

SPECIFICATION SHEET



Digital pH Measurement System

The digital pH measurement system consists of a digital electrode (CALMEMO-pH) capable of storing calibration data and a digital amplifier cable that can connect to a PC. This system reduces maintenance and management workload compared to conventional systems.

Dedicated converters (HBM-100D and HBM-160D models) are also available in the lineup, enabling analog transmission or RS-485 transmission output from the indicator (converter), just like conventional system configurations.

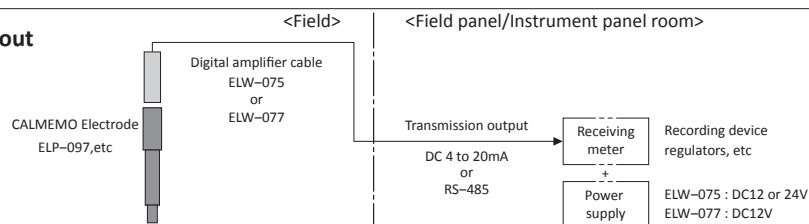
- Electrode-specific data such as calibration values and calibration record are stored in the pH electrode's internal memory rather than in the field transmitter. This allows the pH electrode and transmitter to be used without the traditional constraint of pairing them. Additionally, old calibration data can be retrieved.
- Intelligent diagnostic information (next calibration date, electrode operating days, electrode integrity, electrode response characteristics) can be read out, allowing you to understand the degree of electrode degradation and contamination for maintenance feedback.



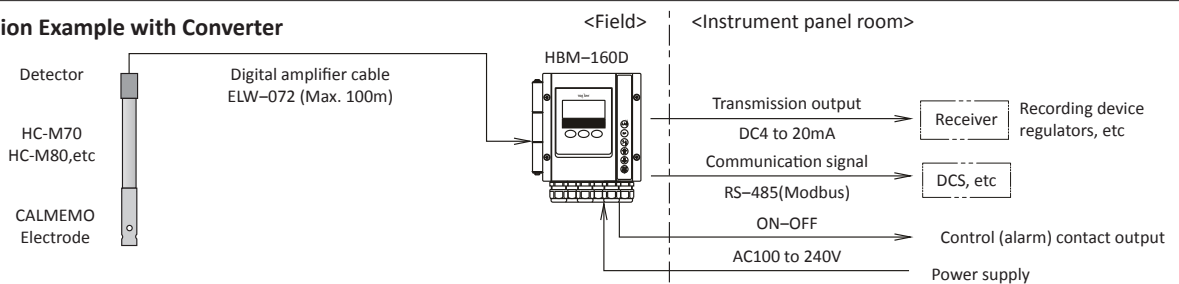
- pH measurements can be transmitted directly to higher-level systems such as DCS via standard analog (DC 4 to 20mA) or digital (RS-485) transmission signals without requiring a converter.
- Since no converter is required, implementation costs can be reduced.
- Operates on DC 12V or 24V for energy savings.
- When performing standard solution calibration and loading past calibration data, please use the USB adapter (COMM-1) and the PC connection cable (ELW-072).

Diagram

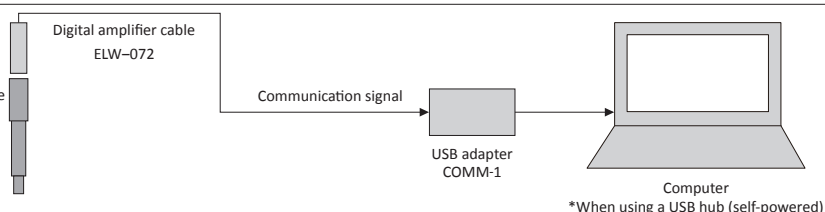
Example Configuration Without Converters (Monitor Only)



Configuration Example with Converter



Calibration of Electrode · During Calibration data Processing (Continuous measurement is not possible)



*When using a USB hub (self-powered)

■ pH Composite Electrode ELP-□□□

Feature

- The electrode incorporates built-in memory to store its specific calibration values and past calibration record. The stored data can be refer using a PC.
- The electrode incorporates a built-in preamplifier, enabling rapid response by processing changes in the glass membrane's potential within the electrode itself.
- The electrode body is made of PPS, which serves as the liquid ground, creating a robust structure with excellent chemical resistance.



Model	ELP-097	ELP-098	ELP-103
Liquid-flow section structure	Ceramic Junction Fixed Type (Resin Fixed)		PTFE and Ceramic Junction (Screw-Fastened: Internal Fluid Exchange Type)
Measurement target	Normal Use	Long Life Span Use	Normal Use
Measurement range/Unit	pH 0 to 14	pH 0 to 12	pH 0 to 14
Sample water condition	Temperature -5 to 105°C		
	Flow Rate: Max 2m/sec		
	100μS/cm above	500μS/cm above	50μS/cm above
Material of wetted parts	Glass, Titanium, PPS, epoxy, ceramic		Glass, Titanium, PPS, epoxy, ceramic, PTFE
Measurement method	Glass electrode (reference electrode: silver/silver chloride)		
Repeatability	±0.05pH		
Stability	0.03pH/24hour		
Flow velocity	MAX 2m/S		
Pressure resistance	0 to 1MPa (25°C) Sensor Head Section		
Connection screw specifications	NPT 3/4		
External dimensions	φ37 (Max) × 184mm		

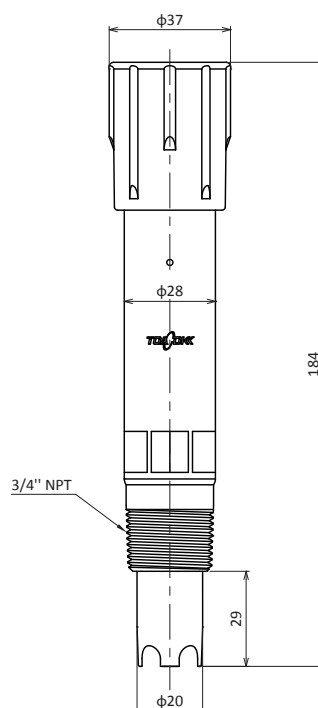
Product code

ELP□□□-0-□

Specification
 Y Standard
 Z Special

Dimensions

Unit : mm



■ Digital Output Cable ELW-07□

Feature

- It incorporates a digital amplifier with a CPU and transmits the output from the pH composite electrode as a digital signal, making it less susceptible to external noise.
- We offer three types of cables. Please select the appropriate one for your specific application.
- Use “072” when calibrating electrodes on a PC or connecting to a converter.
- For DC 4 to 20mA transmission without a converter, use “075”. For RS-485 compliant Modbus communication, use “077”.



Model		ELW-072	ELW-075	ELW-077
Combination converter		HBM-100D, HBM-160D	—	—
Combination Electrode		ELP-097, ELP-098, ELP-103		
Length of Cable		1.5 to 100m		
Communication Specifications	Measurement Output	HBM100D, HBM160D Output	4 to 20mA Analog Output: Isolated	Digital Output RS-485 (Modbus Communication)
	Output range	—	0 to 14pH	0 to 14pH, Temperature 0 to 100°C
	Communication speed	—	—	9600bps
Power		HBM100D, HBM160D supplied by converter	DC 12V or DC 24V±10%	DC 12V±10% (Noise-free)
Maximum power consumption			approx. 1.2VA (DC12V) or 1.6VA (DC24V)	approx.0.50VA
Permissible Ambient Temperature		-5 to +85°C		
Operating Pressure		0 to 0.1MPa (25°C)		
Connection Screw Specifications		Lead side: 1"NPT (Wrench size: 1-1/8 (28.58mm))	Lead side: 1"NPT (Wrench size: 1-1/8 (28.58mm)) Power supply side: 3/4"NPT (Wrench size 1") (Connect at one location only; waterproofing required)	
Overseas Standards Compatibility		EC Directive Korea Radio Act (Register No. R-R-TDc-030ELW-072)		
Material		Body: PPS Cable: PVC, O-ring: FKM		
Connection		Electrode: 16 pin connector Converter: Bar Crimp Terminal		
External Dimensions		BODY φ34×108mm		
Mass		Approx. 330g (excluding electrodes, with 5m lead wire)		

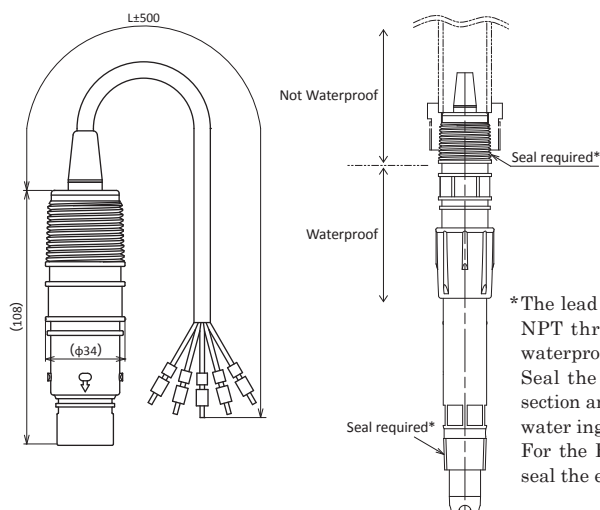
Product code

ELW075-0-		
or		Cable length
ELW077	F	1.5m
or	K	5m
or	M	10m
ELW072	Y	Other Designated*1
		Form of notation
	A	Standard
	B	English
	C	Chinese
	Z	Special

*1. We can produce lengths of up to 100 meters.

Dimensions

Unit : mm



*The lead wire side from the 1" NPT threaded section is not waterproof. Seal the connection threaded section and install it to prevent water ingress. For the HC-M80/85/86 holder, seal the electrode side.

■ USB Adapter COMM-1 (Target Equipment: ELW-072)

○Used in instrument rooms, etc., when connecting a pH composite electrode to a computer.

Maximum current : 300mA When using a hub, a self-powered USB hub is required.
Connect : Electrode; for digital amplifier cable rod terminals, PC; USB B Socket
Accessories : USB socket conversion cable (USB Plan B - Plan A)
Data processing software (CALMEMO Monitor), Batch calibration software (CALMEMO Calibrator)

Product code

COMM1-0-□
0 Specification
9 Standard
Special

● CALMEMO Monitor (Target Device: ELW-072)

○CALMEMO- This is application software for reading and writing all data from pH electrodes.

Feature

Measurement Value : pH, temperature, electrode potential, Display etc.
Warning Display : Zero potential abnormality, slope value abnormality, etc.

Setting Value Change : Display/change electrode set values

Electrode calibration : Calibration operation

Proofreading : Display/save calibration history

History Display

Probe Information : Digital amplifier information
Display of electrode serial number, calibration data, and integrity status

File output : Date, time, elapsed days, measurement file format; CSV

Security : View Mode, Administrator (Supervisor) Mode

● CALMEMO Calibrator (Target Device: ELW-072)

○This application software connects up to 16 CALMEMO - up to 16 *1 CALMEMO- pH electrode and perform and performs batch calibration using standard solutions.

○Each electrode requires a digital amplifier cable and a USB adapter.

*1. When using a USB hub (self-powered)

Operating Environment

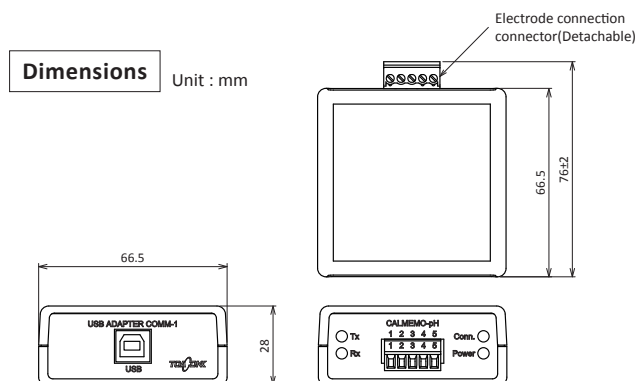
(Common to CALMEMO Monitor and CALMEMO Calibrator)

OS : Microsoft Windows 10/11*
PC : Devices on the above operating systems run properly

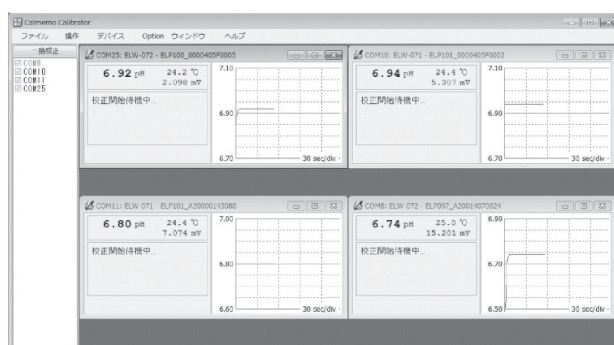
Hard Disk : 100MB Above Available space

DRIVE : CD-ROM DRIVE

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



CALMEMO Monitor Display Screen



CALMEMO Calibrator Display Screen

■ pH Panel mount analyzer HBM-100D

■ pH Converter HBM-160D



- Use the converter when on-site displays or alarm outputs are required.
- There are panel-mounted types and outdoor-installed types.
- Please use the ELW-072 digital amplifier cable.

Model	HBM-100D	HBM-160D
Installation Method	Panel installation	50A Pipe Installation
Measurement range	pH : -1.00 to 15.00mV : -800 to 800mV Temperature : -5 to 100°C	
Indicator	Liquid Crystal Display (LCD) with backlight	
pH Value Transmission Output	DC 4 to 20mA Isolated Type Load Resistance: 650Ω or less	
Transmission Output Range	0.01pH units, 2pH width or more Arbitrarily configurable	
Temperature Transmission Output, Output Range	NONE	DC 4 to 20mA Isolated Type Load Resistance: 650Ω or less, adjustable in 0.1°C increments over a 10°C range
Communication method	RS-485 compliant (Modbus communication)	
Adjustment (Alarm) Output	Output: 2 points (upper/lower freely configurable) a-contact	Output: 2 points (upper/lower freely configurable) c-contact
	Contact Rating: AC 250V, 3A below DC 30V, 3A below (resistive load)	Adjustment Sensitivity: 0.01 to 2.00 pH, freely adjustable
	<UL certified product > Pilot Duty: C300, D300, R300 (inductive load)	UL certification not obtained (no plans to obtain)
Performance	Linearity: Within ±0.03pH (equivalent input) Repeatability: Within ±0.02pH (equivalent input)	
Power	AC 100 to 240V ±10% 50/60Hz	
Power Consumption	Maximum: Approximately 14VA	
Ambient Temperature/Humidity	-10 to 50°C 0 to 95%RH below	-20 to 55°C 0 to 95%RH below
Dimension	96(W)×96(H)×90(D)mm Panel cut 92×92mm	181(W)×180(H)×95(D)mm
Case Material	Aluminum	Aluminum die casting
Finish Color	Surface color: Pale yellow (DICG-36) Panel frame: Light gray (PANTONE 537C)	Body: Metallic Silver Display and Key Operation Panel: Munsell N1.5
Wiring Port	NONE	Cable glands (6 pcs) Remove to reveal G1/2×6
Structure	Indoor installation IP20	Outdoor installation IP65 (equivalent to NEMA 4X)
MASS	Approximately 0.6 kg	Approximately 2.1 kg
Measurement Law	(Not yet completed)	(Not yet completed)
Other Features	Electrode Operating Days Display: Stores and displays the number of days the electrode has been used. Next Calibration Date Display: Calculated based on the last calibration date and the set calibration cycle. Sample Water pH Temperature Compensation: Temperature coefficient setting range...±0.100/°C Reference temperature...25°C Manual Glass Electrode Temperature Compensation: Compensates for the glass electrode's temperature characteristics by inputting the sample water temperature pH Shift: Parallel shift within ±1.00pH (Temperature: CALMEMO-pH electrode; ±5°C General electrode; ±9.9°C) Status Signal Output: Outputs maintenance signals, fault signals, etc., using the control (alarm) output.	
Optional Features	Control (Alarm) Output: normally open contacts 4a or 2c (Upper/lower limits freely configurable) *UL-certified models cannot be selected Power Failure Output: None	Control (Alarm) Output: 4 point; 3point a, 1point c contacts (Upper/lower limits freely configurable) Power failure output: Outputs contact signal when power fails Contact capacity: AC 250V 3A or less DC 30V 3A or less (resistive load) Supported only when using 2 alarm outputs Wall/rack mounting brackets, hood (sunshade), etc.

Product code

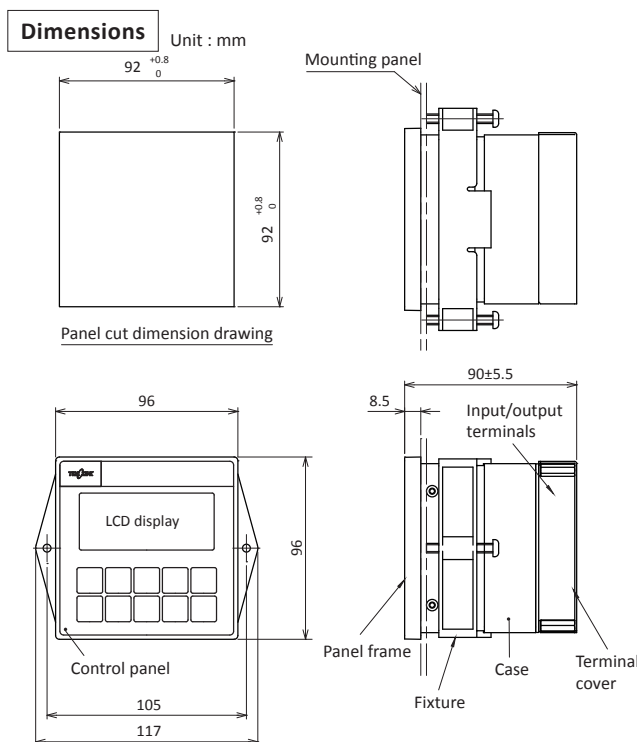
- *1. Alarm (adjustment) contact outputs can be freely configured for upper limit or lower limit operation, along with sensitivity range. Additionally, status signal contact outputs can be freely assigned for maintenance in progress, cleaning in progress, or fault signals.
- *2. This is required when combining with non-timer cleaners model (JHC-7E, BHC-7E, RHC-7EC) or the PHC(G)-7D. It is not required for time cleaners (such as JHC/RHC-7C models) or the UHC ultrasonic cleaner. Since the control voltage for these cleaners is AC 100V, the power supply to the HBM-100D model must also be limited to AC 100V. If the voltage is AC 100V or higher, a step-down transformer ZP-30 model is required. Please note that the CALMEMO-pH electrode is not compatible with the cleaner. When using a cleaner, combine it with a standard electrode such as the 5600 model or GSS-304 model.
- *3. EC directives are EU standards, while UL certification is a U.S. standard.
- *4. UL-certified products are limited to specifications with alarm (control) contact outputs of “2 points (2 circuit a-contact)” and labeling in “English.” Special specifications cannot be accommodated.

Product code

- *1. The pH measurement display range is pH 1.00 to 15.00. Please specify a range of at least 2 pH units in 0.1 pH increments.
- *2. The water temperature measurement display range is 5 to 100°C. Please specify in increments of 1°C over a 10°C range.
- *3. Required when combining with timer-less washers model (JHC-7E, BHC-7E, RHC-7EC) or the PHC(G)-7D. (Not required for models such as the UHC type with ultrasonic cleaning or the JHC/RHC-7C type with timer) Since the control voltage for these cleaners is AC 100V, the power supply for the HBM-160D type is also limited to AC 100V. For voltages above AC 100V, a step-down transformer (ZP-30 type) is required.

Note: The CALMEMO-pH electrode is not compatible with the cleaner. When using the cleaner, combine it with a standard electrode such as the 5600 model or GSS-304 model.

- *4. Standard paint is a melamine resin primer and top coat with an average film thickness of 30 µm or more. Heavy-duty anti-corrosion paint is an epoxy resin primer and intermediate coat, followed by a polyurethane resin top coat with a film thickness of 100 µm or more.
- *5. Install ceramic surge arresters (simplified type) on the power supply line and transmission line. Note that adding this option will result in non-compliance with EC directives.

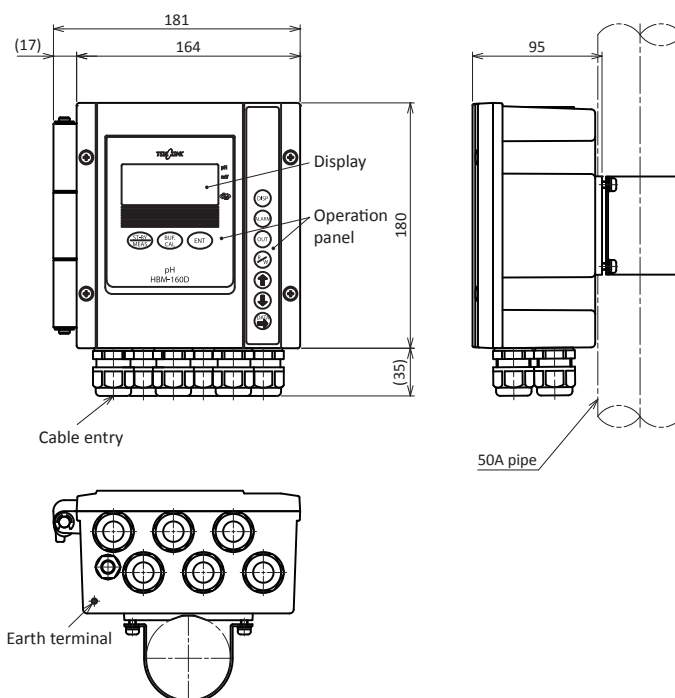


● HBM-160D

Dimensions

Unit : mm

<Pole Mounting>



■ Combination electrode holder

● Immersion holder: HC-M70 type

Structure : Rainproof
 Sample Water : Pressure; Atmospheric pressure
 Conditions : Flow velocity; 1 m/s or less
 Holder Material : Holder Body; PP, PVC, or PVDF
 (depending on product code specification selection) Rubber Cap; CR
 Electrode Protection Cover; PP

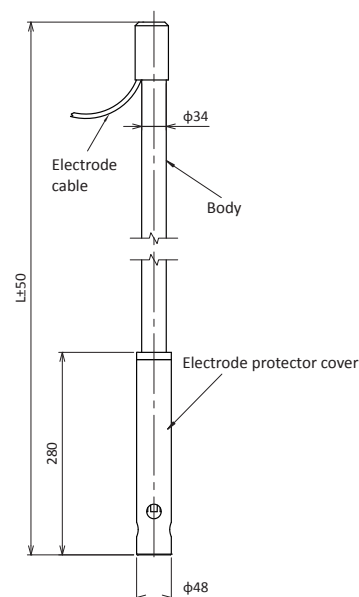
Holder Length : 0.5 to 3.0m
 Operating : PP; -5 to 80°C, PVC; -5 to 60°C
 Temperature rate : PVDF; -5 to 85°C (Depending on product code specification selection)

Product code

HCM70-0-					
A	.....	Material of wet part			
B	.....	Polypropylene (PP)			
C	.....	Polyvinyl Chloride (PVC)			
	.....	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	.....	Not required			
K	.....	With 5m cabling			
M	.....	With 10m cabling			
Y	.....	Others specified *1			
	.....	Holder guide assay *2			
0	.....	None			
1	.....	Included SUS316			
	.....	Markings			
A	.....	Standard			
B	.....	English			

Dimensions

Unit : mm



*1. We can manufacture lengths up to 100 meters.

*2. When combining with the ZN-7 type support bracket, Select "Included".

*The electrodes will be arranged separately.

● Flow-through Holder: HC-M80

Structure : Rainproof
 Sample Water : Pressure; 0 to 0.1MPa
 Conditions
 Holder Material : Holder body; PP or PVC (depending on product code specification selection)
 Bag nut; PE O-ring; FKM

Pipe connection : 25A JIS 10K FF or Rc1/2 (depending on standard product code specification selection)
 Flow rate : 2 to 10 L/min.
 Operating : PP; -5 to 80°C, PVC; -5 to 60°C
 temperature range (depending on product code specification selection)

Product code

HCM80-0-□□□

A	Wetted parts material
B	Polypropylene (PP)
Z	Polyvinyl Chloride (PVC)
	Special
1	Piping connection specifications & face-to-face dimensions
2	25A JIS10K FF 210×110 (Standard)
9	Rc1/2 210×50
	Special
0	Digital amplifier cable
K	Not required
M	With 5m cabling
Y	With 10m cabling
	Others specified *1
A	Markings
B	Japanese (Standard)
	English

*1. We can manufacture lengths up to 100 meters.

● Screw-in Type Horizontal Flow-through Holder: HC-M85

● Liquid-flow Holder (Screw-in Vertical Type): HC-M86

Structure : Rainproof
 Sample Water Conditions : Pressure; 0 to 1MPa (25°C)
 Temperature; -5 to 105°C
 Holder Material : PPS
 Piping Connection Specifications : Rc3/4
 Flow rate : 1 to 5L/min.
 Operating temperature range : -5 to 85°C

Product code

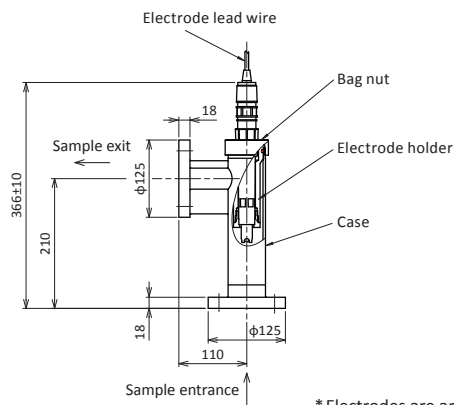
HCM85-0-□□
 or
 HCM86

0	Digital amplifier cable
K	Not required
M	With 5m cabling
Y	With 10m cabling
	Others specified *1
A	Markings
B	Japanese (Standard)
	English

*1. We can manufacture lengths up to 100 meters.

Dimensions

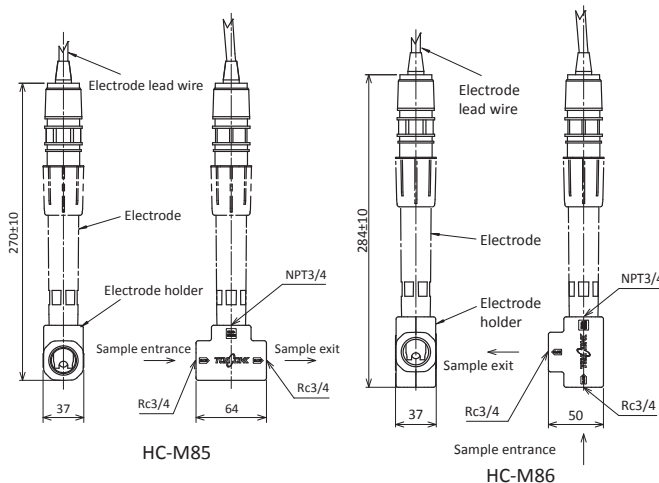
Unit : mm



* Electrodes are arranged separately.

Dimensions

Unit : mm



* Electrodes are arranged separately.



DKK-TOA CORPORATION

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CAUTION

Please read the operation manual carefully before using products.