SPECIFICATION SHEET

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

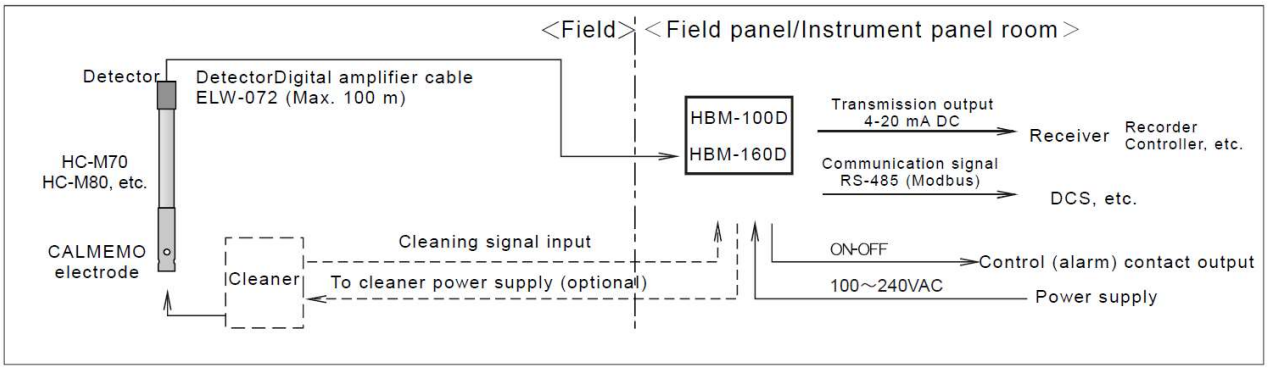
- The system stores electrode-specific data, such as calibrated values and calibration history, inside the pH electrode rather than in on-site transmitters. As a result, unlike conventional systems, there is no need to connect the pH electrode to a transmitter one-to-one. In addition, past calibration 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.

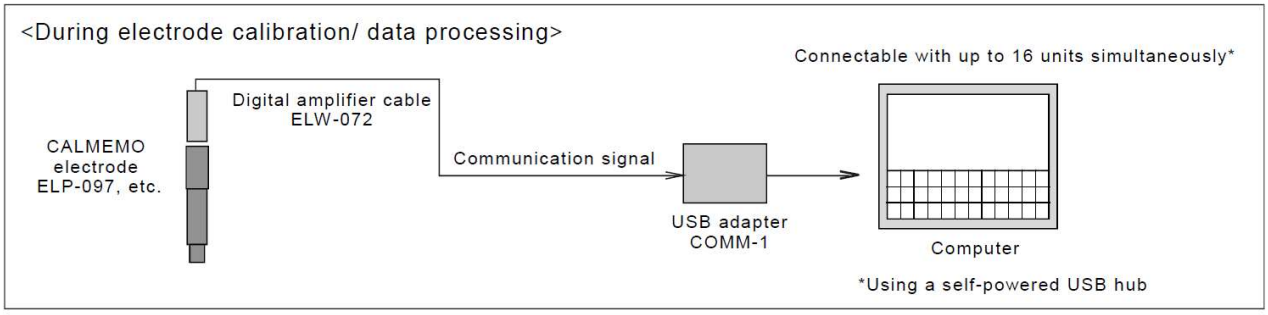
Model : HBM-160D

○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





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)		

Digital amplifier cable

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 ϕ 34×108mm

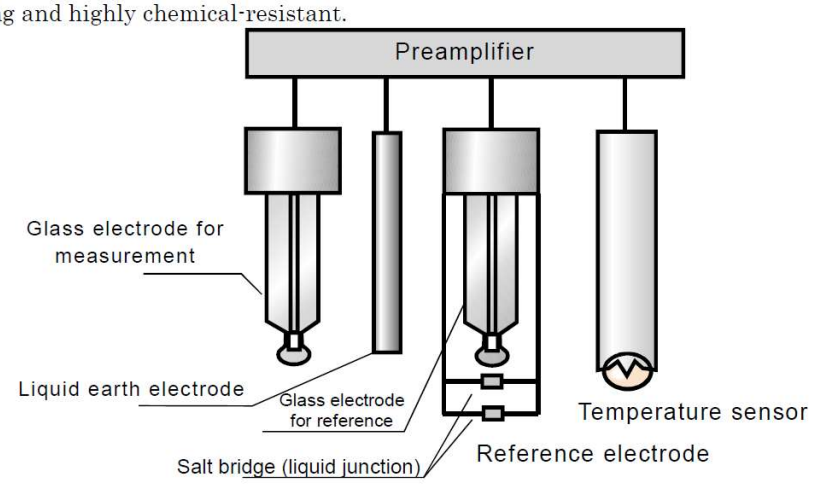
Applicable Electrodes

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 : ϕ 37 (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.



Applicable Electrode Holders

● Immersion type holder

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)

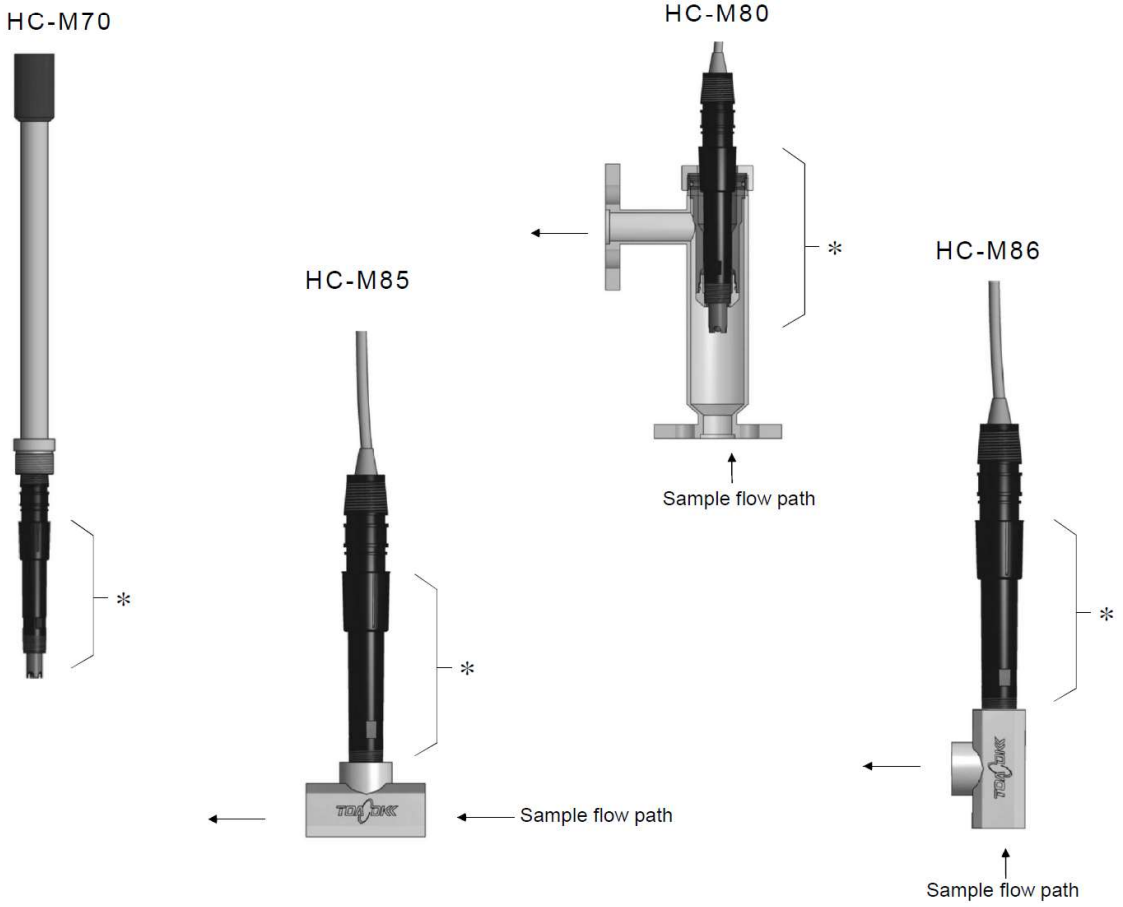
Model	: HC-M80
Structure	: Rainproof type
Sample solution condition	: Pressure; 0-0.1 MPa
Holder materials	: Holder body; PP or PVC (depending on product code specification choice) Cap nut; PE O-Ring; FKM
Connection method (standard)	: 25A J IS 10K FF or Rc1/2 (depending on product code specification 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℃



＊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

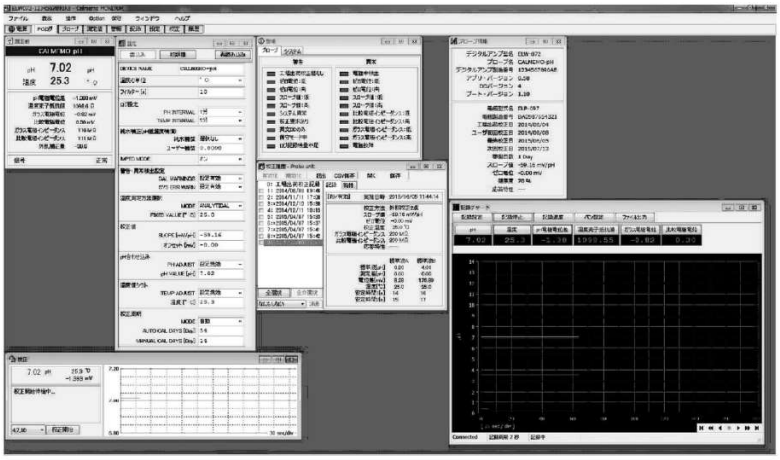
This software, a standard accessory of the USB adapter, reads and writes all data on the CALMEMO-pH electrode.

Functions

Measured value display : pH, temperature, electrode potential, etc.
Alarm display : zero potential errors, slope value errors, etc.
Set value change : display/change of electrode set values
Electrode calibration : calibration work
Calibration history display: display/storage of calibration history

Probe information : digital amplifier information, display of electrode serial number, calibration data, health, etc.
Chart display : display of continuous measurement trend
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]

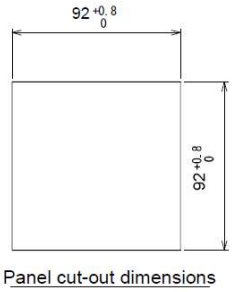
Operating environment
(common to the CALMEMO Monitor and the CALMEMO Calibrator)

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

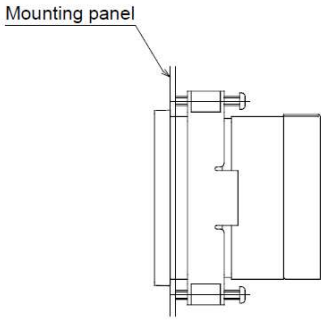
*Windows is a registered trademark of Microsoft Corporation in the United States.

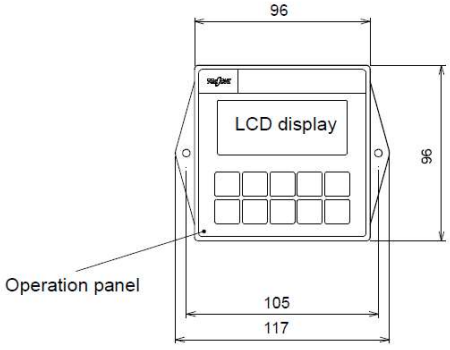
Model HBM-100D

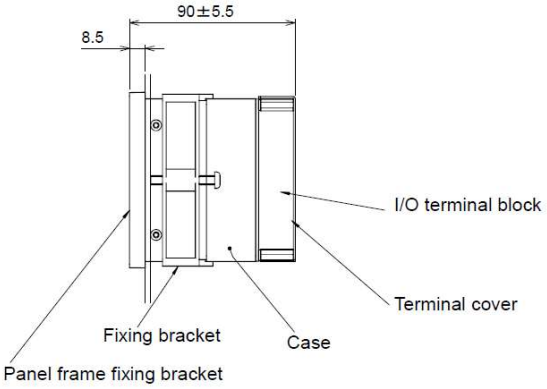
Dimensions Unit: mm



Panel cut-out dimensions



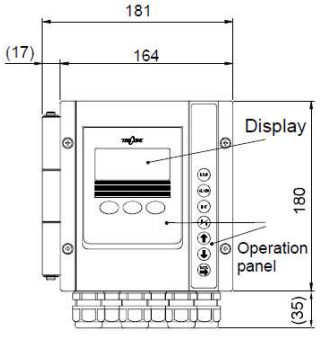


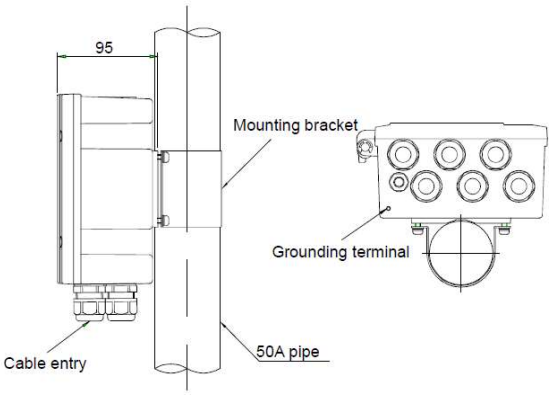


Model HBM-160D

Dimensions Unit: mm

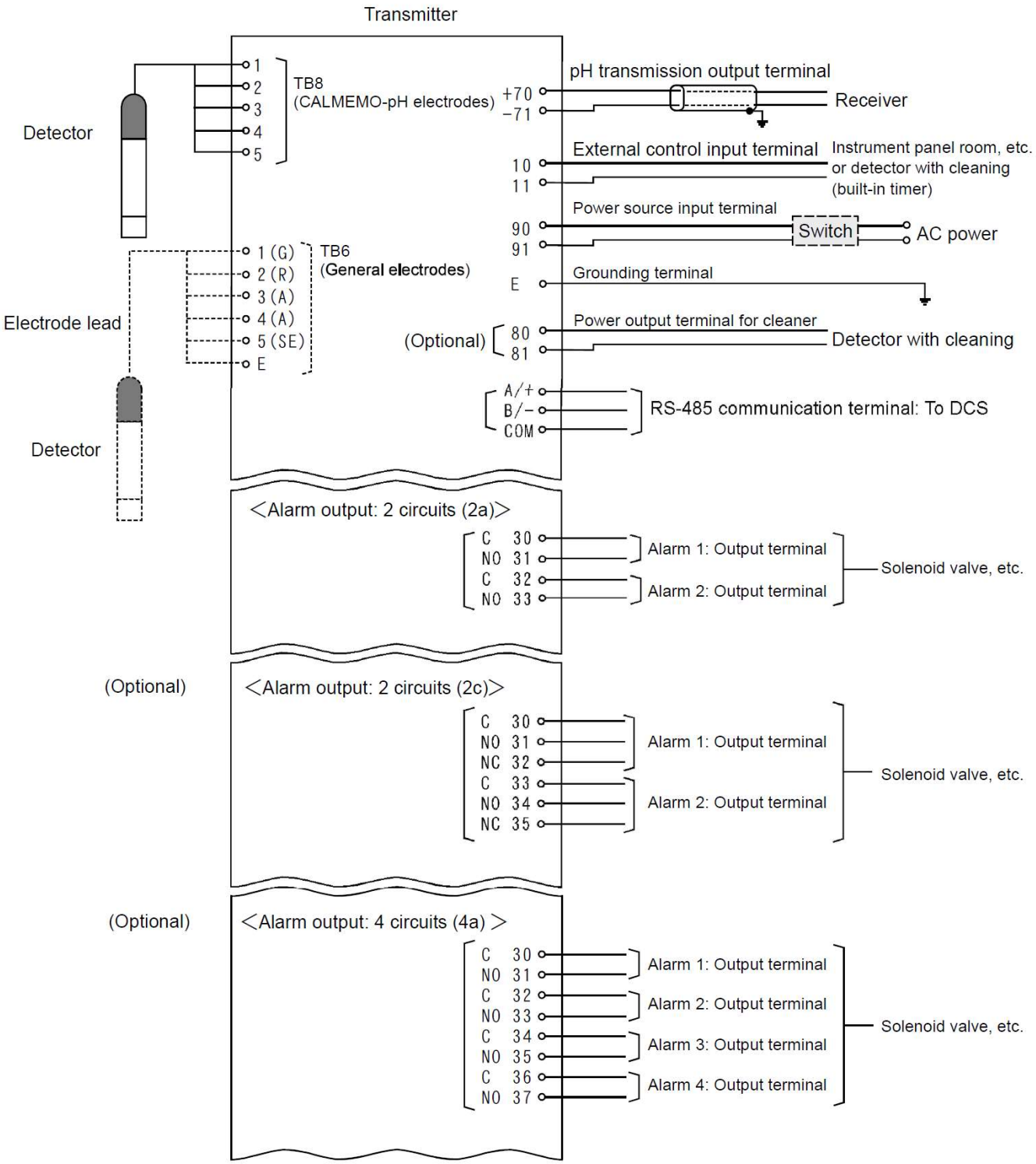
● Pole mounting





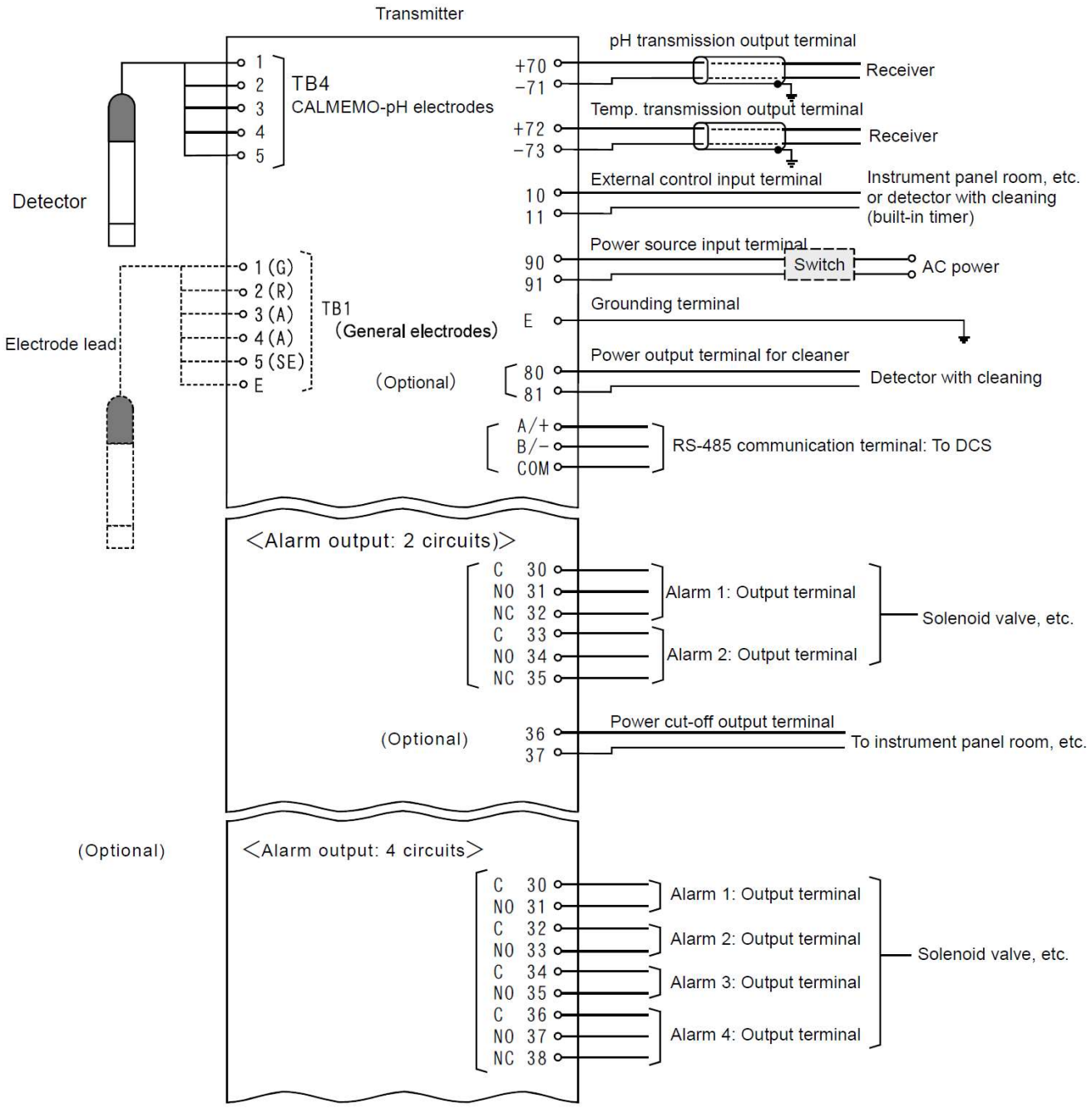
Device wiring diagrams

Model :HBM-100D



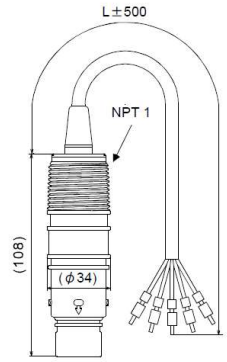
Device wiring diagrams

Model :HBM-160D



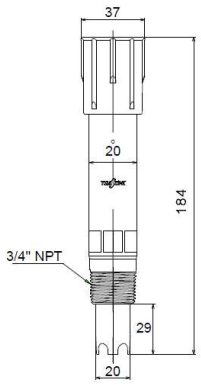
Digital amplifier cable Model:ELW-072

Dimensions Unit: mm



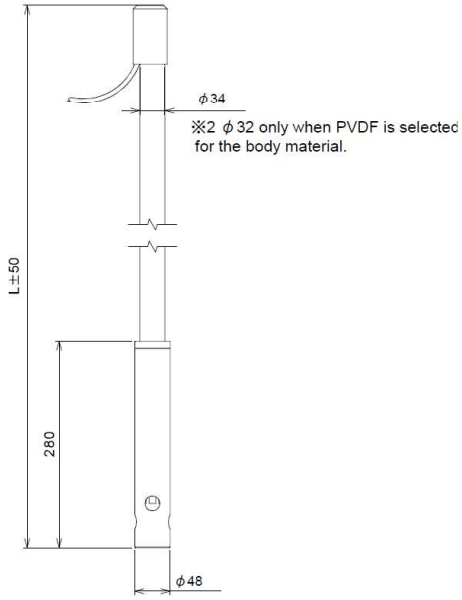
Electrode Model:ELP-□□□

Dimensions Unit: mm



Immersion type holder HC-M70

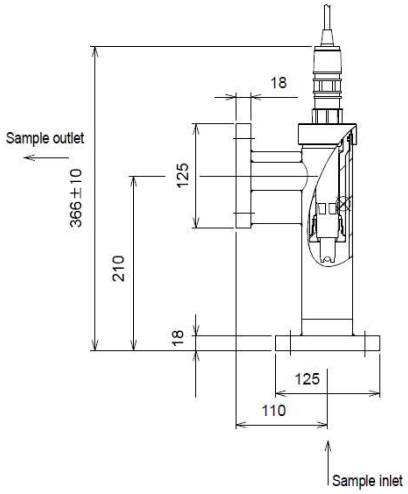
Dimensions Unit: mm



*The electrode must be prepared separately.

Flow type holder HC-M80

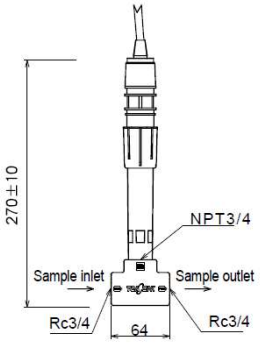
Dimensions Unit: mm



*The electrode must be prepared separately.

Flow-through type holder HC-M85

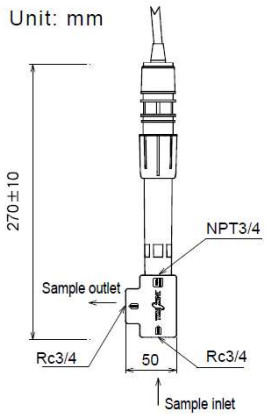
Dimensions Unit: mm



*The electrode must be prepared separately.

Flow-through type holder HC-M86

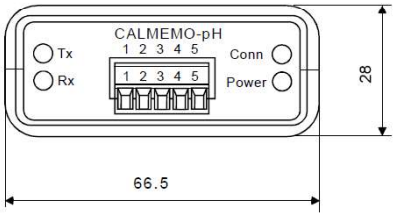
Dimensions Unit: mm



*The electrode must be prepared separately.

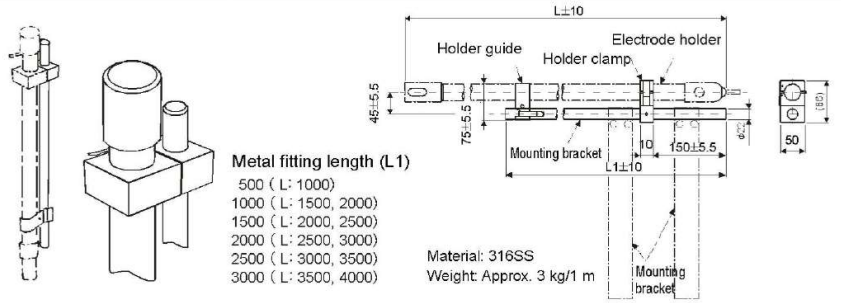
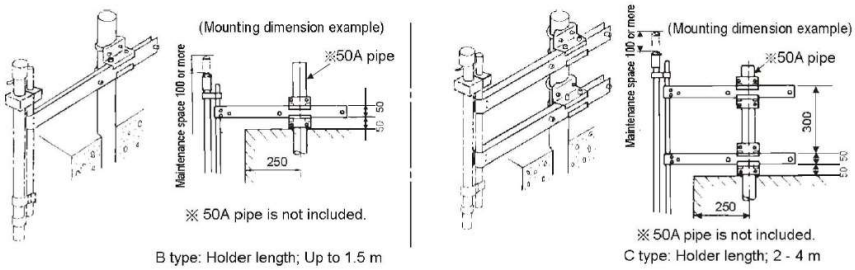
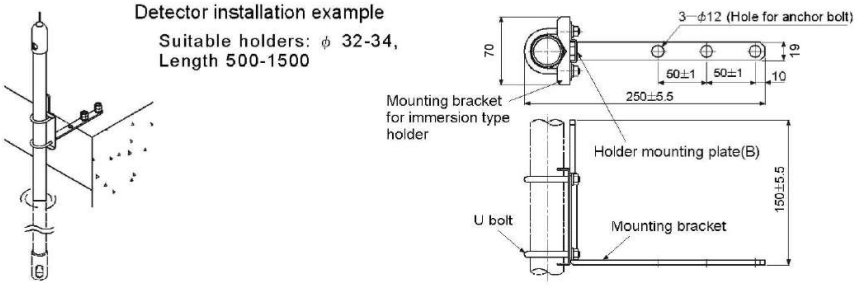
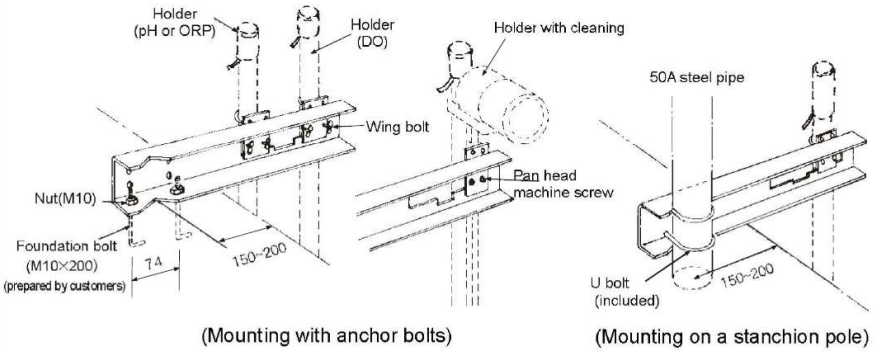
USB adaptor COMM-1

Dimensions Unit: mm



■ 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.	
ZC-1	Fixing to 50A pole Used together with ZN-7 for holders without cleaning Length: 600 mm Material: SPCC or S.S.	
ZCD-2	Simplified mounting bracket for holder only Anchor bolt (M10) fixing Length: 250 mm Material: 304SS	
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 is not more than 2 m. Holder with cleaning can be mounted.	

TOA DKK

DKK-TOA CORPORATION

⚠ CAUTION Please read the operation manual carefully before using producuts.

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