TECHNICAL GUIDANCE

MAGMAX®
EGM5300C
Compact Electromagnetic Flowmeter

GENERAL

MAGMAX® EGM5300C is a combination of EGS5000 primary head with Ceramic measuring tube and high performance converter EGC300.
EGM5300C with high durability and high anti-corrosive capability is widely applicable for chemical liquid, slurry and many other applications.
And improved self-diagnostic functions include vacancy detection and detection unit monitoring.
2.5 to 100mm sizes are available.

FEATURES

- ❑ Combination of Ceramic tube and Platinum electrodes is adopted for high anti-corrosive, anti-erosion, and anti-penetration capability.
- ❑ Dimensionally stable measuring tube with excellent temperature resistance and long-term stability, no creep and no abrasion as is the case with plastic liners.
- ❑ Stainless steel housing is adopt.
- ❑ The newly designed reducing tube offers high accuracy and stability even for low velocity range and mechanical durability of measuring tube.
- ❑ High accuracy of ±0.5% of reading.
- ❑ High speed data processing for quick response. Suitable for batch process control and for pulsating flow.
- ❑ The excitation system extendable up to twice the commercial frequency allows applications to much fluid noise such as slurry.
- ❑ Blue dot matrix LCD (with backlight) used for the display. Capable of providing 1 to 3-digit display.
- ❑ Equipped with a quick setup function to readily respond to changed flow range, pulse rate, etc.
  A touch panel system by an infrared sensor allows you to alter the settings without removing the cover of the conversion section.
- ❑ 10kHz high-speed pulse output. Capable of responding to short batch processes.
- ❑ Current and pulse output, bi-directional measurement, double range, status output, control input...Full function provided in compact design.

STANDARD SPECIFICATION

General Specification

- Excitation : Square wave
- Nominal size : 2.5, 4, 6, 10, 15, 25, 40, 50, 80, 100mm
- Measuring range : Flow velocity Min. 0 to 0.3m/s
  Max. 0 to 12m/s
  Flow rate Min. 0 to 0.0054m^3/h
  (Minimum flow at 2.5mm size)
  Max. 0 to 339m^3/h
  (Maximum flow at 100mm size)
- Protection class : IP66/67 (IEC 60529)
- Housing material
  Primary head : Size 2.5 to 15mm : Stainless steel cast
  Size 25 to 100mm : Stainless steel
  Converter : Aluminum alloy (*1)
- Wetted part material
  Measuring tube : Size 2.5 to 25mm
  Zirconia ceramics (ZrO_2)
  Size 40 to 100mm
  Alumina ceramics (Al_2O_3)
  Electrode : Size 2.5 to 25mm ; Pt CERMET
  Size 40 to 100mm ; Platinum
  Earth ring : Stainless steel/SS316 [Standard], Hastelloy® B, Hastelloy® C, Titanium, Tantalum (*2) (*3)
  Gasket for earth ring (*3) : PTFE jacket type with joint sheet core or Fluorocarbon resin
- Painting : Siloxane coating (*4)
- Color (*4) : Grey (Converter housing)
  Jade green (Converter cover / Terminal box cover)

(*1) Anti-corrosive painting
(*2) Tantalum earth ring is a combination of tantalum plate and PTFE jacket type gasket with Viton core.
(*3) Refer to "Operating range for the earth ring gaskets".
(*4) Terminal box only

TOKYO KEISO CO.,LTD.
TG-F2232-E00
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- Cable entry : 2 × G1/2 female thread
  2 × 1/2 NPT female thread
  2 × M20 with watertight glands
  (Option : Watertight glands for G1/2)
  (Option : Number of wiring connection ; 3)
- Supply voltage : 100 to 230V AC (85 to 250V AC)
  24V DC (9 to 31V)
- Supply frequency : 48 to 63Hz (AC)
- Power consumption : AC; approx. 22VA
  DC; approx. 12W
- Ambient temp. : –40 to +65°C (Fluid temp. ≤140°C)
  –50 to +70°C (For storage)
- Grounding : Grounding resistance must be less than 100Ω.
- Process connection : Wafer type
- Matching flanges : JIS10K/20K/30K/40K,
  ANSI class 150/300, DIN PN16/40

Fluid Specification

- Temperature : –40 to +140°C
- Pressure : Size 2.5 to 80mm ; 0 Pa (abs) to 4 MPa
  Size 100mm ; 0 Pa (abs) to 1.6 MPa
- Conductivity : To be 1μ S/cm or more for size 25 to 100mm
  To be 5μ S/cm or more for size 4 to 15mm
  To be 10μ S/cm or more for size 2.5mm
  (To be 20μ S/cm or more for water)
- Permissible temperature change : Temperature rising
  in 10 minutes ; ΔT≤150°C
  (for sudden change ; ΔT≤120°C)
  Temperature falling
  in 10 minutes ; ΔT≤100°C
  (for sudden change ; ΔT≤80°C)

Indication and Output Specification

- Indicator : Blue, 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 (Only nominal size 25 to 100 mm), and coil temperature
- Current output : 4 to 20mA DC (Max. 22mA)
  Internal power supply :
  Less than 1000ohms (Load resistance)
  External power supply :
  32V DC (External voltage)
- Pulse output
  Open collector output
  Rating : Less than 32V DC, 20mA (≤10kHz)
  Less than 100mA (≤100Hz)
  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 2000m/s
- Status output
  Open collector output
  Rating : 32V DC, 100mA Max.
  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 detection (Only nominal size 25 to 100 mm)
- Control input
  Voltage input
  Low : 0 to 2.5V DC High : 19 to 32V DC
  Contents
  One of the following selectable:
  1) No control input (Standard factory setting)
  2) Signal hold
  3) Signal lock to 0%
  4) Total counter reset
  5) Error reset
  6) Range selection (For double range measurement)
- Description of input and output terminal

Terminal	Standard setup	Switchover by reprogramming
A (A, A / A–)	Current output	–
B (B / B–)	Status output	Control input
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%
  Setting value (Standard) :
  Current output, Pulse output ; ON 1%, OFF 3% 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 ; 3s
  Pulse output ; Damping time constant 0
- Isolation of input and output
  Each circuit of power supply, electrode input, terminal A, terminal B, terminal C, and terminal D are isolated.

Standard Functions

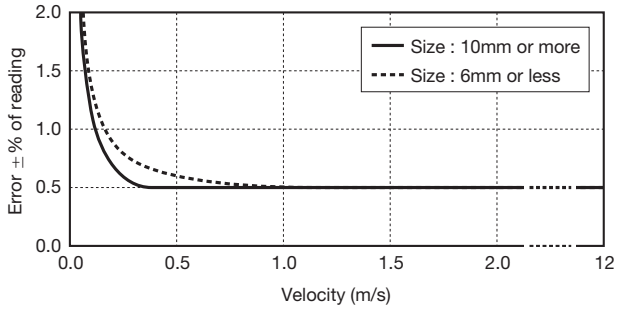
- Customer's free measuring unit setting function
  Volume (or mass) and time unit in 7 characters can be created.
- Automatic zero adjustment function
  Zero adjustment is automatically conducted at "ZERO ADJUST MODE" (Subject to zero flow)
- Bi-directional flow measurement function
  A flow-direction 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 ; By automatic or control input signal
- Excitation current frequency switching function
  Standard mode :
  1/6 of supply frequency (Standard)
  High frequency mode :
  1/50 to 2 of supply frequency (For slurry, pulsating flow, etc.) (*5)
- 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 :
  Velocity distribution, Linearity, Magnetizing current / frequency, Empty 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 and pulse output is 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
- Touch sensor setting function (Infrared radiation)
  By four infrared sensors, data setup from exterior is possible without removing cover.
- HART communication
  Please confirm the specification to us.

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

Accuracy (*6)

- Indication and pulse output
  [Size : 2.5 to 6mm]
  For velocity ≥ 1m/s ; ±0.5% of reading
  For velocity < 1m/s ; ±0.4% of reading + velocity error of ±0.001m/s
  [Size : 10 to 100mm]
  For velocity ≥ 0.33m/s ; ±0.5% of reading
  For velocity < 0.33m/s ; ±0.2% of reading + velocity error of ±0.001m/s



- Current output :
  Additional error of ±0.01mA be added onto displey and pulse output.

(*6) Basis condition

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

Operating range for the earth ring gaskets

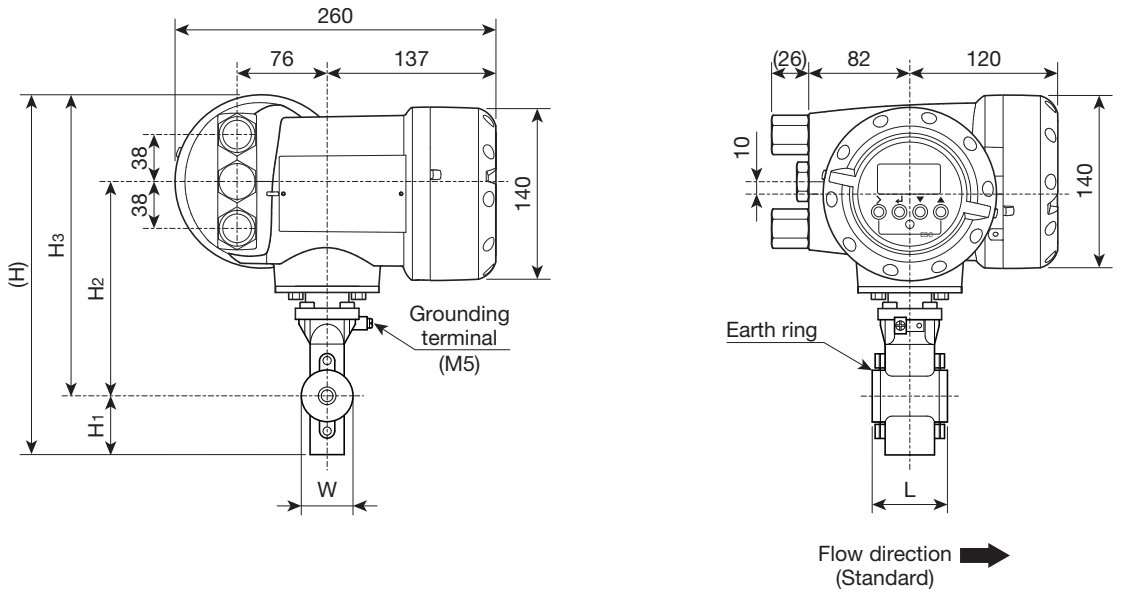
Gasket	Fluid pressure	Fluid temperature
PTFE jacket type with joint sheet core (equivalent to VALQUA No. N7035)	1.5MPa	140°C
Fluorocarbon resin (equivalent to VALQUA No. 7020)	4MPa	140°C
Tantalum earth ring (PTFE jacket type gasket with Viton core)	0.7MPa	140°C

FLOW RANGE

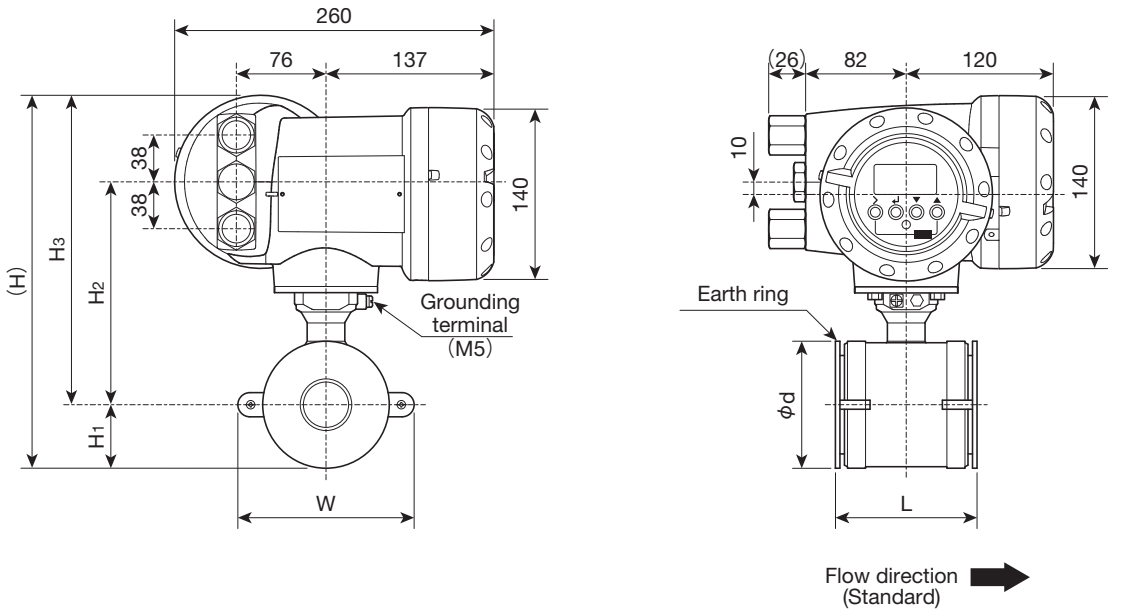
Nominal size (mm)	Possible setting range (m³/h)	
	Min. (Flow velocity : 0 to 0.3 m/s)	Max. (Flow velocity : 0 to 12 m/s)
2.5	0 ~ 0.0054	0 ~ 0.212
4	0 ~ 0.0136	0 ~ 0.542
6	0 ~ 0.0306	0 ~ 1.22
10	0 ~ 0.0849	0 ~ 3.39
15	0 ~ 0.191	0 ~ 7.63
25	0 ~ 0.531	0 ~ 21.2
40	0 ~ 1.36	0 ~ 54.2
50	0 ~ 2.13	0 ~ 84.6
80	0 ~ 5.43	0 ~ 217
100	0 ~ 8.49	0 ~ 339

DIMENSIONS

Nominal size: 2.5 to 15mm



Nominal size: 25 to 100mm

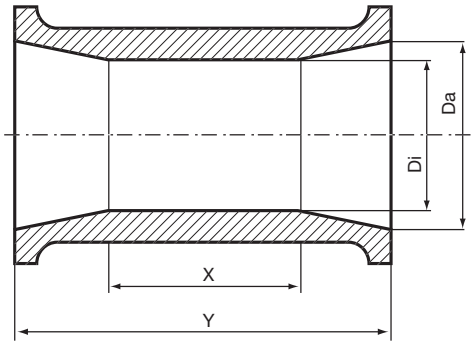


Nominal size (mm)	Dimensions (mm)							Mass (kg)
	L*	(H)	H_1	H_2	H_3	W	d	
2.5 ~ 15	68	306	51	185	255	44	–	6
25	69	271	34	167	237	102	68	6
40	94	286	42	174	244	117	84	7
50	114	304	51	183	253	136	102	8
80	164	336	67	199	269	168	134	11
100	214	361	79	212	282	193	158	13

*1 Dimension L is for with PTFE jacket type gaskets for earth rings.
Dimension L is shorter by 2mm in case of Fluorocarbon resin gaskets for earth rings.

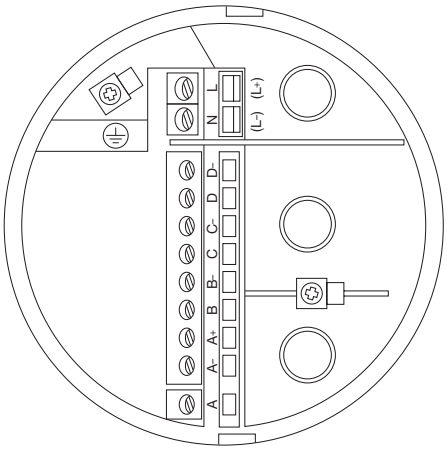
*2 Dimension L is shorter by 5mm (size 2.5 to 15mm) or 1mm (size 25 to 100mm) in case of Tantalum earth rings.

DIMENSIONS FOR CERAMIC TUBE

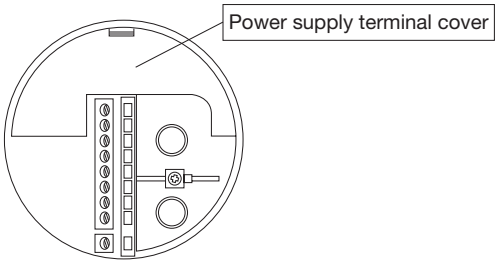


Nominal size (mm)	Dimensions (mm)			
	Da	Di	X	Y
2.5	6	2	20	50
4	7	3	20	50
6	9	5	20	50
10	12	7	20	50
15	14	12	20	50
25	24	20	26	55
40	37	30	36	80
50	49	40	51	100
80	78	60	70	150
100	98	80	103	200

ELECTRICAL CONNECTION



Protection cover is provided for power supply terminals.



Terminal	Description
L / L+	L+ (+) • L– (–) (AC power supply / DC power supply)
N / L–	
⏚	Grounding

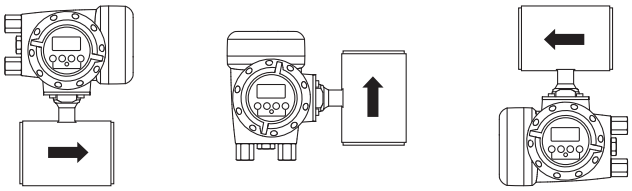
Terminal	Description		Polarity	
D–	Pulse output or Status output		–	
D			+	
C–	Status output		–	
C			+	
B–	Status output or Control input		–	
B			+	
A+	Current output (4 to 20mA DC / HART: Internal power supply)		+	
A–		Current output (4 to 20mA DC / HART: External power supply)		–
A	Current output (4 to 20mA DC / HART: Internal power supply)		–	+

- Terminal type : Plug-in type screw terminal
- Connection capacity: 0.5 to 2.5mm^2

Mounting position of LCD display

Indication part of EGM5300C can be changed according to the flow direction.

Version A Version B Version C



The mounting position will be arranged according to the customer's request when ordering.
The arrow indicates standard flow direction.
Flow direction can be changed by data setting.

MODEL AND SPECIFICATION CODE

● Nominal size : 2.5 to 100mm

Model : EGM5300C

Primary head Spec. code	V N 1 8	4		N		1 C	0		0	0	0 0	0	0 2 0 0 0 0 0		Description			Standard
Primary head code	V N 1 8														Wafer / Ceramic type / Platinum electrodes			○
(Fixed code)		4													always 4	Connection flange size		○
Nominal size			1												2.5mm	10 or 15A	1/2"	○
			2												4mm			○
			3												6mm			○
			5												10mm			○
			6												15mm	15A	1/2"	○
			8												25mm	25A	1"	○
			B												40mm	40A	1-1/2"	○
			C												50mm	50A	2"	○
			E												80mm	80A	3"	○
			F												100mm	100A	4"	○
Process connection				N											Wafer type			○
Use purpose					0										General type (Non-Ex)			○
Type						1 C									Compact version (EGC300 Converter)			○
(Fixed code)							0								always 0			○
Earth ring / Gasket for earth ring *1								1							Stainless steel (SS316) / PTFE			○
								2							Hastelloy® C / PTFE	Fluid pressure : 1.5MPa or less		
								3							Hastelloy® B / PTFE			
								6							Titanium / PTFE			
								K							Stainless steel (SS316) / Fluorocarbon resin	Fluid pressure : 4MPa or less		
								L							Hastelloy® C / Fluorocarbon resin			
								R							Hastelloy® B / Fluorocarbon resin			
								S							Titanium / Fluorocarbon resin			
								T							Tantalum with PTFE gaskets	Fluid pressure : 0.7MPa or less		
								9							Others			
Electrode material									0						Standard			○
Protection class										0					IP66/67			○
(Fixed code)											0 0				always 0000			○
Calibration												0			Standard calibration			○
(Fixed code)													0 2 0 0 0 0 0		always 0200000			○
Special feature														(Blank)	None			○
														/Z	Involved *2			

Converter Spec. code	V N 3 0	4	4				2 0 0	1	2	1	0 0 0 0 0		Description	Standard
Converter code	V N 3 0												Type: EGC300 (Cylindrical housing)	○
(Fixed code)		4											always 4	○
Type			4										LCD indication	○
Power supply				1									24V DC (18 to 31V)	
				A									100 to 230V AC (85 to 250V)	○
Use purpose					0								General type (Non-Ex)	○
Cable entry						4							1/2 NPT female thread	
						5							G1/2 female thread	○
						6							M20 with watertight glands	
(Fixed code)							2 0 0						always 200	○
Housing								1					Standard (Aluminium alloy)	○
(Fixed code)									2				always 2	○
Output type										1			Standard (Current output + Pulse output + Control input + Status output)	○
(Fixed code)											0 0 0 0 0		always 00000	○
Special feature												(Blank)	None	○
												/Z	Involved *2	

*1 Refer to "Operating range for the earth ring gaskets".

*2 In case that Special feature are involved, put [/Z] at the end of spec. code and specify the details.
It is recommended to consult TOKYO KEISO for such availability before ordering.

STANDARD ACCESSORIES

- Parameter sheet : 1
- Instruction manual : 1

OPTION

- Bolt and nut for piping : 1 set [Symbol : BN]
  Material : SUS304, for JIS10K flange
- PTFE jacket type gaskets for piping : 2 pcs [Symbol : FG]
  VALQUA No. N7030, for JIS10K flange
  Note) Inform us of the flange rating in case of the piping side flange is except JIS10K with bolts and nuts.
- G1/2 watertight glands for cable entry : 1 set [Symbol : WG]
- Number of wiring connection : 3 [Symbol : 3G]
- No converter data (parameter) setting [Symbol : NS]
  We will supply with standard data setting in case you have no request.
  Please set the data of flow range, pulse rate and flow direction etc. that required operating.

ORDERING INSTRUCTIONS

Specify the following when ordering :

1. Model and spec. code
   Example : Model : EGM5300C
   Primary head spec. code :
   VN1848N01C01000000200000
   Converter spec. code : VN3044A0520012100000
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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