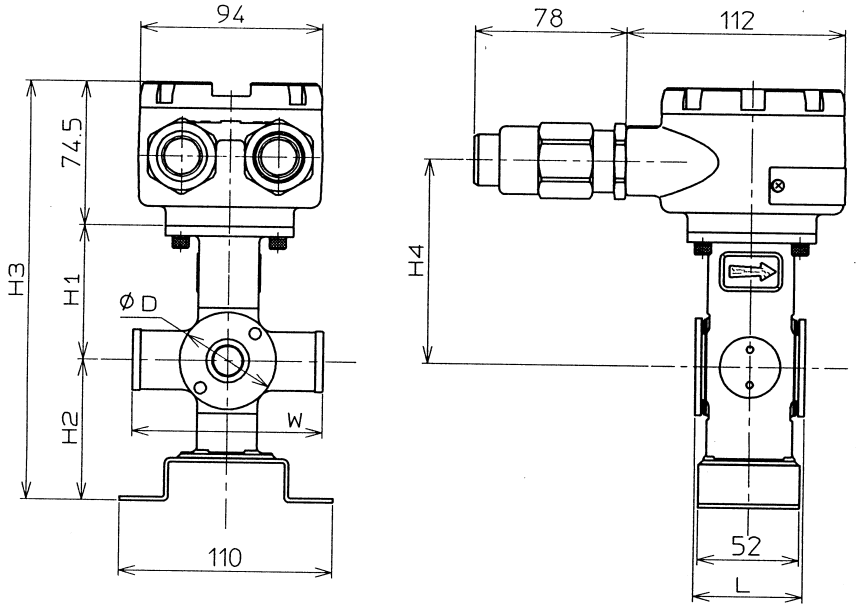
Dimension and terminal connection drawings

(Unit：mm)

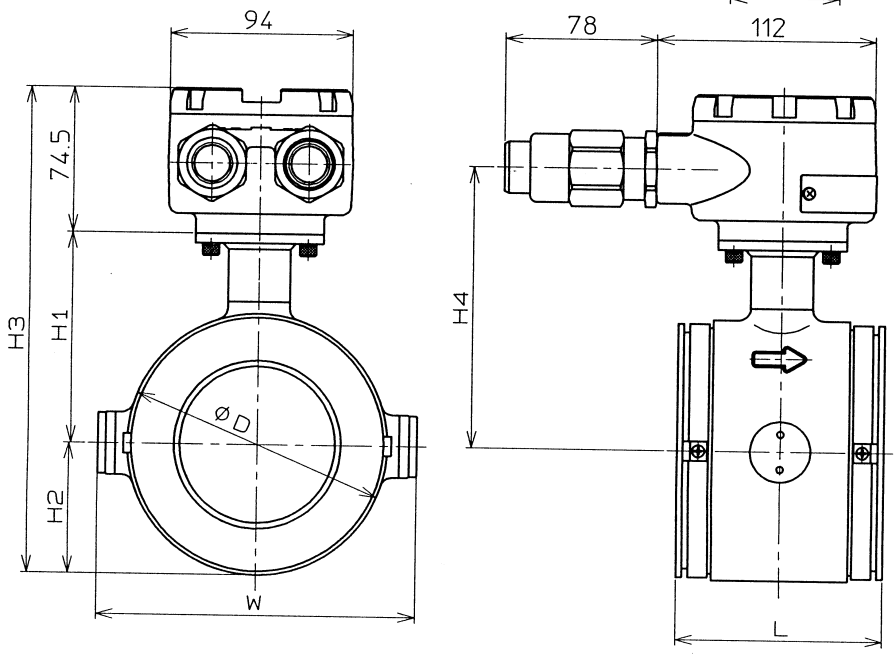


Wafer

2.5 to 15mm



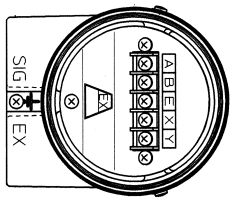
25 to 200mm



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	ϕD	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

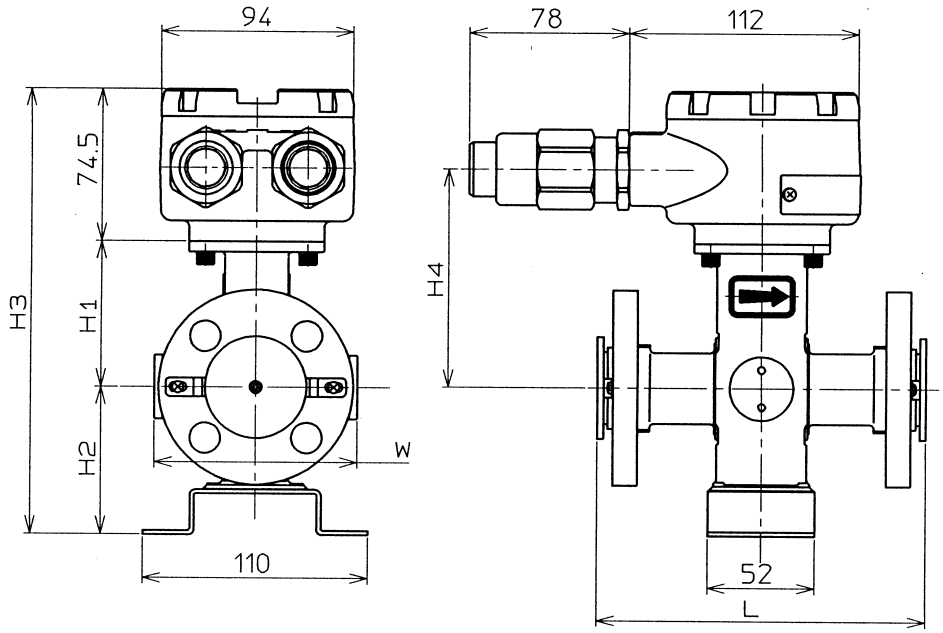
Note: Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets.
For other material grounding rings than SUS316 , gaskets are included. (Gasket thickness: 3mm)

(Unit：mm)

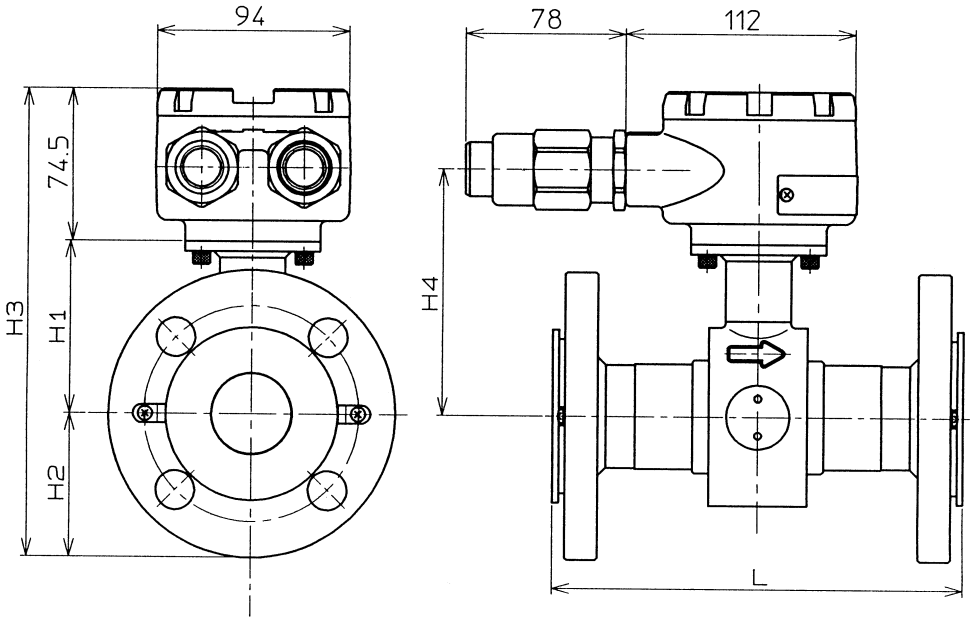


Flange

2.5 to 15mm



25mm



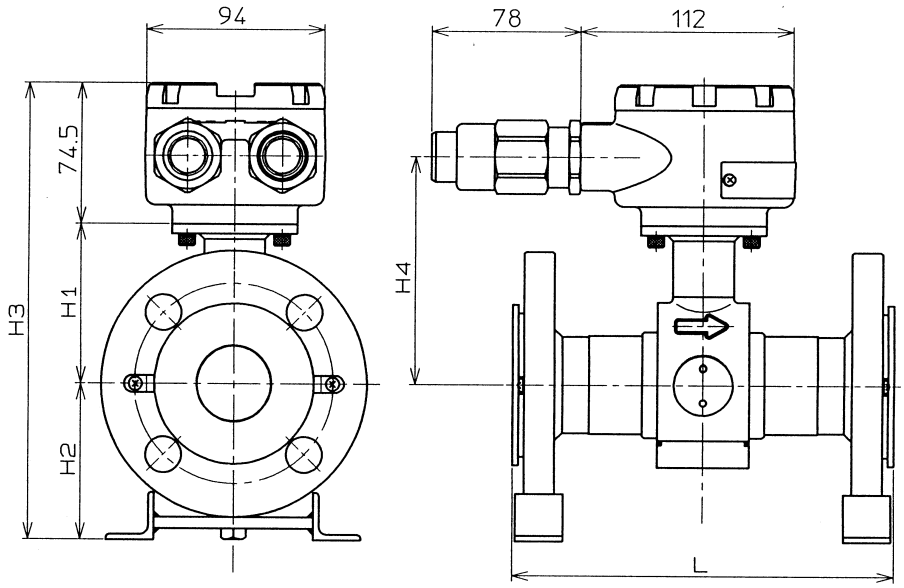
Detector diameter		2.5	5	10	15	25
Face to face dimension	L	160	160	160	160	200
Height	H1	71	71	71	71	77
	H2	70	70	70	70	63
	H3	188	188	188	188	187
	H4	96	96	96	96	96
Width	W	98	98	98	98	106
Mass		5.7	5.7	5.7	5.7	8.1

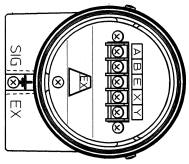
Note: - The table indicates dimensions for ANSI 150 Flange.
- Face to face dimension (L) indicates the dimension with SUS316 grounding rings without gaskets. For other material grounding rings than SUS316 , gaskets are included. (Gasket thickness: 3mm)

Flange

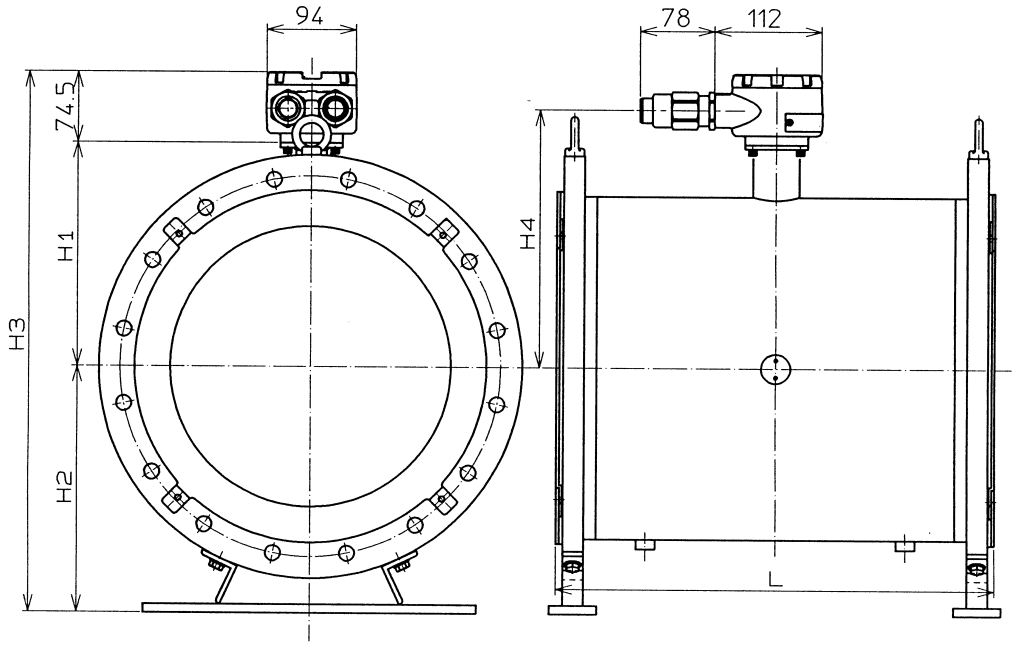
40 to 100mm

(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
Height	H1	84	93	100	108	121	133	160	185	235	258
	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)

Specifications are subject to change without notice.

azbil

Yamatake Corporation
Advanced Automation Company
1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL:http://www.azbil.com