

### GENERAL

**MAGMAX<sup>®</sup>** EGM2100C is less expensive, commonly used compact electromagnetic flowmeter suitable for water, sewage and hot water.

EGM2100C is a combination of EGS2000 primary head with Polypropylene and Hard rubber liner, and converter EGC100.

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

25 to 1000mm sizes are available.

### FEATURES

- ❑ Polypropylene liner (Size 25 to 150mm) achieved high-durability and high-heat resistance. Suitable for water, sewage and hot water for process temperature up to 90°C.
- ❑ Hastelloy<sup>®</sup> C22 electrodes as standard.
- ❑ High accuracy of  $\pm 0.5\%$  of reading.
- ❑ High speed data processing for quick response. Suitable for batch process control and for 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 : 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 0.531m<sup>3</sup>/h  
(Minimum flow at 25mm size)  
Max. 0 to 33928m<sup>3</sup>/h  
(Maximum flow at 1000mm size)
  - Protection class : IP66/67 (IEC 60529)
  - Body material
    - Measuring tube : Stainless steel (SS304)
    - Primary head housing : Carbon steel<sup>(\*)</sup> [Standard]<sup>(\*\*)</sup>  
[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
- (\*\*) When the size is 25 to 40mm and the wetted part lining is hard rubber: Cast duplex stainless steel.

- Wetted part material
  - Liner : [Standard]
    - Size 25 to 150mm ; Polypropylene
    - Size 200 to 1000mm ; Hard rubber
  - [Option]
    - Hard rubber (Size 25 to 150mm)
    - \* Refer to the "LINER MATERIAL AND FLANGE."
  - Electrode : Hastelloy® C22 [Standard]
    - [Option] Stainless steel/SS316
  - Earth ring : [Option] Stainless steel/SS316
- 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
  - Liner material : Polypropylene -5 to +90°C\*
  - Hard rubber -5 to +80°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 : 20μS/cm or more

### 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 : Less than 32V DC, 100 mA Max.
    - Residual voltage: Less than 1.5 VDC at 10 mA
    - Leak current: Less than 0.5 mA 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.

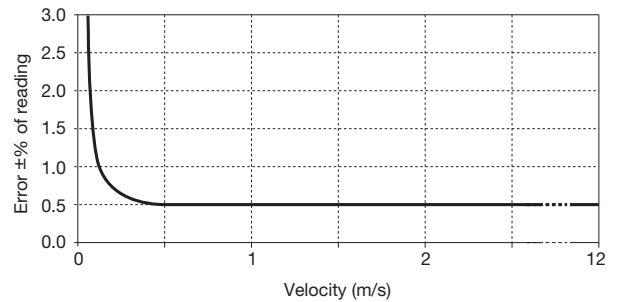
**Standard Functions**

- 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  
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 fail  
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)	Temperature
Polypropylene	25 to 150	-5 to +90°C
Hard rubber	25 to 1000	-5 to +80°C

### Maximum Pressure

Liner	Nominal size (mm)	Pressure MPa *1
Polypropylene	25 to 80 (Except 65mm)	4.0
	65, 100 to 150	1.6
Hard rubber	25 to 1000	15

\*1 Maximum operating pressure must be within the flange rating pressure.

The value on this table indicates maximum pressure which can be manufactured.

Consult TOKYO KEISO for details.

### Permissible Vacuum Load

\*2 : Vacuum not acceptable - : Not applicable

Liner	Nominal size (mm)	Minimum pressure kPa (abs) / Fluid temp.			
		40°C	60°C	80°C	90°C
Polypropylene	25 to 150	25	40	40	*2
Hard rubber	25 to 300	25	40	40	-
	350 to 1000	50	60	60	-

## FLOW RANGE

Nominal size (mm)	Possible setting range (m³/h)		Nominal size (mm)	Possible setting range (m³/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)
25	0 to 0.531	0 to 21.2	300	0 to 76.4	0 to 3053
40	0 to 1.36	0 to 54.2	350	0 to 104	0 to 4156
50	0 to 2.13	0 to 84.8	400	0 to 136	0 to 5428
65	0 to 3.59	0 to 143	450	0 to 172	0 to 6870
80	0 to 5.43	0 to 217	500	0 to 213	0 to 8482
100	0 to 8.49	0 to 339	600	0 to 306	0 to 12214
125	0 to 13.3	0 to 530	700	0 to 416	0 to 16624
150	0 to 19.1	0 to 763	800	0 to 543	0 to 21714
200	0 to 34.0	0 to 1357	900	0 to 688	0 to 27481
250	0 to 53.1	0 to 2120	1000	0 to 849	0 to 33928

## LINER MATERIAL AND FLANGE

◎ : Standard ○ : Option - : Not applicable

Flange rating	Liner	Nominal size (mm)																			
		25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
JIS10K *1	Polypropylene	◎	◎	◎	◎	◎	◎	◎	◎	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
JIS20K	Polypropylene	◎	◎	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber *2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
ASME class 150	Polypropylene	◎	◎	◎	◎	◎	◎	◎	◎	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
ASME class 300	Polypropylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber *2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
DIN PN10	Hard rubber	-	-	-	-	-	-	-	-	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
DIN PN16	Polypropylene	-	-	-	◎	-	◎	◎	◎	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber	-	-	-	○	-	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
DIN PN25	Polypropylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber *2	-	-	-	○	-	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
DIN PN40	Polypropylene	◎	◎	◎	-	◎	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hard rubber *2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-

\*1 JIS20K flange is provided for nominal size 25 and 40mm as standard.

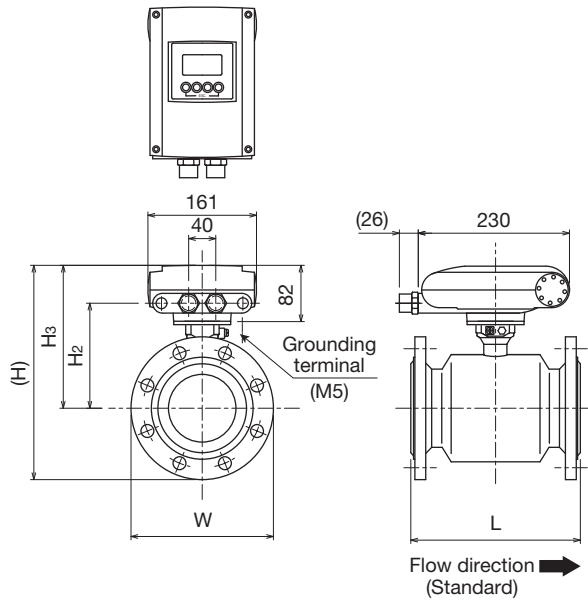
(Installation dimensions of JIS20K flange are equal to JIS10K except the flange thickness.)

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

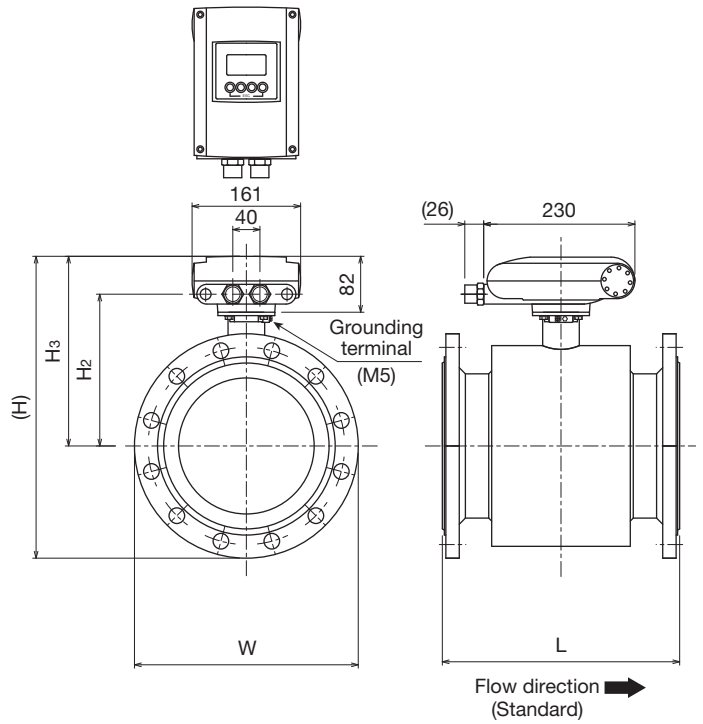
**DIMENSIONS**

**Version 1 type**

Nominal size: 25 to 150mm

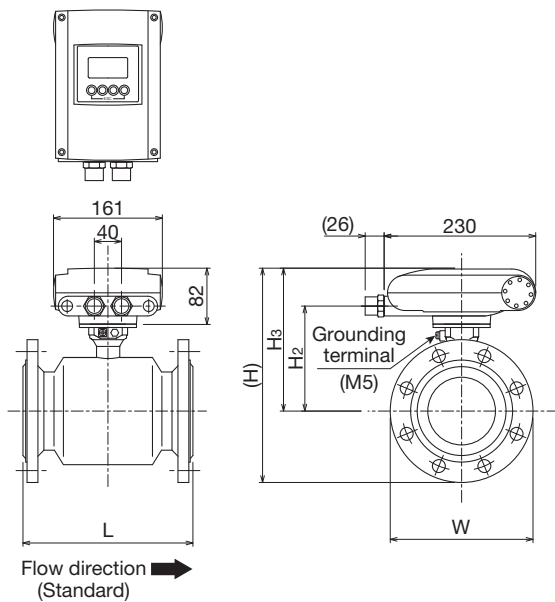


Nominal size: 200 to 1000mm

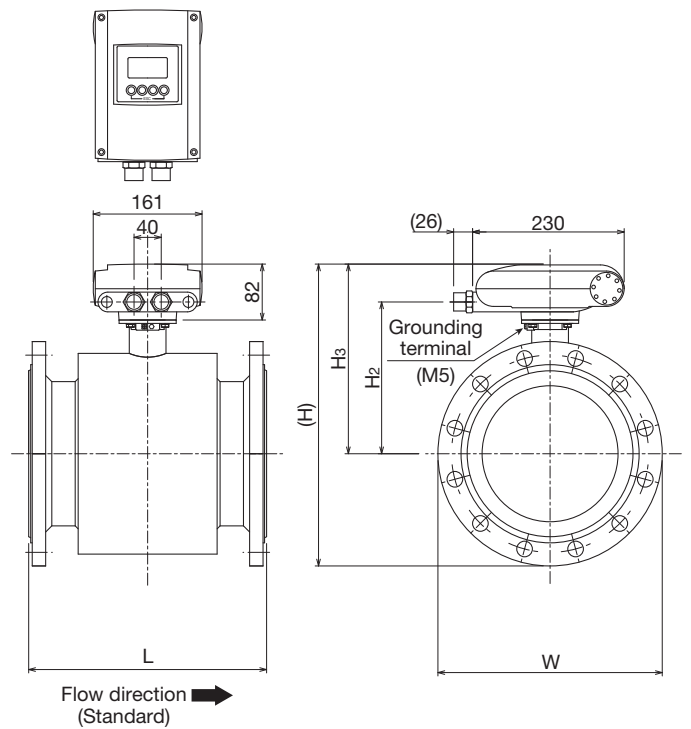


**Version 2 type**

Nominal size: 25 to 150mm



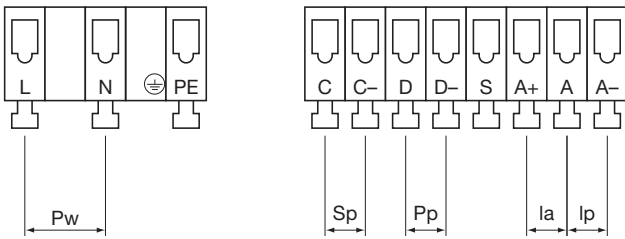
Nominal size: 200 to 1000mm



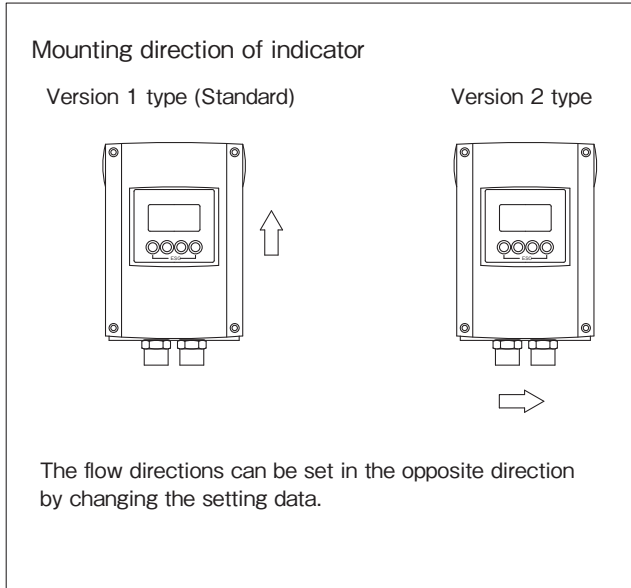
Nominal size (mm)	Dimensions (mm)							Mass (kg)	
	L *1		(H)		H2	H3	W *2	JIS 10K	ASME 150
	JIS 10K	ASME 150	JIS 10K	ASME 150					
25	150	150	228	220	111	166	90	10	11
40	150	150	243	237	118	173	105	11	12
50	200	200	262	261	130	185	120	11	12
65	200	200	271	272	134	189	140	13	14
80	200	200	284	286	136	191	150	15	16
100	250	250	314	323	154	209	175	18	21
125	250	250	348	350	168	223	210	22	25
150	300	300	379	378	184	239	240	25	29
200	350	350	446	452	226	281	291	40	49
250	400	400	502	505	247	302	331	55	71
300	500	500	549	568	272	327	381	66	103
350	500	700	594	615	294	349	428	86	137
400	600	800	655	673	320	375	483	107	175
450	600	800	710	717	345	400	533	127	196
500	600	800	764	775	371	426	585	138	233
600	600	800	879	887	426	481	694	176	318
700	700	-	992	-	485	540	812	258	-
800	900	-	1106	-	541	596	922	342	-
900	1000	-	1208	-	593	648	1026	440	-
1000	1200	-	1318	-	645	700	1132	524	-

- \*1 1) Dimension L does not include earth rings thickness.  
 2) Total overall length (L') with earth rings is as follows.  
 $L' = L + 2 \times (3+t)$  mm  
 t : Gasket thickness between the liner and earth ring \*  
 \* In case of install the earth ring, gaskets are also needed between the primary head liner side and earth ring.  
 3) 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
	N (L-)	(-)	The ( ) show DC power.
	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>







