SPECIFICATION SHEET

TOA DKK

CALMEMO - pH Meter   HBM-100D (Panel type)
HBM-160D (Field installation type)

HBM-100D/HBM-160D support CALMEMO-pH electrodes. HBM-100D is a DIN size (96 x 96 mm) panel mount type pH controller, and HBM-160D is a weatherproof, field installation type pH analyzer (transmitter) that is housed in a robust, die-cast aluminum enclosure.
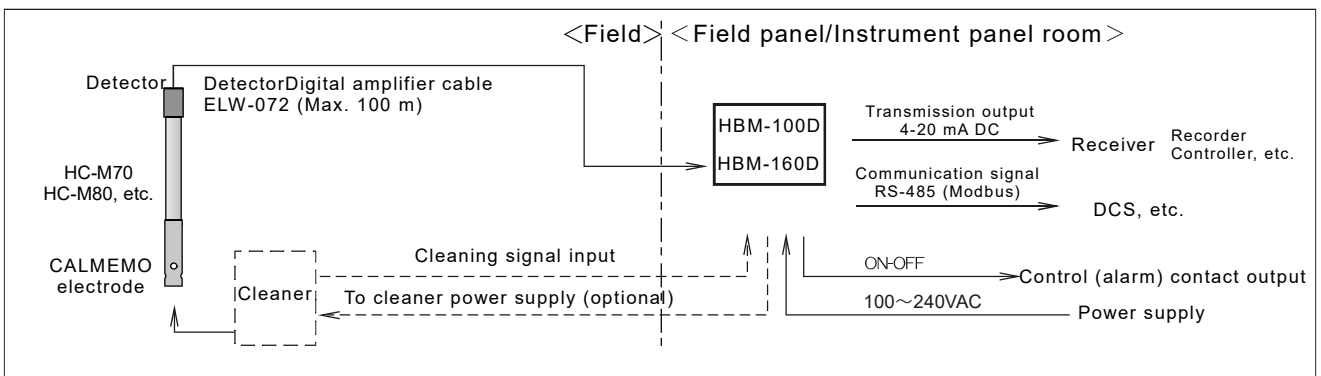
Model : HBM-100D

○Outstanding functions of CALMEMO-pH measurement system
・ The system stores electrode-specific data, such as calibrated values and calibration history, inside the pH electrode rather than in on-site transmitters. As a result, unlike conventional systems, there is no need to connect the pH electrode to a transmitter one-to-one. In addition, past calibration history data can be retrieved.
・ Intelligent diagnostic information (the next calibration date, the number of electrode operating days, the health of the electrode, electrode response characteristics) can be retrieved to understand the degree of degradation and cleanliness of the electrode and to provide information for maintenance purposes.
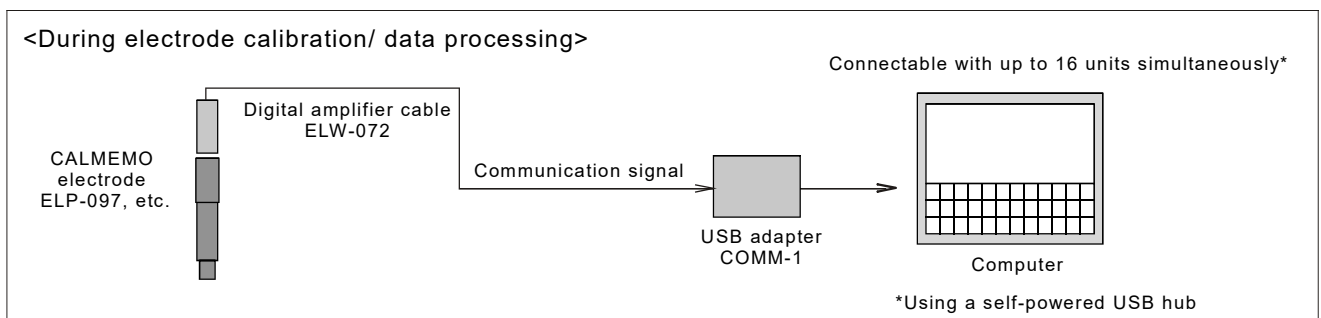
Model : HBM-160D

○New features as pH analyzer/controller
・ In addition to CALMEMO-pH electrodes, general electrodes (5600 type/ GSS-304 type etc.) can be connected. (When connected simultaneously, connection with CALMEMO electrodes is preferred.)
・ A semi-transparent backlit LCD with 16 adjustable levels of brightness is adopted as the display part that is easy to see in light or dark locations.
・ The main unit of the pH analyzer/controller is equipped with a clock function and memory, allowing the use of intelligent diagnostic information even when general electrodes are used.
・ Since RS-485 (Modbus) transmission is included as standard equipment, digital communication with upper DCS, etc. is possible.

Configuration

‹Field› ‹Field panel/Instrument panel room›

Detector | DetectorDigital amplifier cable ELW-072 (Max. 100 m)

HC-M70 HC-M80, etc.

CALMEMO electrode

Cleaner

Cleaning signal input
To cleaner power supply (optional)

HBM-100D
HBM-160D

Transmission output 4-20 mA DC → Receiver → Recorder Controller, etc.
Communication signal RS-485 (Modbus) → DCS, etc.
ON-OFF → Control (alarm) contact output
100～240VAC → Power supply

<During electrode calibration/ data processing>

Connectable with up to 16 units simultaneously*

CALMEMO electrode ELP-097, etc.

Digital amplifier cable ELW-072

Communication signal → USB adapter COMM-1 → Computer

*Using a self-powered USB hub

CALMEMO-pH Analyzer/Controller is a system for performing labor-saving maintenance, simplified management work and stable pH measurement.

○ Labor-saving maintenance*1

Calibration work can be performed even in the instrument panel room by saving the calibration value and the calibration history of the electrode in the pH electrode body. As a result, maintenance work in locations where it is difficult to work for a long time, such as at high altitudes and high temperatures, can be drastically reduced.

*1 An optional USB adaptor and its standard accessory software to be installed are required.

○ Simplified management work

A single external form of the CALMEMO-pH electrode can be used for any type of electrode holder: immersion type, flow type, and flow-through type.

In addition, the intelligent diagnostic information facilitates the management of electrode replacement timing and the cleaning effect, enabling a reduction in the risk of missing measurements and easier management work.

○ Stable pH measurement

By employing differential pH measurement electrodes and digital communication between the electrode and transmitter using a built-in CPU inside the cable connector, the system can perform stable pH measurements.

Transmitter Standard Specifications

Product name	pH Controller	pH Analyzer
Model	HBM-100D	HBM-160D
Mounting	Panel mounting	50A pipe mounting
Measurement range	pH: -1.00 - 15.00 mV: -800 - 800 mV Temp: -5.0℃ - 100.0℃	
Display instrument	Liquid crystal display (LCD) equipped with LED backlight	
pH transmission output Transmission output range	4-20 mA DC isolated, Max. resistance 650 Ω or less. Adjustable (0.01 pH steps), Minimum width of 2pH.	
Temp. transmission output Transmission output range	None	4-20 mADC isolated, Max. resistance 650 Ω or less. Adjustable (0.1℃ steps). Minimum width of 10℃.
Communication method	RS-485 compliant (Modbus Communication)	
Control (alarm) output	Output contacts: 2 contacts (upper and lower limits can be set as desired) a-contacts	Output contacts: 2 contacts (upper and lower limits can be set as desired) c-contacts
	Contact capacity: 250 V AC 3A or less, 30V DC 3A or less (resistive load) Adjustable sensitivity setting: 0.01-2.00 pH width	
Performance	Linearity: ±0.03 pH or less (using equivalent input) Repeatability: ±0.02 pH or less (using equivalent input)	
Power requirements	100-240VAC, ±10% 50/60 Hz	
Power consumption	Max. 14 VA	
Ambient conditions	-10℃ - 50℃, 0 - 95%RH or less.	-20℃ - 55℃, 0 - 95%RH or less.
Dimensions	96 (W) × 96 (H)×90 (D)mm (panel cut-out 92×92mm)	181(W)×180(H)×95(D)mm
Case materials	Aluminum	Die-cast aluminum
Color	Surface: Light yellow (DICG-36) Panel frame: Light gray (PANTONE537C)	Main unit: Metallic silver Display/Key operation parts: Munsell N 1.5
Cable entry	None	6 cable glands (G1/2 × 6 when cable glands are removed)
Construction	Indoor-use installation type (IP20)	Outdoor installation type (IP65/NEMA4X equivalent)
Weight	Approx. 0.6 kg	Approx. 2.1 kg
Other functions	Display of electrode operating days	The unit can save and display the number of electrode operating days inside the electrode.
	Display of next calibration date	The unit can calculate the next calibration date from the latest alibration date and the calibration cycle set.
	Cleaning signal input	The unit can receive a "cleaning" signal from the chemical cleaner, pulse air jet cleaner, and other cleaners to hold output during the cleaning process.
	Temperature compensation for sample pH value	Coefficient setting range: ±0.100/℃ Standard conversion temperature: 25℃
	Manual temperature compensation for glass electrode	Manual temperature compensation is carried out by specifying the sample solution temperature.
	pH value shift	The measured value can be shifted within the range of ±1.00 pH. (Temperature shift range: ±5℃ for CALMEMO-pH electrodes, ±9.9℃ for general electrodes)
	Status signal output	Signals of "under maintenance," "failure alarm," etc. can be output using control (alarm) output.
Optional features	Control (alarm) output	HBM-100D: 4a-contacts or 2c-contacts (upper and lower limits can be set as desired) HBM-160D: 4 points; 3a-contacts, 1c-contact (upper and lower limits can be set as desired)
	Power cut-off output	HBM-100D: None HBM-160D: Closed contact signal is delivered during power cut-off. Contact capacity: 250VAC, 3A or less 30VDC, 3A or less (resistive load) Available only when the alarm output is 2 points
	Cleaner control output	The internal timer delivers 100VAC power to the chemical cleaner, water jet cleaner, and other cleaners
	Brackets for wall or rack mounting, hood (sunshade), etc. (HBM-160D)	

Model : ELW-072
Product name : Digital amplifier cable
Materials : Body; PPS
　Cable; PVC, O-Ring; FKM
Digital amplifier : Communication method; Modbus
(dedicated to transmitter connection)
Connection : Electrode side; 16-pin connector
Transmitter side; Rod-shaped crimp terminal
Cable length : 1.5-100 m
Connection thread standard: NPT 1
Dimensions : Body φ34×108mm

Applicable Electrodes

Model	Structure and number of liquid junctions		Application	Measurement range	Sample solution temperature	Sample solution electric conductivity
ELP-097	Ceramic junction fixed type	2	General use	pH 0〜14	-5〜105℃	100μS/cm or more
ELP-098		1	Long-life use	pH 0〜12	-5〜105℃	500μS/cm or more
ELP-100		2	Hydrofluoric acid resistant	pH 2〜12	-5〜50℃	
ELP-101			High alkali resistant	pH 2〜14	-5〜50℃	
ELP-102			Metal ion resistant	pH 2〜12	-5〜50℃	100μS/cm or more
ELP-103	PTFE junction and replaceable internal solution type	1	General use	pH 0〜14	-5〜105℃	50μS/cm or more
ELP-104			Hydrofluoric acid resistant	pH 2〜12	-5〜50℃	
ELP-105			Metal ion resistant	pH 2〜14	-5〜50℃	

Electrode common specifications

Pressure resistance : 0-1 MPa (25° C) Sensor head section
Detection part materials : PPS, titanium, glass, ceramic, and epoxy resin (for
ceramic junction fixed type), or PPS, titanium, glass,
ceramic, and PTFE (for PTFE junction and
replaceable internal solution type)
Temperature element : Pt100
Connection thread standard: NPT 3/4
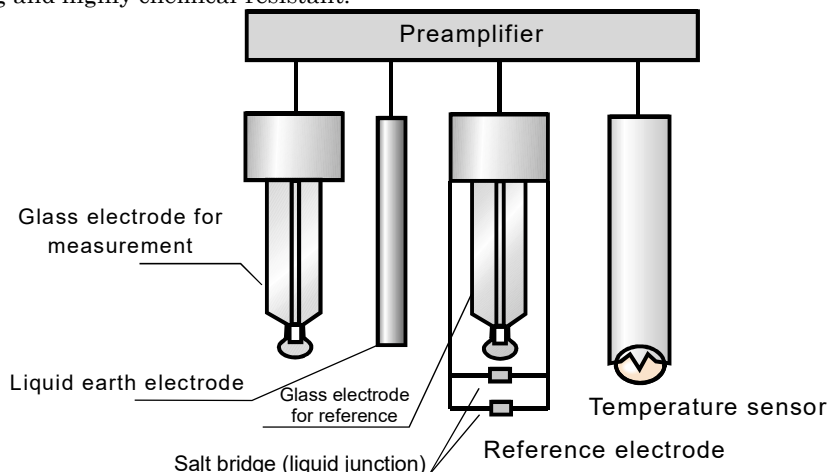Dimensions : φ37 (Max.) x 184 mm

　The CALMEMO-pH electrode system is based on differential pH measurement electrode technology.
　A normal pH electrode system uses two types of electrode: a glass electrode and a reference electrode. On the other hand, the differential pH measurement electrode system uses three types of electrode: two glass electrodes, one for measurement and one for reference, and an additional liquid earth electrode.
　This liquid earth electrode restrains the effect of asymmetry potential at the reference electrode and around loop currents, allowing accurate pH measurement.
The PPS resin electrode body, the titanium liquid earth and the glass membrane guard make the structure very strong and highly chemical-resistant.

Preamplifier

Glass electrode for measurement
Liquid earth electrode
Glass electrode for reference
Salt bridge (liquid junction)
Reference electrode
Temperature sensor

● Immersion type holder

Model	: HC-M70	Holder length	: 0.5-3.0 m
Structure	: Rainproof type	Operating temperature range	: PP ; -5℃ - 80℃
Sample solution condition	: Pressure; atmospheric pressure		PVC ; -5℃ - 60℃
	Flow rate; 1m/s or less		PVDF ; -5℃ - 85℃
Holder materials	: Holder body; PP, PVC, or PVDF		(depending on product code specification choice)

Model   : HC-M70
Structure   : Rainproof type
Sample solution condition: Pressure; atmospheric pressure
                              Flow rate; 1m/s or less
Holder materials   : Holder body; PP, PVC, or PVDF
                              (depending on product code specification choice)
                              Rubber cap; CR Electrode protective cover; PP

Holder length   : 0.5-3.0 m
Operating temperature range : PP   ; -5℃ - 80℃
                              PVC   ; -5℃ - 60℃
                              PVDF ; -5℃ - 85℃
                              (depending on product code specification choice)

● Flow type holder (Flange or cap nut type)

Model   : HC-M80
Structure   : Rainproof type
Sample solution condition : Pressure; 0-0.1 MPa
Holder materials   : Holder body; PP or PVC
                              (depending on product code specification choice)
                              Cap nut; PE
                              O-Ring; FKM

Connection method (standard) : 25A J IS 10K FF or Rc1/2
                              (depending on product code specification choice)
Flow rate   : 2-10 L/min.
Operating temperature range : PP; -5℃ - 80℃
                              PVC; -5℃ - 60℃
                              (depending on product code specification choice)

● Flow-through type holder (Screw type, horizontal flow)

Model   : HC-M85
Structure   : Rainproof type
Sample solution condition : Pressure ; 0-1 MPa (25℃)
                              Temp.   ; -5℃ - 105℃
Holder materials   : PPS

Piping connection standard : Rc 3/4
Flow rate   : 1-5 L/min.
Operating temperature range : -5℃ - 85℃
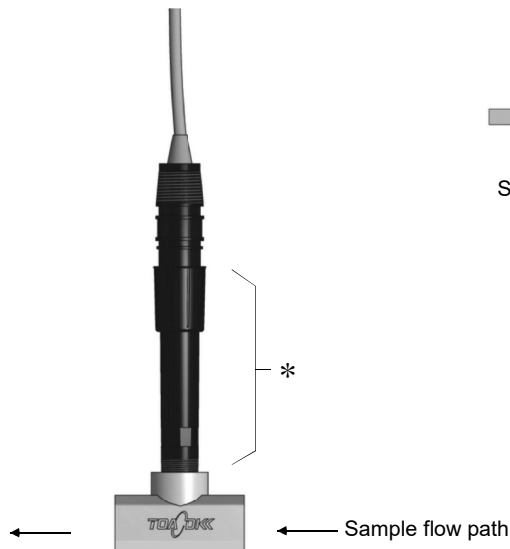
● Flow-through type holder (Screw type, vertical flow)

Model   : HC-M86
Structure   : Rainproof type
Sample solution condition : Pressure; 0-1 MPa (25℃)
                              Temp.   ; -5℃ - 105℃
Holder materials   : PPS

Piping connection standard : Rc 3/4
Flow rate   : 1-5 L/min.
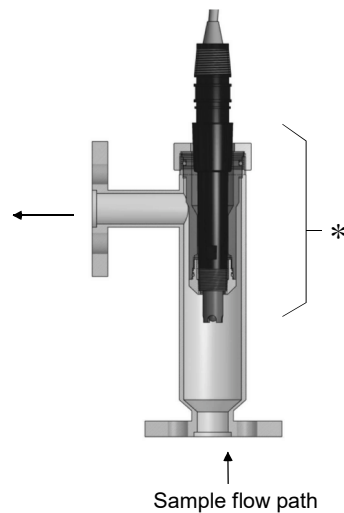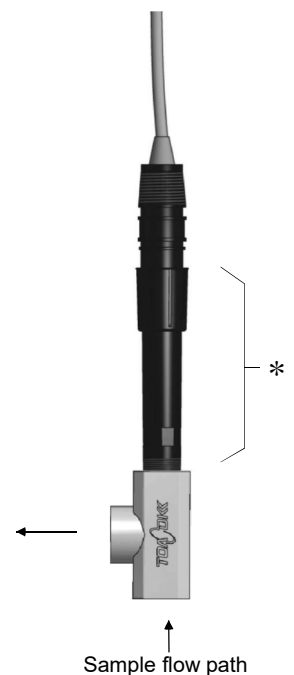Operating temperature range : -5℃ - 85℃

HC-M70

HC-M80

HC-M85

HC-M86

Sample flow path

Sample flow path

Sample flow path
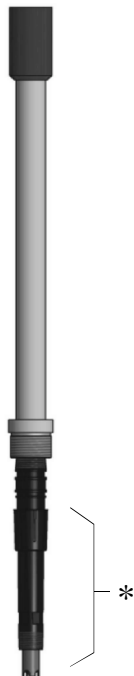
＊Electrodes are not included in the holder.

Options

● USB Adaptor

|	
Model	: COMM-1
Application	: It is used for connecting the electrode to a PC in the instrument panel room, etc.
Maximum current consumption	: 300mA * A self-powered USB hub is required when using a hub.
Connection	: Electrode side; Rod-shaped crimp terminal of digital amplifier cable PC side; USB B socket
Accessories	: USB conversion cable (USB B Plug - A Plug), Data processing software (CALMEMO Monitor), Collective calibration software (CALMEMO Calibrator)

PC software specifications

○ CALMEMO Monitor

This software, a standard accessory of the USB adapter, reads and writes all data on the CALMEMO-pH electrode.

Functions

Measured value display	: pH, temperature, electrode potential, etc.	Probe information	: digital amplifier information, display of electrode serial number, calibration data, health, etc.
Alarm display	: zero potential errors, slope value errors, etc.		
Set value change	: display/change of electrode set values		
Electrode calibration	: calibration work	Chart display	: display of continuous measurement trend
Calibration history display	: display/storage of calibration history	File output	: date, time, elapsed days, measured values
		File format	: CSV
		Security	: Browsing mode, Supervisor mode (available only to supervisors)

【CALMEMO Monitor, Screen】
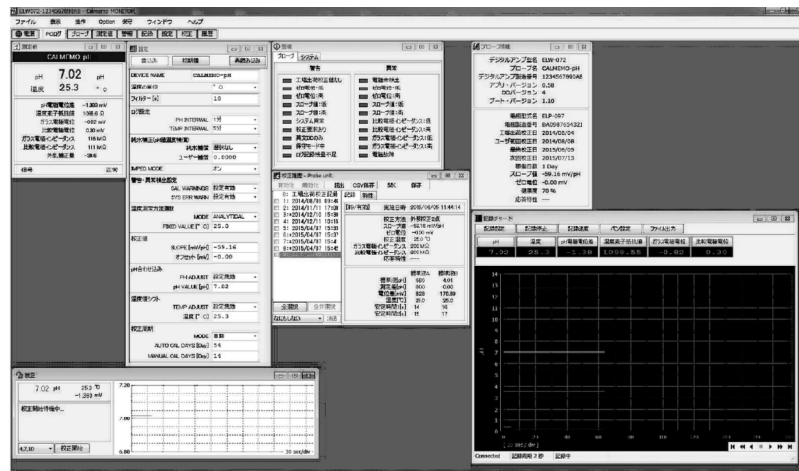
○ CALMEMO Calibrator

This application software connects up to 16*1 CALMEMO-pH electrodes and collectively performs standard solution calibration.
A digital amplifier cable and USB adapter are required for each electrode.
Operating environment (common to the CALMEMO Monitor and the CALMEMO Calibrator)

　＊1 Using self-powered USB hub
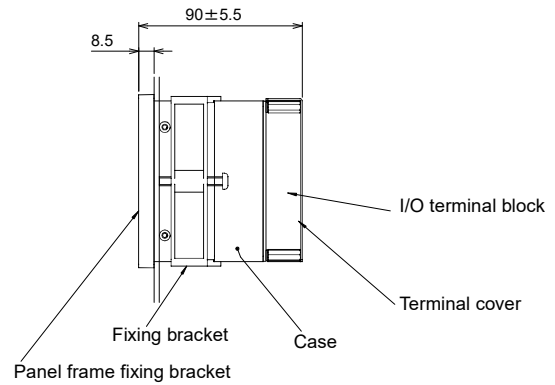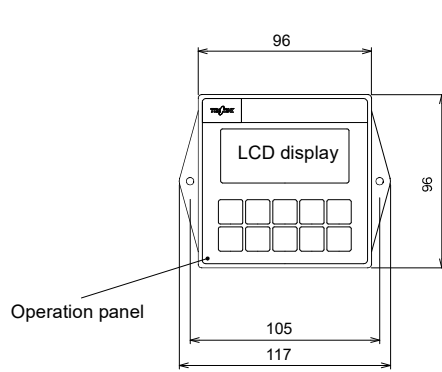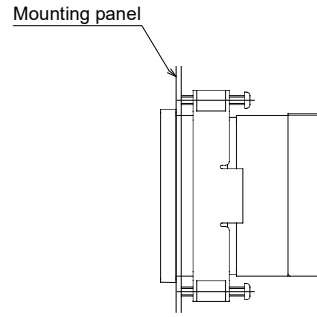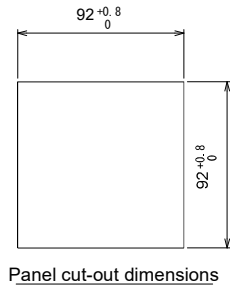
[CALMEMO Calibrator, Screen]

Operating environment
(common to the CALMEMO Monitor and the CALMEMO Calibrator)

OS	: Microsoft Windows Vista/7/8/8.1/10*
PC	: A model on which the above OS operates normally
Hard disk	: 100 MB or more free space
Drive	: CD-ROM drive

*Windows is a registered trademark of Microsoft Corporation in the United States.

Model HBM-100D

Dimensions Unit: mm

92 +0.8 0

92 +0.8 0

Mounting panel

Panel cut-out dimensions

96

LCD display

96

105

117

Operation panel

8.5

90 ± 5.5

I/O terminal block

Terminal cover

Fixing bracket

Case

Panel frame fixing bracket

Product code

HBM100D -0- ☐☐☐☐

Control (alarm) contact output *1
A · 2 points (2 circuits a-contacts)
B · 4 points (4 circuits a-contacts)
C · 2 points (2 circuits c-contacts)

Cleaner control 100 V AC output *2
0 · N/A
1 · Equipped

Markings
A · Japanese (Standard)
B · English

Individual certification *3
0 · · · · · · · · · · · · · · · · · · None
1 · · · · · · · · · · · · · · · · · · Applied (with inspection mark and inspection certificate)
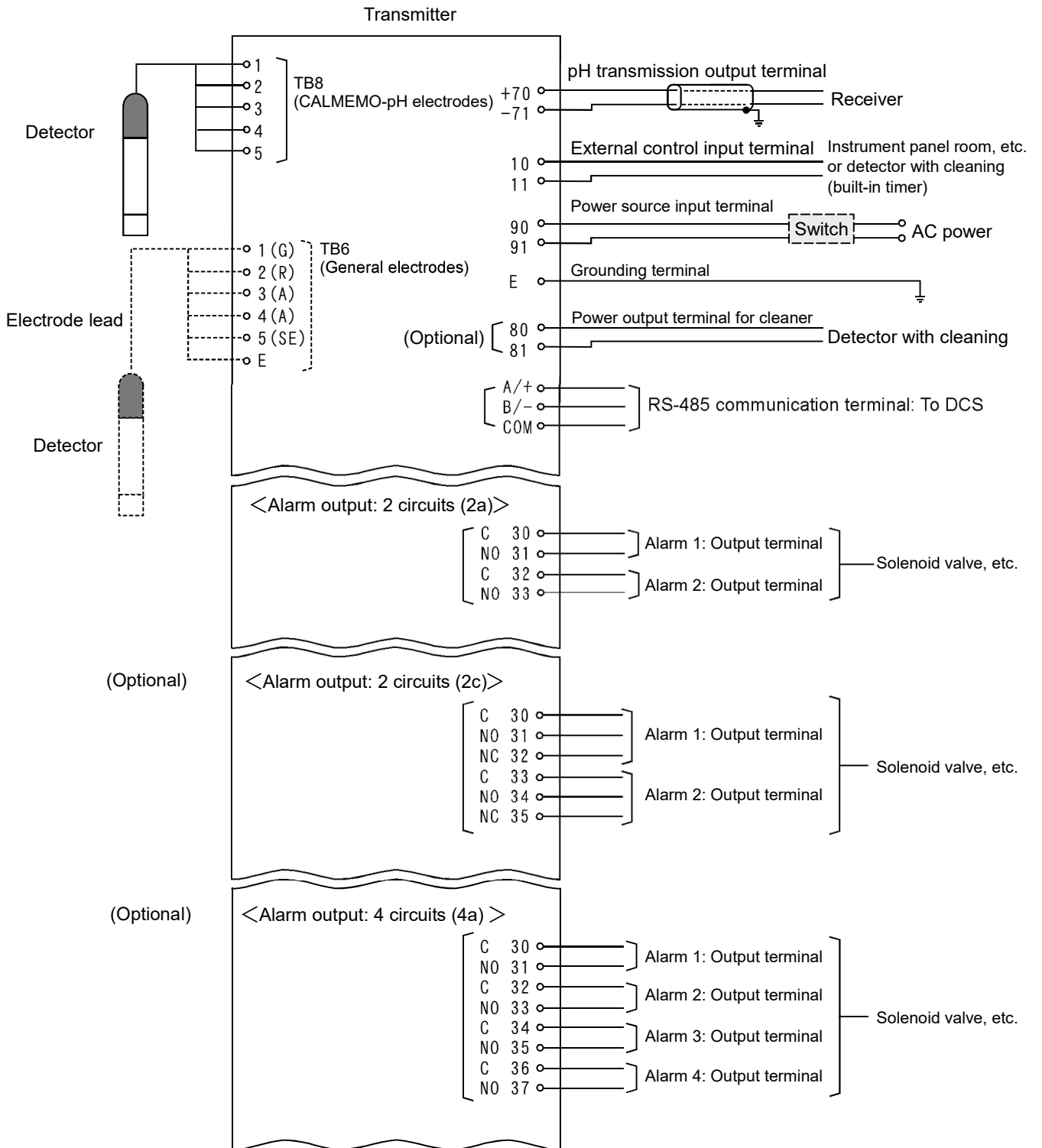
*1. This function is assigned to the control (alarm) contact output terminals. When "Equipped" is specified, the control (alarm) contact output (upper/lower limits, proportional upper/lower limits) or status signal (Maintenance/Cleaning/Instrument error) output can be selected.

*2. Since the cleaners run on a 100 V AC power supply, only 100 V AC is supplied to the HBM-100B when "Equipped" is specified.
To run the unit on a supply voltage greater than 100 V AC, the ZP-30 step-down transformer is required.
When this specification is "Equipped," the EC Directive shall not be applicable to the unit.

*3. The Measurement Law certification is valid only when the system is used in conjunction with a certified general electrode.
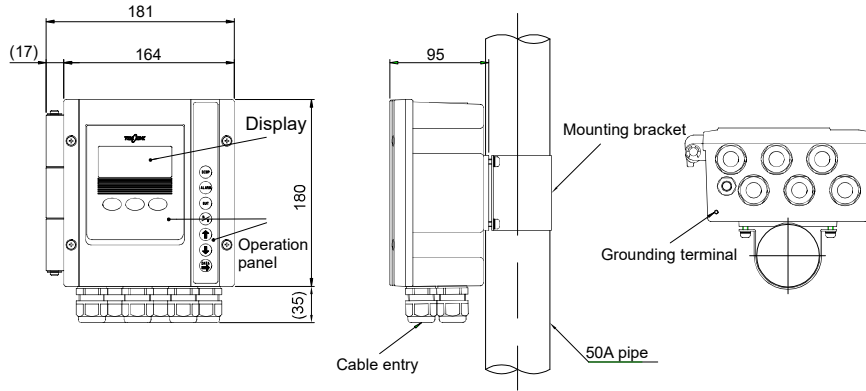
Model :HBM-100D

Transmitter

Detector

TB8
(CALMEMO-pH electrodes)

1
2
3
4
5

pH transmission output terminal
+70
−71
Receiver

External control input terminal
10
11
Instrument panel room, etc.
or detector with cleaning
(built-in timer)

Power source input terminal
90
91
Switch
AC power

Electrode lead

TB6
(General electrodes)

1 (G)
2 (R)
3 (A)
4 (A)
5 (SE)
E

Grounding terminal
E

Detector

(Optional)
Power output terminal for cleaner
80
81
Detector with cleaning

A/+
B/−
COM
RS-485 communication terminal: To DCS

＜Alarm output: 2 circuits (2a)＞

C   30
NO   31
Alarm 1: Output terminal
C   32
NO   33
Alarm 2: Output terminal
Solenoid valve, etc.

(Optional)
＜Alarm output: 2 circuits (2c)＞

C   30
NO   31
NC   32
Alarm 1: Output terminal
C   33
NO   34
NC   35
Alarm 2: Output terminal
Solenoid valve, etc.

(Optional)
＜Alarm output: 4 circuits (4a) ＞

C   30
NO   31
Alarm 1: Output terminal
C   32
NO   33
Alarm 2: Output terminal
C   34
NO   35
Alarm 3: Output terminal
C   36
NO   37
Alarm 4: Output terminal
Solenoid valve, etc.

Model HBM-160D

● Pole mounting

Display
Operation panel
Cable entry
Mounting bracket
Grounding terminal
50A pipe

181
164
(17)
95
180
(35)

Product code

HBM160D-0- ☐☐☐☐☐☐☐☐☐☐

pH-value transmission output range (4-20mADC)
A .... pH 0-14
Y .... Custom specifications *1

Solution temperature transmission output range (4-20 mADC)
A .... 0℃ - 50℃
Y .... Custom specifications *2

Upper and lower limits control (alarm) contact output *3
A .... 2 points (2 circuits c-contacts)
B .... 4 points (3 circuits a-contacts, 1 circuits c-contact)

Power cut-off signal contact output (contact closed when power is cut off)
0 .... N/A
1 .... Equipped (only when 2-point alarm contact is equipped)

Cleaner control output 100VAC *4
0 .... N/A
1 .... Equipped (when used together with JHC/PHC/RHC)

Surface finish (coating) *5
A .... Standard coating
B .... High performance coating

Arrester *6
0 .... N/A
1 .... Included

Mounting bracket
A .... 50A pipe mount
B .... Wall or rack mount

Cable entry
A .... Cable gland (conduit threads G1/2 when cable gland is removed)
B .... NPT 1/2 supplied with adapters

Hood (sunshade)
0 .... N/A
1 .... Equipped

Markings
A .... Japanese (standard)
B .... English

Individual certification *7
0 .... N/A
1 .... Applied (with inspection mark and inspection certificate)

*1. Specify the pH measurement output range in 0.01 pH increments, with a minimum width of 2 pH and a range of -1.00 - 15.00 pH.

*2. Specify the solution temperature output range in 1℃ increments, with a minimum width of 10℃ and a range of -5℃ - 100℃.

*3. This function is assigned to the alarm contact output terminals. When "Equipped" is specified, the control (alarm) contact output (upper/lower limits) or status signal (Maintenance/Cleaning/Instrument error) output can be selected.

*4. Although the unit runs on a universal AC power supply, the applicable power supply voltage for various E series cleaners (JHC/BHC/RHC/PHC) is 100VAC.
Accordingly, when "Equipped" is specified, please note that the power supply to the unit is limited to 100 V AC.
To run the unit on a supply voltage greater than 100VAC, the ZP-30 step-down transformer is required.
When this specification is "Equipped," the EC Directive shall not be applicable to the unit.

*5. Standard coating: Melamine primer and topcoat. Average film thickness: Greater than 30 μ m.
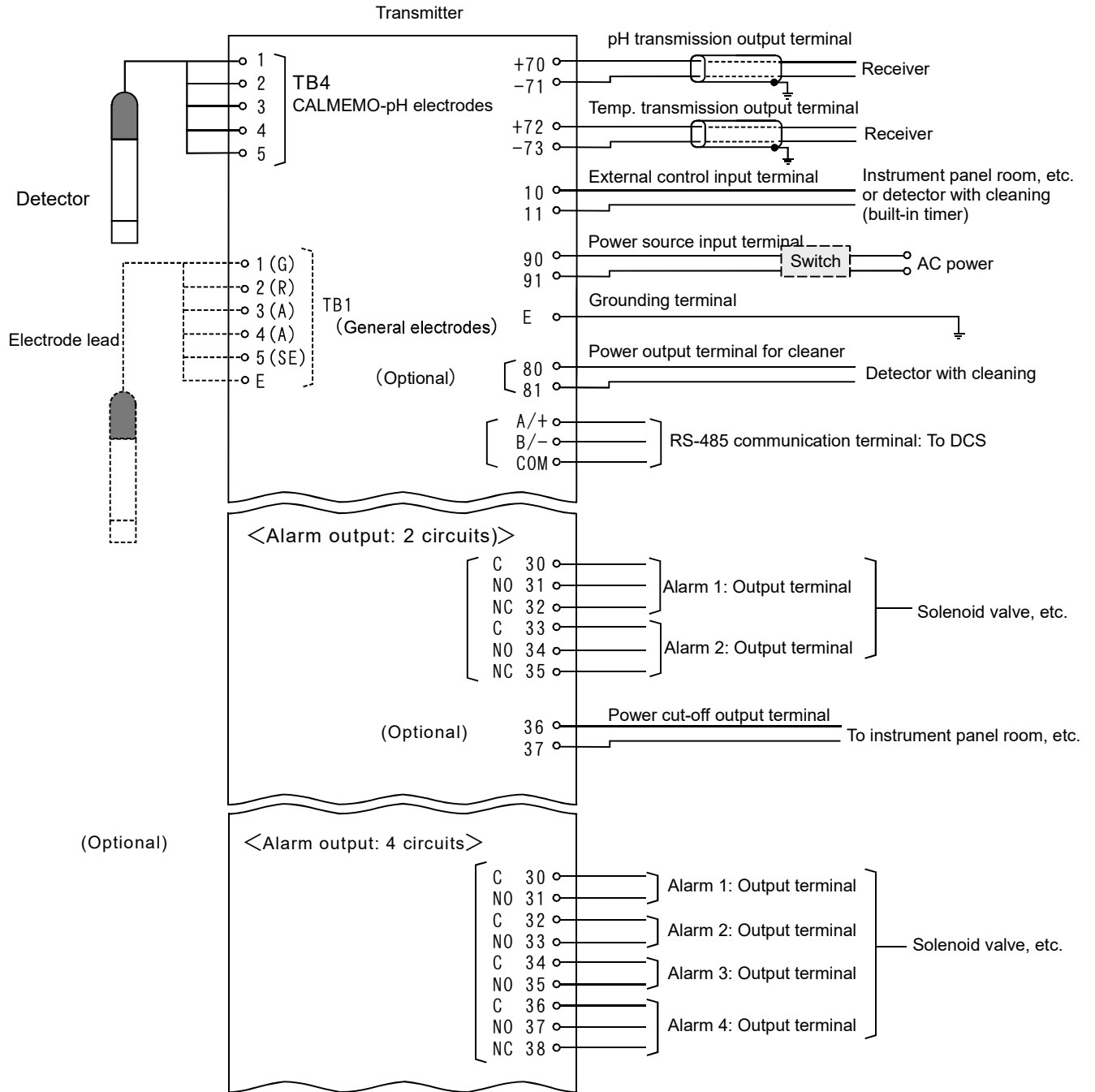High performance coating: Epoxy primer and middle coat, polyurethane resin topcoat.

*6. A ceramic surge arrester (simplified) must be mounted on the power line and transmission line.
When this option is added, the EC Directive shall not be applicable to the unit.

*7. The Measurement Law certification is valid only when the system is used in conjunction with a certified general electrode.

# Device wiring diagrams

Model :HBM-160D

Transmitter

Detector

TB4
CALMEMO-pH electrodes
- 1
- 2
- 3
- 4
- 5

Electrode lead

TB1
（General electrodes）
- 1 (G)
- 2 (R)
- 3 (A)
- 4 (A)
- 5 (SE)
- E

pH transmission output terminal
+70
−71 — Receiver

Temp. transmission output terminal
+72
−73 — Receiver

External control input terminal
10
11
Instrument panel room, etc. or detector with cleaning (built-in timer)

Power source input terminal
90
91
Switch — AC power

Grounding terminal
E

（Optional）
Power output terminal for cleaner
80
81 — Detector with cleaning

A/+
B/−
COM
RS-485 communication terminal: To DCS

＜Alarm output: 2 circuits)＞

C   30
NO 31   Alarm 1: Output terminal
NC 32
C   33
NO 34   Alarm 2: Output terminal
NC 35

Solenoid valve, etc.

（Optional）
Power cut-off output terminal
36
37 — To instrument panel room, etc.

（Optional）

＜Alarm output: 4 circuits＞

C   30
NO 31   Alarm 1: Output terminal
C   32
NO 33   Alarm 2: Output terminal
C   34
NO 35   Alarm 3: Output terminal
C   36
NO 37   Alarm 4: Output terminal
NC 38

Solenoid valve, etc.

Digital amplifier cable Model:ELW-072

Product code

ELW072-0-□□

- Cable length
  - F ·············· 1.5m [1]
  - L ·············· 5m
  - M ·············· 10m
  - Y ·············· Custom specifications [2]
- Markings
  - A ·············· Japanese (standard)
  - B ·············· English

*1. For USB adapter
*2. Available up to 100 m

Dimensions Unit: mm

L±500

NPT 1

(108)

(φ34)
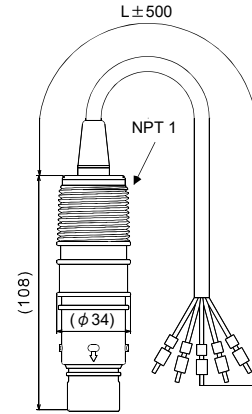
Electrode

Product code

ELP□□□-0-□ *

- Specifications
  - 0 ·············· Standard
  - 9 ·············· Special

Please select the electrode type from the list on page 2 depending on the specifications.

Dimensions Unit: mm

37

20°

184

3/4" NPT

29

20
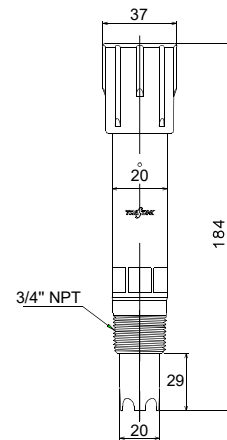
Immersion type holder HC-M70

Product code

HCM70-0-□□□□□

- Wetted part material
  - A ·············· Polypropylene (PP)
  - B ·············· Polyvinyl chloride (PVC)
  - C ·············· Polyvinylidene fluoride (PVDF)
- Holder length (L)
  - 1 ·············· 0.5m
  - 2 ·············· 1.0m
  - 3 ·············· 1.5m
  - 4 ·············· 2.0m
  - 5 ·············· 2.5m
  - 6 ·············· 3.0m
- Digital amplifier cable
  - 0 ·············· N/A
  - L ·············· 5 m cable specifications
  - M ·············· 10 m cable specifications
  - Y ·············· Custom specifications [1]
- Holder guide assay [2]
  - 0 ·············· N/A
  - 1 ·············· Equipped 316SS
- Markings
  - A ·············· Japanese (standard)
  - B ·············· English

*1. Available up to 100m
*2. Please select "Equipped" when used together with the metal fitting ZN-7.

Dimensions Unit: mm

φ34

※2 φ32 only when PVDF is selected for the body material.

L±50

280

φ48
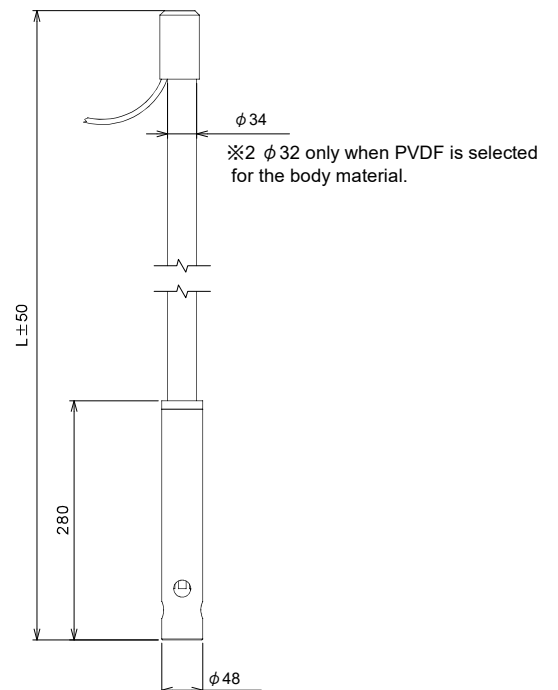
＊The electrode must be prepared separately.

Flow type holder HC-M80

HCM80-0-□□□□

Wetted part material
A ·············· Polypropylene (PP)
B ·············· Polyvinyl chloride (PVC)
Z ·············· Special

Dimensions
1 ·············· 25A JIS10K FF 210×110(standard)
2 ·············· Rc1/2 210 × 50
9 ·············· Special

Digital amplifier cable
0 ·············· Unnecessary
L ·············· 5 m cable specifications
M ·············· 10 m cable specifications
Y ·············· Custom specifications*1

Markings
A ·············· Japanese (standard)
B ·············· English

*1. Available up to 100 m

Dimensions Unit: mm

18
125
366±10
210
18
125
110
Sample outlet
Sample inlet

＊The electrode must be prepared separately.

Flow-through type holder HC-M85

Product code

HCM85-0-□□

Digital amplifier cable
0 ·············· Unnecessary
L ·············· 5 m cable specifications
M ·············· 10 m cable specifications
Y ·············· Custom specifications*1

Markings
A ·············· Japanese (standard)
B ·············· English

*1. Available up to 100 m

Dimensions Unit: mm

270±10
NPT3/4
Sample inlet
Sample outlet
Rc3/4
64
Rc3/4

＊The electrode must be prepared separately.

Flow-through type holder HC-M86

Product code

HCM86-0-□□

Digital amplifier cable
0 ·············· Unnecessary
L ·············· 5 m cable specifications
M ·············· 10 m cable specifications
Y ·············· Custom specifications*1

Markings
A ·············· Japanese (standard)
B ·············· English

*1. Available up to 100 m

Dimensions Unit: mm

270±10
NPT3/4
Sample outlet
Rc3/4
50
Rc3/4
Sample inlet

＊The electrode must be prepared separately.

USB adaptor COMM-1

Product code

COMM1-0-□

Specifications
0 ·············· Standard
9 ·············· Special

Dimensions Unit: mm

CALMEMO-pH
1 2 3 4 5
Tx
Rx
1 2 3 4 5
Conn
Power
28
66.5
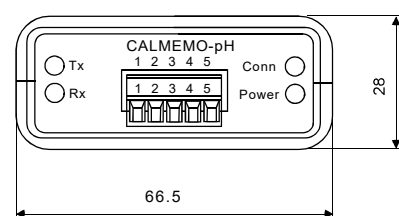
■ Related equipment

Mounting bracket for immersion type holder

Model	Application	Installation examples
ZN-7 (metal fitting)	It is used in combination with type A, B, and C metal fittings for holders without cleaning. The holder is one-touch detachable. The L length should be shorter than the holder length so that the hook emerges on the water's surface.	Metal fitting length (L1) 500 (L: 1000) 1000 (L: 1500, 2000) 1500 (L: 2000, 2500) 2000 (L: 2500, 3000) 2500 (L: 3000, 3500) 3000 (L: 3500, 4000) Material: 316SS Weight: Approx. 3 kg/1 m Holder guide, Holder clamp, Electrode holder, Mounting bracket
ZC-1	Fixing to 50A pole Used together with ZN-7 for holders without cleaning Length: 600 mm Material: SPCC or S.S.	※50A pipe is not included. B type: Holder length; Up to 1.5 m ※50A pipe is not included. C type: Holder length; 2 - 4 m
ZCD-2	Simplified mounting bracket for holder only Anchor bolt (M10) fixing Length: 250 mm Material: 304SS	Detector installation example Suitable holders: φ 32-34, Length 500-1500 Mounting bracket for immersion type holder, Holder mounting plate(B), U bolt, Mounting bracket 3—φ12 (Hole for anchor bolt)
ZC-2	Both fixing with anchor bolts and fixing to a 50 A pole are possible. Two holders such as pH and DO can be mounted. The holder is one-touch detachable. Bracket length: 500 mm Material: 304SS Holder length used together with is not more than 2 m. Holder with cleaning can be mounted.	Holder (pH or ORP), Holder (DO), Holder with cleaning, 50A steel pipe, Wing bolt, Pan head machine screw, Nut(M10), Foundation bolt (M10×200) (prepared by customers), U bolt (included) (Mounting with anchor bolts) (Mounting on a stanchion pole)