

### GENERAL

**MAGMAX<sup>®</sup>** EGM4100C is a combination of well-accepted flange type EGS4000 primary head with PFA, PTFE or other lining materials and converter EGC100.

Improved self-diagnostic functions include empty pipe detection and conductivity monitoring.

With 10mm to 1000mm in size EGS4000 is widely used for chemicals and many other applications.

### FEATURES

- ❑ Punched plate reinforced high quality clear PFA is adopted (size : 25 to 150mm) for high anti-corrosive, anti-erosion, and anti-penetration capability.
- ❑ A variety of lining materials including PFA and PTFE are available.
- ❑ High accuracy of  $\pm 0.5\%$  of reading.
- ❑ High speed data processing for quick response. Suitable for batch process control and pulsating flow.
- ❑ The extendable excitation system allows applications to much fluid noise such as slurry.
- ❑ The LCD with backlight provides 1 to 3 lines of versatile indication.
- ❑ Equipped with a quick setup function to readily respond to changed flow range, pulse rate, etc.  
The push buttons allow you to alter the settings without removing the cover of conversion section.
- ❑ 10kHz high-speed pulse output. Capable of responding to short batch processes.
- ❑ Bi-directional measurement, double ranges and status outputs including flow rate alarms are standardized.



### STANDARD SPECIFICATION

#### General Specification

- Excitation : Square wave
- Nominal size : 10, 15, 20, 25, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, and 1000mm  
(For size over 1000mm, consult TOKYO KEISO.)
- Measuring range : Flow velocity  
Min. 0 to 0.3m/s  
Max. 0 to 12m/s  
Flow rate  
Min. 0 to 0.085m<sup>3</sup>/h  
(Minimum flow at 10mm size)  
Max. 0 to 33928m<sup>3</sup>/h  
(Maximum flow at 1000mm size)
- Protection class : IP66/67 (IEC 60529)
- Meter body material  
Measuring tube : Stainless steel / SS304  
Primary head housing : Size 20mm or less ; Cast duplex stainless steel<sup>(\*)</sup>  
Size 25mm or more ; Carbon steel<sup>(\*)</sup>  
[Standard]  
[Option] Stainless steel/SS304  
Flanges : Carbon steel<sup>(\*)</sup> [Standard]  
[Option] Stainless steel/SS316L  
Converter housing : Aluminum alloy<sup>(\*)</sup>  
Converter cover : Aluminum alloy<sup>(\*)</sup>  
Indicator water : Polyester  
protection sheet

(\*) Anti-corrosive painting

● Wetted part material

Liner : [Standard]  
 Size 10 to 20mm ; PTFE  
 Size 25 to 150mm ; PFA  
 Size 200 to 1000mm ; ETFE  
 [Option]  
 PTFE  
 Note: Refer to the "LINER MATERIAL AND FLANGE."

Electrode : Hastelloy® C22 [Standard]  
 [Option]  
 Hastelloy® B2, Stainless steel/SS316, Titanium, Tantalum, Platinum, Low noise type

Earth ring : Stainless steel/SS316 [Standard]  
 [Option]  
 Hastelloy® B, Hastelloy® C, Titanium, Tantalum

● Painting : Siloxane coating  
 ● Color : Grey (Primary head housing/converter housing)  
 Jade green (Converter cover)

● Cable entry : 2 × G1/2 female thread  
 2 × 1/2 NPT female thread  
 2 × M20 with watertight glands  
 (Option : Watertight glands for G1/2)

● Supply voltage : 100 to 230V AC (85 to 253V AC)  
 24V DC (11 to 31V)  
 Note: Figures in ( ) show allowable voltage range.

● Supply frequency : 48 to 63Hz (AC)

● Power consumption : AC; (approx.) 8VA  
 DC; (approx.) 4W

● Ambient temp. : -40 to +65°C (For operation)  
 -40 to +70°C (For storage)

● Grounding : Grounding resistance must be less than 100Ω.

● Process connection : Flange connection

● Flanges : JIS10K/20K, ASME class 150/300, DIN PN40/16/10  
 Note: Refer to the "LINER MATERIAL AND FLANGE."

**Fluid Specification**

● Temperature : -40 to +140°C  
 ● Pressure : Subject to pressure and temperature rating of the flanges.

Note: The allowable pressure and temperature differ with the liner material. Refer to "FLUID TEMPERATURE AND PRESSURE RANGE" for details.

● Conductivity : 10μ S/cm or more for 10 to 150mm  
 5μ S/cm or more for 200 to 1000mm  
 However 20μ S/cm or more is required for water.

**Indication and Output Specification**

● Indicator : Dot matrix LCD (With backlight)  
 128 × 64 pixels (59 × 31mm)  
 Indication function :  
 Changeover (2 screens)  
 One to three lines are displayed at one screen.  
 Contents of indication ; Flow rate, velocity, total flow, conductivity, and coil temperature

● Current output : 4 to 20mA DC (Max. 22mA at burn out error mode)  
 Internal power supply :  
 Less than 750ohms (Load resistance)  
 External power supply :  
 Less than 32V DC (External voltage)

● Pulse output  
 Open collector output  
 Rating : Less than 32V DC, 20mA (≤10kHz)  
 Less than 100mA (≤100Hz)  
 Residual voltage: Less than 1.5 VDC at 10 mA  
 Leak current: Less than 0.5 mA at 24 VDC

Pulse rate  
 2 to 36,000,000 pulse/h (0.00056Hz to 10kHz)

Pulse width  
 One of the following selectable  
 1) Automatic : Pulse width by which duty factor to be 50% at full scale  
 2) Duty factor 1:1 fixed  
 3) Free setting ; 0.05 to 2000ms

● Status output  
 Open collector output  
 Rating : 32V DC, 100mA Max.  
 Residual voltage: Less than 1.5 VDC at 10 mA  
 Leak current: Less than 0.5mA at 24 VDC

Contents of output  
 One of the following selectable:  
 1) No status output (Standard factory setting)  
 2) Identification of flow direction  
 3) Over range  
 4) Error  
 5) Flow alarm  
 6) Identification of range (For double range measurement)  
 7) Empty pipe detection

● Description of input and output terminal

Terminal	Standard setup	Switchover by reprogramming
A (A, A+ / A-)	Current output	-
C (C, C-)	Status output	-
D (D, D-)	Pulse output	Status output

- Low flow cutoff  
Current output, Pulse output, Indicator (Separate setting is possible.)  
Setting value : 0.0 to 20.0% FS  
Setting value (Standard) :  
Current output, Pulse output ; ON 1%, OFF 2% FS  
Indicator ; Without low flow cutoff
- Damping time constant  
Current output, Pulse output, Indicator (Separate setting is possible.)  
Setting value : 0.0 to 100.0s  
Setting value (Standard) :  
Current output, Indicator ; 4s  
Pulse output ; Damping time constant 0
- Isolation of input and output  
Each circuit of power supply, electrode input, terminal A, terminal C, and terminal D are isolated.

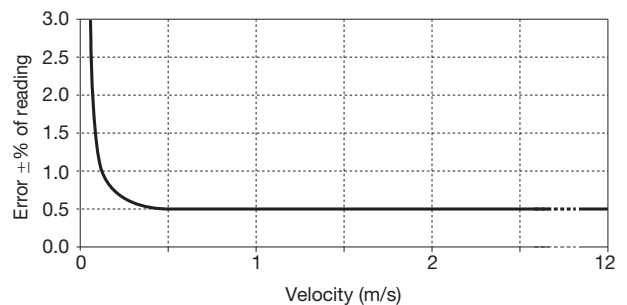
### Standard Functions

- Customer's free measuring unit setting function  
Volume (or mass) and time unit in 7 characters can be created.
- Automatic zero adjustment function  
Zero adjustment is automatically conducted at "ZERO ADJUST MODE" (Subject to zero flow)
- Bi-directional flow measurement function  
A flow-direction distinction signal is outputted in state output and current.
- Double range measurement function  
Possible range setting range ratio 1 : 20 to 1 : 1.25  
(Setting range of low range : 5 to 80% of high range)  
Range selection : Automatic
- Excitation current frequency switching function  
Standard mode :  
1/6 of supply frequency (Standard)  
Special frequency mode :  
1/50 to 1/2 times of supply frequency <sup>(\*)2</sup>
- Self diagnosis function  
The following conditions are indicated by error message;  
Functional diagnosis :  
Coil disconnection, CPU, Memory, Software, Output module, and Output connection  
Status diagnosis :  
Empty pipe detection, Over range, Counter over flow, and Power fail detection
- Memory save function for power failure  
Operation parameters and totalization figures are stored for more than 10 years by EEPROM (Non volatile memory).
- Testing function  
Simulating output function for current, pulse output and status output are integrated.  
Current output test : Arbitrary output (0.0 to 22.0 mA)  
Pulse output test : Arbitrary output (1Hz to 10kHz)  
Status output test : On / Off
- Push button setting function  
The push buttons allow you to alter the settings without removing the cover of conversion section.

(\*)2 It can be changed for every application, such as slurry and a pulsating flow.

### Accuracy <sup>(\*)3</sup>

- Indication and pulse output  
For velocity  $\geq 0.5\text{m/s}$  ;  $\pm 0.5\%$  of reading  
For velocity  $< 0.5\text{m/s}$  ;  $\pm 0.3\%$  of reading + velocity error of  $\pm 0.001\text{m/s}$



- Current output :  
Additional error of  $\pm 0.01\text{mA}$  be added to the accuracy of indication or pulse output.

(\*)3 Basis condition

Fluid	: Water
Fluid temperature	: 10 to 30°C
Conductivity	: 150 $\mu\text{S/cm}$ or more
Supply voltage	: Rated voltage $\pm 2\%$
Ambient temperature	: 18 to 28°C
Upstream / Downstream pipe length:	10D / 2D (D: Diameter)
Warm-up time	: About 10 minutes
Measuring time	: 100s

## FLUID TEMPERATURE AND PRESSURE RANGE

### Fluid Temperature

Liner	Nominal size (mm)	Fluid temperature	Ambient temperature
PFA	25 to 150	-40 to +140°C	-40 to +65°C
PTFE	10 to 20, 200 to 600		
ETFE	200 to 1000		

### Maximum Pressure / Permissible Vacuum Load

Liner	Nominal size (mm)	Pressure MPa *	Minimum pressure kPa (abs) / Fluid temp.				
			40°C	60°C	80°C	100°C	120°C
PFA	25 to 150	5	0	0	0	0	0
PTFE	10 to 20	5	0	0	0	0	50
	200 to 300	5	50	75	100	100	100
	350 to 600	5	80	100	100	100	100
ETFE	200 to 1000	15	10	10	10	10	10

\* Maximum operating pressure must be within the flange rating pressure. The value on this table indicates maximum pressure of main body.

## FLOW RANGE

Nominal size (mm)	Possible setting range (m <sup>3</sup> /h)		Nominal size (mm)	Possible setting range (m <sup>3</sup> /h)	
	Min. (Velocity : 0 to 0.3 m/s)	Max. (Velocity : 0 to 12 m/s)		Min. (Velocity : 0 to 0.3 m/s)	Max. (Velocity : 0 to 12 m/s)
10	0 to 0.085	0 to 3.393	250	0 to 53.013	0 to 2120.520
15	0 to 0.191	0 to 7.634	300	0 to 76.341	0 to 3053.640
20	0 to 0.339	0 to 13.572	350	0 to 103.908	0 to 4156.320
25	0 to 0.530	0 to 21.205	400	0 to 135.717	0 to 5428.680
40	0 to 1.357	0 to 54.287	450	0 to 171.765	0 to 6870.600
50	0 to 2.121	0 to 84.823	500	0 to 212.058	0 to 8482.320
65	0 to 3.584	0 to 143.352	600	0 to 305.370	0 to 12214.800
80	0 to 5.429	0 to 217.152	700	0 to 415.620	0 to 16624.800
100	0 to 8.482	0 to 339.288	800	0 to 542.880	0 to 21715.200
125	0 to 13.254	0 to 530.148	900	0 to 687.060	0 to 27482.400
150	0 to 19.085	0 to 763.404	1000	0 to 848.220	0 to 33928.800
200	0 to 33.930	0 to 1357.200			

**LINER MATERIAL AND FLANGE**

⊙: Standard   ○: Option   -: Not applicable

Flange rating	Liner	Nominal size (mm)																						
		10	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
JIS10K*1	PTFE	⊙	⊙	⊙	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
JIS20K	PTFE *2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	-
ASME class150	PTFE	⊙	⊙	⊙	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
ASME class300	PTFE *2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-	-	-	-
DIN PN10	PTFE	-	-	-	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
DIN PN16	PTFE	-	-	-	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	-	-	-	⊙	-	⊙	⊙	⊙	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○
DIN PN25	PTFE	-	-	-	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	-	-	-	○	-	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-	-	-	-
DIN PN40	PTFE	⊙	⊙	⊙	-	-	-	-	-	-	-	-	○	○	○	○	○	○	○	○	-	-	-	-
	PFA	-	-	-	⊙	⊙	⊙	○	⊙	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-
	ETFE	-	-	-	-	-	-	-	-	-	-	-	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-	-	-	-

\*1 JIS20K flange is provided for nominal size 10 to 40mm as standard.

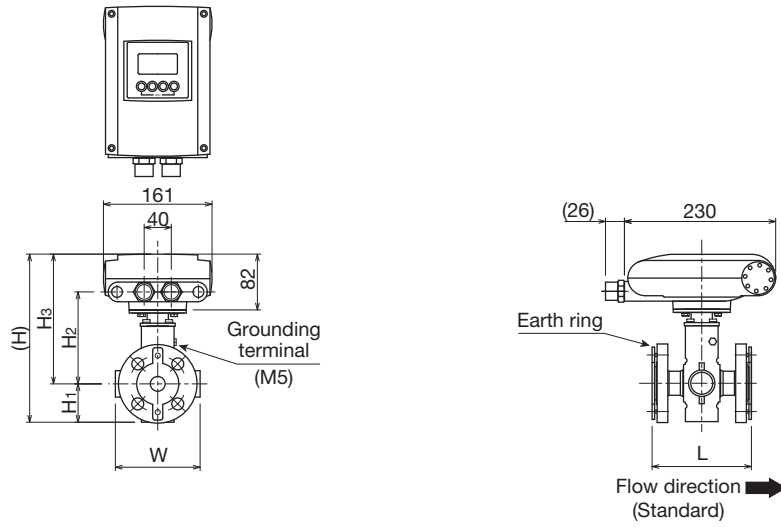
(Installation dimensions of JIS20K flange are equal to JIS10K except the flange thickness.)

\*2 The shape of detector housing for the nominal size 25 to 150 mm differs from the standard type.

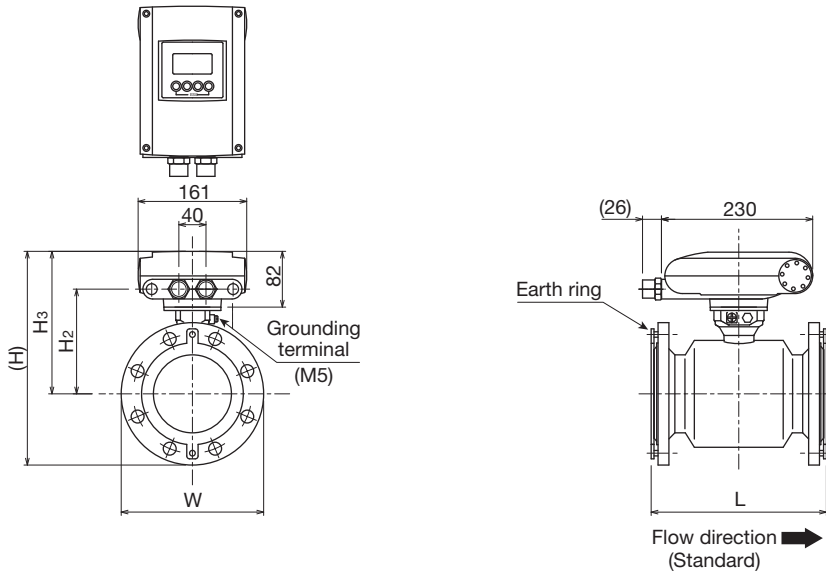
**DIMENSIONS**

**Version 1 type**

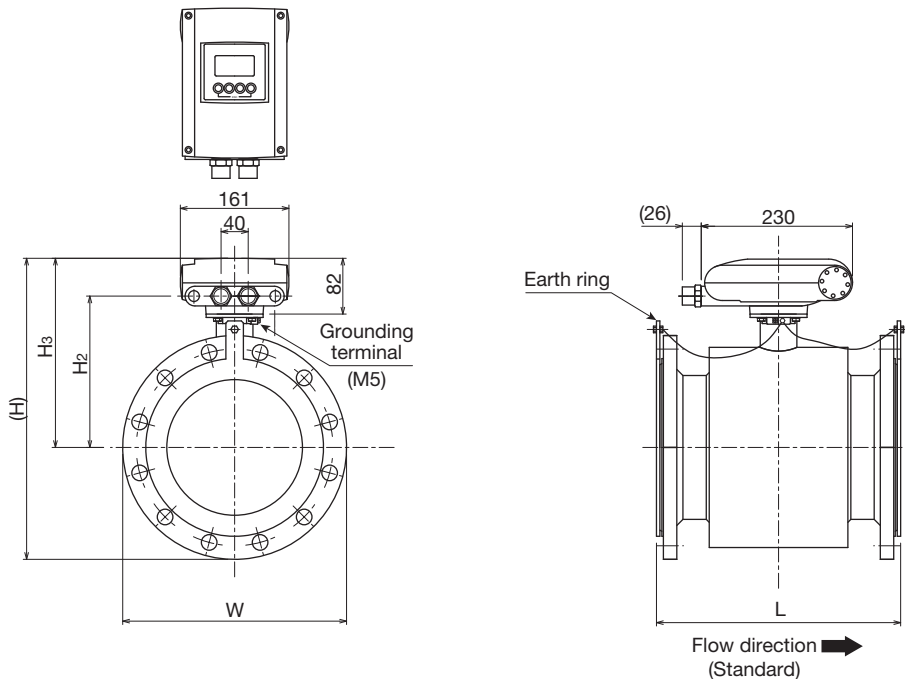
Nominal size: 10 to 20mm



Nominal size: 25 to 150mm

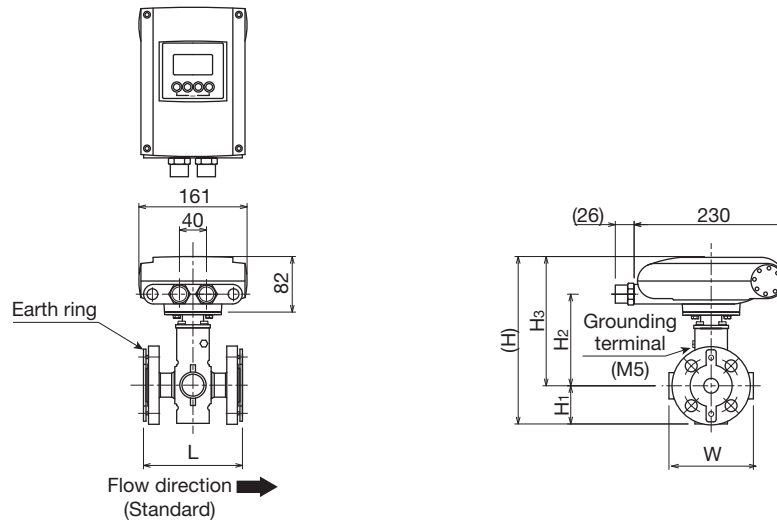


Nominal size: 200 to 1000mm

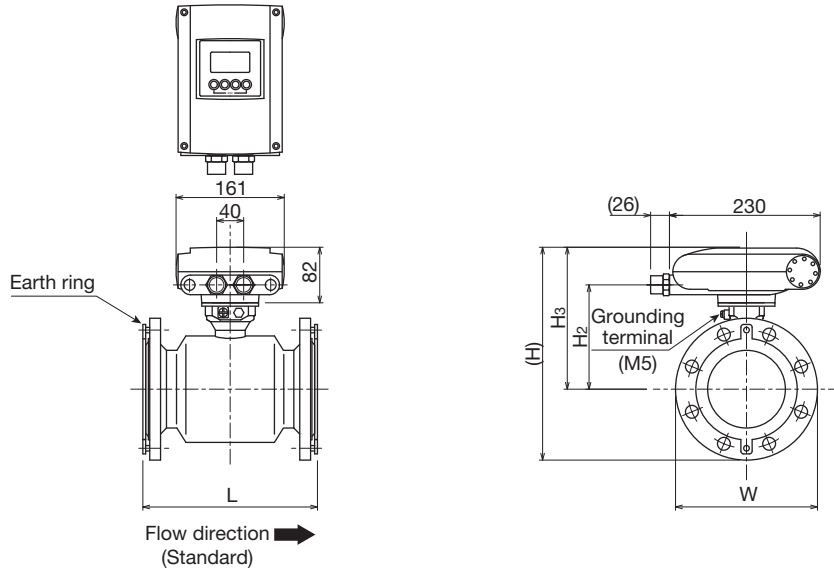


Version 2 type

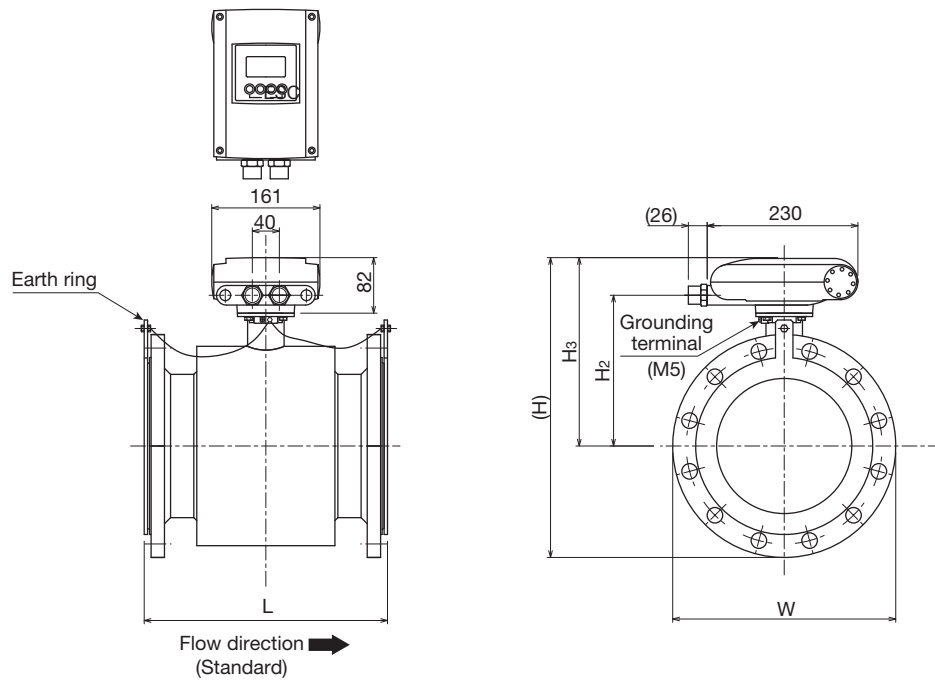
Nominal size: 10 to 20mm



Nominal size: 25 to 150mm



Nominal size: 200 to 1000mm



Nominal size (mm)	Dimensions (mm)								Mass (kg)	
	L *1		(H)		H1	H2	H3	W *2	JIS 10K	ASME 150
	JIS 10K	ASME 150	JIS 10K	ASME 150						
10	156	156	269	269	62	152	207	121	8	9
15	156	156	269	269	62	152	207	121	8	9
20	156	156	269	269	62	152	207	121	10	11
25	156	156	228	220	-	111	166	90	10	11
40	156	156	243	237	-	118	173	105	11	12
50	206	206	262	261	-	130	185	120	11	12
65	206	206	271	272	-	134	189	140	13	14
80	206	206	284	286	-	136	191	150	15	16
100	256	256	314	323	-	154	209	175	18	21
125	256	256	348	350	-	168	223	210	22	25
150	306	306	379	378	-	184	239	240	25	29
200	356	356	446	452	-	226	281	291	43	52
250	406	406	502	505	-	247	302	331	59	75
300	506	506	549	568	-	272	327	381	71	108
350	506	708	594	615	-	294	349	428	92	143
400	606	806	655	673	-	320	375	483	115	183
450	606	806	710	717	-	345	400	533	136	205
500	606	806	764	775	-	371	426	585	150	245
600	606	806	879	887	-	426	481	694	192	334
700	706	-	992	-	-	485	540	812	280	-
800	906	-	1106	-	-	541	596	922	370	-
900	1006	-	1208	-	-	593	648	1026	474	-
1000	1206	-	1318	-	-	645	700	1132	565	-

\*1 1) Dimension L includes earth rings thickness.

In case of tantalum earth ring, total length (L') is as follows

Size 10 to 150mm : L' = (L+7) mm

(For size over 200mm, consult TOKYO KEISO.)

When lining material is ETFE or hard rubber, gaskets are also required between primary head liner side and earth rings. The total face to face dimensions L' will be as follows.

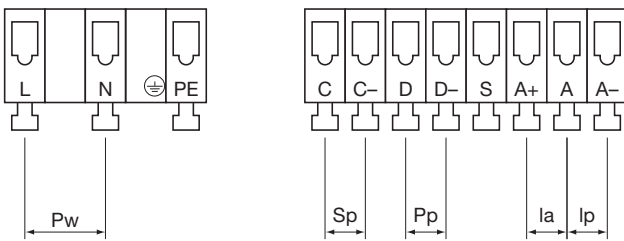
L' = L + 2 × t

t : Gasket thickness between the liner and earth ring

2) Dimension L is for JIS10K and ASME class150 flange. Consult TOKYO KEISO for other flanges.

\*2 Dimension W indicates external dimension of housing

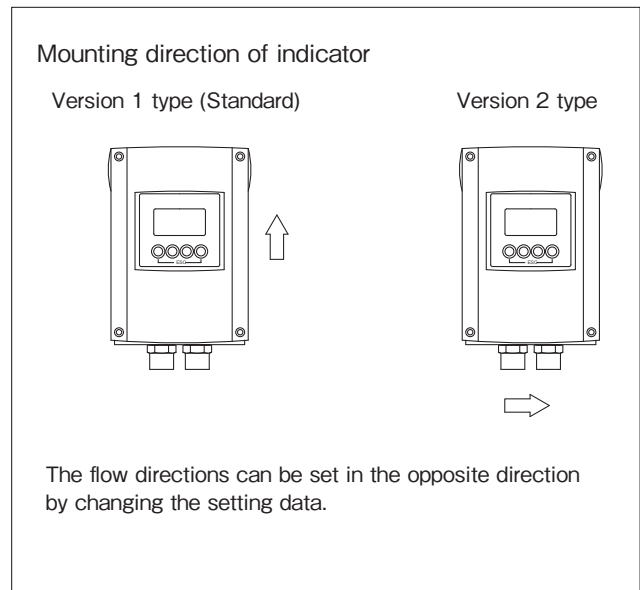
## ELECTRICAL CONNECTION



Mark	Terminal	Polarity	Description
Ip	A	+	Current output when power is supplied externally.
	A-	-	
Ia	A	-	Current output when power is supplied internally.
	A+	+	
Sp	C	+	Status output by open collector
	C-	-	
Pp	D	+	Pulse output by open collector
	D-	-	
Pw	L (L+)	(+)	AC or DC power supply The ( ) show DC power.
	N (L-)	(-)	
	PE (FE)		Grounding for power supply. The (FE) shows DC power.
	S		Grounding for shielded wire

● Terminal type : Spring clamp terminal

● Applicable core size : 0.5 to 2.5mm<sup>2</sup>





MODEL AND SPECIFICATION CODE

● Nominal size: 10 to 150mm

Model: EGM4100C

Primary head Spec. code	V	N	0	3	4			1	3		1	0	0	0	0	0	0	0	0	0	Description	Standard
Primary head code	V	N	0	3	4																Flange type	○
(Fixed code)					4																Always 4	○
Nominal size						1															10mm *1	○
						2															15mm	○
						3															20mm	○
						4															25mm	○
						6															40mm	○
						7															50mm	○
						8															65mm	○
						A															80mm	○
						B															100mm	○
						C															125mm	○
					D															150mm	○	
Flange						3															DIN PN16	
						4															DIN PN25	
						5															DIN PN40	
						A															ASME class 150	
						B															ASME class 300	
						M															JIS 20K	
						N															JIS 10K (For size: More than 50mm) *3	○
						9															Others	
						0																General type (Non-explosionproof)
Use purpose																					Compact version (EGC100 converter)	○
Type						1	3														PTFE (For size 10 to 20mm)	○
Lining ※4																					PFA (For size 25 to 150mm)	○
						S															Stainless steel (SS316)	○
Electrode material						1															Stainless steel (SS316)	
						3															Hastelloy® C22	○ *5
						4															Hastelloy® B2	○ *6
						5															Tantalum	
						6															Titanium	
						7															Platinum	
						G															Low-noise electrode (Hastelloy® C22)	
						U															Low-noise electrode (Stainless steel (SS316))	
Construction of electrode						1															Fixed mounting	○
Primary head housing / flange material																					U	○
																					W	○
																					1	○
																					3	○
Protection class																					0	○
(Fixed code)																					0 0	○
Calibration																					0	○
Earth ring																					H	○
																					K	○
																					L	○
																					M	○
																					N	○
																					9	○
																						Others
(Fixed code)																					0 2 0 0 0 0 0 0	○
Special feature																					(Blank)	○
																					/Z	○
																					Involved *7	○

Converter Spec. code	V	N	3	1	4	4			6	0	0	1	2	1	0	0	0	0	0	0	Description	Standard
Converter code	V	N	3	1	4	4															Type: EGC100	○
(Fixed code)					4																Always 4	○
Type						4															Compact type (EGC100 Converter 0° type)	○
Power supply							1														24 V DC (11 to 31V), General type (Non-explosionproof)	
							A														100 to 230 V AC (85 to 253V)	○
Use purpose							0														General type (Non-explosionproof)	○
Cable entry							4														1/2 NPT female thread	
							5														G1/2 female thread	○
							6														M20 with watertight glands	
(Fixed code)								6	0	0										Always 600	○	
Housing																					Standard	○
Mounting position of LCD display																					1	○
																					2	○
(Fixed code)																					2	○
Output type																					1	○
(Fixed code)																					0 0 0 0 0	○
Special feature																					(Blank)	○
																					/Z	○
																					Involved *7	○

\*1 Nominal size 10mm is provided with size 15mm or 1/2" angles.  
 \*2 Standard liner material in this table indicates for JIS10K ange. Refer to "LINER MATERIAL AND FLANGE" table as details.  
 \*3 JIS20K ange is provided for nominal size 10 to 40mm as standard. (Installation dimensions of JIS20K ange are equal to JIS10K except the ange thickness.)  
 Select JIS20K ange (Code: M) for size 10 to 40mm.  
 \*4 Applicable liner material is subject to nominal size and ange rating. Refer to "LINER MATERIAL AND FLANGE" table as details.  
 \*5 Standard electrode material for size 40 to 1000mm is Hastelloy® C22.  
 \*6 Standard electrode material for size 10 to 25mm is Hastelloy® B2.  
 \*7 Add code "/Z" to a series of above mentioned codes with explanation for the other requirements not mentioned above code table.  
 Do not hesitate to consult TOKYO KEISO Co., Ltd. before ordering for such requirements.





## STANDARD ACCESSORIES

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- Parameter sheet : 1
- Instruction manual : 1

## OPTION

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- G1/2 watertight glands for cable entry : 1 set [Symbol : WG]

## ORDERING INSTRUCTIONS

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Specify the following when ordering :

1. Model and spec. code

Example : Model : EGM4100C

Primary head spec. code :

VN0347N013S3110000H02000000

Converter spec. code : VN3144A05600112100000

2. Flow range (Full scale) (Unnecessary when option is NS.)

3. Option (Specify if necessary.)

Specify the symbol with reference to the option.

4. Fluid name

\* Specification is subject to change without notice.

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