TECHNICAL GUIDANCE

MAGMAX®
EGC300F/EGC300W
Converter for Electromagnetic Flowmeter

GENERAL

MAGMAX® EGC300F/EGC300W series is a separate type converter for electromagnetic flowmeters, which has various functions, high accuracy and high reliability.
An excitation system extendable up to twice the commercial frequency has been introduced to reduce fluid noise.
And improved self-diagnostic functions include vacancy detection and detection unit monitoring.
Two types of field installation type EGC300F and wall installation type EGC300W are selectable.

FEATURES

- ❏ Current and pulse output, bi-directional measurement, double range, status output, control input...Full function provided in compact design.
- ❏ High accuracy of ±0.5% of reading.
- ❏ High speed data processing for quick response. Suitable for batch process control and 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.
- ❏ 10 kHz high-speed pulse output. Capable of responding to short batch processes.

STANDARD SPECIFICATION

[EGC300F/EGC300W Common Specifications]

General Specification

- Primary head for combination : MAGMAX Series Primary head EGS1000, EGS2000, EGS4000, EGS5000, EGS6000 or others
- Excitation : Square wave
- Measuring range : Flow velocity Min. 0 to 0.3 m/s, Max. 0 to 12 m/s
- Cable entry : 4 × G1/2 female thread
  4 × 1/2 NPT female thread
  4 × M20 (with watertight glands)
  (Option : Watertight glands for G1/2)
  (Option : Number of wiring connection ; 5)
- Supply voltage : 100 to 230 V AC (85 to 250 V AC)
  (Option) 24 V DC (9 to 31 V)
- Supply frequency : 48 to 63 Hz (AC)
- Power consumption : AC; (approx.) 22 VA
  DC; (approx.) 12 W
- Ambient temp. : –40 to +65°C (For operation)
  –50 to +70°C (For storage)

- Grounding : Grounding resistance must be less than 100Ω.
- Cable

  Exclusive cable for electrode signal : 1) DS cable
  2c × 0.5 mm² with double shield, PVC sheath, outer diameter ; approx. 10 mm
  2) BTS cable
  2c × 0.5 mm² with double or separate shield, PVC sheath, outer diameter ; approx. 11 mm

  Excitation current cable : 3c × 0.75 to 2.5 mm², (*1) outer diameter ≤ 12 mm

  Power supply and output signal cables : 2 or 4c × 0.5 to 2.5 mm², (*2) outer diameter ≤ 12 mm

(*1) There is a restriction of the cable length and terminal structure.
Refer to “Excitation current cable” for details.

(*2) There is a restriction of the terminal structure.
Refer to “Connection capacity” for details.

Indication and Output Specification

- Indicator : Blue, dot matrix LCD (With backlight)
  128 × 64 pixels (59 × 31 mm)
  Indication function :
  Changeover (2 screens)
  One to three lines are displayed at one screen.
  Contents of indication ; Flow rate, velocity, total flow, conductivity (In case of primary head type EGS5000, it is only nominal size 25 to 250 mm), and coil temperature
- Current output : 4 to 20 mA DC (Max. 22 mA)
  Internal power supply :
  Less than 1000 ohms (Load resistance)
  External power supply :
  Less than 32 V DC (External voltage)
- Pulse output

  Open collector output
  Rating : Less than 32 V DC, 20 mA (≤10 kHz)
  Less than 100 mA (≤10 Hz)

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

  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 2000 m/s
- Status output

  Open collector output
  Rating : Less than 32 V DC, 100 mA 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 (In case of primary head type EGS5000, it is only nominal size 25 to 250 mm)
- Control input

  Voltage input
  Low : 0 to 2.5 V DC High : 19 to 32 V 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% FS
  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

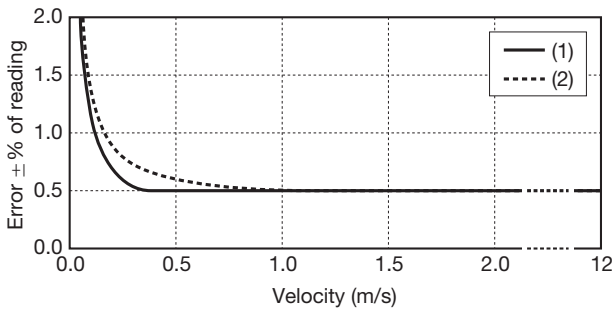
- Customer’s free measuring unit setting function
  Volume (or mass) and time unit in 7 characters can be created.
- Automatic zero adjustment function
  Zero adjustment is automatically conducted at "ZERO ADJUST MODE" (Subject to zero flow)
- Bi-directional flow measurement function
  A flow-direction 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.) (*3)

- 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 (1 Hz to 10 kHz)
  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.

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

Accuracy (*4)

- Indication and Pulse output
  1) Primary heads for combination
  EGS2000, EGS4000,
  EGS5000 (Nominal size : 10 to 250 mm), EGS6000
  For velocity ≥ 0.33 m/s : ±0.5% of reading
  For velocity < 0.33 m/s : ±0.2% of reading
  + velocity error of ± 0.001 m/s
  [graph (1)]
  2) Primary heads for combination
  EGS1000, EGS5000 (Nominal size : 2.5 to 6 mm)
  For velocity ≥ 1 m/s : ±0.5% of reading
  For velocity < 1 m/s : ±0.4% of reading
  + velocity error of ± 0.001 m/s
  [graph (2)]



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

(*4) Basis condition

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

[EGC300F (Field installation type) specification]

General Specification

- Protection class : IP66/67 (IEC 60529)
- Housing material : Aluminum alloy (*5)
- Painting : Siloxane coating
- Color : Grey (Converter housing / Terminal box housing), Jade green (Converter cover / Terminal box cover)
- Installation : Wall installation
  (Option : Fittings for 2B pipe installation)

(*5) Anti-corrosive painting

[EGC300W (Wall installation type) specification]

General Specification

- Protection class : IP65/66 (IEC 60529)
- Housing material : Polyamide resin
- Painting : Polyurethane resin painting
- Color : White gray (Body / Terminal box cover), Jade green (Converter cover)
- Installation : Wall installation

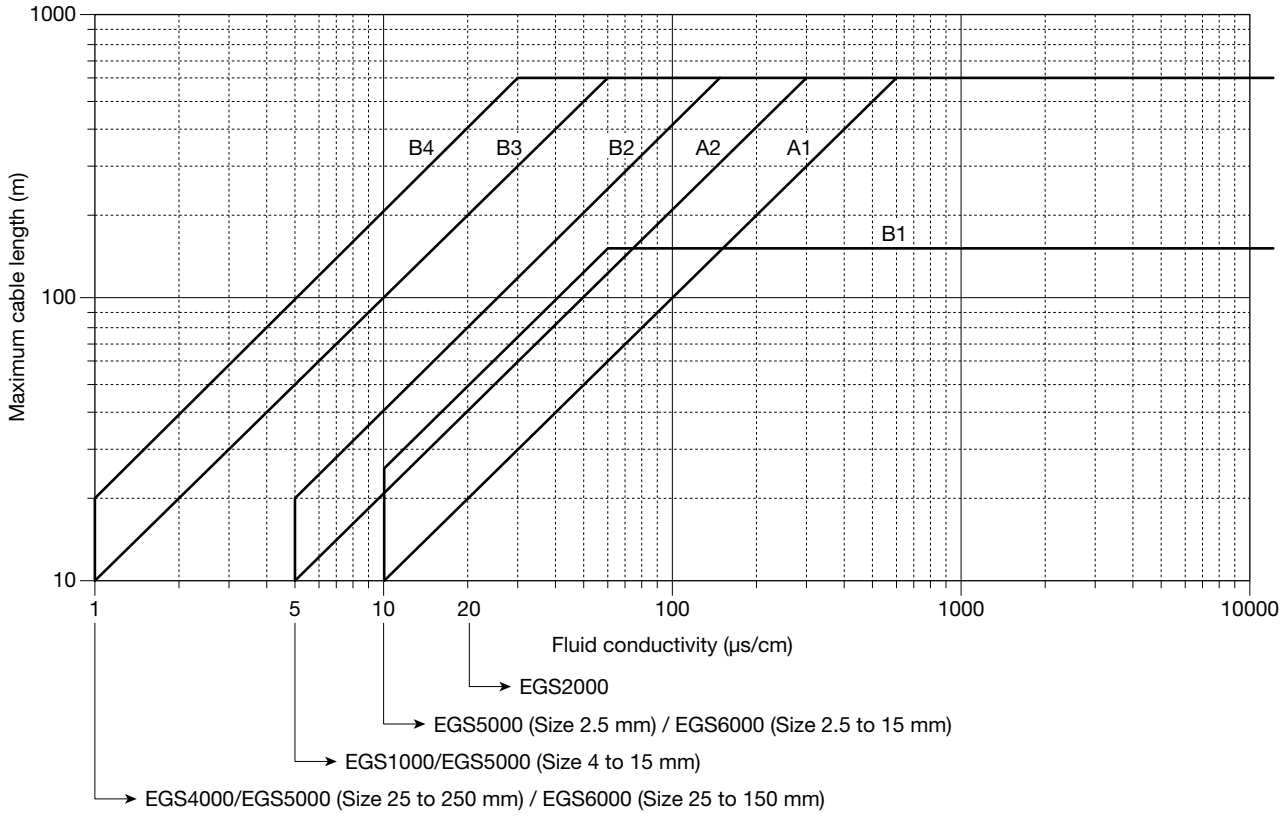
CABLE LENGTH BETWEEN PRIMARY HEAD AND CONVERTER

[Electrode signal cable]

● The maximum length of electrode signal cable

Primary head	Nominal size (mm)	DS		BTS	
		Max. cable length	Graph	Max. cable length	Graph
EGS1000	10 to 150	10 to 600 m	A1	20 to 600 m	B2
EGS2000	25 to 150	10 to 600 m	A1	10 to 600 m	B3
	200 to 2000	10 to 600 m	A2	20 to 600 m	B4
EGS4000	10 to 150	10 to 600 m	A1	10 to 600 m	B3
	200 to 2000	10 to 600 m	A2	20 to 600 m	B4
EGS5000	2.5	–	–	25 to 150 m	B1
	4 to 15	–	–	20 to 600 m	B2
	25 to 100	10 to 600 m	A1	10 to 600 m	B3
	150 to 250	10 to 600 m	A2	20 to 600 m	B4
EGS6000	2.5 to 15	–	–	25 to 150 m	B1
	25 to 150	10 to 600 m	A1	10 to 600 m	B3

● Fluid conductivity characteristics graph



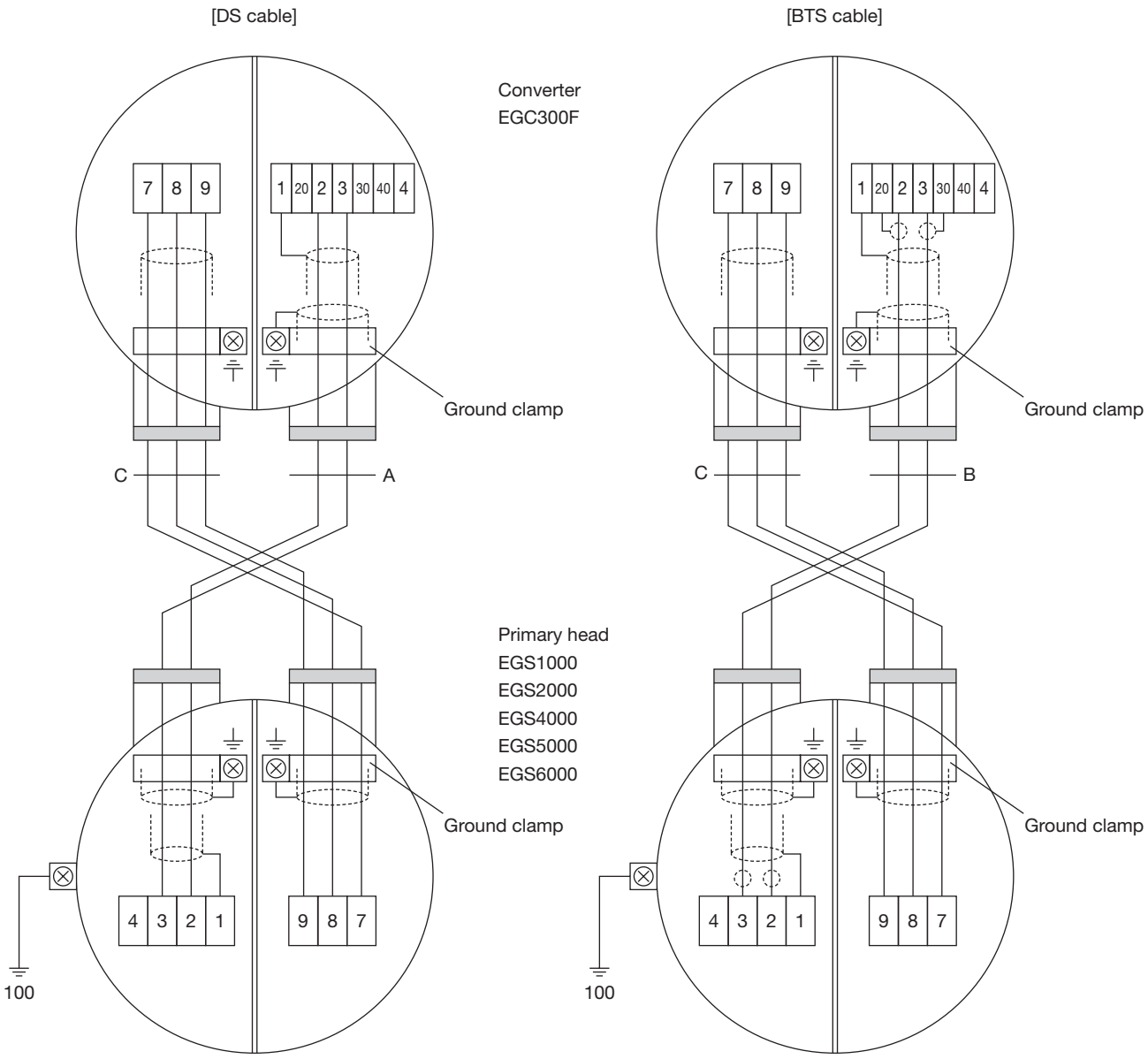
[Excitation current cable]

Cable length	Nominal cross-section	
	EGC300F	EGC300W
0 to 150 m	3 × 0.75 to 2.5 mm^2	3 × 0.75 to 1.5 mm^2
150 to 300 m	3 × 1.5 to 2.5 mm^2	*
300 to 600 m	3 × 2.5 mm^2	*

* In case of EGC300W, special cable will be provided if cable length exceeds 150 m.
Consult TOKYO KEISO for details.

ELECTRICAL CONNECTION BETWEEN CONVERTER AND PRIMARY HEAD

EGC300F (Field installation type)



A: Electrode signal cable (DS cable)
C: Excitation current cable

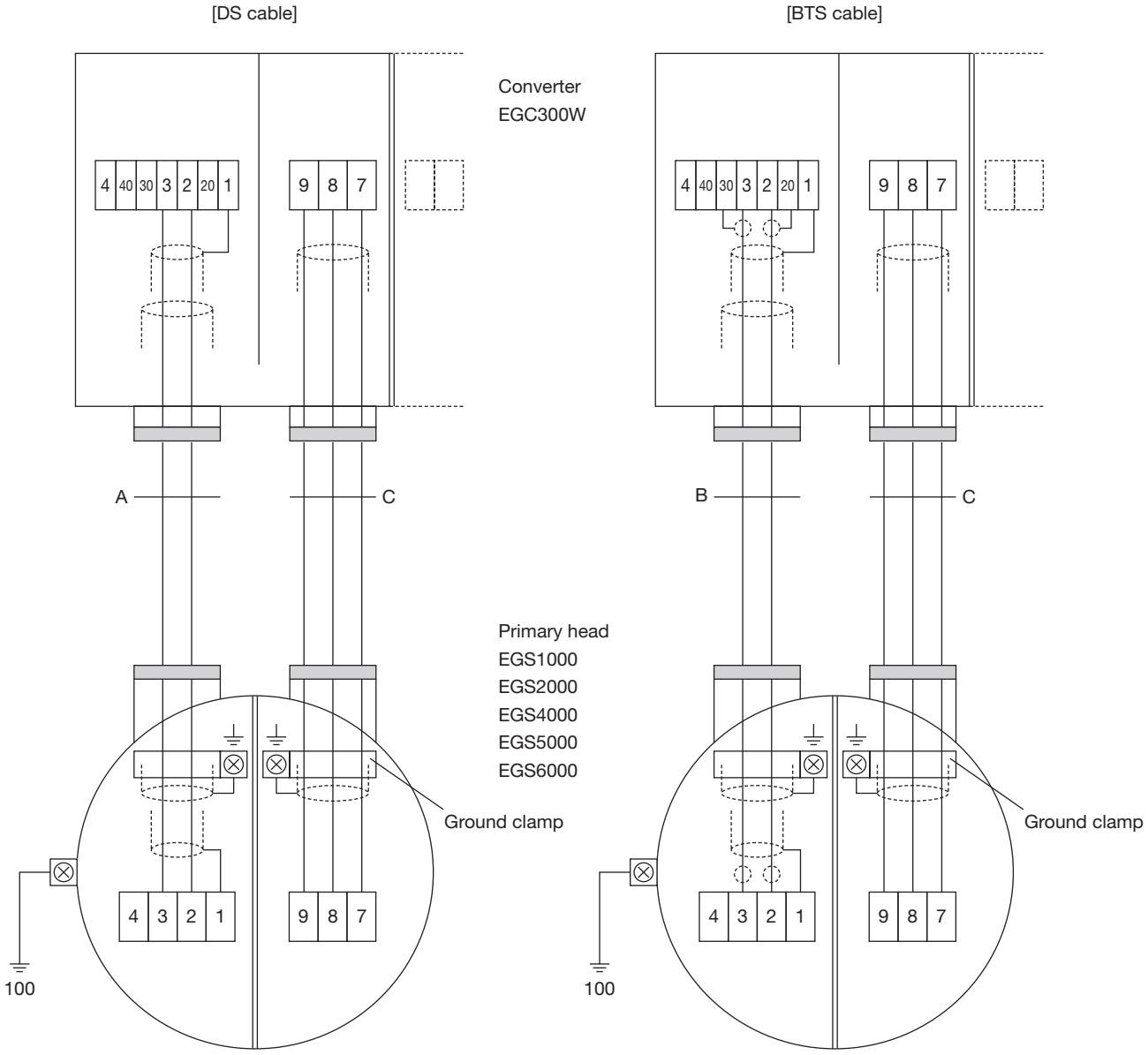
B: Electrode signal cable (BTS cable)
C: Excitation current cable

Terminal symbol	Description
1	Electrode signal input
20	
2	
3	
30	
7	Excitation current output *
8	
9	
⏚	Grounding

- Cable
  - A: DS cable for electrode signal (Exclusive cable)
  - B: BTS cable for electrode signal (Exclusive cable)
  - C: Excitation current cable*
    - 3c × 0.75 to 2.5 mm² (Shield)
    - (Supplied by customer)
- Terminal : Spring clamp terminal

* When the detector of combination is other than EGS series, since excitation current cable is 2-core, connect with 7 and 8 of terminal. However, self-diagnostic function is restricted.

EGC300W (Wall installation type)



A: Electrode signal cable (DS cable)
C: Excitation current cable

B: Electrode signal cable (BTS cable)
C: Excitation current cable

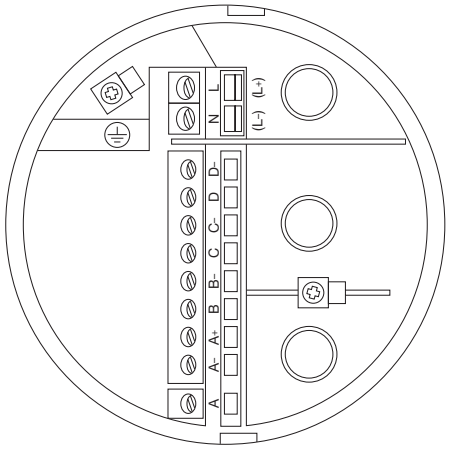
Terminal symbol	Description
1	Electrode signal input
20	
2	
3	
30	
7	Excitation current output *
8	
9	
⏚	Grounding

- Cable
  - A: DS cable for electrode signal (Exclusive cable)
  - B: BTS cable for electrode signal (Exclusive cable)
  - C: Excitation current cable*
    - 3c × 0.75 to 1.5 mm² (Shield)
    - (Supplied by customer)
- Terminal : Spring clamp terminal

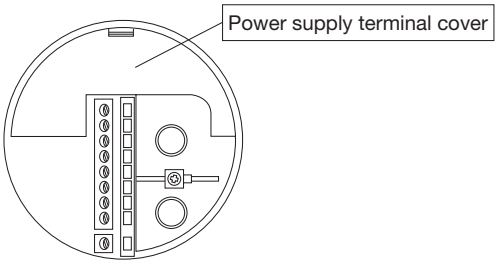
* When the detector of combination is other than EGS series, since excitation current cable is 2-core, connect with 7 and 8 of terminal. However, self-diagnostic function is restricted.

ELECTRICAL CONNECTION

EGC300F (Field installation type)



Protection cover is provided for power supply terminals.

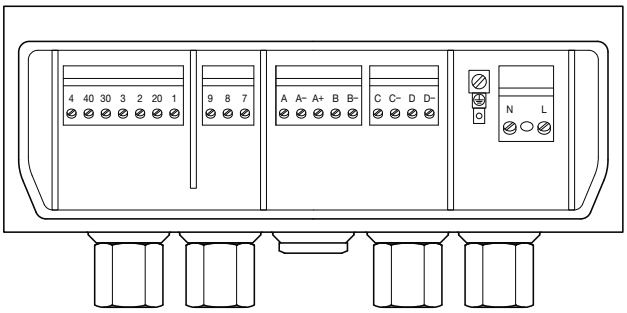


Terminal	Description
L / L+	L+ (+) • L– (–) (AC power supply / DC power supply)
N / L–	
⏚	Grounding

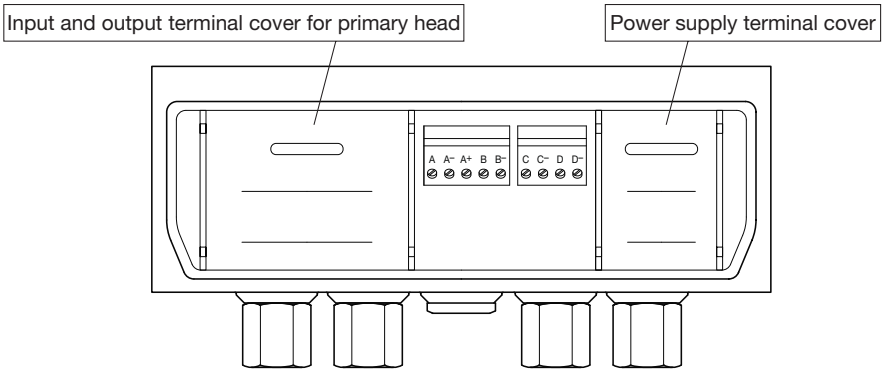
Terminal	Description		Polarity	
D–	Pulse output or Status output		–	
D			+	
C–	Status output		–	
C			+	
B–	Status output or Control input		–	
B			+	
A+	Current output (4 to 20 mA DC / HART: Internal power supply)		+	
A–		Current output (4 to 20 mA DC / HART: External power supply)		–
A	Current output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

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

EGC300W (Wall installation type)



Power supply terminal and input and output terminal for primary head have a cover for protection.



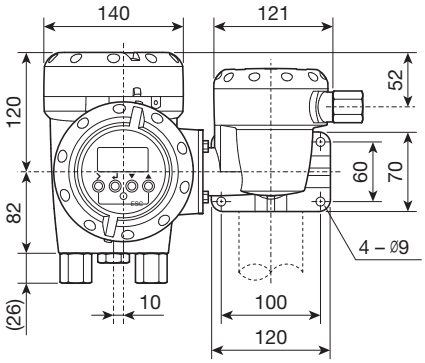
Terminal	Description
L / L+	L+ (+) • L– (–) (AC power supply / DC power supply)
N / L–	
⏚	Grounding

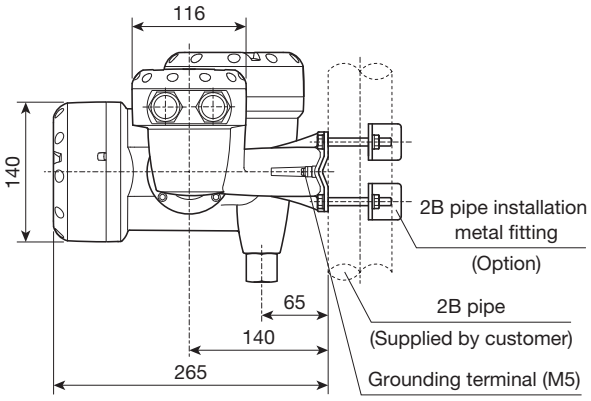
Terminal	Description		Polarity	
D–	Pulse output or Status output		–	
D			+	
C–	Status output		–	
C			+	
B–	Status output or Control input		–	
B			+	
A+	Current output (4 to 4 mA DC / HART: Internal power supply)		+	
A–		Current output (4 to 20 mA DC / HART: External power supply)		–
A	Current output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

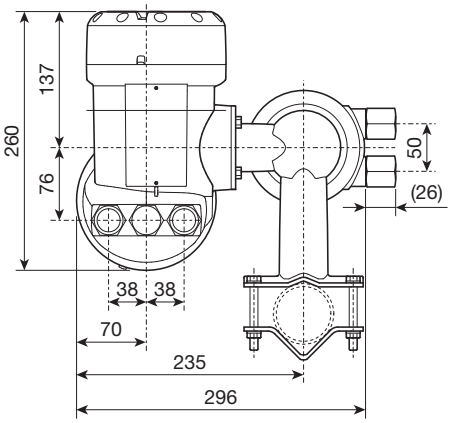
- Terminal type : Plug-in type screw terminal
- Connection capacity: Power cable ; 0.5 to 2.5 mm^2
  Signal cable ; 0.5 to 1.5 mm^2

DIMENSIONS

EGC300F (Field installation type)

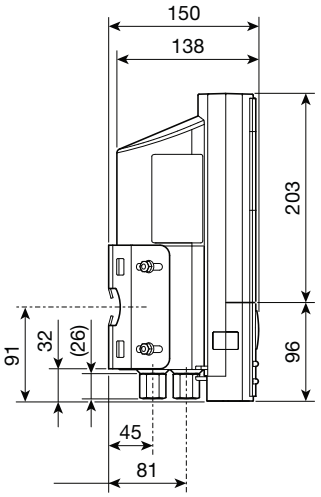


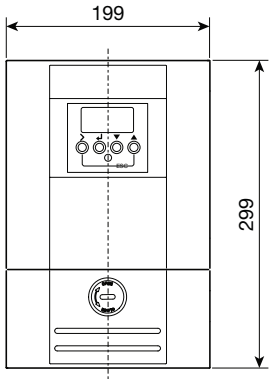




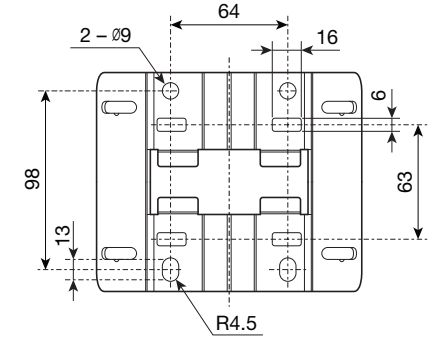
Mass: Approx. 5.7kg

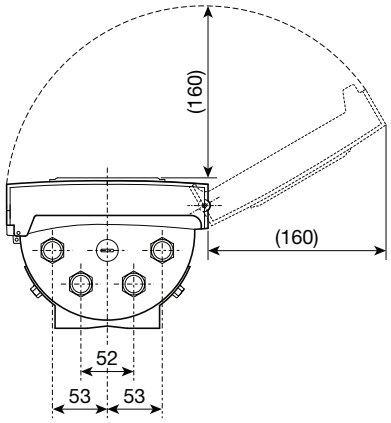
EGC300W (Wall installation type)





[Metal fitting for EGC300W]





Mass: Approx. 2.4kg

MODEL AND SPECIFICATION CODE

Model : EGC300F / EGC300W

Converter Spec. code	V N 3 0	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			H										Type : EGC300F (Field installation type), with LCD indication	
			N										Type : EGC300W (Wall installation type), with LCD indication	○
Power supply				1									24 V DC (18 to 31 V)	
				A									100 to 230 V AC (85 to 250 V)	○
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 (EGC300F : Aluminium alloy, EGC300W : Polyamide resin)	○
(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 *1	

*1 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

- G1/2 watertight glands for cable entry : 1 set [Symbol : WG]
- Number of wiring connection : 5 [Symbol : 5G]
- 2B pipe installation metal fitting
- 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 : EGC300W
   Primary head spec. code : VN304NA0520012100000
2. Flow range (Full scale), Pulse rate
3. Option
4. Type and length of electrode signal cable
   DS cable or BTS cable (Max. 600 m, 10 m unit)

* Specification is subject to change without notice.

TOKYO KEISO CO.,LTD.

Head Office : Shiba Toho Building, 1-7-24 Shibakoen, Minato-ku, Tokyo 105-8558
Tel : +81-3-3431-1625 (KEY) ; Fax : +81-3-3433-4922
e-mail : overseas.sales@tokyokeiso.co.jp ; URL : https://www.tokyokeiso.co.jp