HORIBA
Process & Environmental

pH
ORP

Water Quality Meter Series — Selection Guidebook

for pH Meters and ORP Meters

Contents

For all water treatment processes, from pure

The "water expert," a long-selling product, now protects the quality of the world's water.

Horiba Advanced Techno's water quality meter series has all the measurement items necessary for sensors as well as holders and cleaners can be combined to meet each customer's needs, from or the "48/96 Series Indoor-Use Panel Installation Type Water Quality Meter" according to your site's

Outdoor-use type Water Quality Analyzer **H-1 Series**

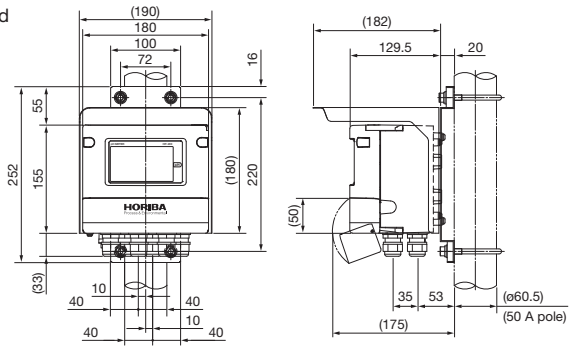
Developed to embody the key concepts of Tough (Robustness), Intelligence (Functionality), and Easy Maintenance (Maintainability) to cope with the harsh environmental conditions of on-site processes. The robust die-cast aluminum case, noise resistance, auto-calibration, various self-diagnostic functions, and a wide range of interfaces facilitate on-site water quality management both indoors and outdoors.

H-1 Series Lineup

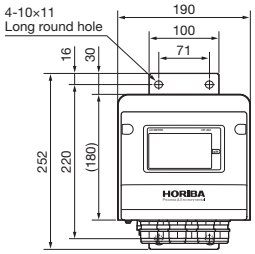
pH meters	HP-200	4-wire
	HP-300	2-wire
	HP-300-IS	2-wire, explosion-proof
ORP meters	HO-200	4-wire
	HO-300	2-wire
	HO-300-IS	2-wire, explosion-proof
Electroconductivity meters (Conductivity meters)	HE-200C	4-wire, low concentration
	HE-300C	2-wire, low concentration
	HE-300C-IS	2-wire, explosion-proof
	HE-200H	4-wire, high concentration
Electrical resistivity meters (Resistivity meters)	HE-200R	4-wire
	HE-300R	2-wire
Dissolved oxygen meters (DO meters)	HD-200	4-wire, diaphragm type
	HD-300	2-wire, diaphragm type
	HD-200FL	4-wire, optical type
Turbidimeters	HU-200TB-W	4-wire, wide range, flow-through type
	HU-200TB-H	4-wire, high concentration, flow-through type
	HU-200TB-EH	4-wire, high sensitivity, flow-through type
Turbidity and SS meters	HU-200TB-IM	4-wire, immersion type
MLSS meters (Sludge densitometers)	HU-200SS	4-wire
Colorimeters	HU-200CL	4-wire
Residual chlorine meters	HR-200	4-wire, water flow bead type
	HR-200RT	4-wire, rotating electrode bead type
Turbidity, chromaticity, and residual chlorine meters	HU-200M-CR	4-wire
Simplified fluoride ion meters	HC-200F	4-wire
	HC-300F	2-wire
Ammonium nitrogen meters	HC-200NH	4-wire

External dimensions (Unit: mm)

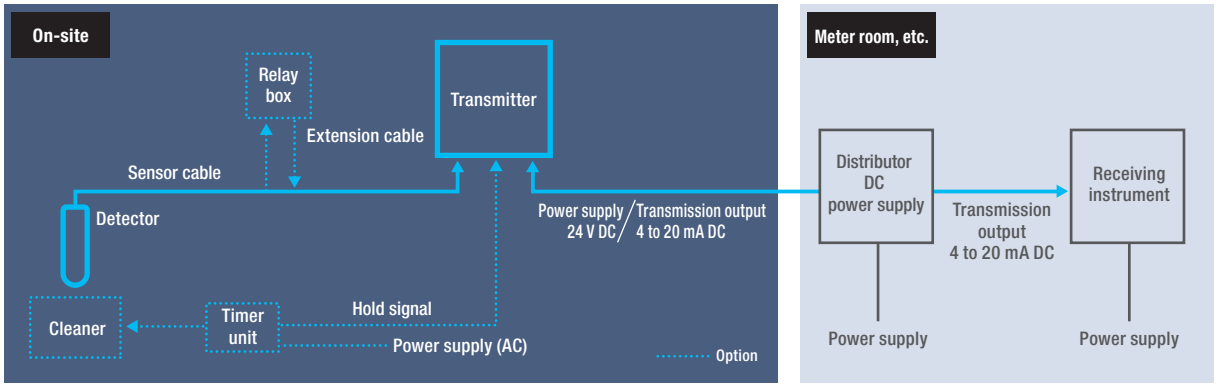
Pole-mounted



Wall-mounted



2-wire system configuration diagram (example) (H-1 series)



water and tap water to sewage and wastewater.

comprehensive measurement and management of water quality. A wide variety of transmitters and measurement to maintenance. Choose either the "H-1 Series Outdoor-Use Type Water Quality Meter" conditions.

Indoor-use panel installation type Water Quality Analyzer 48/96 Series

DIN standard size for installation in control panels. Each control panel has a durable embossed finish and can be operated using the front keys. The compact body offers a full range of functionality, including a status display that uses icons and a security function that employs a PIN code.

<Transmitter>

48 series

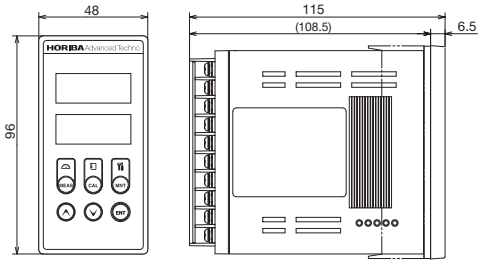
96 series

48/96 Series Lineup

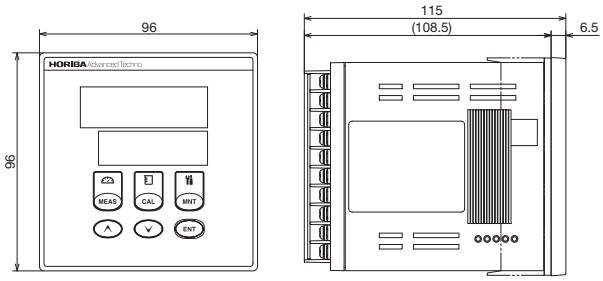
pH meters	HP-480	4-wire
	HP-480PL	4-wire, pulse proportional control
	HP-480TP	4-wire, time-division proportional control
	HP-960FTP	4-wire, 4-point alarm, time-division proportional control
ORP meters	HO-480	4-wire
Electroconductivity meters (Conductivity meters)	HE-480C	4-wire, for low concentration
	HE-480C-DC24V	4-wire, 24 V DC power supply
	HE-960CW	4-wire, 2-channel
	HE-960CW-P	4-wire, 2-channel, USP/EP compatible
	HE-480H	4-wire, for high concentration
	HE-960HI	4-wire, wide range
Electrical resistivity meters (Resistivity meters)	HE-480R	4-wire
	HE-480R-DC24V	4-wire, 24 V DC power supply
	HE-960RW	4-wire, 2-channel
Dissolved oxygen meters (DO meters)	HD-480	4-wire, diaphragm type
Residual chlorine meters	HR-480	4-wire, galvanic type
	HR-480P	4-wire, polarograph type, water flow bead type

External dimensions (Unit: mm)

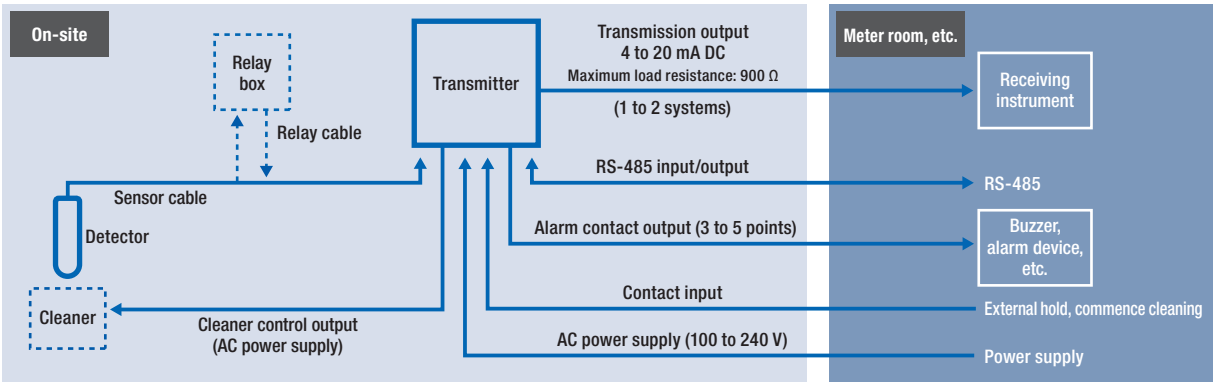
Transmitter: 48 series



Transmitter: 96 series



4-wire system configuration diagram (example) (H-1 series, 48/96 series)



MEMO

Industrial Water Quality Analyzer Series

pH Meter

[Measurement object] pH in liquid
[Measurement method] Glass electrode
[Purpose] Control and management in tap/sewage wastewater treatment and production processes

H-1 Series

Outdoor-use type pH Meter

■ pH transmitter code table

Model	Specifications
HP-200	4-Wire, Power : AC 100 to 240 V ±10% 50/60 Hz
HP-300	2-Wire, Power : 24VDC
HP-300-IS	2-Wire, Explosion-proof: Ex ia II C T4 X, Power : 24VDC

48/96 Series

Indoor-use panel installation type pH Meter

■ pH transmitter code table

Model	Specifications
HP-480	4-Wire, Power : AC100 to 240V ±10% 50/60Hz (Common specifications)
HP-480TP	Time sharing proportional control function
HP-480PL	Pulse proportional control
HP-960FTP	Time sharing proportional control function with F Zone

ORP Meter

[Measurement object] ORP (Oxidation-reduction Potential) in liquid
[Measurement method] Metal electrode
[Purpose] Control and monitoring in wastewater treatment and production processes

H-1 Series

Outdoor-use type ORP Meter

■ ORP transmitter code table

Model	Specifications
HO-200	4-Wire, Power : AC 100 to 240 V ± 10% 50/60 Hz
HO-300	2-Wire, Power : 24VDC
HO-300-IS	2-Wire, Explosion-proof : Ex ia II C T4 X, Power : 24VDC

48/96 Series

Indoor-use panel installation type ORP Meter

■ ORP transmitter code table

Model	Specifications
HO-480	4-Wire, Power : AC100 to 240V ± 10% 50/60Hz

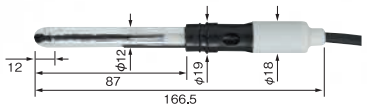
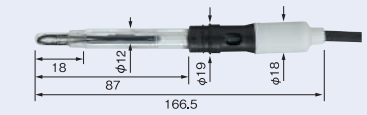
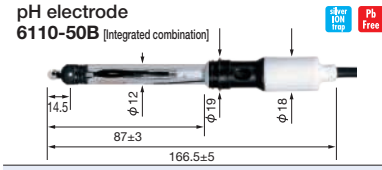
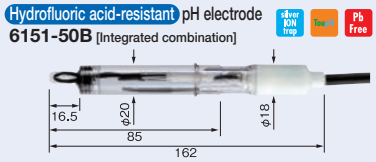
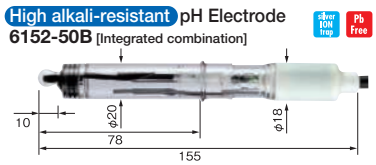
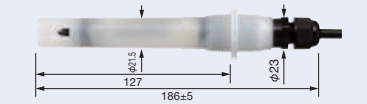
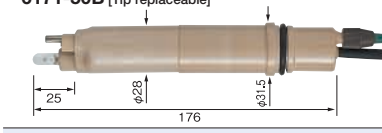
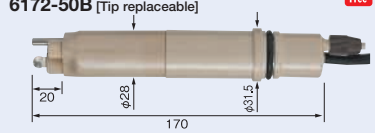
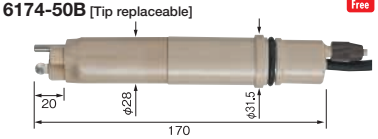
* The information in this catalog is current as of April 2023. For the latest information, please refer to our website.
* Please note that some products in this catalog are made-to-order.

Sensor

Immersion/ Drop-in Type

Flow-through Type

pH electrode

Model	Liquid junction	Usable temperature range	Usable pressure range	Temperature compensation	Cable length	Code	Traits
Dome type pH electrode **6108-50B** [Integrated combination] 	Zirconia ceramic	–10 to 100 °C*1	0 to 0.6 MPa	1 kΩ	5 m (Standard)*2	3200265000	The response film is made of domed thick film glass, which provides breakage resistance and good washability. It is suitable for high temperature and high pressure processes and has good acid resistance. It can also be used with many types of cleaners, including jet, brush, and ultrasonic cleaners.
Sleeve type pH electrode **6109-50B** [Integrated combination] 	Fixed sleeve	–10 to 80 °C*1	0 to 0.03 MPa	1 kΩ	5 m (Standard)*2	3200265001	The liquid-junction part adopts a fixed sleeve for easy handling. It is effective for measurement of clogging and viscous samples.
pH electrode **6110-50B** [Integrated combination] 	Zirconia ceramic	–10 to 60 °C*1	0 to 0.03 MPa	1 kΩ	5 m (Standard)*2	3200294534	The liquid junction is larger than other electrodes, making it more resistant to contamination. Furthermore, the liquid junction's horizontal orientation facilitates jet cleaning and other cleaning effects. Various types of cleaning devices can be installed.
Hydrofluoric acid-resistant pH electrode **6151-50B** [Integrated combination] 	Alimina ceramic	–10 to 60 °C*1	0 to 0.2 MPa	1 kΩ	5 m (Standard)*2	3200264992	Response film for hydrofluoric acid resistance and a PSU (polysulfone) body with excellent chemical resistance. It has a service life of 1 month (approx.) under severe conditions such as a hydrofluoric acid concentration of 1,000 ppm at 25°C and pH 3-4.
High alkali-resistant pH Electrode **6152-50B** [Integrated combination] 	Zirconia ceramic	–10 to 60 °C*1	0 to 0.2 MPa	1 kΩ	5 m (Standard)*2	3200264998	Alkali-resistant response film and PSU (polysulfone) body with excellent chemical resistance. It has a service life of 3 months (approx.) under severe conditions such as 0.1 mol/L caustic soda at 60°C.
Gel-filled electrode **6155-60B** [Cable type] **6155-C** [Connector type] 	Zirconia ceramic & Polyethylene	–10 to 100 °C*1	0 to 0.7 Mpa	1 kΩ	Cable type 6 m (Standard)*2 Connector type 5m	Cable type 3200859290 Connector type 3200659142	There is no need to refill the internal liquid, thus reducing maintenance time and frequency. It can also handle low conductivity samples with conductivities as low as 10 µS/cm. In addition, it has excellent resistance to high temperatures and high pressures. A cable type and a connector type are available. * The connector type separately requires the dedicated cable C-50B-VP1.
Hydrofluoric acid-resistant pH Electrode **6171-50B** [Tip replaceable] 	Alimina ceramic	–10 to 60 °C*1	0 to 0.03 MPa	1 kΩ	5 m (Standard)*2	3200265005	In addition to the features of 6174 general-purpose tip-replaceable pH electrodes, a response film for hydrofluoric acid resistance is used for the ph tip, while porous alumina is used for the liquid-junction tip.It has a service life of 1 month (approx.) under severe conditions such as a hydrofluoric acid concentration of 1,000 ppm at 25°C and pH 3-4.
High alkali-resistant pH electrode **6172-50B** [Tip replaceable] 	Zirconia ceramic	–10 to 60 °C*1	0 to 0.03 MPa	1 kΩ	5 m (Standard)*2	3200265006	In addition to the features of 6174 general-purpose tip-replaceable pH electrodes, an alkali-resistant response film is used. It has a service life of 3 months (approx.) under severe conditions such as 0.1 mol/L caustic soda at 60°C.
pH electrode pH **6174-50B** [Tip replaceable] 	Zirconia ceramic	–10 to 100 °C*1	0 to 0.03 MPa	1 kΩ	5 m (Standard)*2	3200269746	The pH tip and liquid-junction tip are cartridges for easy replacement and maintenance. The body is made of PPS (polyphenylene sulfide), which has excellent heat and chemical resistance and is resistant to breakage. It also features liquid grounding to resist noise.

Notes on electrode selection

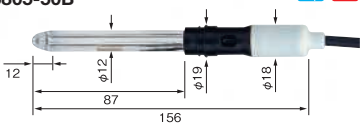
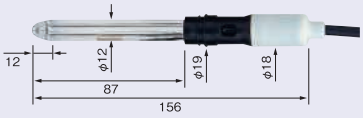
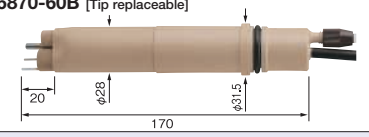
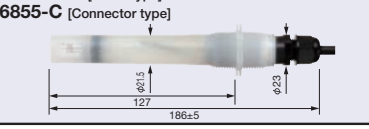
If you are using one of the samples below, please consult our sales department.
- **A strong oxidizing solution such as aqua regia, chromic acid, hypochlorous acid, and perchloric acid.**
- **When containing corrosive gas such as ammonia, chlorine, and hydrogen sulfide.**

Sensor

Immersion/ Drop-in Type

Flow-through Type

ORP electrode

Model	Liquid junction	Usable temperature range	Usable pressure range	Temperature compensation	Cable length	Code	Traits
Platinum plated sensor **6805-50B** 	Zirconia ceramic	0 to 80 °C*1	0 to 0.3 MPa	—	5 m (Standard)*2	3100206119	General purpose ORP sensor. The flat platinum electrode provides excellent washability. It can be used with many types of cleaners, including jet, brush, and ultrasonic cleaners.
Gold plated sensor **6815-50B** 	Zirconia ceramic	0 to 80 °C*1	0 to 0.3 MPa	—	5 m (Standard)*2	3100206120	Gold plating is applied to the 6805's platinum electrode. This is effective for samples for which the ORP values are not stable with platinum electrodes (e.g., samples containing Cr, cyanide, etc.)
Platinum plated sensor **6870-60B** [Tip replaceable] 	Zirconia ceramic	–10 to 105 °C*1	0 to 0.03 MPa	6.8 kΩ	6 m (Standard)*2	3014085403	The ORP tip and liquid-junction tip are cartridges for easy replacement, thus ensuring easy maintenance. The body is made of PPS (polyphenylene sulfide), which has excellent heat and chemical resistance and is resistant to breakage. It also features liquid grounding to resist noise.
Gel-filled electrode **6855-50B** [Cable type] **6855-C** [Connector type] 	Zirconia ceramic & Polyethylene	–10 to 100 °C*1	0 to 0.7 MPa	—	5 m (Standard)*2	Cable type 3200659143 Connector type 3200659144	There is no need to refill the internal liquid, thus reducing maintenance time and frequency. It can also handle low conductivity samples with conductivities as low as 10 µS/cm. In addition, it has excellent resistance to high temperatures and high pressures. A cable type and a connector type are available. * The connector type requires the dedicated cable C-50B-VP8.

*1 For the range of actual operating temperatures and pressures, please also check the specifications of the holder/cleaner to be used with the product.
*2 For other cable lengths, please inquire separately. Cable lengths can be changed on a made-to-order basis.

Sleeve Movable sleeve — Makes cleaning of liquid junction easy.
ToupH ToupH Electrode — Increases strength and sensitivity significantly.
silver ION trap Silver Ion Trap — Controls outflow of silver ion significantly.
Pb Free Lead-free glass — Lead-free glass membrane and body.

Tip for electrode

Type	Model	Code	Specifications
pH tip	7112	3014057312	Tip for pH Electrode for 6174-50B
pH tip	7123	3200265034	Hydrofluoric acid-resistant tip for 6171-50B
pH tip	7124	3200265033	High alkali-resistant tip for 6172-50B
ORP Tip	7312	3014085095	Tip for platinum plated sensor for 6870-60B
Liquid junction tip	RE-01	3200314777	R Tip (Alumina) for 6171-50B
Liquid junction tip	RE-02	3200043644	R Tip (Zirconia) for 6172-50B/6174-50B/6870-60B

Select from a wide range of products according to your application.

Selection of electrodes

● Recommended ▲ Good — Not recommended

		pH								ORP			
		Glass electrode					Gel-filled electrode	Tip replaceable			Glass electrode		Gel-filled electrode	Tip replaceable
	Model	6108	6109	6110	6151	6152	6155	6171	6172	6174	6805	6815*2	6855	6870
														
Sample Properties	General wastewater	●	●	●	●	●	●	●	●	●	●	●	●	●
	High viscosity, suspended solids (Slurry)	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
	High temperature (Maximum (°C) ● 100 ▲ 80 — 60)	●	▲	—	—	—	●	—	—	●	▲	▲	●	●
	High pressure (Maximum (MPa) ● 0.7*Under 40°C ▲ 0.6 — 0.03 *0.2 for 6151/6152)	▲	—	—	—	—	●	—	—	—	—	—	●	—
	High acid*	▲	▲	▲	●	—	▲	●	—	▲	▲	▲	▲	▲
	High alkali*	▲	▲	▲	—	●	▲	—	●	▲	▲	▲	▲	▲
	Contains hydrofluoric acid*	—	—	—	●	—	—	●	—	—	▲	▲	▲	▲
	Low conductivity (Minimum (µS/cm) ● 10 ▲ 100 *6151/6152 is negotiable)	▲	▲	▲	▲	▲	●	▲	▲	▲	▲	▲	●	▲
	High salinity* (e.g., sea water)	▲	▲	—	—	●	—	—	●	—	●	●	●	●

* ●▲— are for reference purposes only. Performance varies depending on sample conditions. For details, please contact our sales representative.

Compatible holders

Model	6108	6109	6110	6151	6152	6155	6171	6172	6174	6805	6815*2	6870	6855
Immersion type	CH-101 CH-101P CH-101PF					SH-101 NH-10P*1 NH-10S*1	HIBP HIBS			CH-101 CH-101P CH-101PF		HIBP HIBS	SH-101 NH-10P*1 NH-10S*1
Flow-through type	CF-251 CF-301 CF-401S	CF-251		CF-251 CF-301		CF-601*2	CF-501			CF-251 CF-301		CF-501	CF-601*2

*1 Requires use of the dedicated adapter NH-ADH. See p. 32 for details.
*2 If you already have a CF-251/301/401S/501 flow-through type holder, electrode 6155/6855 can be attached by combining it with the dedicated CF-AD series adapter. See p. 30 for details.

■ This selection chart is only a guide. For details, please contact your dealer.

■ Selection of holders

		Model	High temperature sample water	Outdoor installation	High pressure in the pipe
Immersion type	Compatible with glass electrode	CH-101	▲	▲ PP	—
		CH-101P	—	● PVC	—
		CH-101PF	●	● PVDF	—
	Compatible with tip replaceable electrode	HIBP	▲	▲ PP	—
		HIBS	●	● SUS316	—
Drop-in type	Compatible with gel-filled electrode	SH-101	▲	▲ PP	—
		NH-10P	—	● PVC	—
		NH-10S	●	● SUS316	—
Flow-through type	Compatible with glass electrode	CF-251	▲	▲ PP	—
		CF-251P	—	● PVC	—
		CF-251S	●	● SUS316	—
		CF-251-T	▲	▲ PP, PVC KCl tank included	—
		CF-251P-T	—	● PVC, PVC KCl tank included	—
		CF-251S-T	●	● SUS316, PVC KCl tank included	—
		CF-301	▲	▲ PP	▲
		CF-301P	—	● PVC	▲
		CF-301S	●	● SUS316	▲
		CF-401S	●	● SUS316	●
	Compatible with tip replaceable electrode	CF-501	▲	▲ PP	—
		CF-501P	—	● PVC	—
		CF-501S	●	● SUS316	—
	Compatible with gel-filled electrode	CF-601	▲	▲ PP	—
		CF-601P	—	● PVC	—
		CF-601S	●	● SUS316	● 0.7 MPa Maximum
		CF-6P	—	● PVC, FKM	—

Please refer to pp. 33, 34 for details.

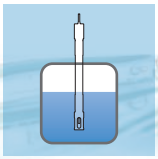
● 100 °C maximum ▲ 80 °C maximum — 50 °C maximum
● Optimal ▲ Avoid direct sunlight
● 0.6 MPa maximum ▲ 0.3 MPa maximum — Not appropriate

■ Selection of cleaners

● Optimal ▲ Suitable — Not appropriate

Type of Cleaner		Ultrasonic cleaner UCH-1X1/2X1 UH-111A UCF-301/601	Jet cleaner JCH-1X1/2X1 JH-11A/100A JCF-3X1	Jet propulsion brush cleaner BH-1X1	Brush cleaner BCH-1X1	Brush jet cleaner BCH-1X1J	Chemical cleaner CCH-151
		Employs a unique burst oscillation method. Continuous cleaning is possible because there are no effects on the measured values during cleaning. [Immersion type] UCH Series [Drop-in type] UH Series [Flow-through type] UCF Series	The unique burst oscillation method enables continuous cleaning without affecting measurement values. Can be cleaned with water or air jets. Effective for cleaning physical deposits. [Immersion type] JCH Series [Drop-in type] JH Series [Flow-through type] JCF Series	This cleaner uses water or air jets to rotate the brush. The jet source does not require a power supply and can be used in explosion-proof areas. [Immersion type] BH Series	Motor-driven brush cleaner. Effective for cleaning physical deposits. [Immersion type] BCH Series	Combines a motor-driven brush cleaner with a jet cleaner. [Immersion type] BCH Series	Chemical cleaning with dilute hydrochloric acid. Ideal for cleaning coating materials such as calcium. [Immersion type] CCH Series
Type of dirt	Food wastewater, pulp mill wastewater	▲	●	●	●	●	▲
	Microorganisms: Algae, bacteria (activated sludge)	●	●	●	●	▲	▲
	Organic matter, oil: Tar, heavy oil	—	—	—	—	▲	▲
	Organic matter, oil: Light oil	●	▲	▲	▲	▲	●
	Organic matter, oil: Fatty acids, amines	—	▲	▲	▲	▲	●
	Suspended solids: Earth and sand	●	▲	▲	—	—	▲
	Suspended solids: Metal powder	▲	▲	▲	—	—	▲
	Suspended solids: Clay, lime	▲	▲	▲	—	—	▲
	Insoluble inorganic components: Coagulation sediment neutralization treatment components ($CaCO_3$, etc.), scale	▲	▲	▲	▲	▲	●

Please refer to pp.31 to 36 for details.



Immersion/drop-in type

Outdoor installation type Water quality analyzer H-1 Series pH/ORP Meter Configuration Table

pp.5, 20-25 Transmitter

pp.6-8 Sensor

pp.9, 29 Holder

pH

Outdoor installation type 2-Wire
- HP-300
- HP-300-IS (Explosion-proof)

Outdoor installation type 4-Wire
- HP-200

Glass (Temperature compensation 1kΩ)

			Holder	
General	6108	Dome type pH electrode	Immersion: CH-101	PP
General	6110	pH electrode	CH-101P	PVC
General	6109	Sleeve type pH electrode	CH-101PF	PVDF
Special	6151	Hydrofluoric acid-resistant pH electrode		
Special	6152	High alkali-resistant pH electrode		

Tip replaceable (Temperature compensation 1kΩ)

			Holder	
General	6174	pH electrode	Immersion: HIBP	PP
Special	6171	Hydrofluoric acid-resistant pH electrode	HIBS*	SUS316
Special	6172	High alkali-resistant pH electrode		

* Do not use Hydrofluoric acid-resistant pH electrode 6171-50B.

Gel filled (Temperature compensation 1kΩ)

			Holder	
General	6155	Gel-filled pH electrode <Cable type>	Immersion: SH-101	PP
			Drop-in: NH-10P	PVC
			NH-10S	SUS316

* Select the adapter NH-ADH and the guide wire TS-WXM as a set.

ORP

Outdoor installation type 2-Wire
- HO-300
- HO-300-IS (Explosion-proof)

Outdoor installation type 4-Wire
- HO-200

Glass (Without temperature compensation)

			Holder	
General	6805	Platinum plated sensor	Immersion: CH-101	PP
General	6815	Platinum + Gold plated sensor	CH-101P	PVC
			CH-101PF	PVDF

Tip replaceable (Temperature compensation 6.8kΩ)

			Holder	
General	6870	Platinum plated sensor	Immersion: HIBP	PP
			HIBS	SUS316

Gel filled (Without temperature compensation)

			Holder	
General	6855	Gel-filled ORP electrode <Cable type>	Immersion: SH-101	PP
			Drop-in: NH-10P	PVC
			NH-10S	SUS316

* Select the adapter NH-ADH and the guide wire TS-WXM as a set.

Relay box/Extension cable

p.40 (Select as needed)

Relay box
- For general site — CT-50pH
- For high humidity site — TB-25pH

Extension cable
- For pH electrode/ORP electrode(6870) — C-5A
- For ORP electrode(6805/6815) — C-2A

Cleaner

pp.9, 31, 32, 34-36
(Select as needed)

Holder accessory

p.39

Note: Holder length is subject to some restrictions. See p. 18 for details.

For holder

- **Bracket**
  - BA-2A — ABS — For slab fastening
  - BA-1S — SUS304 — For slab fastening
  - MB-10 — SUS304 — For 2B(50A) Pole
  - MH-100 — SUS304 — For NH-10
- **Support Pipe**
  - SP-60 — SUS316 — Paired with MH-65
- **Bracket**
  - MH-65 — SUS304 — Paired with SP-60
- **Flange bracket**
  - FK-1 — PP
  - FK-1P — PVC
  - FK-1S — SUS304
  - RF-S1 — SUS316 — For HIBS holder

  Flange size : JIS 10K 50A FF
- **Pole stand**
  - PS-50-1.5-SUS-300 — SUS300 — 50A Pole 1.5m
  - PS-50-1.7-SUS-300 — SUS300 — 50A Pole 1.7m

For cleaner

- **Bracket**
  - MH-65 — SUS304
  - MH-100 — SUS304 — For UH-111A, JH-11A
- **Flange bracket**
  - SFK
- **Pole stand**
  - PS-50-1.5-SUS-300 — SUS300 — 50A Pole 1.5m
  - PS-50-1.7-SUS-300 — SUS300 — 50A Pole 1.7m

Ultrasonic cleaner

- UCH-101 — Integrated oscillator type
- UCH-111 — Non-integrated type

[Compatible electrode] 6108/6805/6815 (6174/6172/6870 Separate quote for installation)

- UCH-201 — Integrated oscillator type
- UCH-211 — Non-integrated type

[Compatible electrode] 6155/6855

- UH-111A — Drop-in type

[Compatible electrode] 6155/6855

* Select the UH-111A, NH-ADH adapter, and TS-WXM guide wire as a set.

Jet cleaner

- JCH-101 — Integrated timer unit type * For HP/HO-300
- JCH-121A — External timer type * For HP/HO-300

[Compatible electrode] 6108/6152/6805/6815 (6174/6172/6870 Separate quote for installation)

- JCH-221A — External timer type * For HP/HO-300
- JH-11A — Drop-in type

[Compatible electrode] 6155/6855

* Select the guide wire TS and the adapter NH-ADH as a set.

Brush cleaner

- BCH-121 — External timer type * For HP/HO-200

Brush jet cleaner

- BCH-101J — Integrated timer unit type * For HP/HO-300

[Compatible electrode] 6108

Jet propulsion brush cleaner

- BH-111A — * For HP/HO-200

[Compatible electrode] 6108

- BH-131 — * For HP/HO-200

[Compatible electrode] 6172/6174

Chemical cleaner

- CCH-151

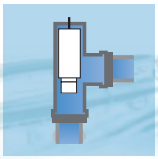
[Compatible electrode] 6108/6151/6152/6805/6815

* For special support, including holders, please refer to pp. p.36

Other accessories for transmitter

p.37
(Select as needed)

- **Metal pipe fittings for air purge** — Used at sites where corrosive gases are present
- **Explosion-proof**
  - Z787 TIIS — Zener barrier
  - KFD2-STC4-EX1 TIIS — Isolated barrier
  - Attachment of the Ex-tag on the electrode cable



Flow-through type

Outdoor installation type Water quality analyzer H-1 Series pH/ORP Meter Configuration Table

Transmitter

pp.5, 20-25

Electrode

pp.6-8

pH

- Outdoor installation type 2-Wire
  - HP-300
  - HP-300-IS (Explosion-proof)
- Outdoor installation type 4-Wire
  - HP-200

ORP

- Outdoor installation type 2-Wire
  - HO-300
  - HO-300-IS (Explosion-proof)
- Outdoor installation type 4-Wire
  - HO-200

Glass (Temperature compensation 1kΩ)

- General 6108 — Dome type pH electrode
- General 6110 — pH electrode
- General 6109 — Sleeve type pH electrode
- Special 6151 — Hydrofluoric acid-resistant pH electrode
- Special 6152 — High alkali-resistant pH electrode

Tip replaceable (Temperature compensation 1kΩ)

- General 6174 — pH electrode
- Special 6171 — Hydrofluoric acid-resistant pH electrode
- Special 6172 — High alkali-resistant pH electrode

Gel filled (Temperature compensation 1kΩ)

- General 6155 — Gel-filled pH electrode <Cable type>
- General 6155-C — Gel-filled pH electrode *Dedicated cable C-XXB-VP1 is needed for connector type 6155-C

Tip replaceable (Temperature compensation 6.8kΩ)

- General 6870 — Platinum plated sensor

Glass (Without temperature compensation)

- General 6805 — Platinum plated sensor
- General 6815 — Platinum + Gold plated sensor

Gel filled (Without temperature compensation)

- General 6855 — Gel-filled ORP electrode <Cable type>
- General 6855-C — Gel-filled ORP electrode *Dedicated cable C-XXB-VP1 is needed for connector type 6855-C

Accessories for transmitter

p.37
(Select as needed)

- Metal pipe fittings for air purge — Used at sites where corrosive gases are present
- For explosion-proof
  - Z787 TIIS — Zener barrier
  - KFD2-STC4-EX1 TIIS — Isolated barrier
  - Attachment of the Ex-tag on the electrode cable

Relay box/Extension cable

p.40
(Select as needed)

- Relay box
  - For general site — CT-50pH
  - For high humidity site — TB-25pH
- Extension cable
  - For pH electrode/ORP electrode(6870) — C-5A
  - For ORP electrode(6805/6815) — C-2A

Holder

pp.9, 30

- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316
- High-humidity/ pressure compatible
  - CF-401S SUS316

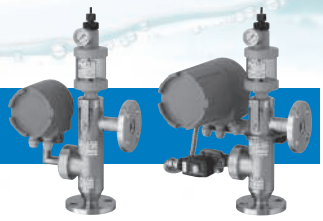
- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316
- High-humidity/ pressure compatible
  - CF-501
  - CF-501P
  - CF-501S
- Head pressure type
  - CF-601
  - CF-601P
  - CF-601S
  - CF-6P

Note: The conventional CF-251/301/401/501 can be used together with the 6155/6855. Such use separately requires a dedicated adapter from the CF-AD series.

- High-humidity/ pressure compatible
  - CF-501
  - CF-501P
  - CF-501S
- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316
- Head pressure type
  - CF-601
  - CF-601P
  - CF-601S
  - CF-6P

Cleaner

pp.9, 31, 33
(Select as needed)



- Ultrasonic cleaner
  - UCF-301 Integrated oscillator type
- Jet cleaner
  - JCF-301 Integrated timer unit type
  - JCF-311 External timer type

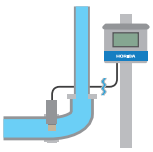
- Ultrasonic cleaner
  - UCF-301 Integrated oscillator type [Compatible electrode] 6152*1
- Jet cleaner
  - JCF-301 Integrated timer unit type
  - JCF-311 External timer type
  [Compatible electrode] 6152*1
- Ultrasonic cleaner
  - UCF-601 Integrated oscillator type
- Jet cleaner
  - JCF-601 Integrated timer unit type
- Ultrasonic cleaner
  - UCF-301 Integrated oscillator type*1
- Jet cleaner
  - JCF-301 Integrated timer unit type*1
  - JCF-311 External timer type*1
- Ultrasonic cleaner
  - UCF-601 Integrated oscillator type
- Jet cleaner
  - JCF-601 Integrated timer unit type

*1 UCF/JCF-301 and JCF-311 can be used together with the 6855. Such use separately requires a dedicated adapter from the CF-AD series.

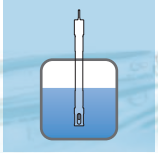
Flow through type Installation example

* Selection criteria are for reference only. Please be sure to check the actual site conditions and consult with our sales representative.

☑Direct pipe insertion
* 6155/6855 only



☑With the holder/cleaner



Immersion/drop-in type

Indoor-use Panel Installation Type Water quality analyzer **48/96** Series

pH/ORP Meter Configuration Table

pp.5, 26-28
Transmitter

pp.6-8
Sensor

pp.9, 29
Holder

pH Panel installation type 4-Wire

- HP-480
- HP-480TP
- HP-960-FTP
- HP-480PL

Glass (Temperature compensation 1kΩ)

General	6108	Dome type pH electrode	Immersion	CH-101 PP / CH-101P PVC / CH-101PF PVDF
General	6110	pH electrode		
General	6109	Sleeve type pH electrode		
Special	6151	Hydrofluoric acid-resistant pH electrode		
Special	6152	High alkali-resistant pH electrode		

Tip replaceable (Temperature compensation 1kΩ)

General	6174	pH electrode	Immersion	HIBP PP / HIBS* SUS316
Special	6171	Hydrofluoric acid-resistant pH electrode		
Special	6172	High alkali-resistant pH electrode		

* Do not use Hydrofluoric acid-resistant pH electrode 6171-50B.

Gel filled (Temperature compensation 1kΩ)

General	6155	Gel-filled pH electrode <Cable type>	Immersion	SH-101 PP
			Drop-in	NH-10P PVC / NH-10S SUS316

* Select the adapter NH-ADH and the guide wire TS-WXM as a set.

ORP Panel installation type 4-Wire

- HO-480

Glass (Without temperature compensation)

General	6805	Platinum plated sensor	Immersion	CH-101 PP / CH-101P PVC / CH-101PF PVDF
General	6815	Platinum + Gold plated sensor		

Tip replaceable (Temperature compensation 6.8KΩ)

General	6870	Platinum plated sensor	Immersion	HIBP PP / HIBS SUS316

Gel filled (Without temperature compensation)

General	6855	Gel-filled ORP electrode <Cable type>	Immersion	SH-101 PP
			Drop-in	NH-10P PVC / NH-10S SUS316

* Select the adapter NH-ADH and the guide wire TS-WXM as a set.

Relay box/Extension cable

p.40
(Select as needed)

Relay box

- For general site — CT-50pH
- For high humidity site — TB-25pH

Extension cable

- For pH electrode/ORP electrode(6870) — C-5A
- For ORP electrode(6805/6815) — C-2A

Cleaner

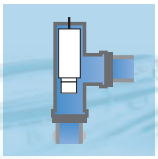
pp.9, 31, 32, 34-36
(Select as needed)

Holder accessory

pp.39

Holder length is subject to some restrictions. See p. 18 for details.

- **Ultrasonic cleaner**
  - **UCH-101** Integrated oscillator type
  - **UCH-111** Non-integrated type
  - [Compatible electrode] 6108/6109/6152/6805/6815 (6174/6172/6870)
  - **UCH-201** Integrated oscillator type
  - **UCH-211** Non-integrated type
  - [Compatible electrode] 6155/6855
  - **UH-111A** Drop-in type
  - [Compatible electrode] 6155/6855
  - * Select the UH-111A, NH-ADH adapter, and TS-WXM guide wire as a set.
- **Jet cleaner**
  - **JCH-101**
- **Jet propulsion brush cleaner**
  - **BCH-101J**
  - [Compatible electrode] 6108
  - [Compatible transmitter] HP-960FTP
- **For holder**
  - **Bracket**
    - **BA-2A** ABS
    - **BA-1S** SUS304
    - For slab fastening
    - **MB-10** SUS304 — For 2B(50A)Pole
    - **MH-100** SUS304 — For NH-10
  - **Support Pipe**
    - **SP-60** SUS316 — Paired with MH-65
  - **Bracket**
    - **MH-65** SUS304 — Paired with SP-60
  - **Flange bracket**
    - **FK-1** PP
    - **FK-1P** PVC
    - **FK-1S** SUS304
    - **RF-S1** SUS316 — For HIBS holder
    - Flange : JIS 10K 50A FF
  - **Pole stand**
    - **PS-50-1.5-SUS-300** SUS300 — 50A Pole 1.5m
    - **PS-50-1.7-SUS-300** SUS300 — 50A Pole 1.7m
- **For cleaner**
  - **Bracket**
    - **MH-65** SUS304
    - **MH-100** SUS304 — For UH-111A, JH-11A
  - **Flange bracket**
    - **SFK**
  - **Pole stand**
    - **PS-50-1.5-SUS-300** SUS300 — 50A Pole 1.5m
    - **PS-50-1.7-SUS-300** SUS300 — 50A Pole 1.7m



Flow-through type

Indoor use Panel Installation Type Water quality analyzer **48/96** Series pH/ORP Meter Configuration Table

Transmitter

pp.5, 26-28

Electrode

pp.6-8

pH — Panel installation type 4-Wire

- HP-480
- HP-480TP
- HP-960-FTP
- HP-480PL

ORP — Panel installation type 4-Wire

- HO-480

Glass (Temperature compensation 1kΩ)	General	6108	Dome type pH electrode
	General	6110	pH electrode
	General	6109	Sleeve type pH electrode
	Special	6151	Hydrofluoric acid-resistan pH electrode
	Special	6152	High alkali-resistant pH electrode
Tip replaceable (Temperature compensation 1kΩ)	General	6174	pH electrode
	Special	6171	Hydrofluoric acid-resistant pH electrode
	Special	6172	High alkali-resistant pH electrode
Gel filled (Temperature compensation 1kΩ)	General	6155	Gel-filled pH electrode <Cable type>
	General	6155-C	Gel-filled pH electrode *Dedicated cable C-XXB-VP1 is needed for connector type 6855-C
Tip replaceable (Temperature compensation 6.8kΩ)	General	6870	Platinum plated sensor
Glass (Without temperature compensation)	General	6805	Platinum plated sensor
	General	6815	Gold plated sensor
Gel filled (Without temperature compensation)	General	6855	Gel-filled ORP electrode <Cable type>
	General	6855-C	Gel-filled ORP electrode *Dedicated cable C-XXB-VP1 is needed for connector type 6855-C

Relay box/Extension cable

p.40 (Select as needed)

Relay box
- For general site — CT-50pH
- For high humidity site — TB-25pH

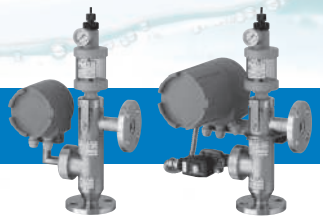
Extension cable
- For pH electrode/ORP electrode(6870) — C-5A
- For ORP electrode(6805/6815) — C-2A

Holder

pp.9, 30

Cleaner

pp.9, 31, 33
(Select as needed)



- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316
- High-humidity/ pressure compatible
  - CF-401S SUS316

→ Ultrasonic cleaner → UCF-301

- CF-251 PP
- CF-251P PVC
- CF-251S SUS316

- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316

→ Ultrasonic cleaner → UCF-301

- Atmospheric pressure type
  - CF-501
  - CF-501P
  - CF-501S
- Head pressure type
  - CF-601
  - CF-601P
  - CF-601S
  - CF-6P

Note: The conventional CF-251/301/401/501 can be used together with the 6155/6855. Such use separately requires a dedicated adapter from the CF-AD series.

→ Ultrasonic cleaner → UCF-601

- Atmospheric pressure type
  - CF-501
  - CF-501P
  - CF-501S

→ Ultrasonic cleaner → UCF-301

- Atmospheric pressure type
  - CF-251 PP
  - CF-251P PVC
  - CF-251S SUS316
- Pressurized type
  - CF-301 PP
  - CF-301P PVC
  - CF-301S SUS316
- Head pressure type
  - CF-601
  - CF-601P
  - CF-601S
  - CF-6P

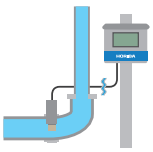
Note: The conventional CF-251/301/401/501 can be used together with the 6155/6855. Such use separately requires a dedicated adapter from the CF-AD series.

→ Ultrasonic cleaner → UCF-601

Flow-through type Installation example

* Selection criteria are for reference only. Please be sure to check the actual site conditions and consult with our sales representative.

☑Direct pipe insertion
* 6155/6855 only



☑With the holder/cleaner

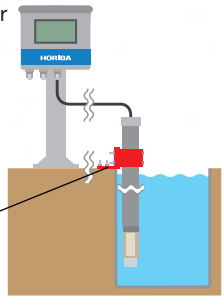
Installation Examples

* Selection criteria are for reference only. Please be sure to check the actual site conditions and consult with our sales representative.
* Regarding chemical cleaner installation, please consult with our sales representative.

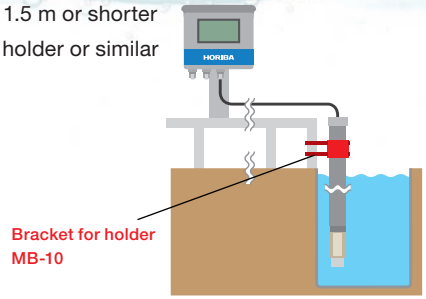
Immersion type

Selection criteria: Holder length of shorter than 2 m and KCl-replenishing electrodes (other than 6155/6855).

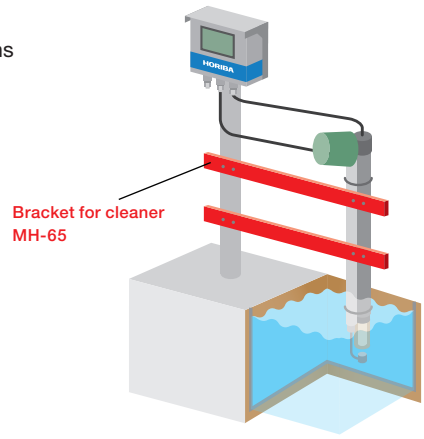
- ☑No cleaner
- ☑Holder length of 1.5 m or shorter
- ☑Ground-mounted holder



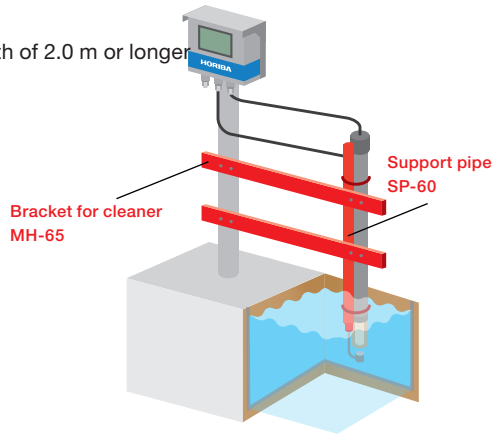
- ☑No cleaner
- ☑Holder length of 1.5 m or shorter
- ☑Fence-mounted holder or similar



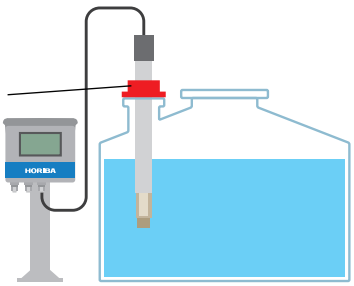
- ☑With cleaner
- ☑All holder lengths



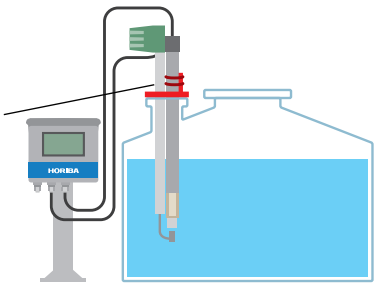
- ☑No cleaner
- ☑Holder length of 2.0 m or longer



- ☑Flange installed
- ☑No cleaner



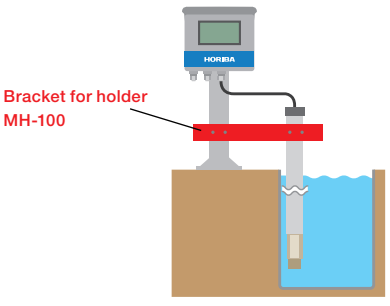
- ☑Flange installed
- ☑With cleaner



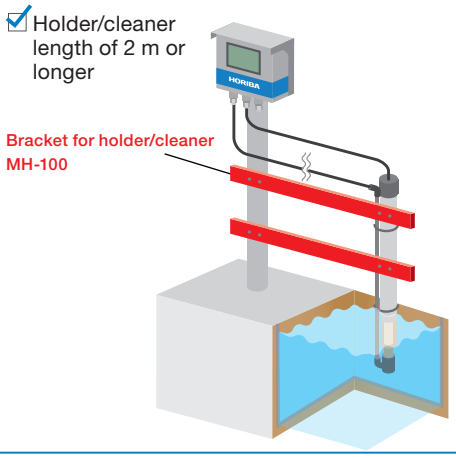
Drop-in type

Selection criteria: Holder length of 2 m or longer (In this case, if the installation site is at a high or narrow location, it can be dangerous to perform maintenance. Additionally, using fittings other than MH-100 may result in the breakage of holders.)

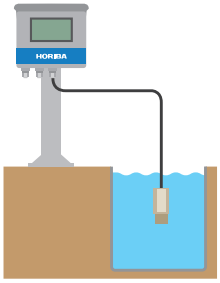
- ☑Holder/cleaner length of 2 m or longer



- ☑Holder/cleaner length of 2 m or longer

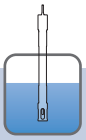


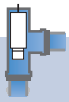
- ☑No cleaner
- ☑Want to reduce installation costs
- ☑No flow velocity, or there is flow velocity but the customer provides the holder



MEMO

Transmitter


Immersion/ Drop-in Type


Flow-through Type

HP-200 Specifications

Product name			pH meter
Model			HP-200
Com10.5bined sensor			Glass electrode
Measurement range	pH		pH0 to pH14 (Display range: pH-1 to pH15)
	Temperature		0°C to 100°C Display range: -10°C to 110°C The sensor types are detected automatically. Display range: -20°C to 130°C The sensor types are input by manually.
Display resolution	pH		0.01pH
	Temperature		0.1°C
Performance	pH	Repeatability	Within ±0.03 pH (response for equivalent input)
		Linearity	Within ±0.03 pH (response for equivalent input)
	Tempera-ture	Repeatability	±0.3°C (response for equivalent input)
		Linearity	±0.3°C (response for equivalent input)
Transmission output	Number of outputs		2 (The negative terminals for transmission outputs are internally connected at the same electric potential)
	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 900Ω
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range	Output 1	pH: Selection from preset ranges or free range input within measuring range.
		Output 2	Temperature: Free setting within a range between -20°C and 130°C
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Contact output	Number of outputs		5
	Output type		No-voltage contact output
	Contact type		Relay contact; SPDT (1c)
	Output capacity		250 VAC 3 A, 30 VDC 3 A (resistance load)
	Contact function	R1, R2	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, and time-sharing proportional control. (The contact is closed during alarm operation, opened normally and while the power is down.)
		R3, R4	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, currently holding of transmission output, and cleaning output. (The contact is closed during alarm operation, opened normally and while the power is down.)
		FAIL	Error alarm (Closed in the normal state, opened in the failure state or while the power is down.)
	Alarm setting range		• Setting range:0.00 pH to 14.00 pH • Delay time: 0 to 600 seconds
	Control function	ON/OFF	• Setting range: 0.00 pH to 14.00 pH • Control width: 0.02 pH to 4.00 pH (±0.01 pH to ±2.00 pH)
		Time-sharing proportion-al control	• Setting range: 0.00 to 14.00 pH • Proportional band: 0.02 pH to 4.00 pH • Period: 5 to 300 seconds • Control duty ratio shift function: 50% to 100% at the alarm setting point. • Variable off time extension in the F-zone: When the deviation enters a certain range (Fine-zone), the off time of the duty is automatically extended accordingly. This function is disabled when the duty ratio shift function is enabled. • F-zone: 1% to 100% of proportional band (When the deviation enters the above range, the automatic off time extension is enabled.) • Maximum off time extension: 0 to 300 seconds • Maximum duty setting: 50% to 100% (regardless of the proportional band)
Cleaning output	Number of outputs		1
	Output type		AC power control output (Applied power supply voltage)
	Contact type		Relay contact; SPST (1a)
	Output contact capacity		250 VAC 0.5 A
	External instrument		Solenoid valve for cleaning control
	Settings	Cleaning period	0.1 to 168.0 hours
		Cleaning time	2 to 600 seconds
		Hold time	2 to 600 seconds
	Timer accuracy		Within 2 minutes per month
	Description of cleaning operation		One of the following operations. • Operation of internal timer only • Operation of internal timer and external input command • Enable the internal timer only when external input is active. • The cleaning trigger signal (The external trigger signal must be longer than 2 second)

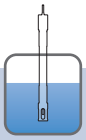
Contact input	Number of inputs	1
	Contact type	No-voltage “a” contact for open collector
	Conditions	ON resistance: 100Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC max
	Contact function	External input for cleaning or transmission holding if cleaner is not attached.
Communication function	Communication type	RS-485
	Signal type	2 wire system, isolated from the input circuit Not isolated from transmission circuit
Temperature compensation	Applicable temperature element	Platinum resistor: 1 kΩ (0°C)
		Positive relation resistor with temperature: 500Ω (25°C), 6.8kΩ (25°C), 10kΩ (25°C)
	Element selection method	Automatic temperature sensor type detection or manual selection (No temperature element is selectable)
	Temperature compensation range	0°C to 100°C
	Temperature calibration	1 point calibration comparing reference thermometer
Calibration	Calibration method	Auto or basic (manual) calibration
	Number of calibration points	Selectable from 1, 2, and 3 points
	Kinds of standard solutions	pH 2, 4, 7, 9, and 10 Any pH standard solution (with difference of 2 pH or more) for basic calibration
	Additional capabilities	Automatic detection of kind of standard solution Automatic detection of electric potential stability Automatic detection of calibration failure (asymmetry potential, sensitivity, or response time) Calibration history (asymmetry potential, sensitivity, and number of days elapsed after last calibration)
Self-check	Calibration error	Asymmetry potential error, sensitivity error, and response time error Temperature calibration error Standard solution detection error
	Electrode diagnostic error	Cracking of glass response membrane Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Converter error	CPU error, ADC error, and memory error
Operating temperature range		-20°C to 55°C (without freeze)
Operating humidity range		Relative humidity: 5% to 90% (without condensation)
Storage temperature		-25°C to 65°C
Power supply	Rated power supply voltage	100 V to 240 V AC ±10% 50/60 Hz
	Power consumption	15 VA (max)
	Others	With power switch for maintenance use
Compatible standards	CE marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rules	Part15 Class A
Structure	Installation	Outdoor installation type
	Installation method	Mounted on 50A pole or wall
	Protection code	IP65
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings	SUS304
	Material of hood	SUS304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass		Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg

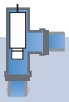
Note 1: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured pH value ± 0.25 pH.

Note 2: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note 3: An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

Transmitter


Immersion/ Drop-in Type

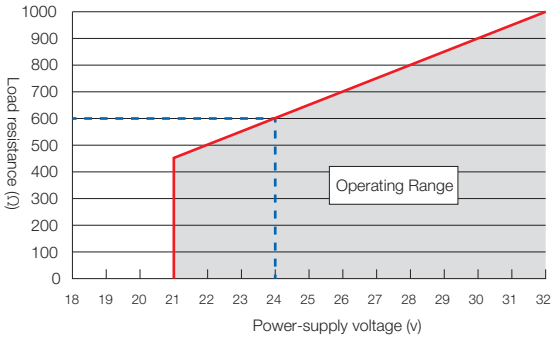

Flow-through Type

HP-300 Specifications

Product name			pH meter
Model			HP-300
Combined sensor			Glass electrode
Measurement range	pH		pH 0 to pH 14 (Display range: pH -1 to pH 15)
	Temperature		0°C to 100°C Display range: -10°C to 110°C The sensor types are detected automatically. Display range: -20°C to 130°C The sensor types are input by manually.
Display resolution	pH		0.01pH
	Temperature		0.1°C
Performance	pH	Repeatability	Within ±0.03 pH (response for equivalent input)
		Linearity	Within ±0.03 pH (response for equivalent input)
	Temperature	Repeatability	±0.3°C (response for equivalent input)
		Linearity	±0.3°C (response for equivalent input)
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 600 Ω Case of 24 V DC power supply
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range		pH: Selection from preset ranges or free range input within measuring range.
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Contact input	Number of inputs		1
	Contact type		No-voltage “a” contact for open collector
	Conditions		ON resistance: 40Ωmax. Open voltage: 1.2 VDC Short-circuit current: 21 mA DC max
	Contact function		External input for transmission holding.
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ (0°C)
			Positive relation resistor with temperature : 500Ω (25°C), 6.8 kΩ (25°C), 10 kΩ (25°C)
	Element selection method		Automatic temperature sensor type detection or manual selection (No temperature element is selectable)
	Temperature compensation range		0°C to 100°C
	Temperature calibration		1 point calibration comparing reference thermometer
Calibration	Calibration method		Auto or basic (manual) calibration
	Number of calibration points		Selectable from 1, 2, and 3 points
	Kinds of standard solutions		pH 2, 4, 7, 9, and 10 Any pH standard solution (with difference of 2 pH or more) for basic calibration
	Additional capabilities		Automatic detection of kind of standard solution Automatic detection of electric potential stability Automatic detection of calibration failure (asymmetry potential, sensitivity, or response time) Calibration history (asymmetry potential, sensitivity, and number of days elapsed after last calibration)
Self-check	Calibration error		Asymmetry potential error, sensitivity error, and response time error Temperature calibration error Standard solution detection error
	Electrode diagnostic error		Cracking of glass response membrane Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Meter error		CPU error, ADC error, and memory error
Operating temperature range			-20°C to 60°C (without freeze)
Operating humidity range			Relative humidity: 5% to 90% (without condensation)
Storage temperature			-25°C to 65°C
Power supply	Power supply voltage range		24 V DC (21 V to 32 V) (* Note 1)
	Power consumption		0.6 W (max)
Compatible standards	CE marking (* Note 2, 3)		EMC: EN61326-1 Class A, Industrial electromagnetic environment RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rules		Part15 CLASS A
Structure	Installation		Outdoor installation type
	Installation method		Mounted on 50A pole or wall
	Protection code		IP65
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings		SUS304
	Material of hood		SUS 304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window		Polycarbonate
	Display element		Reflective monochrome LCD
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass			Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg

Note 1: The maximum load resistance that can be connected is decided depending on the power-supply voltage.

Relation between power-supply voltage and load resistance

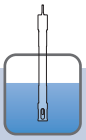


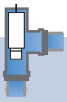
Note 2: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured pH value ±0.1 pH.

Note 3: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note 4: An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

Transmitter


Immersion/ Drop-in Type


Flow-through Type

HP-300-IS Specifications

Product name			Intrinsically safe explosion proof pH meter
Model			HP-300-IS
Approved sensor			Glass electrode (* Note 1)
	Type of approved pH electrode		6108, 6108G, 6109, 6110, 6151, 6152, 6153, 6171, 6172, 6173, 6174
Measurement range	pH		pH0 to pH14 (Display range: pH-1 to pH15)
	Temperature		-10°C to 100°C Display range: -10°C to 110°C The sensor types are detected automatically. Display range: -20°C to 130°C The sensor types are input by manually.
Display resolution	pH		0.01 pH
	Temperature		0.1°C
Performance	pH	Repeatability	Within ±0.03 pH (response for equivalent input)
		Linearity	Within ±0.03 pH (response for equivalent input)
	Temperature	Repeatability	±0.3°C (response for equivalent input)
		Linearity	±0.3°C (response for equivalent input)
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 650. Case of 24 V DC power supply (* Note 2)
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range		pH: Selection from preset ranges or free range input within measuring range.
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ. (0°C)
	Element selection method		Automatic temperature sensor type detection or manual selection (No temperature element is selectable)
	Temperature compensation range		0°C to 100°C
	Temperature calibration		1 point calibration comparing reference thermometer
Calibration	Calibration method		Auto or basic (manual) calibration
	Number of calibration points		Selectable from 1, 2, and 3 points
	Kinds of standard solutions		pH 2, 4, 7, 9, and 10 Any pH standard solution (with difference of 2 pH or more) for basic calibration
	Additional capabilities		Automatic detection of kind of standard solution Automatic detection of electric potential stability Automatic detection of calibration failure (asymmetry potential, sensitivity, or response time) Calibration history (asymmetry potential, sensitivity, and number of days elapsed after last calibration)
Self-check	Calibration error		Asymmetry potential error, sensitivity error, and response time error Temperature calibration error Standard solution detection error
	Electrode diagnostic error		Cracking of glass response membrane Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Meter error		CPU error, ADC error, and memory error
Operating temperature range			-20°C to 55°C (without freeze)
Operating humidity range			Relative humidity: 5% to 90% (without condensation)
Storage temperature			-25°C to 65°C
Power supply	Power supply voltage range		24 V DC (22V to 28.3V) (* Note 3)
	Power consumption		0.6 W(max)
Explosion-proof construction	Explosion-proof construction as specified in TIIS of Japan		Intrinsically safety — Ex ia II C T4 X Product name — pH meter Official approval number — TC20430
		intrinsic safety rating	Maximum input voltage — Ui 28.3 V Maximum input current — Ii 93.3 mA Maximum input power — Pi 0.66 W Maximum internal inductance — Li Negligible value Maximum internal capacitance — Ci 1nF
Structure	Installation		Outdoor installation type
	Installation method		Mounted on 50 A pole or wall
	Protection code		IP65
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings		SUS304
	Material of hood		SUS 304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window		Polycarbonate
	Display element		Reflective monochrome LCD
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass			Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg

Note 1: The pH electrodes listed in the approved sensor can be connected to the pH meter for intrinsically safe apparatus.
Note 2: The maximum load resistance to pick up signal depends on the power supply voltage and combination of barriers. The meshed areas shown in Fig.1 to 3 are the load resistance applicable.
Note 3: The maximum power supply voltage rating to the barrier is not the rating of the pHmeter. Supply power to the barrier within the rating of the barrier.

Relation between power-supply voltage and load resistance
Only converter

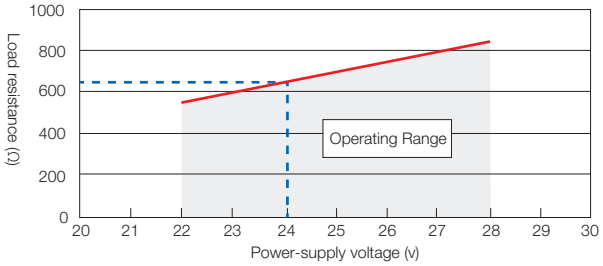


Fig.1: Power supply voltage in converter simple substance, and relation of load resistance.

Relation between power-supply voltage and load resistance
Zener barrier [Z787]

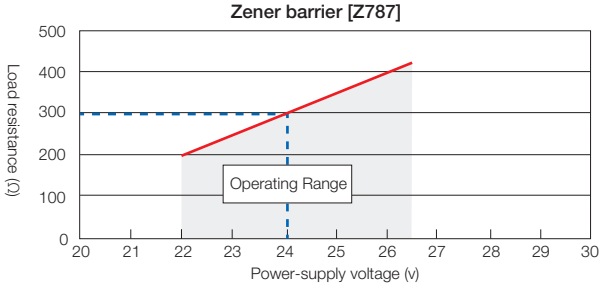


Fig.2: Power supply voltage at the time of combining Zener barrier with converter, and relation of load resistance.

Relation between power-supply voltage and load resistance
Insulated barrier [KFD2-STC4-EX1 TIIS]

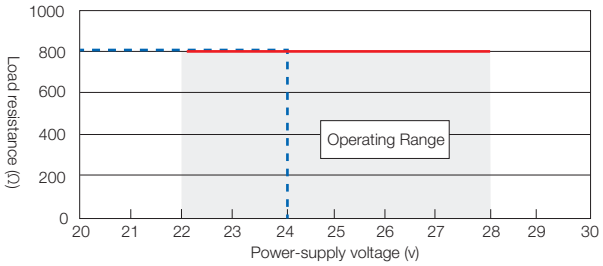


Fig.3: Power supply voltage at the time of combining insulated barrier with converter, and relation of load resistance.

HO-200 Specifications

Product name			ORP meter
Model			HO-200
Combined sensor			ORP electrode
Measurement range	ORP		-2000 mV to 2000 mV (Display range: -2200 mV to 2200 mV)
	Temperature		0°C to 100°C Display range: -10°C to 110°C The sensor types are detected automatically. Display range: -20°C to 130°C The sensor types are input by manually.
Display resolution	ORP		1 mV
	Temperature		0.1°C
Performance	ORP	Repeatability	Within ±5 mV (response for equivalent input)
		Linearity	Within ±5 mV (response for equivalent input)
	Tempera-ture	Repeatability	±0.3°C (response for equivalent input)
		Linearity	±0.3°C (response for equivalent input)
Transmission output	Number of outputs		2 (The negative terminals for transmission outputs are internally connected at the same electric potential)
	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 900Ω
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range	Output 1	ORP: Selection from preset ranges or free range input within measuring range.
		Output 2	Temperature: Free setting within a range between -20°C and 130°C
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Contact output	Number of outputs		3
	Output type		No-voltage contact output
	Contact type		Relay contact; SPDT (1c)
	Output capacity		250 VAC 3 A, 30 VDC 3 A (resistance load)
	Contact function	R1,R2	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, currently holding of transmission output, and cleaning output. (The contact is closed during alarm operation, opened normally and while the power is down.)
		FAIL	Error alarm (Closed in the normal state, opened in the failure state or while the power is down.)
	Alarm setting range		• Setting range: -2000 mV to 2000 mV • Delay time: 0 to 600 seconds
	Control setting range		• Setting range: -2000 mV to 2000 mV • Control width: 2 mV to 400 mV (±1 mV to ±200 mV)
Cleaning output	Number of outputs		1
	Output type		AC power control output (Applied power supply voltage)
	Contact type		Relay contact; SPST (1a)
	Output contact capacity		250 VAC 0.5 A
	External instrument		Solenoid valve for cleaning control
	Settings	Cleaning period	0.1 to 168.0 hours
		Cleaning time	2 to 600 seconds
		Hold time	2 to 600 seconds
	Timer accuracy		Within 2 minutes per month
	Description of cleaning operation		One of the following operations. • Operation of internal timer only • Operation of internal timer and external input command • Enable the internal timer only when external input is active. • The cleaning trigger signal (The external trigger signal must be longer than 2 second)
Contact input	Number of inputs		1
	Contact type		No-voltage “a” contact for open collector
	Conditions		ON resistance: 100 Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC max
	Contact function		External input for cleaning or transmission holding if cleaner is not attached.
Communication function	Communication type		RS-485
	Signal type		2 wire system, isolated from the input circuit Not isolated from transmission circuit

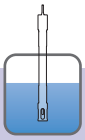
Temperature compensation	Applicable temperature element	Platinum resistor: 1 kΩ (0°C)
		Positive relation resistor with temperature: 500Ω (25°C), 6.8 kΩ (25°C), 10 kΩ (25°C)
	Element selection method	Automatic temperature sensor type detection or manual selection (No temperature element is selectable)
	Temperature compensation range	0°C to 100°C
	Temperature calibration	1 point calibration comparing reference thermometer
Calibration	ORP adjust function	Adjust (Offset adjustment): -200 mV to 200 mV Span sensitivity correction: (0.500 to 1.500)
Self-check	Electrode diagnostic error	Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Converter error	CPU error, ADC error, and memory error
Operating temperature range		-20°C to 55°C (without freeze)
Operating humidity range		Relative humidity: 5% to 90% (without condensation)
Storage temperature		-25°C to 65°C
Power supply	Rated power supply voltage	100 V to 240 V AC ±10% 50/60 Hz
	Power consumption	15VA(max)
	Others	With power switch for maintenance use
Compatible standards	CE marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC rules	Part15 Class A
Structure	Installation	Outdoor installation type
	Installation method	Mounted on 50A pole or wall
	Protection code	IP65
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings	SUS304
	Material of hood	SUS 304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass		Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg

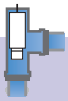
Note 1: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured ORP value ± 15 mV.

Note 2: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note 3: An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

Transmitter


Immersion/ Drop-in Type

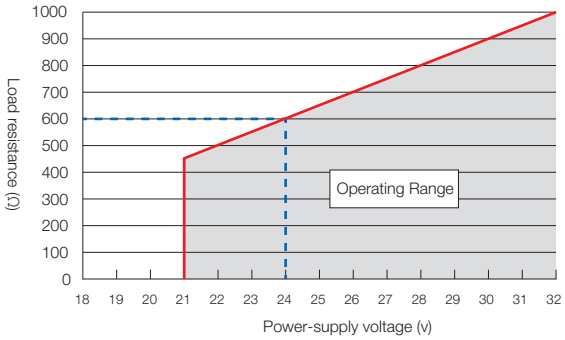

Flow-through Type

HO-300 Specifications

Product name			ORP meter
Model			HO-300
Combined sensor			ORP electrode
Measurement range	ORP		-2000 mV to 2000 mV (Display range: -2200 mV to 2200 mV)
	Temperature		0°C to 100°C Display range: -10°C to 110°C The sensor types are detected automatically. Display range: -20°C to 130°C The sensor types are input by manually.
Display resolution	ORP		1 mV
	Temperature		0.1°C
Performance	ORP	Repeatability	Within ±5 mV (response for equivalent input)
		Linearity	Within ±5 mV (response for equivalent input)
	Temperature	Repeatability	±0.3°C (response for equivalent input)
		Linearity	±0.3°C (response for equivalent input)
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 600Ω Case of 24 V DC power supply
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range		ORP: Selection from preset ranges or free range input within measuring range.
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Contact input	Number of inputs		1
	Contact type		No-voltage “a” contact for open collector
	Conditions		ON resistance: 40Ω max. Open voltage: 1.2 VDC Short-circuit current: 21 mA DC max
	Contact function		External input for transmission holding.
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ (0°C)
			Positive relation resistor with temperature: 500Ω (25°C), 6.8 kΩ (25°C), 10 kΩ (25°C)
	Element selection method		Automatic temperature sensor type detection or manual selection (No temperature element is selectable)
	Temperature compensation range		0°C to 100°C
	Temperature calibration		1 point calibration comparing reference thermometer
Calibration	ORP adjust function		Adjust (Offset adjustment): -200 mV to 200 mV Span sensitivity correction: (0.500 to 1.500)
Self-check	Electrode diagnostic error		Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Meter error		CPU error, ADC error, and memory error
Operating temperature range			-20°C to 60°C (without freeze)
Operating humidity range			Relative humidity: 5% to 90% (without condensation)
Storage temperature			-25°C to 65°C
Power supply	Power supply voltage range		24 V DC (21V to 32V) (* Note 1)
	Power consumption		0.6 W (max)
Compatible standards	CE marking (* Note 2, 3)		EMC: EN61326-1 Class A, Industrial electromagnetic environment RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rules		Part15 CLASS A
Structure	Installation		Outdoor installation type
	Installation method		Mounted on 50A pole or wall
	Protection code	IP65	IEC60529, JIS C0920
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings		SUS304
	Material of hood		SUS 304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window		Polycarbonate
	Display element		Reflective monochrome LCD
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass			Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg

Note 1: The maximum load resistance that can be connected is decided depending on the power-supply voltage.

Relation between power-supply voltage and load resistance



Note 2: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured ORP value ± 6 mV.

Note 3: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note 4: An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

HO-300-IS Specifications

Product name			Intrinsically safe explosion proof ORP meter
Model			HO-300-IS
Combined sensor			ORP electrode (* Note 1)
	Type of approved ORP electrode		6805,6815,2500,2500LD
Measurement range	ORP		-2000 mV to 2000 mV (Display range: -2200 mV to 2200 mV)
Display resolution	ORP		1 mV
Performance	ORP	Repeatability	Within ±5 mV (response for equivalent input)
		Linearity	Within ±5 mV (response for equivalent input)
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type
	Load resistance		Maximum: 650Ω Case of 24 V DC power supply (* Note 2)
	Linearity		Within ±0.08 mA (output only)
	Repeatability		Within ±0.02 mA (output only)
	Output range		ORP: Selection from preset ranges or free range input within measuring range.
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.
Calibration	ORP adjust function		Adjust (Offset adjustment): -200 mV to 200 mV Span sensitivity correction: (0.500 to 1.500)
Self-check	Electrode diagnostic error		Reference electrode impedance error (only applicable for differential circuit mode with a liquid ground electrode) Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Meter error		CPU error, ADC error, and memory error
Operating temperature range			-20°C to 55°C (without freeze)
Operating humidity range			Relative humidity: 5% to 90% (without condensation)
Storage temperature			-25°C to 65°C
Power supply	Power supply voltage range		24 V DC (22V to 28.3V) (*Note 3)
	Power consumption		0.6 W(max)
Explosion-proof construction	Explosion-proof construction as specified in TIIS of Japan		Intrinsically safety Ex ia II C T4 X Product name ORP meter Official approval number TC20278
		intrinsic safety rating	Maximum input voltage Ui 28.3V Maximum input current Ii 93.3mA Maximum input power Pi 0.66W Maximum internal inductance Li Negligible value Maximum internal capacitance Ci 1nF
Structure	Installation		Outdoor installation type
	Installation method		Mounted on 50A pole or wall
	Protection code		IP65
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings		SUS304
	Material of hood		SUS 304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window		Polycarbonate
	Display element		Reflective monochrome LCD
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass			Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg

Note 1: The ORP electrodes listed in the approved sensor can be connected to the ORP meter for intrinsically safe apparatus.
Note 2: The maximum load resistance to pick up signal depends on the power supply voltage and combination of barriers. The meshed areas shown in Fig.1 to 3 are the load resistance applicable.
Note 3: The maximum power supply voltage rating to the barrier is not the rating of the ORP meter. Supply power to the barrier within the rating of the barrier.

Relation between power-supply voltage and load resistance
Only converter

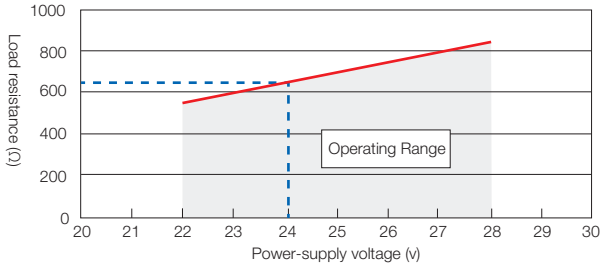


Fig.1: Power supply voltage in converter simple substance, and relation of load resistance.

Relation between power-supply voltage and load resistance
Zener barrier [Z787]

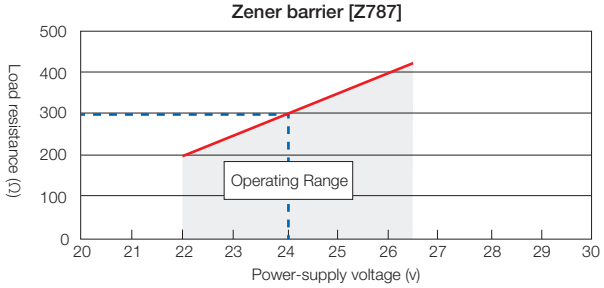


Fig.2: Power supply voltage at the time of combining Zener barrier with converter, and relation of load resistance.

Relation between power-supply voltage and load resistance Insulated barrier
[KFD2-STC4-EX1 TIIS]

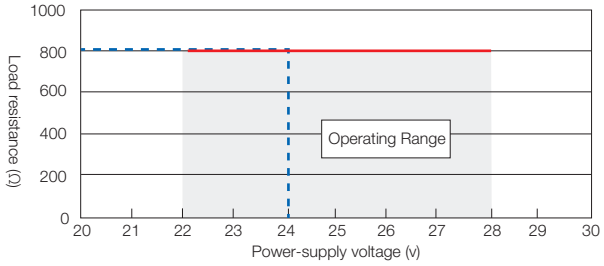
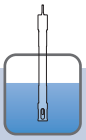
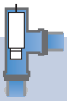


Fig.3: Power supply voltage at the time of combining insulated barrier with converter, and relation of load resistance.

Transmitter


Immersion/ Drop-in Type


Flow-through Type

HP-480 Specifications

Product name		Industrial pH meter
Model		HP-480
Measuring range		pH 0 to 14: resolution of 0.01 pH Temperature 0 to 100: resolution of 1°C (selectable)
Transmission output		4 to 20 mA DC, input/output isolated type Maximum load resistance 900Ω
Transmission output range		Free range
Repeatability and linearity		±0.05 pH, ±0.08 mA (for transmission output range of pH 0 to 14)
Contact output		Output: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact capacity: 240 VAC, 3 A and 30 VDC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.
Calibration function		Two-point automatic calibration or manual calibration Two-point automatic calibration: automatically determines whether the electric potential is stable or not. Types of standard solution: pH 2, 4, 7, 9 and 10 (JIS) Combination of standard solutions: pH 7 and one of the others Manual calibration: Freely selectable, but the difference should be over 2 pH. Temperature calibration (one point)
Transmission output hold function		• Just before hold • Optional value hold • Continuous Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function		• Calibration failure Asymmetry potential error, sensitivity error, response speed error and standard solution error • Electrode self-check Temperature sensor short-circuit and temperature sensor disconnection • Outside of the measuring range • Transducer error
Temperature compensation element		Selectable from compensation ON (500Ω (25°C), 6.8 kΩ (25°C), 350Ω (25°C), 1 kΩ (0°C) or 10 kΩ (25°C)) and compensation OFF
Temperature-compensated range		0 to 100°C
Ambient temperature		-5 to 45°C
Relative humidity		20 to 85% (without dew condensation)
Storage temperature		-25 to 65°C
Power supply		Rated voltage 100 to 240 VAC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 drop-proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Contamination level 2 (IEC61010-1)
Conforming standards	CE Marking (*1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) x 96 (H) x 115 D mm Case depth: approx. 105 mm
Mass		Approx. 400 g

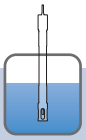
*1: Influence at immunity (industrial environment)
Noise increase:±0.2 pH or less

HP-960FTP Specifications

Product name		Industrial pH meter
Model		HP-960FTP
Measuring range		pH 0 to pH 14: 0.01 pH resolution Temperature 0°C to 100°C: 1°C resolution (selectable display)
Repeatability		Within ±0.05 pH (in equivalent input)
Linearity		Within ±0.05 pH (in equivalent input)
Transmission output		4 mA to 20 mA DC, input/output isolated type Maximum load resistance 900Ω Transmission output range:Freely selectable within the measurement range
Contact output		Outputs: 4 points Alarm contact output (R1, R2, R3 and R4) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control, timesharing proportional control), alarm, and maintenance.
Contact input		Input: 1 point Contact type: open collector, No-voltage contact Contact function:external input for Hold operation
Control action		ON/OFF control • Upper and lower limits setting range: pH 0.00 to pH 14.00 • Control width: pH 0.00 to pH 4.00 (+/- pH 0.00 to +/- pH 2.00) Time-division proportional control • Upper and lower limits setting range: pH 0.00 to pH 14.00 • Proportional band: pH 0.00 to pH 4.00 • Cycle time: 5 s to 300 s • Control output shift capability: 0% to 50% of shift volume for the cycle time • Self-extending cycle time capability: The cycle time is extended automatically when the deviation value enters a set range (F zone) in proportion to the deviation value. (This feature has no effect when the shift function has been enabled.) • F zone: 1% to 100% of the proportional band (Self-extension of the cycle time starts working when the deviation enters the above range.) • Upper limit for extending the cycle time: 0 s to 300 s. • Maximum control volume: 50% to 100% (To be applied regardless of whether the measured value is in the proportional band or not.)
Calibration function		Two-point automatic calibration or manual calibration Two-point automatic calibration: automatically determines whether the electric potential is stable or not. Types of standard solution: pH 2, 4, 7, 9 and 10 (JIS) Combination of standard solutions: pH7 and one of the others Manual calibration: Freely selectable, but the difference should be over 2 pH. Temperature calibration (one point)
Transmission output hold function		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function		• Calibration function Asymmetry potential error, sensitivity error, response speed error and standard solution error • Electrode self-check Temperature sensor short-circuit and temperature sensor disconnection • Outside of the measuring range • Transducer error
Temperature compensation element		Selectable from compensation ON (500Ω (25°C), 6.8 kΩ (25°C), 350Ω (25°C), 1 kΩ (0°C) or 10 kΩ (25°C)) and compensation OFF
Temperature-compensated range		0 to 100°C
Ambient temperature		-5 to 45°C
Relative humidity		20 to 85% (without dew condensation)
Storage temperature		-25 to 65°C
Power supply		Rated voltage 100 to 240 VAC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: splash-proof construction
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking (*1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		96 (W) x 96 (H) x 115 D mm Case depth: approx. 105 mm
Mass		Approx. 500 g

*1: Immunity (Industrial electromagnetic environment)
Noise increase ±0.05 pH or less

Transmitter


Immersion/ Drop-in Type


Flow-through Type

HP-480TP Specifications

Product name		Industrial pH meter
Model		HP-480TP
Measuring range		pH 0 to 14: resolution of 0.01 pH Temperature 0 to 100: resolution of 1°C (selectable)
Transmission output		4 to 20 mA DC, input/output isolated type Maximum load resistance 900Ω
Transmission output range		Free range
Repeatability and linearity		±0.05 pH, ±0.08 mA (for transmission output range of pH 0 to 14)
Contact output		Output: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact capacity: 240 VAC, 3 A and 30 VDC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.
Control action		ON/OFF control • Upper and lower limits setting range: pH 0.00 to pH 14.00 • Control width: pH 0.00 to pH 4.00 (+/- pH 0.00 to +/- pH 2.00) Time-division proportional control • Upper and lower limits setting range: pH 0.00 to pH 14.00 • Proportional band: pH 0.00 to pH 4.00 • Cycle time: 5 s to 300 s • Control output shift capability: 0% to 50% of shift volume for the cycle time • Self-extending cycle time capability: The cycle time is extended automatically when the deviation value enters a set range (F zone) in proportion to the deviation value. (This feature has no effect when the shift function has been enabled.) • F zone: 1% to 100% of the proportional band (Self-extension of the cycle time starts working when the deviation enters the above range.) • Upper limit for extending the cycle time: 0 s to 300 s. • Maximum control volume: 50% to 100% (To be applied regardless of whether the measured value is in the proportional band or not.)
Calibration function		Two-point automatic calibration or manual calibration Two-point automatic calibration: automatically determines whether the electric potential is stable or not. Types of standard solution: pH 2, 4, 7, 9 and 10 (JIS) Combination of standard solutions: pH 7 and one of the others Manual calibration: Freely selectable, but the difference should be over 2 pH. Temperature calibration (one point)
Transmission output hold function		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function		• Calibration failure Asymmetry potential error, sensitivity error, response speed error and standard solution error • Electrode self-check Temperature sensor short-circuit and temperature sensor disconnection • Outside of the measuring range • Transducer error
Temperature compensation element		Selectable from compensation ON (500Ω (25°C), 6.8 kΩ (25°C), 350Ω (25°C), 1 kΩ (0°C) or 10 kΩ (25°C)) and compensation OFF
Temperature-compensated range		0 to 100°C
Ambient temperature		-5 to 45°C
Relative humidity		20 to 85% (without dew condensation)
Storage temperature		-25 to 65°C
Power supply		Rated voltage 100 to 240 VAC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 drop-proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Contamination level 2 (IEC61010-1)
Conforming standards	CE Marking (*1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) x 96 (H) x 115 D mm Case depth: approx. 105 mm
Mass		Approx. 400 g

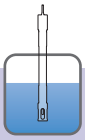
*1: immunity (industrial environment)
Noise increase: ±0.2 pH or less

HP-480PL Specifications

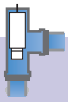
Product name		Pulse proportional control pH meter for industrial use
Model		HP-480PL
Measuring range		pH 0 to 14: resolution of 0.01 pH Temperature 0 to 100: resolution of 1°C (selectable)
Transmission output		4 to 20 mA DC, input/output isolated type Maximum load resistance 900Ω
Transmission output range		Free range
Repeatability and linearity		±0.05 pH, ±0.08 mA (for transmission output range of pH 0 to 14)
Contact output		Output: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPST-NO (1a) Contact capacity: 240 VAC, 0.3 A and 100 VDC, 0.3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.
Control action		• ON/OFF control Upper and Lower limit setting range: 0.00-14.00 pH Differential: 0.1-4.00 pH • Pulse proportional control; Upper and Lower limit setting range: 0.00-14.00 pH Maximum output pulse number: Can be set to any value in a range of 1 to 360SPM Proportional band: 0.01-4.00pH Control output shift function: 0-50%
Calibration function		Two-point automatic calibration or manual calibration Two-point automatic calibration: automatically determines whether the electric potential is stable or not. Types of standard solution: pH 2, 4, 7, 9 and 10 (JIS) Combination of standard solutions: pH7 and one of the others Manual calibration: Freely selectable, but the difference should be over 2 pH. Temperature calibration (one point)
Transmission output hold function		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function		• Calibration failure Asymmetry potential error, sensitivity error, response speed error and standard solution error • Electrode self-check Temperature sensor short-circuit and temperature sensor disconnection • Outside of the measuring range • Transducer error
Temperature compensation element		Selectable from compensation ON (500Ω (25°C), 6.8 kΩ (25°C), 350Ω (25°C), 1 kΩ (0°C) or 10 kΩ (25°C)) and compensation OFF
Temperature-compensated range		0 to 100°C
Ambient temperature		-5 to 45°C
Relative humidity		20 to 85% (without dew condensation)
Storage temperature		-25 to 65°C
Power supply		Rated voltage 100 to 240 VAC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 drop-proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Contamination level 2 (IEC61010-1)
Conforming standards	CE Marking (*1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) x 96 (H) x 115 D mm, Case depth: approx. 105 mm
Mass		Approx. 400 g

*1: Immunity: Industrial electromagnetic environment
Noise increase: ±0.05 pH or less

Transmitter



Immersion/
Drop-in Type

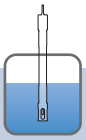


Flow-through
Type

HO-480 Specifications

Product name		Industrial ORP meter
Model		HO-480
Measuring range		±2000 mV: resolution of 1 mV
Transmission output		4 mA to 20 mA DC, input/output isolated type Maximum load resistance 900.
Transmission output range		Free
Repeatability and linearity		±5 mV, ±0.08 mA (for transmission output range of -2000 mV to 2000 mV)
Contact output		Outputs: 2 points Alarm contact output (R1 and R2) • Contact type: relay contact, SPDT (1c) • Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) • Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.
Calibration function		Sensitivity compensation • Adjust: ±200 mV • Span variable range: 50.0% to 150.0%
Transmission output hold feature		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value holding is available in the maintenance mode.)
Self-diagnosis function		• Outside of the measuring range • Converter error
Ambient temperature		-5°C to 45°C
Relative humidity		20% to 85% (without dew condensation)
Storage temperature		-25°C to 65°C
Power supply		Rated voltage 100 V AC to 240 V AC, 50/60 Hz, 10 VA (max)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal:IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking (*1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48(W) mm x 96(H) mm x 115(D) mm, Case depth: approx. 105 mm
Mass		Approx. 400 g

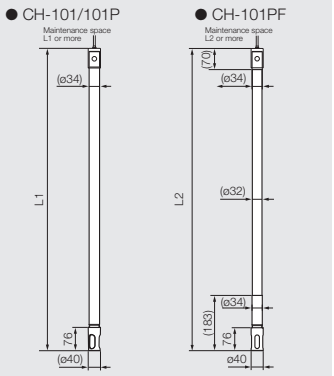
Immersion/drop-in holder



For glass electrode

CH-101(PP)

Dimensional outline (Unit: mm)



[For glass electrode/Code table]

Compatible electrode: 6108/6110/6109/6151/6152/6805/6815

Model	Holder material	Holder length (L1,L2)	Electrode packing	Specification
CH-101				Immersion holder
	-			PP
	P			Transparent PVC (Protective tube, washer: PP)
	PF			PVDF*1
		-0.5		0.5m
		-1.0		1.0m
		-1.5		1.5m
		-2.0		2.0m
		-2.5		2.5m
		-3.0		3.0m
			-	FKM (Recommended when sample is approx. pH10 or lower.)
			-EP	EPDM (Recommended when sample is approx. pH10 or higher, continuous measurement.)

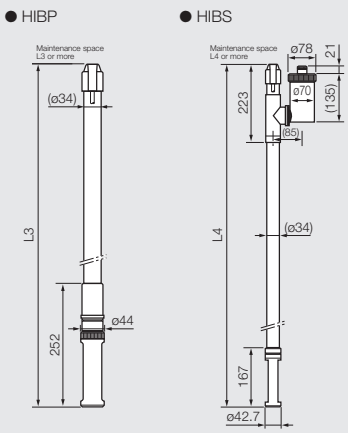
*1 Precautions for the models to be used with CH-101PF-XX (ø32)
(1) Loose flange FK-1 series: Special support is required because it cannot be installed with standard products.
(2) Support pipe SP-60: Special support is required because it cannot be installed with standard products.
* When selecting a holder length of 2.0 m or longer, the recommended electrode cable length is 10 m.

For tip replaceable electrode

HIBP(PP)

HIBS(SUS)

Dimensional outline (Unit: mm)



[For tip replaceable electrode]

Compatible electrode: 6174/6171/6172/6870

Model	Holder material	Holder length (L3,L4)	Specification
HIB			Immersion holder for chip replaceable electrode
	-P		PP
	-S		SUS316
		-0.5	0.5m
		-1.0	1.0m
		-1.5	1.5m
		-2.0	2.0m
		-2.5	2.5m
		-3.0	3.0m

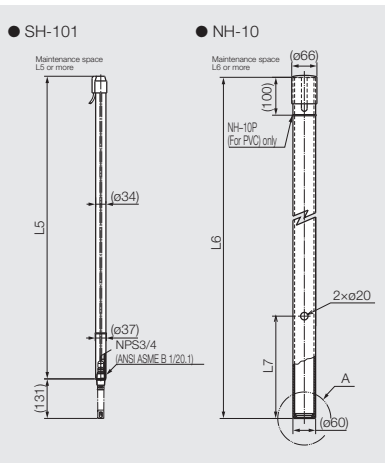
* When selecting a holder length of 2.0 m or longer, the recommended electrode cable length is 10 m.

For gel-filled electrode

SH-101

NH-10 (Drop-in)

Dimensional outline (Unit: mm)



[For gel-filled electrode/Code table]

Compatible electrode: 6155/6855

Model	Holder material	Holder length (L5)	Specification
SH-101			Immersion holder for gel-filled electrode
	-		PP
		-0.5	0.5m
		-1.0	1.0m
		-1.5	1.5m
		-2.0	2.0m
		-2.5	2.5m
		-3.0	3.0m

[For gel-filled type electrode/Code table]

Compatible electrode: 6155/6855

Model	Holder material	Holder length (L6)	Specification
NH-10			Drop-in holder
	-P		PVC
	-S		SUS316
		-1.0	1.0m
		-1.5	1.5m
		-2.0	2.0m
		-2.5	2.5m
		-3.0	3.0m
		-3.5	3.5m
		-4.0	4.0m

* Connector type 6X55-C cannot be used. Please select the cable type.
* An adapter and guide wire (see p. 7) are required when using 6X55 series with drop-in.

* Note when selecting CH/HIBP/HIBS/SH series: If the holder length exceeds 2 m, we recommend the NH series in consideration of maintenance and other work.

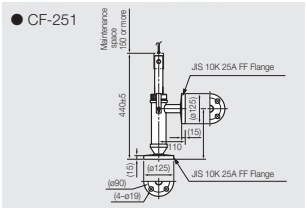
Flow-through holder

Flow-through Type

For glass electrode

CF-251(PP)

■ Dimensional outline (Unit: mm)



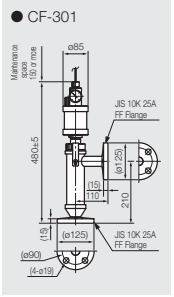
[For glass electrode/Code table]

Compatible electrode: 6108/6110/6109/6151/6152/6805/6815/6855/6855-C

Model	Material	KCl tank	Electrode packing	Connecting dimension	Specification
CF-251					Flow-through holder(atmospheric pressure type)
	-				Chamber material: PP/Holder material: PP*1
	P				Chamber material: PVC/Holder material: PVC (Protective tube, washer: PP)
	S				Chamber material: SUS316/Holder material: PVDF
		-			Without KCl tank
		-T			KCl tank included (PVC 500mL)
			-		FKM (Recommended when sample is approx. pH10 or lower.)
			-EP		EPDM (Recommended when sample is approx. pH10 or higher, continuous measurement.)
				-	JIS 10K 25A FF Flange (JIS standard)

CF-301(PP)

■ Dimensional outline (Unit: mm)



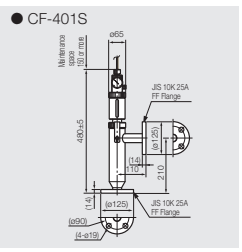
Compatible electrode: 6108/6151/6152/6805/6815/6855/6855-C

Model	Material	Electrode packing	Connecting dimension (pressurizing inlet)	Connecting dimension (holder)	Specification
CF-301					Flow-through holder(pressurized type)
	-				Chamber material: PP/Holder material: PP+PVC*1
	P				Chamber material: PVC/Holder material: PVC (Protective cap, washer : PP)
	S				Chamber material: SUS316/Holder material: PVDF+PVC
		-			FKM (Recommended when sample is approx. pH10 or lower.)
		-EP			EPDM (Recommended when sample is approx. pH10 or higher, continuous measurement.)
			-		Rc1/8 Screw
				-	JIS 10K 25A FF flange (JIS Standard)

Notes when selecting CF-301 (see p. 38 for details)
- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting.
- Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. Customers who choose to pressurize with instrument air should provide their own instrument air tubing or select coil tubing.
- Hand pump: Select a hand pump for manual pressurization. If you will provide your own hand pump, there is no need to select one here.

CF-401S(SUS)

■ Dimensional outline (Unit: mm)



Compatible electrode: 6108

Model	Material	Electrode packing	Connecting dimension (pressurizing inlet)	Connecting dimension (holder)	Specification
CF-401S					Flow-through holder (high-humidity/pressure compatible)
	-				Chamber material: SUS316/Holder material: SUS316, PPS, PVDF
		-			FKM (Recommended when sample is approx. pH10 or lower.)
		-EP			EPDM (Recommended when sample is approx. pH10 or higher, continuous measurement.)
			-		Rc1/8 screw
				-	JIS 10K 25A FF flange (JIS standard)

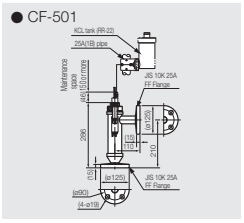
Notes when selecting CF-401S (see p. 38 for details)
Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. Customers should provide their own instrument air tubing or select coil tubing.
CF-401S is designed for high-pressure applications, so pressurization with a hand pump is not recommended.

*1 If deterioration due to ultraviolet rays is a concern, select a PVC or SUS chamber + PVDF holder.

For tip replaceable electrode

CF-501(PP)

■ Dimensional outline (Unit: mm)



[For tip replaceable electrode/Code table]

Compatible electrode: 6174/6171/6172/6155/6155-C/6870

Model	Material	Electrode packing	Connecting dimension (holder)	Specification
CF-501				Flow-through holder (for chip replaceable electrode)
	-			Chamber: PP/Adapter: PP
	P			Chamber: PVC/Adapter: PVC (Protective cap, washer : PP)
	S			Chamber: SUS316/Adapter: SUS316
		-		O ring: FKM*1
			-	JIS 10K 25A FF (JIS standard)

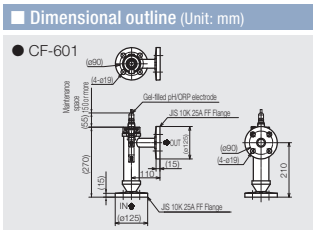
*1 Holder packing: O-ring material EPDM is also available. For details, please contact our sales representative.
* If deterioration due to ultraviolet rays is a concern, select a PVC or SUS material.
* The electrode paired with this holder is of the KCl replenishing type. Please be sure to select the following KCl tank RR-22 or prepare one separately.

Model	Specification
RR-22	KCl tank (included external tank, bracket for 50A pole)

For gel-filled electrode

CF-601(PP)

■ Dimensional outline (Unit: mm)



[For gel-filled electrode/Code table]

Compatible electrode: 6155/6155-C/6855/6855-C

Model	Material	Connecting dimension	Specification
CF-601			Flow-through holder
	-		Chamber: PP/Adapter: PP/Packing: FKM
	P		Chamber: PVC/Adapter: PP/Packing: FKM
	S		Chamber: SUS316/Adapter: SUS316/Packing: FKM
		-	JIS 10K 25A FF flange (JIS Standard)

* If deterioration due to ultraviolet rays is a concern, select a PVC or SUS material.

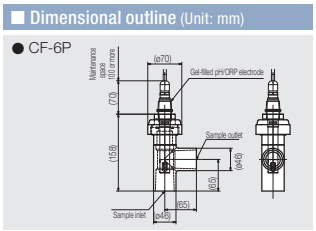
● Cautions on using a non-replenishing electrode with a flow-through holder for glass composite electrodes/tip replaceable electrodes
When using the Flow-through holder CF-251/301/401/501 with 6155/6855 series non-replenishing electrodes, a dedicated CF-AD adapter is required.

[Adapter for flow-through holder]

Model	Material	Code
CF-AD-PP-6X5X	Holder material: PP	3200730763
CF-AD-SUS-6X5X	Holder material: SUS	3200737033

CF-6P

■ Dimensional outline (Unit: mm)



[For gel-filled electrode/Code table]

Compatible electrode: 6155/6155-C/6855/6855-C

Model	Specification
CF-6P	Simplified flow-through holder (atmospheric pressure type), Material: PVC, FKM

Ultrasonic cleaner

Immersion/ Drop-in Type | Flow-through Type

■ Considerations for choosing between the integrated ultrasonic oscillator and separate-mount type

We recommend the separate-mount type in the following cases.

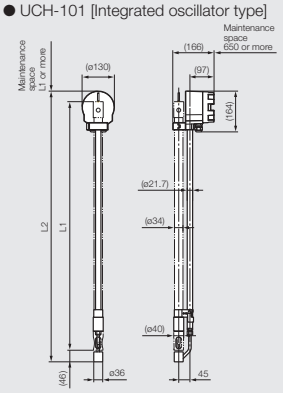
- When the cleaner installation site is dangerous, such as at a height, or when it is flange-mounted (in consideration of the convenience of operating the oscillator).
- When high temperatures or corrosive gases may deteriorate the oscillator's substrate.

■ Immersion type

■ Ultrasonic cleaner for immersion holder
UCH-101

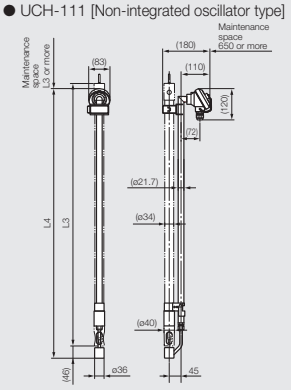
■ Dimensional outline (Unit: mm)

● UCH-101 [Integrated oscillator type]

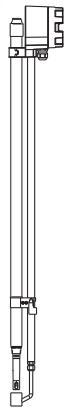


■ Dimensional outline (Unit: mm)

● UCH-111 [Non-integrated oscillator type]

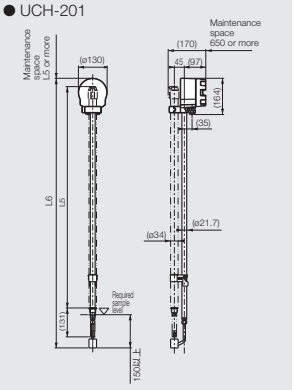


■ Ultrasonic cleaner for immersion holder
UCH-201



■ Dimensional outline (Unit: mm)

● UCH-201



[Ultrasonic cleaner for immersion holder/Code table]

Compatible electrode: 6108/6109/6110/6805/6815

Model	Holder length (L1,L3)	Specification
UCH-101		Integrated oscillator type, Power: AC 100V to 240V
UCH-111		Non-integrated oscillator type*1
	-0.5	0.5m
	-1.0	1.0m
	-1.5	1.5m
	-2.0	2.0m
	-2.5	2.5m
	-3.0	3.0m

*1 The ultrasonic oscillator US-2 (power supply: AC 100 V to 240 V) and cable WI (10m) for the oscillator are included.

[Ultrasonic cleaner for immersion holder/Code table]

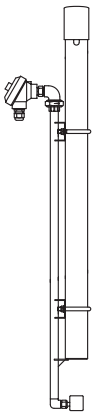
Compatible electrode: 6155/6855

Model	Holder length (L5)	Specification
UCH-201		Integrated oscillator type, Power: AC 100V to 240V
UCH-211		Non-integrated oscillator type*1
	-0.5	0.5m
	-1.0	1.0m
	-1.5	1.5m
	-2.0	2.0m
	-2.5	2.5m
	-3.0	3.0m

*1 The ultrasonic oscillator US-2 (power supply: AC 100 V to 240 V) and cable WI (10m) for the oscillator are included.

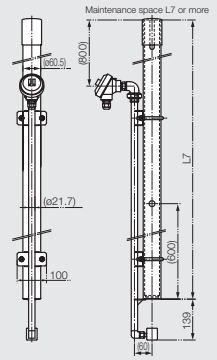
■ Drop-in type

■ Ultrasonic cleaner for drop-in holder
UH-111A



■ Dimensional outline (Unit: mm)

● UH-111A



[Ultrasonic cleaner for drop-in holder/Code table]

Model	Material	Holder length	Specification
UH-111A			Non-integrated oscillator type*1
	-		SUS316
		-2.0	1.8m (L7)
		-2.5	2.3m (L7)
		-3.0	2.8m (L7)
		-3.5	3.3m (L7)
		-4.0	3.8m (L7)

* The drop-in holder NH-10 is included.

Model	Specification	Code
US-2	Ultrasonic oscillator, Power:AC 100V to 240V	3200891855

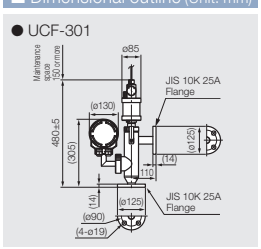
*1 The oscillator cable WI is included with the cleaner's main unit, but the US-2 ultrasonic oscillator is not included.
Please purchase one separately according to the table above.
*2 Ultrasonic cleaner UCH-151/161 for immersion for tip replaceable electrodes is also available. For details, please contact our sales department.
(Compatible electrodes: 6171/6172/6174/6870)

■ Flow-through type

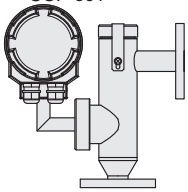
■ Ultrasonic cleaner for flow-through holder
UCF-301

■ Dimensional outline (Unit: mm)

● UCF-301

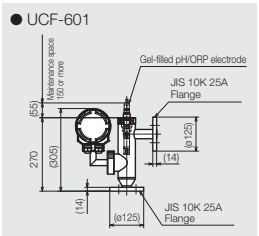


■ Ultrasonic cleaner for flow-through holder
UCF-601



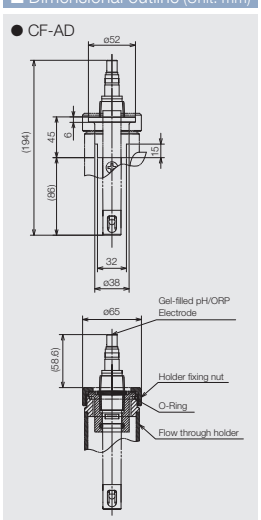
■ Dimensional outline (Unit: mm)

● UCF-601



■ Dimensional outline (Unit: mm)

● CF-AD



[Ultrasonic cleaner for flow-through holder/Code table]

Compatible electrode: 6108/6155/6855

Model	Connecting dimension (pressurizing inlet)	Connecting dimension (holder)	Specification
UCF-301			Integrated oscillator type, Power: AC 90 to 264V, Liquid end materials : SUS316, PP, FKM
	-		Rc1/8
		-	JIS 10K 25A FF Flange (JIS standard)

* A dedicated adapter is required for use with gel-filled electrodes 6155/6855. Please select from the following.

Notes on selection (see p. 38 for details)
- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting.
- Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. Customers who choose to pressurize with instrument air should provide their own instrument air tubing or select coil tubing.
- Hand pump: Select a hand pump for manual pressurization. If you will prepare your own hand pump, there is no need to select one here.

[Adapter for ultrasonic cleaner for flow-through holder/Code table]

Model	Material	Code
CF-AD-PP-6X5X	PP	3200730763
CF-AD-SUS-6X5X	SUS-316	3200737033

[ultrasonic cleaner for flow-through holder/Code table]

Compatible electrode: 6155/6855

Model	Specification
UCF-601	Integrated oscillator type, Power: AC100 to 240V, JIS 10K 25FF Flange

Gel-filled type electrode 6155/6855 can be attached to the cleaner without the dedicated adapter CF-AD series.

Jet cleaner

Immersion Type　Flow-through Type

■ Immersion/flow-through type

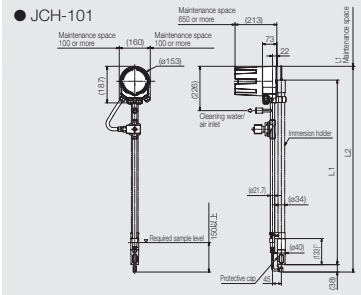
● Please note that the usable jet cleaners differ depending on the transmitter.

■ Jet cleaner for immersion holder <Timer unit integrated type> JCH-101

For HP-300/HO-300/ HP-960FTP.

■ Dimensional outline (Unit: mm)

● JCH-101



[Jet cleaner for immersion holder/Code table]

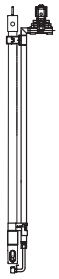
Compatible electrode: 6108/6152/6805/6815

Model	Material	Holder length (L1,L3)	Power supply voltage	Cleaning cycle	Specification
JCH-101					Timer unit integrated type
JCH-121A					Solenoid valve integrated type
	-				Main material of wetted part: SUS316
		-1.0			1.0m
		-1.5			1.5m
		-2.0			2.0m
		-2.5			2.5m
		-3.0			3.0m
			-100V		AC100V±10% 50/60Hz*1
				-	0.1 to 3.0 hours*2

* The customer must provide piping for cleaning.
*1 A power supply voltage of AC 200 V ±10% 50/60 Hz is also available. For details, please contact our sales representative.
*2 A cleaning cycle time of 1.0 to 12.0 hours is also available. For details, please contact our sales representative.

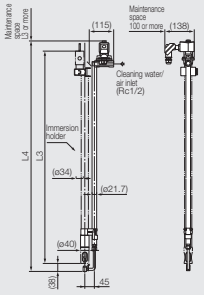
■ Jet cleaner for immersion holder <Solenoid valve integrated type> JCH-121A

For HP-200/HO-200.



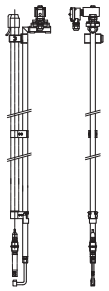
■ Dimensional outline (Unit: mm)

● JCH-121A



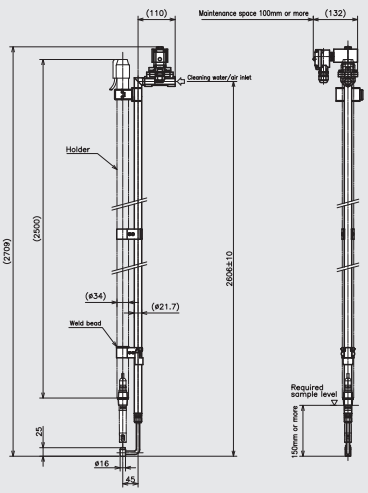
■ Jet cleaner for immersion holder <External timer unit type> JCH-221A

For HP-200/HO-200.



■ Dimensional outline (Unit: mm)

● JCH-221A



[Jet cleaner for immersion holder/Code table]

Compatible electrode: 6155/6855

Model	Holder length (L5)	Specification
JCH-221A		External timer unit type, Power: AC 100V
	-1.0	1.0m
	-1.5	1.5m
	-2.0	2.0m
	-2.5	2.5m
	-3.0	3.0m

Notes on selection
- Select a water piping kit (JH-W5-P) for flushing and a timer unit from the following table. If you will prepare them yourself, there is no need to select them here.

Model	Specification	Code
JH-W5-P	Water piping kit (hose nipple (SUS304, R1/2×ø16), Hose band (SUS304, For ø17 to 25), Hose (ø15×ø22×5m)	3200408120
JT-2AP-100V	Timer unit (Without solenoid valve), Power: AC 100V	3200273829

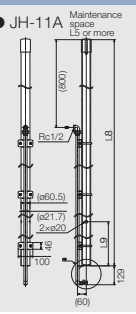
■ Jet cleaner for drop-in holder JH-11A

Compatible with all pH/ORP transmitters of the H-1 series (outdoor-use type).

Notes on selection
- Select a timer unit and a solenoid valve set by referring to Table1 on p. 33. If you will prepare them yourself, there is no need to select them here.
- If you do not have an air/water supply source, select an air pump unit by referring to Table1 on p. 33.
- For cleaning piping: Please select a water piping kit (JH-W5) by referring to Table 2 on p. 33. If you will prepare the piping kit yourself, there is no need to select one here.

■ Dimensional outline (Unit: mm)

● JH-11A



[Jet cleaner for drop-in holder/Code table]

Compatible electrode: 6155/6855 (Cable type)

Model	Holder length	Specification
JH-11A		Drop-in type, Material: SUS316*1.8m (L8)
	-2.0	1.8m (L8)
	-2.5	2.3m (L8)
	-3.0	2.8m (L8)
	-3.5	3.3m (L8)
	-4.0	3.8m (L8)
	-5.0	5.0m (L8)

*1 Please use the guide wire TS and the adapter NH-ADH together.
● For customers using the previous model JH-100A drop-in jet cleaner, please use the JH-101A-AD-PVC-6x5x adapter and the guide wire TS together.

[Adapter/Code table]

Model	Specification
NH-ADH-PVC-6X5X	For JH-11A, Material: PVC
NH-ADH-PVDF-6X5X	For JH-11A, Material: PVDF
JH-101A-AD-PVC-6x5x	For JH-100A, Material: PVC

[Guide wire/Code table]

Model	Wire length	Code
TS-W3M	3m	3200791228
TS-W4M	4m	3200790724
TS-W5M	5m	3200789355
TS-W6M	6m	3200790723

Jet cleaner

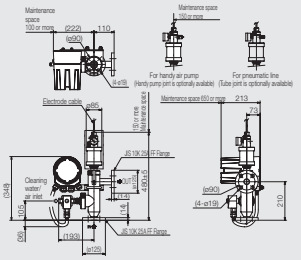
Immersion Type　Flow-through Type

■ Flow-through type

■ Flow-through type <Integrated timer unit type> JCF-301

■ Dimensional outline (Unit: mm)

● JCF-301



[Flow-through type jet cleaner <integrated timer unit type>/Code table]

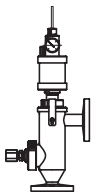
Compatible electrode: 6805/6815/6108/6155/6855

Model	Material	Power supply voltage	Cleaning cycle	Pressurizing inlet size	Connecting dimension (holder)	Specification
JCF-301						Flow-through type jet cleaner, integrated timer unit type>
	-					Chamber, nozzle: SUS316/Holder: PP
		-				AC100V±10%　50/60Hz*1
			-			0.1 to 3.0 hours*2
				-		Rc1/8 Screw diameter
					-	JIS 10K 25A FF flange (JIS Standard)

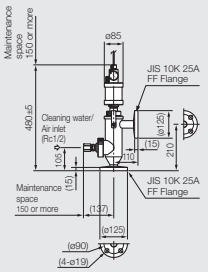
Notes on selection (see p. 38 for details)
- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting.
- Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. Customers who choose to pressurize with instrument air should provide their own instrument air tubing or select coil tubing.
- Hand pump: Select a hand pump for manual pressurization. If you will provide your own hand pump, there is no need to select one here.

*1 A power supply voltage of AC 200 V ±10% 50/60 Hz is also available. For details, please contact our sales representative. (Made-to-order)
*2 A cleaning cycle time of 1.0 to 12.0 hours is also available. For details, please contact our sales representative. (Made-to-order)

■ Flow-through type <External timer unit type> JCF-311



■ Dimensional outline (Unit: mm)



Notes on selection (see p. 38 for details)
- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting.
- Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. Customers who choose to pressurize with instrument air should provide their own instrument air tubing or select coil tubing.
- Hand pump: Select a hand pump for manual pressurization. If you will provide your own hand pump, there is no need to select one here.
- Please select a timer unit and solenoid valve set by referring to [Fig. 1]. If you will prepare them yourself, there is no need to select them here.
- Piping for cleaning: Select either the water piping kit (JH-W5) or air piping kit (JH-A5) from [Fig. 2]. If you will provide your own piping, there is no need to select one here.

[Flow-through type jet cleaner <External timer unit type>/Code table]

Compatible electrode: 6805/6815/6108/6155/6855

Model	Material	Pressurizing inlet size	Instrument air tube	Hand pump	Connecting dimension (holder)	Specification
JCF-311						Flow-through type jet cleaner, External timer unit type> (Without timer/solenoid valve)
	-					Nozzle: SUS316/Chamber/holder: PP
		-				Rc1/8 screw diameter
			-			Without tube
				-		Without hand pump (Rc1/8 screw diameter)
					-	JIS 10K 25A FF Flange (JIS Standard)

[Table1]

Compatible transmitter: HP-200

Model	Specification	Code
SVU-A-A1-S	Solenoid valve unit, Power: AC 100V　Not required if used with APU-20.	3200391090
SVU-A-A2-S	Solenoid valve unit, Power: AC 200V　Not required if used with APU-20.	3200374471

Compatible transmitter: HP-300

Model	Specification	Code
JT2-100V	Timer unit (with solenoid valve), Power: AC 100V　*Select when used with water jet and instrument air.	3200250287
JT-2AP-100V	Timer unit (without solenoid valve), Power: AC 100V　*Select when used with APU-20.	3200273829

Compatible transmitter: HP-200/HP-300　Use when there is no air/water supply source.

Model	Specification	Code
APU-20-N-N-A1	Air pump unit (without timer unit), Material: SPCC, Power: AC 100V	3030047726
APU-20-S-O-A1	Air pump unit (without timer unit), Material: SUS, Power: AC 100V	3030047727

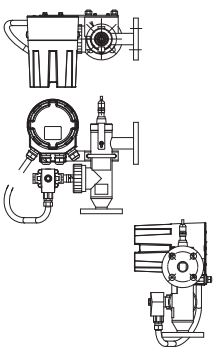
[Table2]

Compatible transmitter: HP-200

Model	Specification	Code
JH-W5	Water piping kit (hose nipple (SUS304, R1/2×ø16), hose band (SUS304, for ø22), 5m hose included*1	3200296561
JH-A5	Air piping kit between holder and solenoid valve, 5m hose included*1	3200296567

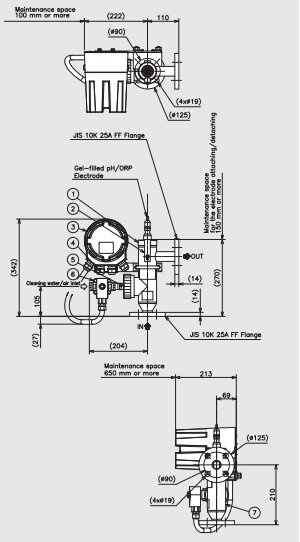
*1 The solenoid valve unit or timer unit should be installed within a hose length of 5 m from the chamber/holder installation location.

■ Flow-through type jet cleaner <Integrated timer unit type> JCF-601-100V



■ Dimensional outline (Unit: mm)

● JCF-601-100V



[Flow-through type jet cleaner <integrated timer unit type>/Code table]

Compatible electrode: 6155/6855

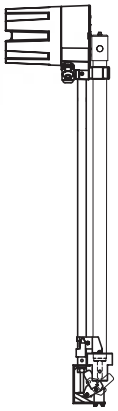
Model	Specification
JCF-601-100V	Power: AC 100 V, Connecting dimension (holder): JIS 10K 25FF Flange

Brush/brush jet cleaner

Immersion Type

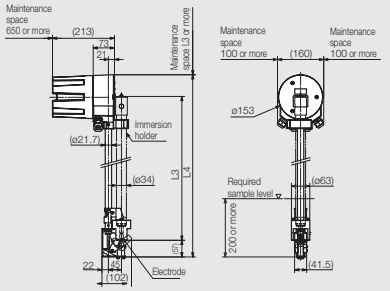
Immersion type (for pH meter)

■ Immersion type brush cleaner (for 4 wire transmitter)
BCH-121

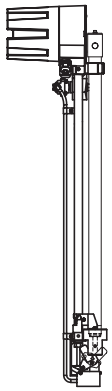


■ Dimensional outline (Unit: mm)

● BCH-121

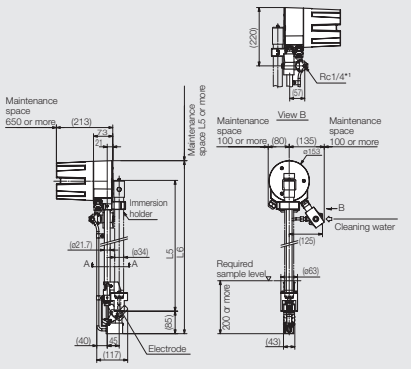


■ Immersion type brush jet cleaner (for 2 wire transmitter)
BCH-101J



■ Dimensional outline (Unit: mm)

● BCH-101J



[Immersion type brush cleaner (for 4 wire transmitter)/Code table]

Compatible electrode: 6108

Model	Material	Holder length (L1,L3)*	Power supply voltage	Cleaning cycle	Specification
BCH-121					Combination with HP-200(4-wire type)
	-				Main material of wetted parts: SUS316
		-0.5			0.5m
		-1.0			1.0m
		-1.5			1.5m
		-2.0			2.0m
		-2.5			2.5m
		-3.0			3.0m
			-100V		AC100V±10% 50/60Hz
			-115V		AC115V±10% 60Hz
			-200V		AC200V±10% 50/60Hz
			-220V		AC220V±10% 50Hz
				-	0.1 to 3.0 hours*1

*1 A cleaning cycle time of 1.0 to 12.0 hours is also available. (Made-to-order) For details, please contact our sales representative.

[Immersion type brush jet cleaner (for 2 wire transmitter)/Code table]

Compatible electrode: 6108

Model	Material	Holder length (L7,L8)*	Power supply voltage	Cleaning cycle	Specification
BCH-101J					Combination with HP-300(2-wire type)
	-				Main material of wetted parts: SUS316
		-0.5			0.5m
		-1.0			1.0m
		-1.5			1.5m
		-2.0			2.0m
		-2.5			2.5m
		-3.0			3.0m
			-100V		AC100V±10% 50/60Hz
			-115V		AC115V±10% 60Hz
			-200V		AC200V±10% 50/60Hz
			-220V		AC220V±10% 50Hz
				-	0.1 to 3.0 hours*1

*1 A cleaning cycle time of 1.0 to 12.0 hours is also available. (Made-to-order) For details, please contact our sales representative.

Accessory for immersion type brush/brush jet cleaner

[Brush/Code table]

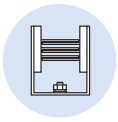
Model	Specification	Code
Brush	For BCH-121, BCH-101J, 1set	3200241522

Jet propulsion brush cleaner

Immersion Type

Immersion type (for pH meter)

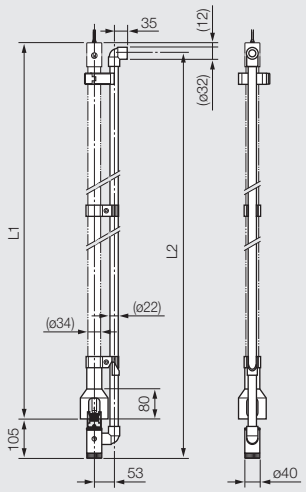
■ Immersion type jet propulsion brush cleaner
BH-111A
For 6108 electrode



BH-111A-XX
Brush part

■ Dimensional outline (Unit: mm)

● BH-111A



[Immersion type jet propulsion brush cleaner/Code table]

Model	Holder length (L1,L3,L5)	Reinforce pipe material	Specification
BH-111A			Compatible electrode: 6108 series
	-1.0		1.0m
	-1.5		1.5m
	-2.0		2.0m
	-2.5		2.5m (Immersion depth: 2m or shorter)
	-3.0		3.0m (Immersion depth: 2m or shorter)
		-	Material of reinforce pipe in holder: SUS316

* The pH electrode and holder must be prepared separately.
* If a water piping kit is needed between the cleaner and solenoid valve, please prepare JH-W5-P separately.
* A solenoid valve unit must be prepared separately.

Accessory for immersion type jet propulsion brush cleaner

● The brush section can be disassembled for cleaning and is easy to replace.

[Solenoid valve unit/Code table]

Model	Power	Material	Specification
SVU-A			Solenoid valve
	-A1		AC100V, 50A pole installation
	-A2		AC200V, 50A pole installation
		-S	Connecting part: SUS304/diaphragm: NBR

[Timer unit/Code table]

Model	Specification
JT-2-100V	Timer unit (with solenoid valve), Power: AC 100V
JT-2AP-100V	Timer unit (without solenoid valve), Power: AC 100V

[Water piping kit between cleaner and solenoid valve/Code table]

Model	Specification
JH-W5-P	Hose band: 2set, hose nipple: 2set, hose: 5m

[Brush for replacement/Code table]

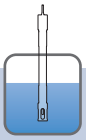
Model	Specification
Brush unit	For BH-111A

[Combination]

Cleaner	Electrode	Holder	Bracket
BH-111A	6108 Series	CH-101 Series	MH-65

* This holder is partially made of metal.

Chemical cleaner



Immersion Type

[Immersion type chemical cleaner/Code table]

Model	Holder materials	Holder length	Packing materials	Control unit	Chemical tank	Pole	Bracket	Air regulator	Air pump	Assembling
CCH-151 (chemical cleaner)										
	-N1 (Holder materials PP)									
	-P (Holder materials PVC)									
		-1.0 (holder length: 1m, with support pipe)								
		-1.5 (holder length: 1.5m, with support pipe)								
		-2.0 (holder length: 2m, with support pipe)								
		-2.5 (holder length: 2.5m, with support pipe)								
		-3.0 (holder length: 3m, with support pipe)								
			-N3 (electrode packing materials: FKM)							
			-EP (materials: EPDM)							
				-2HP (CC-151: for HP-300) *3						
				-4HP (SV-151: for HP-200) *3						
					-PE (PE20L: with meter)					
					-PE (PE20L: with meter / liquid lower-limit detection)					
						-PS (with pole stand)				
						-0 (without pole stand)				
							-M (with Bracket)			
							-0 (without Bracket)			
								-AR (with air regulator)		
								-0 (without air regulator)		
									-AP100 (APU-151, AC 100V specifications)	
									-AP115 (APU-151, AC 115V specifications)	
									-AP200 (APU-151, AC 200V specifications)	
									-AP220 (APU-151, AC 220V specifications)	
									-0 (without air pump)	
										-Y(assembled)
										--N10(Not assembled)

Combination example

[For 4-Wire Transmitter]
CCH-151-1.0-N3-4-PE-PS-M-0-0-Y

- Holder length: 1m
- 4-wire transmitter compatible, solenoid valve unit(SV-151) included
- Dedicated pole stand, mounting bracket

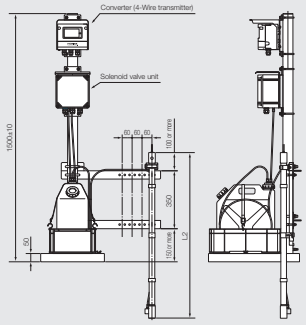
*1 When selecting an air pump unit, please pay attention to the pairing with the transmitter power supply.
When selecting one of our company's air pump units, no air regulator unit is required.
(Specify '-0' for no air regulator unit.)
*2 When specifying '-0' for no air pump unit, a regulator for pressure reduction (adjustable within the range of 0.05 to 0.1 MPa) is separately required in the front stage of the control unit/SV unit for chemical solution. We offer a dedicated regulator unit.
(When necessary, please select '-AR' for use with the air regulator unit.)
* Electrodes that can be paired: 6108/6151/6152 * Please separately prepare transmitters and electrodes.

Immersion type

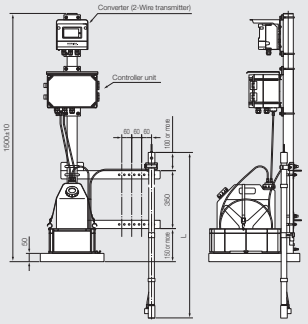
■ Immersion type chemical cleaner
CCH-151 Series

■ Dimensional outline (Unit: mm)

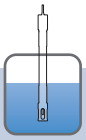
● CCH-151 Series (With solenoid valve unit)
[For 4-Wire Transmitter]

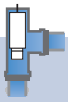


● CCH-151 Series (With controller unit)
[For 2-Wire Transmitter]



Accessory for transmitter


Immersion/
Drop-in Type


Flow-through
Type

■ Fitting for air purge

Select this set when using a water quality meter at a site where corrosive gases are present.

[Fitting for air purge/Code table]

Model	Specification	Code
Fitting for air purge	Metal pipe fittings (6ø) (Included as part of the transmitter)	3200355128

■ Accessories for explosion-proof transmitter

When using explosion-proof transmitters, select this as a set.

[Accessories for explosion-proof transmitter/Code table]

Model	Specification	Code
Z787 TIIS	Zener barrier (Made by Pepperl+Fuchs)	3200420320
KFD2-STC4-EX1 TIIS	Isolated barrier (Made by Pepperl+Fuchs)	3200420323
Attachment of the Ex-tag on the electrode cable	Cable tie included * An explosion-proof transmitter comes standard with the main unit.	3200498604

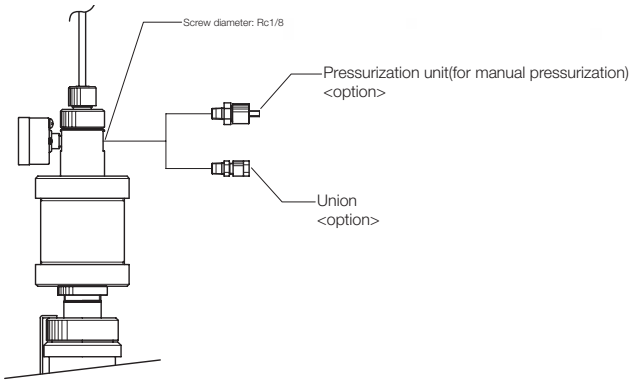
Flow-through holder/cleaner accessory

Flow-through Type

- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. (See [Fig. 1].)
  For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting from the following.
  Manual pressurization (by hand pump) is not recommended for CF-401S.

Model	Specification	Code
Pressurizing unit	For hand pump	3200040983
Union	Size(ø6×ø4), PVDF half union	3200295786

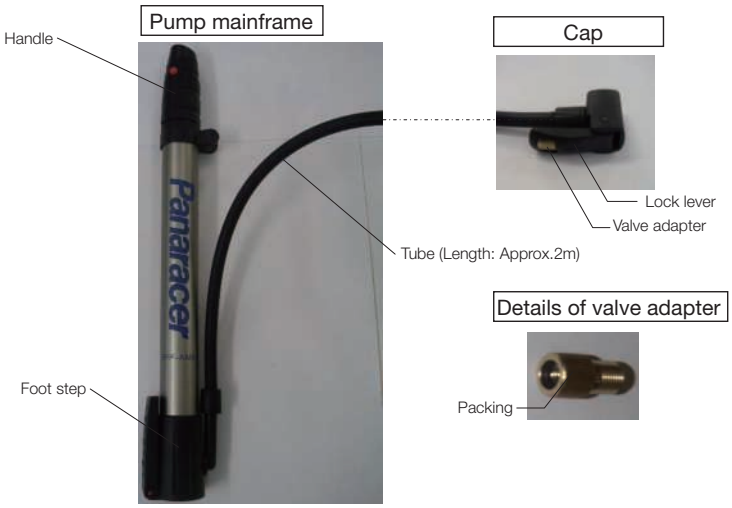
[Fig.1]



- Hand pump: Select the following hand pump [Fig. 2] for manual pressurization.
  If you will provide your own hand pump, there is no need to select one here.
  Manual pressurization (by hand pump) is not recommended for CF-401S.

Model	Code
Hand pump	3200295722

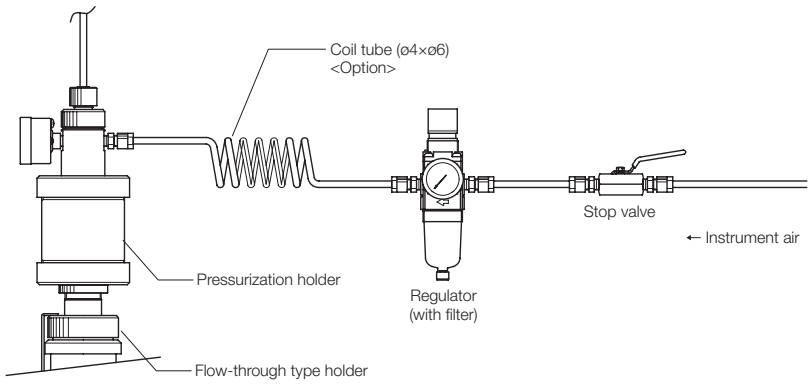
[Fig.2]



- Instrument air tube: Used to connect the flow-through holder to the regulator and instrument air. (See [Fig. 3].)
  Customers who choose to pressurize with instrument air should provide their own instrument air tubing or select the coil tubing below.

Model	Specification	Code
Coil tube	size(ø6×ø4 3.5m to 5.0m), Material: tube fitting included (2set)	3200295789

[Fig.3]

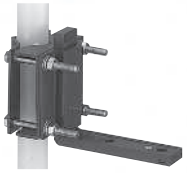


Holder accessory

For immersion holder (CH-101/HIBX/SH-101)

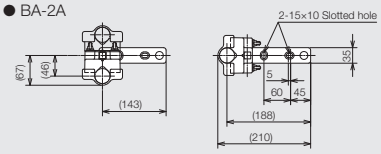
■ Bracket
BA-2A (ABS)
BA-1S (SUS)

Fix the immersion-type holder to the tank wall or the ground.



■ Dimensional outline (Unit: mm)

● BA-2A

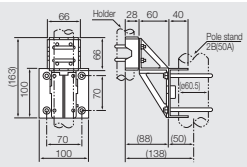


■ Bracket
MB-10

Fix the immersion-type holder to the pole stand PS-50 or the 50A pole.

■ Dimensional outline (Unit: mm)

● MB-10

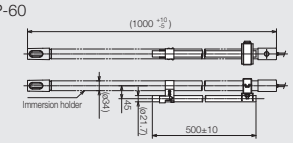


■ Support pipe
SP-60

When mounting the holder on a pole stand, we recommend using this product for holders longer than 2.0 m as support.

■ Dimensional outline (Unit: mm)

● SP-60



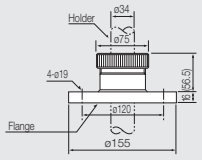
■ Loose flange

Fastens the immersion holder with flange.

FK-1

■ Dimensional outline (Unit: mm)

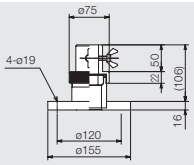
● FK-1



RF-S1

■ Dimensional outline (Unit: mm)

● RF-S1



[Bracket/Code table]

Model	Specification	Code
BA-2A	Material: ABS resin, up to 1.5m	3200704060
BA-1S	Material: SUS304, up to 1.5m	3100197370
MB-10	Material: SUS304	3014068945

[Support pipe/Code table]

Model	Length	Specification	Code
SP-60		Material: SUS316	
	-1.0	For holder length: 1.0m	3030047497
	-1.5	For holder length: 1.5m	3030047164
	-2.0	For holder length: 2.0m	3030047165
	-2.5	For holder length: 2.5m	3030047166
	-3.0	For holder length: 3.0m	3200313678

* When mounting, use MH-65 for the following cleaner/support pipes. Please separately prepare a pole stand for mounting.

[For loose flange (CH-101/SH-101 series/HIBP)/Code table]

Model	Material	Specification	Code
FK-1			
	-	PP, JIS 10K50A	3030047266
	-P	PVC, JIS 10K50A	3030047267
	-S	SUS304, JIS 10K50A	3030047268

* Special handling is required when CH-101PF-XX is selected.

[For loose flange (HIBS)/Code table]

Model	Material	Specification	Code
RF	-S1	SUS316, JIS10K 50A	3014083125

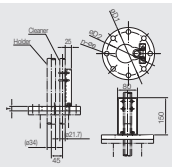
For immersion cleaner/support pipe (SP-60)

■ Flange bracket
SFK-100

Fastens the immersion-type cleaner with flange.

■ Dimensional outline (Unit: mm)

● SFK

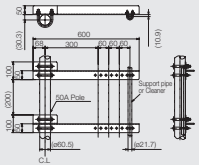


■ Bracket
MH-65

Fastens immersion-type cleaners and support pipes on the pole stand PS-50 or the 50A pole.

■ Dimensional outline (Unit: mm)

● MH-65



[Flange bracket/Code table]

Model	Flange size	Material	Specification
SFK-			
	-100		JIS 10K 100A
	-125		JIS 10K 125A
		-	PVC
		-S	SUS304

* Can be used with ultrasonic cleaners, jet cleaners, and brush cleaners. For use with a chemical cleaner, please consult with us. Do not use with brush jet cleaners or chemical solution brush cleaners.

[Bracket/Code table]

Model	Specification	Code
MH-65	For cleaner/support pipe, SUS304	3030047918

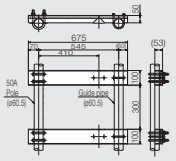
For drop-in holder (NH-10)/Cleaner (JH-11A, JH-100A, UH-111A)

■ Bracket
MH-100

Fastens the drop-in holder/cleaner on the pole stand PS-50 or the 50A pole.

■ Dimensional outline (Unit: mm)

● MH-100



[Bracket/Code table]

Model	set	Specification	Code
MH-100		Material: SUS304	
	1	1set (Select when the holder/ cleaner length is shorter than 2 m.)	3030047721
	2	2set (Select when the holder/ cleaner length is 2 m or longer.)	3030047720

* Connector-type electrodes cannot be used.

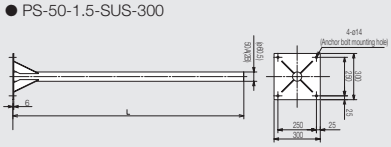
Common accessory

■ Pole stand
PS-50-1.5-SUS-300

Pole stand for fixing and installing outdoor-use type transmitters, holders, and cleaners on site.

■ Dimensional outline (Unit: mm)

● PS-50-1.5-SUS-300



[Pole stand/Code table]

Model	Specification	Code
PS-50-1.5-SUS-300	Material: SUS304, 50A, 1.5m, pole base: 300×300	3030047360
PS-50-1.7-SUS-300	Material: SUS304, 50A, 1.7m, pole base: 300×300	3200312089

Relay box/cables

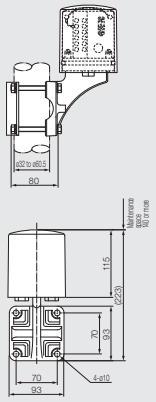
Immersion/ Drop-in Type　Flow-through Type

■ Relay box
CT-50pH
TB-25pH

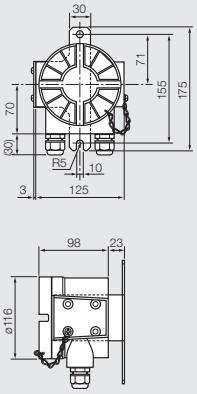
If the electrode holder and the transmitter body are farther apart than the electrode cable length, this is used as a cable repeater.

■ Dimensional outline (Unit: mm)

● CT-50pH



● TB-25pH



[Relay box/Code table]

Model	Specification	Code
CT-50pH	Material: ABS resin, rainproof, for pH meter	3200666840
TB-25pH	Material: PPO, high-humidity compatible (Used in an environment where the humidity is constantly above 80% or equivalent.) For pH/ORP meter	3200305494

■ Extension cable
C-5A (For pH/ORP meter)
C-2A (For ORP meter)

Model	outer diameter
C-5A	ø10
C-2A	ø5

Used to connect the transmitter and the relay box, the maximum combined length of the electrode cable and extension cable is 50 m.

[Extension cable<For pH meter>/Code table]

Model	Terminal	Terminal treatment	Electrode	Cable length	Specification
C-5A					Temperature terminal included: for pH electrode
	-Y				Y type terminal*1
	-O				O type terminal*2
		-T2			both ends terminated
			-PS		For 6108/6109/6110/6151/6152/6155
			-PSE		For 6171/6172/6174
				-5	Cable length: 5m
				-10	Cable length: 10m

*1 This is a made-to-order product.
*2 For cables without termination, please consult with our sales representative.
*3 For cable lengths other than the above, please consult with our sales representative.

[Extension cable<for ORP meter>/Code table]

Model	Terminal	Terminal treatment	Electrode	Cable length	Specification
C-5A					Temperature terminal included for 6870
C-2A					Without temperature terminal for 6805/6815/6855
	-Y				Y type terminal
	-O				O type terminal*1
		-T2			both ends terminated*2
			-O		for 6805/6815/6855
			-OSE		for 6870
				-5	Cable length: 5m
				-10	Cable length:10m

*1 This is a made-to-order product.
*2 For cables without termination, please consult with our sales representative.
*3 For cable lengths other than the above, please consult with our sales representative.

■ Extension cable for gel-filled electrode (connector type)

Dedicated cable used with 6155-C/6855-C gel-filled type electrodes (connector type).

Compatible electrode: 6155-C

Model	Specification	Code
C-50B-VP1	Cable length: 5m	3200667999
C-100B-VP1	Cable length: 10m	3200693635
C-150B-VP1	Cable length: 15m	3200693639
C-200B-VP1	Cable length: 20m	3200693641
C-300B-VP1	Cable length: 30m	3200790525

Compatible electrode: 6855-C

Model	Specification	Code
C-50B-VP8	Cable length: 5m	3200805229
C-100B-VP8	Cable length: 10m	3200805231
C-150B-VP8	Cable length: 15m	3200805232
C-200B-VP8	Cable length: 20m	3200805233

■ Ultrasonic oscillator cable

Cable for the US-2 ultrasonic oscillator.
This is a supplemental product for the cleaner's main unit.

Model	Specification	Code
WI	For US-2 Available from 1 m	3200044210

Standard solution

Immersion/ Drop-in Type　Flow-through Type

[Standard solution kit]

Measurement item	Model	Code	Specification
pH	HAS-1	3200317418	Standard solution pH 4/7/9 (500 ml) x 1, KCl (250 ml) x 2
	HAS-2	3200317419	Standard solution pH 4/7/9 (500 ml) x 1, KCl (250 ml) x 2, polypropylene beaker with lid x 3
	HAS-3	3200317420	Standard powder pH 4/7/9 (10 bags), KCl (250 ml) x 2, polypropylene beaker with lid x 3
	type L-1	3200306266	Standard solution pH 4/7 (500 ml) x 1, KCl (250 ml) x 2, polypropylene beaker with lid x 3
	type M-1	3200306406	Standard solution pH 7/9 (500 ml) x 1, KCl (250 ml) x 2, polypropylene beaker with lid x 3
	type N-1	3200306411	Standard solution pH 4/7 (500 ml) x 1, polypropylene beaker with lid x 3
	type P-1	3200306412	Standard powder pH 4/7 (10 bags), KCl (250 ml) x 2, polypropylene beaker with lid x 3
	type S-1	3200306394	Standard solution pH 4/7 (500 ml) x 1, KCl (250 ml) x 2
	type T-1	3200306405	Standard solution pH 7/9 (500 ml) x 1, KCl (250 ml) x 2
ORP	HAS-4	3200317417	ORP Standard solution (160-22, 160-51) x 10 bags, KCl (250 ml) x 2, polypropylene beaker with lid x 2
	type O-1	3200306847	ORP Standard solution (160-22) x 10 bags, KCl (250 ml) x 2, polypropylene beaker with lid x 2

[Standard solution (Single item)]

Measurement item	Model	Code	Specification
pH	100-4	3200043638	pH 4 standard solution 500 ml x 1 (accuracy ±0.02 pH)
	100-7	3200043637	pH 7 standard solution 500 ml x 1 (accuracy ±0.02 pH)
	100-9	3200043636	pH 9 standard solution 500 ml x 1 (accuracy ±0.02 pH)
	150-4	3200043619	Powder for pH 4 standard solution x 10 bags (accuracy ±0.05 pH)
	150-7	3200043620	Powder for pH 7 standard solution x 10 bags (accuracy ±0.05 pH)
	150-9	3200043621	Powder for pH 9 standard solution x 10 bags (accuracy ±0.05 pH)
ORP	160-22	3200043617	ORP Standard solution x 10 bags
pH/ORP	300	3200043640	Reference electrode internal solution (KCl solution) (3.3 mol/L), 250 ml x 1
	pH/ORP	3200043623	Powder for reference electrode internal solution 500 g

MEMO

MEMO

MEMO

IMS

The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001.
We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

Please read the operation manual before using this product to assure safe and proper handling of the product.

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Bulletin:HAE-T0241A

Printed in Japan 2306SK00