

## Water Quality Meter Series — Selection Guidebook for pH Meters and ORP Meters

### Contents

About the H-1 Series and 48/96 Series	2, 3
Industrial Water Quality Meter Series — pH Meters and ORP Meters	5
About Sensors	6, 7
Selection of Sensors, Holders, and Cleaners	8, 9
pH/ORP Meter Configuration Table	10 to 17
Installation Image	13, 17, 18
Transmitter Specifications	20 to 29
Holders — External Dimensions and Code Table	30
Cleaners — External Dimensions and Code Table	31 to 36
Transmitter Accessories — Code Table	37
Holders, Cleaners, Accessories, and Supplies	38 to 40

# 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.

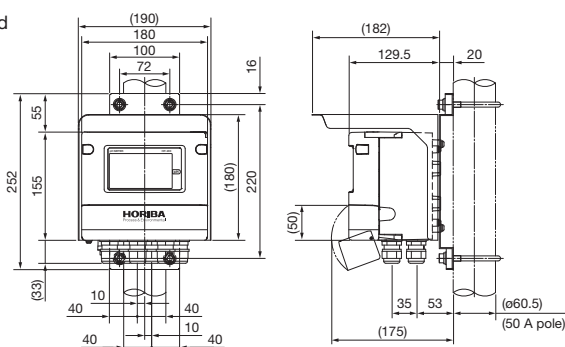


### H-1 Series Lineup

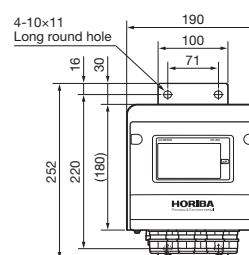
■ pH meters	HP-200	4-wire
	HP-300	2-wire
	HP-300-IS	2-wire, explosion-proof
■ ORP meters	HO-200	4-wire
	HO-300	2-wire
	HO-300-IS	2-wire, explosion-proof
■ Electroconductivity meters (Conductivity meters)	HE-200C	4-wire, low concentration
	HE-300C	2-wire, low concentration
	HE-300C-IS	2-wire, explosion-proof
	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)

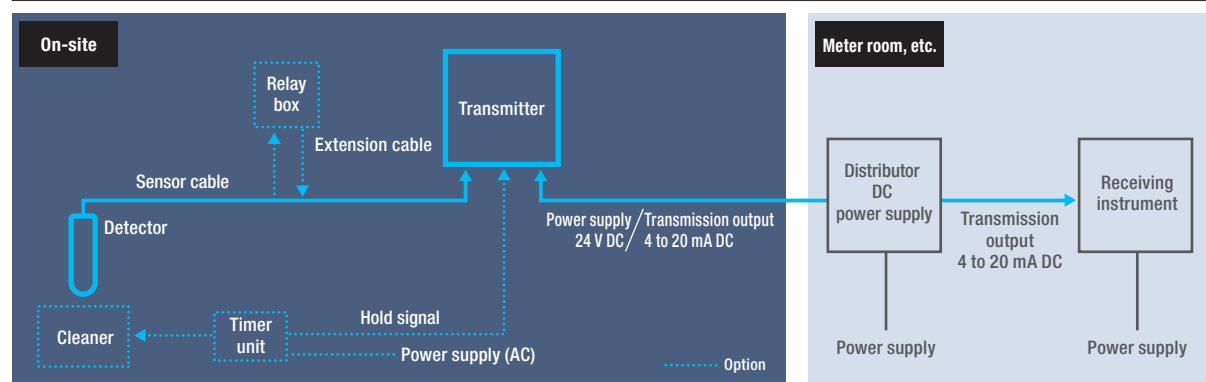
Pole-mounted



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



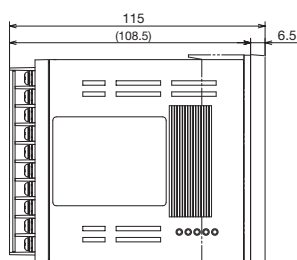
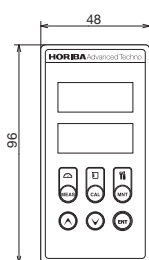
96 series

### 48/96 Series Lineup

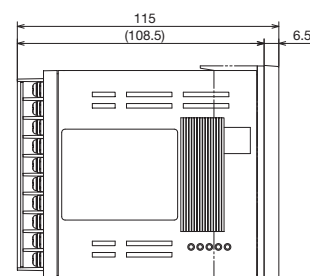
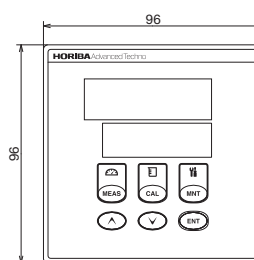
■ pH meters	HP-480	4-wire
	HP-480PL	4-wire, pulse proportional control
	HP-480TP	4-wire, time-division proportional control
	HP-960FTP	4-wire, 4-point alarm, time-division proportional control
■ ORP meters	HO-480	4-wire
■ Electroconductivity meters (Conductivity meters)	HE-480C	4-wire, for low concentration
	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)

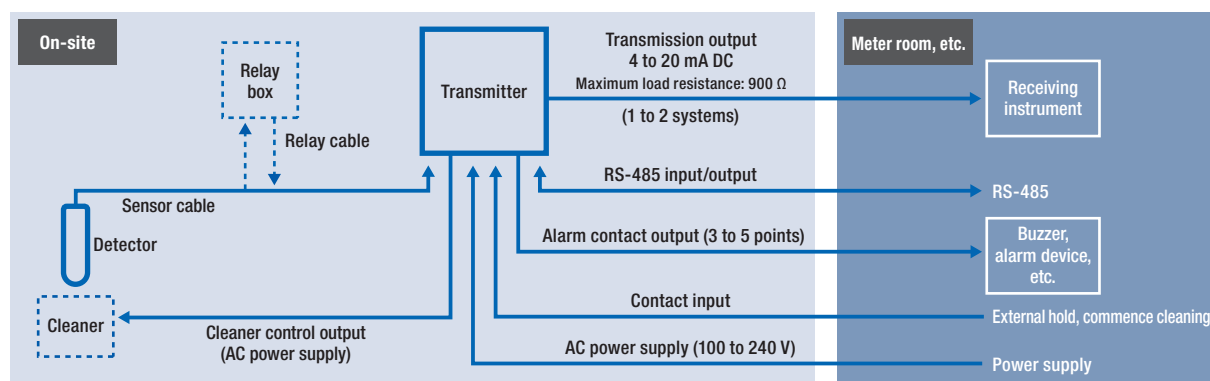
Transmitter: 48 series



Transmitter: 96 series



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





M E M O

pH

ORP

Handwriting practice lines consisting of 20 horizontal dashed lines.



# Industrial Water Quality Analyzer Series

pH

ORP

## 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 $\pm$ 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 $\pm$ 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 $\pm$ 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

#### ORP transmitter code table

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

### 48/96 Series

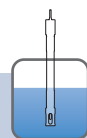
Indoor-use panel installation type ORP Meter



\* 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



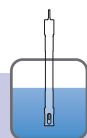
Flow-through  
Type

## pH electrode

Model	Liquid junction	Usable temperature range	Usable pressure range	Temperature compensation	Cable length	Code	Traits
<b>Dome type pH electrode</b> <b>6108-50B</b> [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.
<b>Sleeve type pH electrode</b> <b>6109-50B</b> [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.
<b>pH electrode</b> <b>6110-50B</b> [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.
<b>Hydrofluoric acid-resistant pH electrode</b> <b>6151-50B</b> [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.
<b>High alkali-resistant pH Electrode</b> <b>6152-50B</b> [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.
<b>Gel-filled electrode</b> <b>6155-60B</b> [Cable type] <b>6155-C</b> [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.
<b>Hydrofluoric acid-resistant pH Electrode</b> <b>6171-50B</b> [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.
<b>High alkali-resistant pH electrode</b> <b>6172-50B</b> [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.
<b>pH electrode pH</b> <b>6174-50B</b> [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.



## ■ OPR electrode

Model	Liquid junction	Usable temperature range	Usable pressure range	Temperature compensation	Cable length	Code	Traits
<b>Platinum plated sensor 6805-50B</b> 	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.
<b>Gold plated sensor 6815-50B</b> 	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.)
<b>Platinum plated sensor 6870-60B</b> [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.
<b>Gel-filled electrode 6855-50B</b> [Cable type] <b>6855-C</b> [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-VPB.

\*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.



**Movable sleeve**  
Makes cleaning of liquid junction easy.



**Tough Electrode**  
Increases strength and sensitivity significantly.



**Silver Ion Trap**  
Controls outflow of silver ion significantly.









































































































































**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

### ■ 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 <sup>*2</sup>	6855	6870
Sample Properties														
	General wastewater													
	High viscosity, suspended solids (Slurry)													
	High temperature  Maximum (°C) ● 100 ▲ 80 — 60													
	High pressure  Maximum (MPa) ● 0.7 <sup>Under 40°C</sup> ▲ 0.6 — 0.03 <sup>*0.2 for 6151/6152</sup>													
	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.

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

\*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	▲
	Compatible with tip replaceable electrode	CF-301S	●	● SUS316	▲
		CF-401S	●	● SUS316	●
		CF-501	▲	▲ PP	—
	Compatible with gel-filled electrode	CF-501P	—	● PVC	—
		CF-501S	●	● SUS316	—
		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

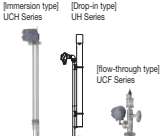
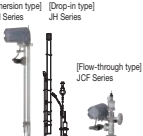




● 0.6 MPa maximum

▲ 0.3 MPa maximum

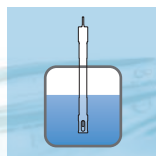
— Not appropriate

## 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.	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.	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.	Motor-driven brush cleaner. Effective for cleaning physical deposits.	Combines a motor-driven brush cleaner with a jet cleaner.	Chemical cleaning with dilute hydrochloric acid. Ideal for cleaning coating materials such as calcium.
						
Food wastewater, pulp mill wastewater	▲	●	●	●	●	▲
Microorganisms	●	●	●	●	▲	▲
Tar, heavy oil	—	—	—	—	▲	▲
Organic matter, oil	●	▲	▲	▲	▲	●
Fatty acids, amines	—	▲	▲	▲	▲	●
Earth and sand	●	▲	▲	—	—	▲
Suspended solids	▲	▲	▲	—	—	▲
Metal powder	▲	▲	▲	—	—	▲
Clay, lime	▲	▲	▲	—	—	▲
Insoluble inorganic components	▲	▲	▲	▲	▲	●
	Coagulation sediment neutralization treatment components (CaCO <sub>3</sub> , 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

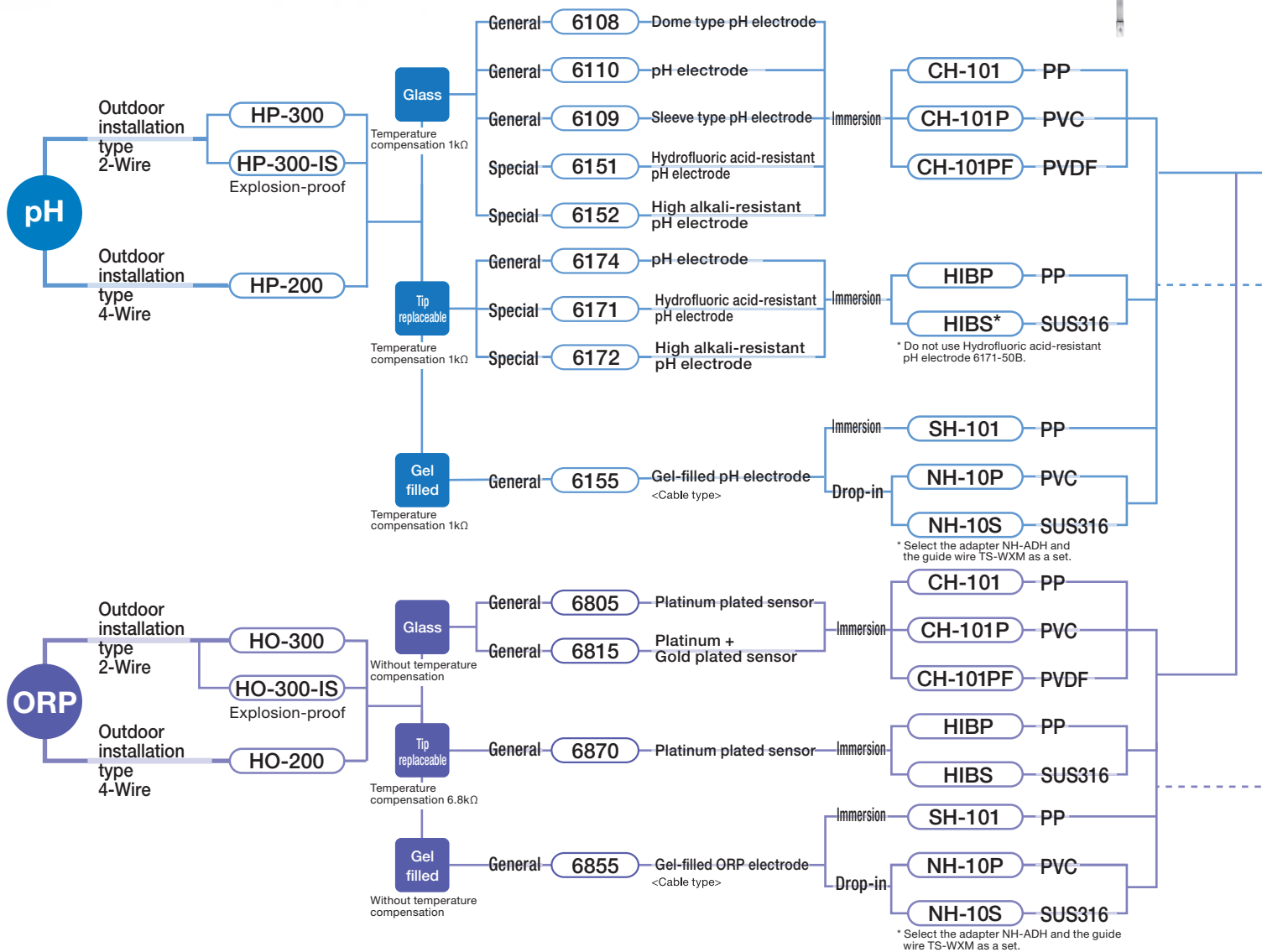
**Transmitter**

pp.6-8

**Sensor**

pp.9, 29

**Holder**



**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)

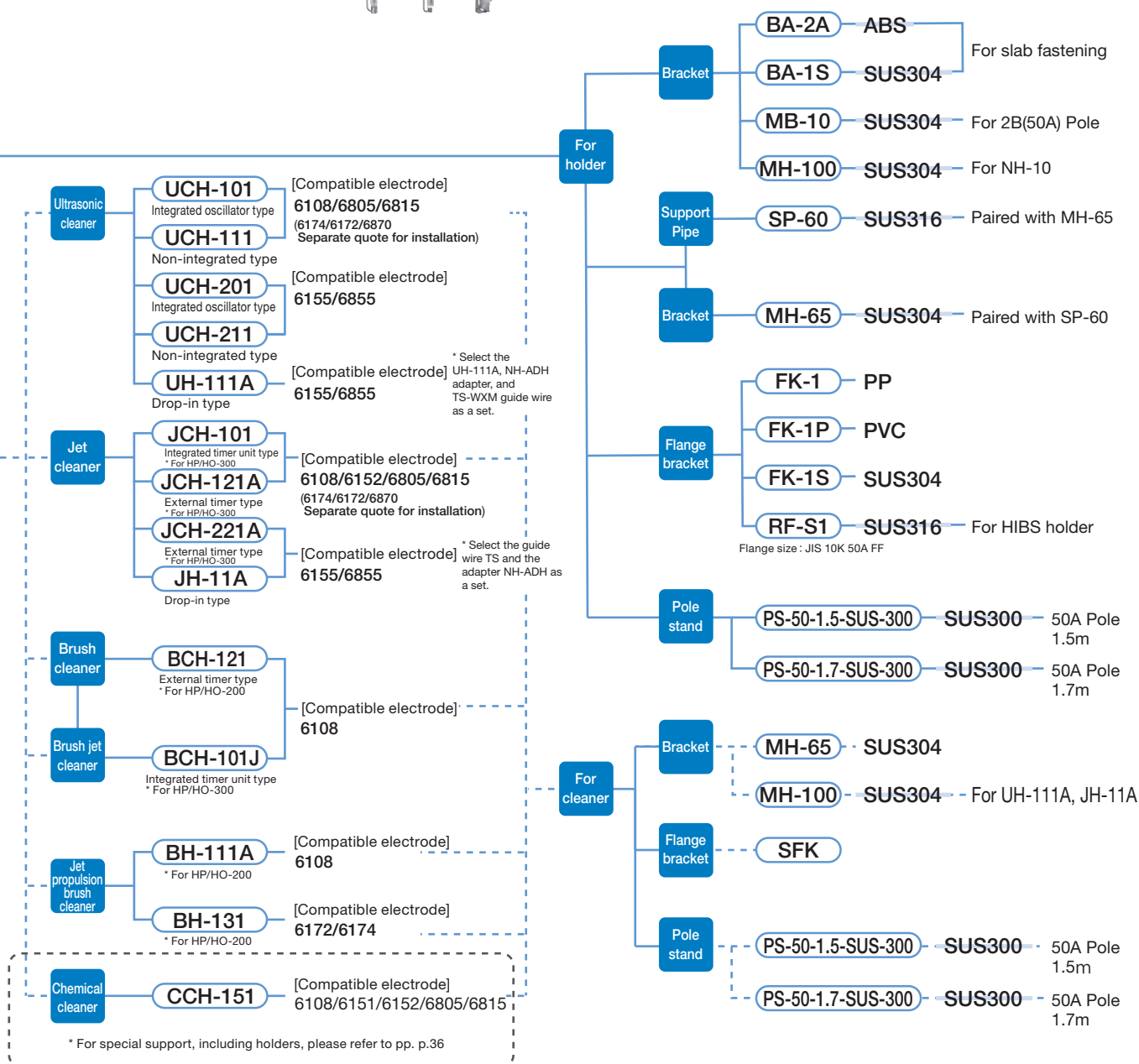


## Holder accessory

p.39



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



## Other accessories for transmitter

p.37  
(Select as needed)



Used at sites where corrosive gases are present



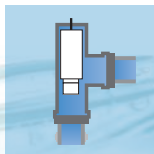
Z787 TIIS

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

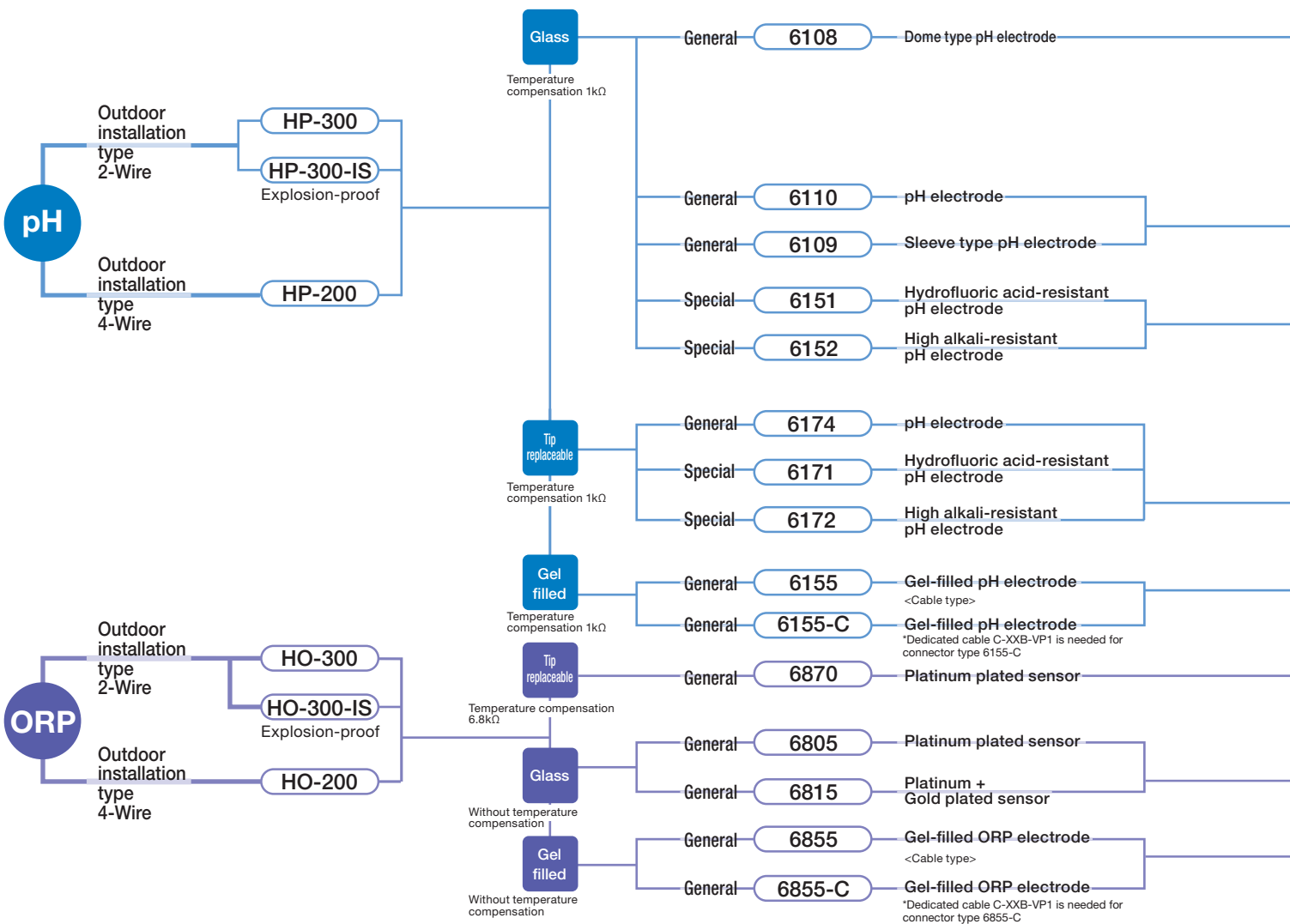
## Transmitter

pp.5, 20-25



## Electrode

pp.6-8



## 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**

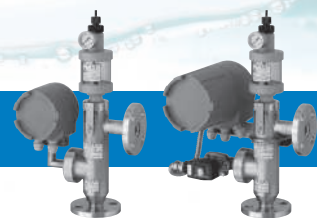


## Holder

pp.9, 30



## 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

- 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

High-humidity/pressure compatible

- CF-501
- CF-501P
- CF-501S

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

- 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<sup>\*1</sup>

- Jet cleaner
  - JCF-301 Integrated timer unit type [Compatible electrode] 6152<sup>\*1</sup>
  - JCF-311 External timer type

- Ultrasonic cleaner
  - UCF-601 Integrated oscillator type

- Jet cleaner
  - JCF-601 Integrated timer unit type

- Ultrasonic cleaner
  - UCF-301 Integrated oscillator type<sup>\*1</sup>

- Jet cleaner
  - JCF-301 Integrated timer unit type<sup>\*1</sup>
  - JCF-311 External timer type<sup>\*1</sup>

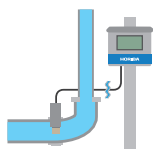
- Ultrasonic cleaner
  - UCF-601 Integrated oscillator type
- Jet cleaner
  - JCF-601 Integrated timer unit type

<sup>\*1</sup> 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.

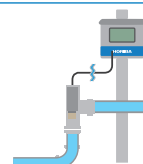
## Flow through type Installation example

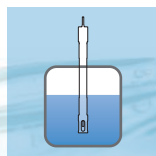
\* Selection criteria are for reference only. Please be sure to check the actual site conditions and consult with our sales representative.

- ✓ Direct pipe insertion  
\* 6155/6855 only



- ✓ With the holder/cleaner





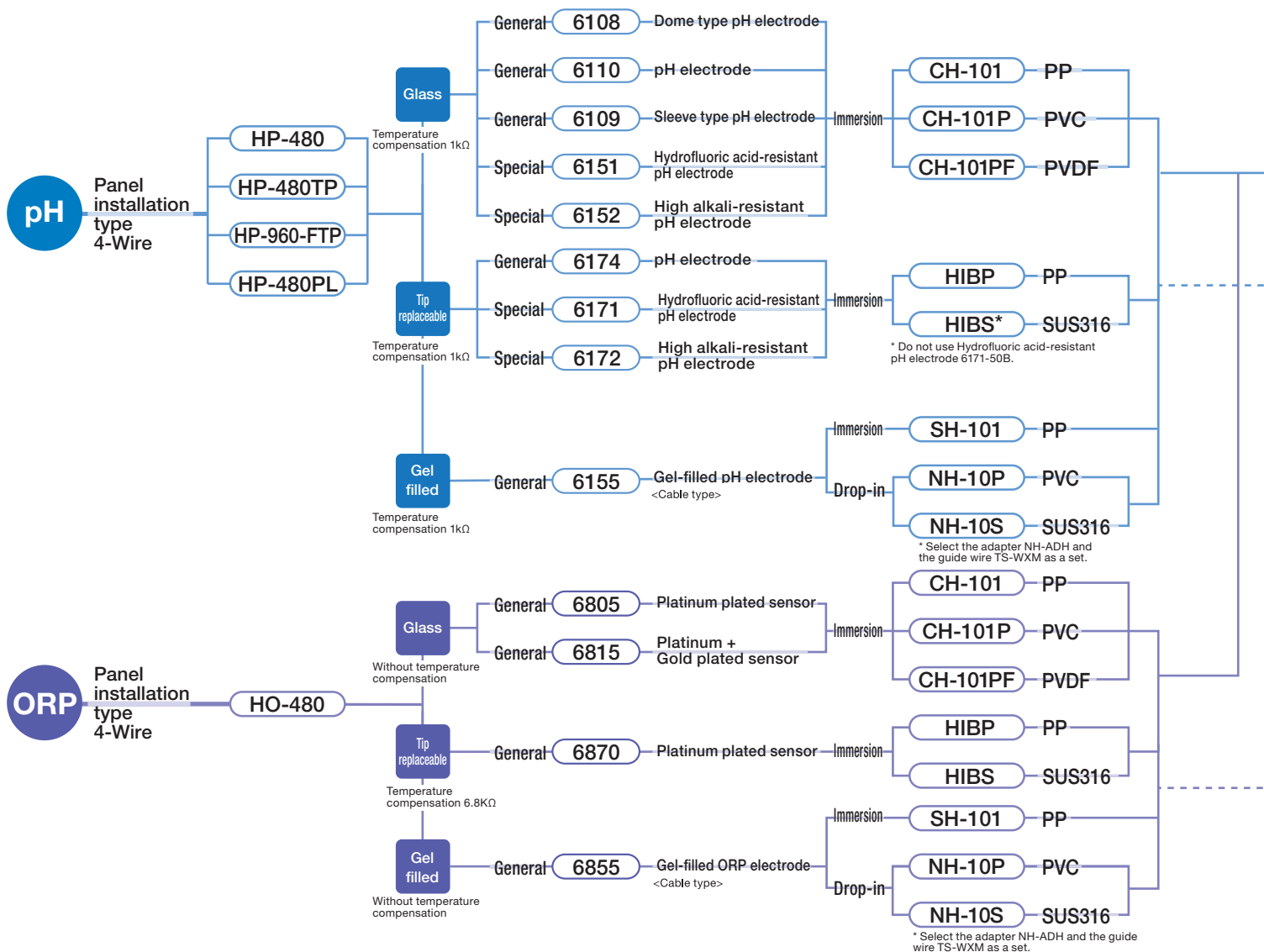
# Immersion/drop-in type

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

**Transmitter** pp.5, 26-28

**Sensor** pp.6-8

**Holder** pp.9, 29



**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

[Compatible electrode]  
**6108/6109/6152/6805/6815**  
(6174/6172/6870)

**UCH-111**

Non-integrated type

**UCH-201**

Integrated oscillator type

[Compatible electrode]  
**6155/6855**

**UCH-211**

Non-integrated type

**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**

[Compatible electrode]  
**6108**  
[Compatible transmitter]  
**HP-960FTP**

## Jet propulsion brush cleaner

**BCH-101J**

## 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

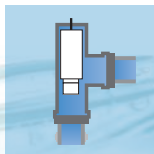
## Flange bracket

**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

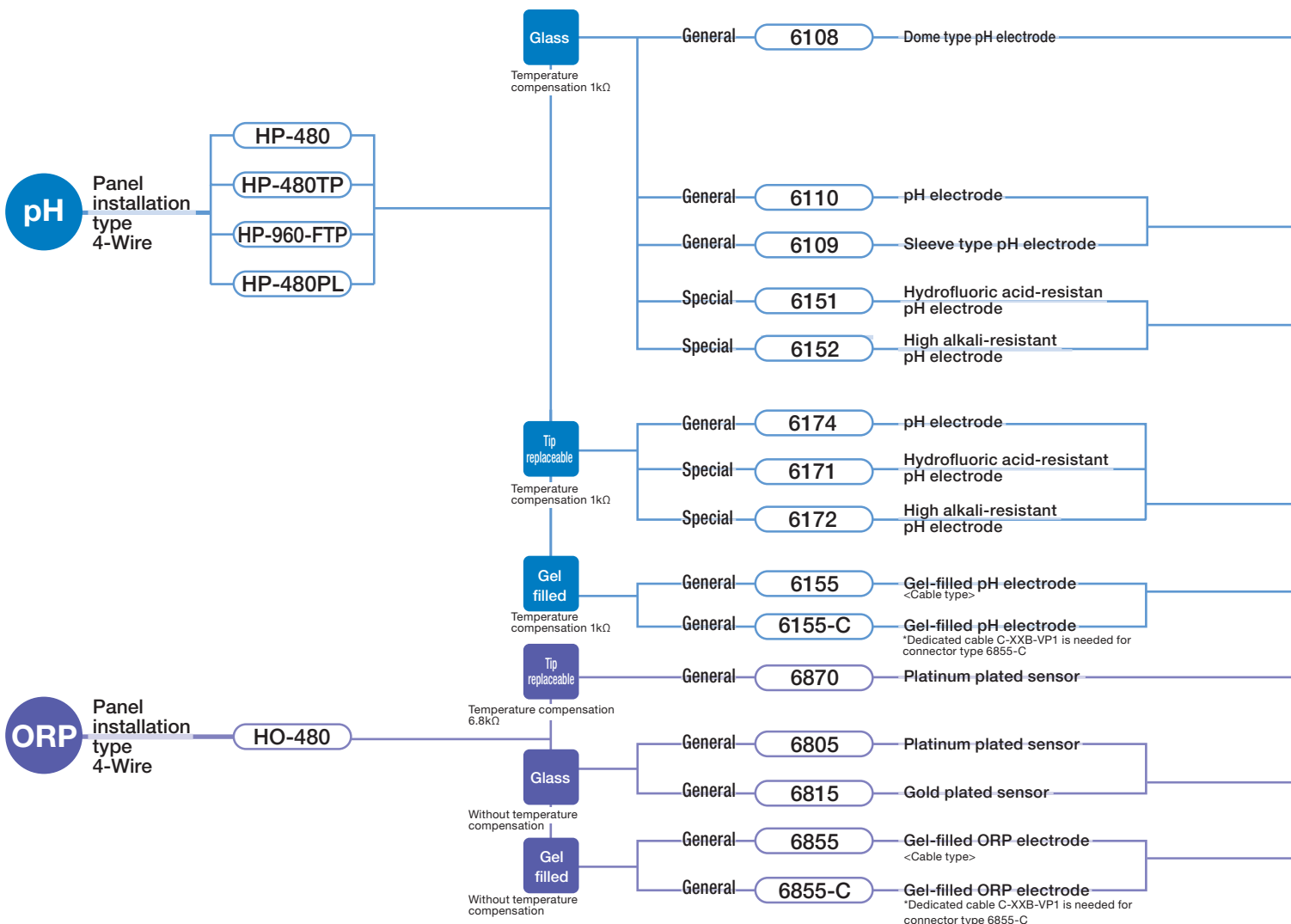
## Transmitter

pp.5, 26-28

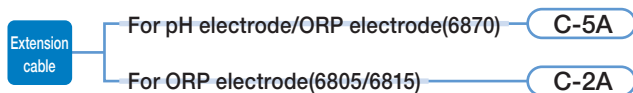
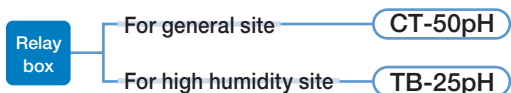


## Electrode

pp.6-8



## Relay box/Extension cable p.40 (Select as needed)



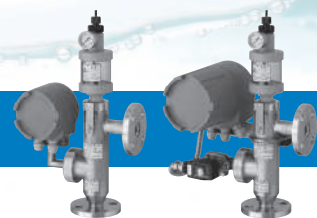


## Holder

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

- 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.

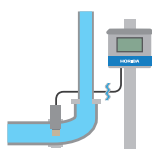
Ultrasonic cleaner

UCF-601

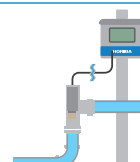
## Flow-through type Installation example

\* 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

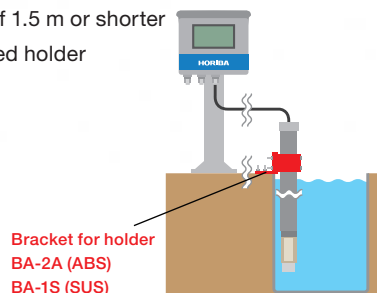


## Installation Examples

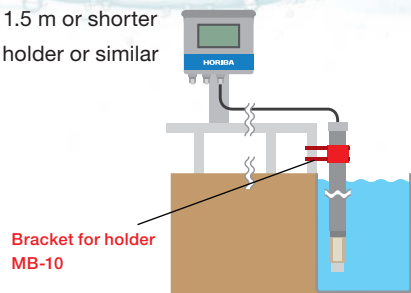
\* Selection criteria are for reference only. Please be sure to check the actual site conditions and consult with our sales representative.  
\* Regarding chemical cleaner installation, please consult with our sales representative.

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

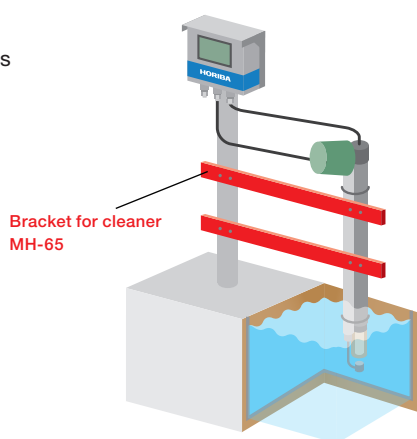
- ✓ No cleaner
- ✓ Holder length of 1.5 m or shorter
- ✓ Ground-mounted holder



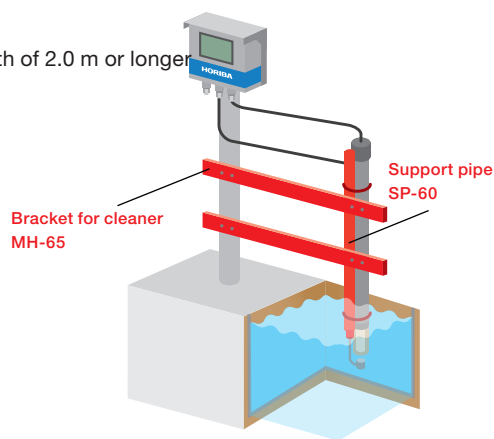
- ✓ No cleaner
- ✓ Holder length of 1.5 m or shorter
- ✓ Fence-mounted holder or similar



- ✓ With cleaner
- ✓ All holder lengths

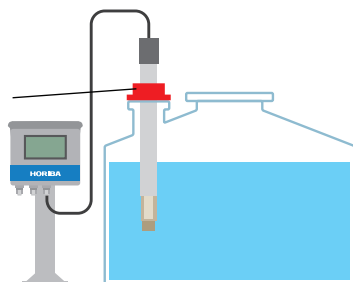


- ✓ No cleaner
- ✓ Holder length of 2.0 m or longer



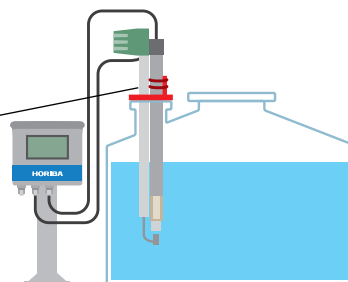
- ✓ Flange installed
- ✓ No cleaner

Loose flange  
FK-1(For CH/SH/HIBP)  
RF-1(For HIBS)



- ✓ Flange installed
- ✓ With cleaner

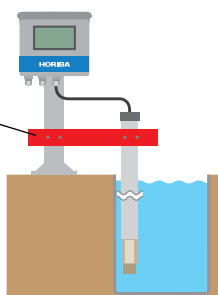
Flange bracket  
SFK-100 (JIS 10K 100)  
SFK-125 (JIS 10K 125)



### 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.)

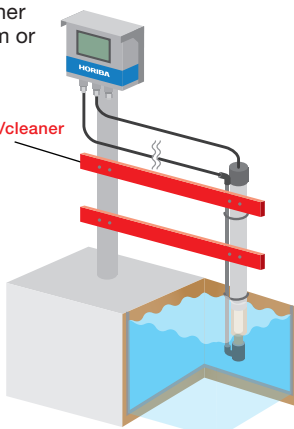
- ✓ Holder/cleaner length of 2 m or longer

Bracket for holder  
MH-100

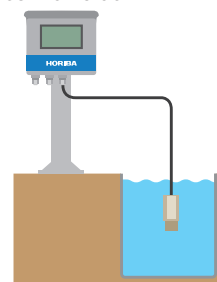


- ✓ Holder/cleaner length of 2 m or longer

Bracket for holder/cleaner  
MH-100



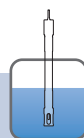
- ✓ No cleaner
- ✓ Want to reduce installation costs
- ✓ No flow velocity, or there is flow velocity but the customer provides the holder



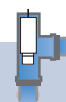
## ORP

[illegible]

# 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)
	Temperature	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 • 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.
		Time-sharing proportional control	• 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: 100 $\Omega$ 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 k $\Omega$ (0°C) Positive relation resistor with temperature: 500 $\Omega$ (25°C), 6.8k $\Omega$ (25°C), 10k $\Omega$ (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 $\pm 10\%$ 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)
External dimensions	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
Mass		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
		Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg

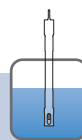
Note 1: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured pH value  $\pm 0.25$  pH.

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

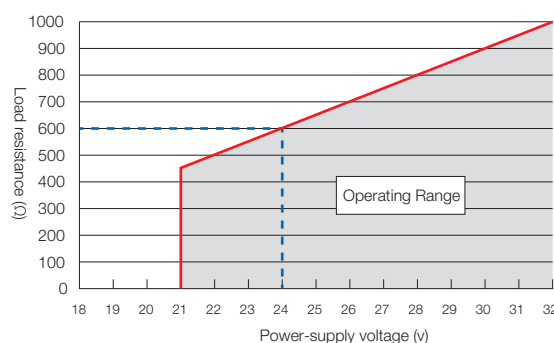
## HP-300 Specifications

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	0.01 pH
	Temperature	0.1°C
Performance	pH	Repeatability Within $\pm 0.03$ pH (response for equivalent input)
		Linearity Within $\pm 0.03$ pH (response for equivalent input)
	Temperature	Repeatability $\pm 0.3^\circ\text{C}$ (response for equivalent input)
		Linearity $\pm 0.3^\circ\text{C}$ (response for equivalent input)
Transmission output	Output type	4 mA to 20 mA DC: input/output isolated type
	Load resistance	Maximum: 600 $\Omega$ Case of 24 V DC power supply
	Linearity	Within $\pm 0.08$ mA (output only)
	Repeatability	Within $\pm 0.02$ 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: 40 $\Omega$ 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 k $\Omega$ (0°C) Positive relation resistor with temperature : 500 $\Omega$ (25°C), 6.8 k $\Omega$ (25°C), 10 k $\Omega$ (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)
External dimensions	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
Mass		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
		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

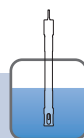


Note 2: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference is within the measured pH value  $\pm 0.1$  pH.

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
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 pH-meter. Supply power to the barrier within the rating of the barrier.

Relation between power-supply voltage and load resistance  
Only converter

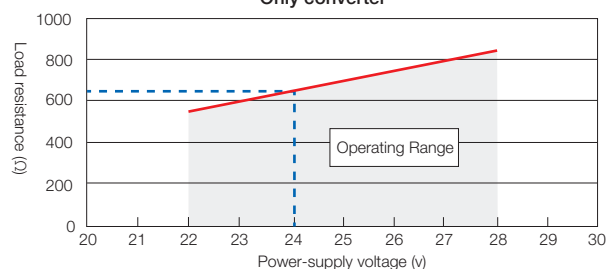


Fig.1: Power supply voltage in converter simple substance, and relation of load resistance.

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

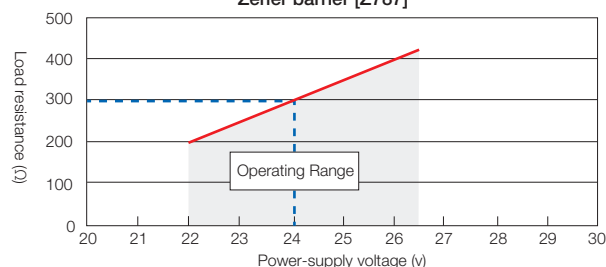


Fig.2: Power supply voltage at the time of combining Zener barrier with converter, and relation of load resistance.

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

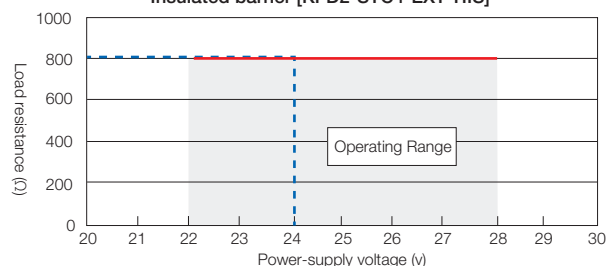
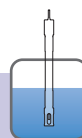


Fig.3: Power supply voltage at the time of combining insulated barrier with converter, and relation of load resistance.

# Transmitter



Immersion/  
Drop-in Type



Flow-through  
Type

## 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)	
	Temperature	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	

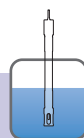
Temperature compensation	Applicable temperature element	Platinum resistor: 1 k $\Omega$ (0°C) Positive relation resistor with temperature: 500 $\Omega$ (25°C), 6.8 k $\Omega$ (25°C), 10 k $\Omega$ (25°C)
	Element selection method	Automatic temperature sensor type detection or manual selection (No temperature 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 $\pm 10\%$ 50/60 Hz
	Power consumption	15VA(max)
Compatible standards	Others	With power switch for maintenance use
	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)
External dimensions	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
Mass		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings) 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  $\pm 15$  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



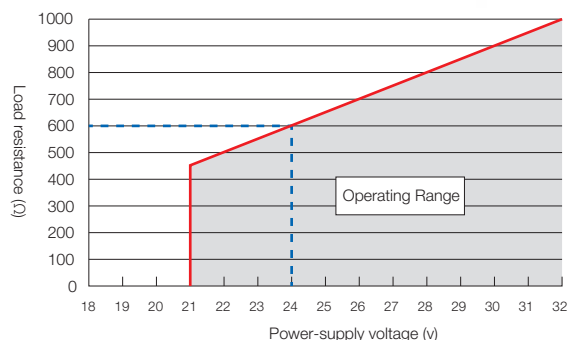
Flow-through  
Type

## 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 $\pm 5$ mV (response for equivalent input)
		Linearity Within $\pm 5$ mV (response for equivalent input)
	Temperature	Repeatability $\pm 0.3^\circ\text{C}$ (response for equivalent input)
		Linearity $\pm 0.3^\circ\text{C}$ (response for equivalent input)
Transmission output	Output type	4 mA to 20 mA DC: input/output isolated type
	Load resistance	Maximum: 600 $\Omega$ Case of 24 V DC power supply
	Linearity	Within $\pm 0.08$ mA (output only)
	Repeatability	Within $\pm 0.02$ 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: 40 $\Omega$ 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 k $\Omega$ (0°C) Positive relation resistor with temperature: 500 $\Omega$ (25°C), 6.8 k $\Omega$ (25°C), 10 k $\Omega$ (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.

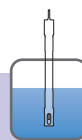
### Relation between power-supply voltage and load resistance



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  $\pm 6$  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.



Immersion/  
Drop-in Type



Flow-through  
Type

## 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 $\pm 5$ mV (response for equivalent input)
		Linearity Within $\pm 5$ mV (response for equivalent input)
Transmission output	Output type	4 mA to 20 mA DC: input/output isolated type
	Load resistance	Maximum: 650 $\Omega$ Case of 24 V DC power supply (* Note 2)
	Linearity	Within $\pm 0.08$ mA (output only)
	Repeatability	Within $\pm 0.02$ 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 Product name Official approval number
		Ex ia II C T4 X ORP meter TC20278
	intrinsic safety rating	Maximum input voltage
		Maximum input current
		Maximum input power
		Maximum internal inductance
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

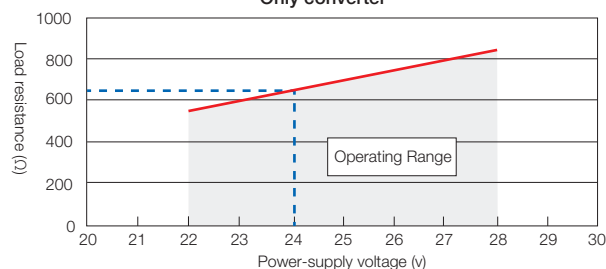


Fig.1: Power supply voltage in converter simple substance, and relation of load resistance.

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

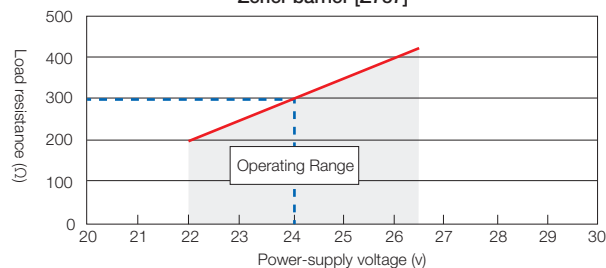


Fig.2: Power supply voltage at the time of combining Zener barrier with converter, and relation of load resistance.

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

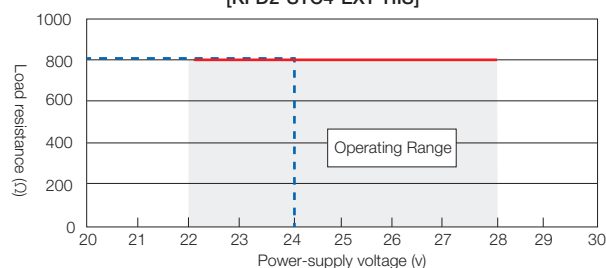
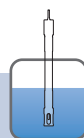


Fig.3: Power supply voltage at the time of combining insulated barrier with converter, and relation of load resistance.



# 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	<ul style="list-style-type: none"> <li>Just before hold</li> <li>Optional value hold</li> <li>Continuous</li> </ul> Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function	<ul style="list-style-type: none"> <li>Calibration failure</li> <li>Asymmetry potential error, sensitivity error, response speed error and standard solution error</li> <li>Electrode self-check</li> <li>Temperature sensor short-circuit and temperature sensor disconnection</li> <li>Outside of the measuring range</li> <li>Transducer error</li> </ul>
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 <ul style="list-style-type: none"> <li>Upper and lower limits setting range: pH 0.00 to pH 14.00</li> <li>Control width: pH 0.00 to pH 4.00 (+/- pH 0.00 to +/- pH 2.00)</li> </ul> Time-division proportional control <ul style="list-style-type: none"> <li>Upper and lower limits setting range: pH 0.00 to pH 14.00</li> <li>Proportional band: pH 0.00 to pH 4.00</li> <li>Cycle time: 5 s to 300 s</li> <li>Control output shift capability: 0% to 50% of shift volume for the cycle time</li> <li>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.)</li> <li>F zone: 1% to 100% of the proportional band (Self-extension of the cycle time starts working when the deviation enters the above range.)</li> <li>Upper limit for extending the cycle time: 0 s to 300 s.</li> <li>Maximum control volume: 50% to 100% (To be applied regardless of whether the measured value is in the proportional band or not.)</li> </ul>
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	<ul style="list-style-type: none"> <li>Previous value hold</li> <li>Optional value hold</li> <li>Continuous</li> </ul> Selectable from the above (However, only the just before hold is available in the maintenance mode.)
Self-diagnosis function	<ul style="list-style-type: none"> <li>Calibration function</li> <li>Asymmetry potential error, sensitivity error, response speed error and standard solution error</li> <li>Electrode self-check</li> <li>Temperature sensor short-circuit and temperature sensor disconnection</li> <li>Outside of the measuring range</li> <li>Transducer error</li> </ul>
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

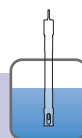
\*1: immunity (industrial environment)  
Noise increase: ±0.2 pH or less

## 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 Part 15
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

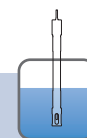


Flow-through  
Type

## 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



Immersion/  
Drop-in Type

pH

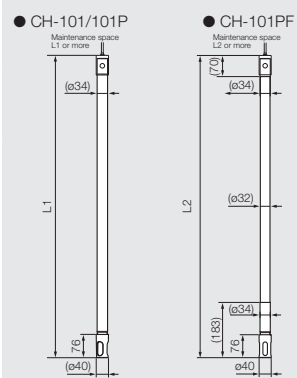
ORP

## 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
	P			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
	-EP			FKM (Recommended when sample is approx. pH10 or lower.) 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.

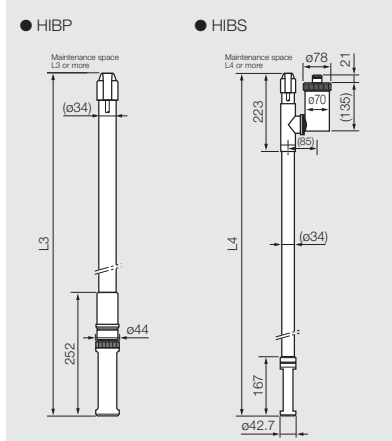
## For tip replaceable electrode

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.

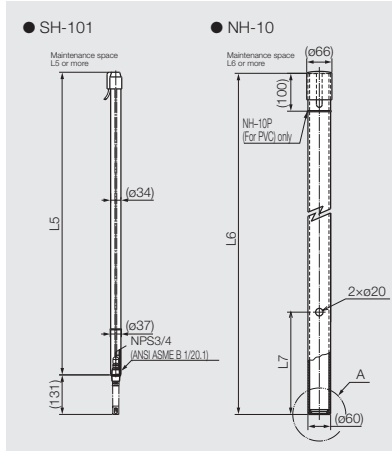
## For gel-filled electrode

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

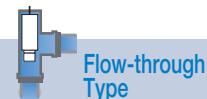
Model	Holder material	Holder length (L6)	Specification
NH-10			Drop-in holder
	-P		PVC
	-S		SUS316
		-1.0	1.0m
		-1.5	1.5m
		-2.0	2.0m
		-2.5	2.5m
		-3.0	3.0m
		-3.5	3.5m
		-4.0	4.0m

\* 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



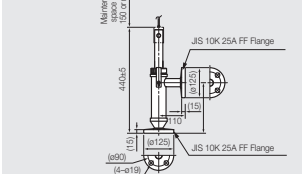
## For glass electrode

### CF-251(PP)



### Dimensional outline (Unit: mm)

#### CF-251

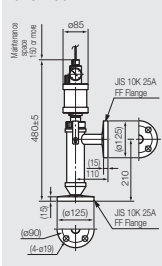


### CF-301(PP)



### Dimensional outline (Unit: mm)

#### CF-301

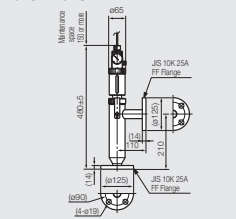


### CF-401S(SUS)



### Dimensional outline (Unit: mm)

#### CF-401S



## [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)
	P	-	-	-	Chamber material: PP/Holder material: PP*1
	S	-	-	-	Chamber material: PVC/Holder material: PVC (Protective tube, washer: PP)
	-	-	-	-	Chamber material: SUS316/Holder material: PVDF
	-	-	-	-	Without KCl tank
	-	-	-	-	KCl tank included (PVC 500mL)
	-	-	-	-	FKM (Recommended when sample is approx. pH10 or lower.)
	-	-	-	-	EPDM (Recommended when sample is approx. pH10 or higher, continuous measurement.)
	-	-	-	-	JIS 10K 25A FF Flange (JIS standard)

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)
	P	-	-	-	Chamber material: PP/Holder material: PP+PVC*1
	S	-	-	-	Chamber material: PVC/Holder material: PVC (Protective cap, washer: PP)
	-	-	-	-	Chamber material: SUS316/Holder material: PVDF+PVC
	-	-	-	-	FKM (Recommended when sample is approx. pH10 or lower.)
	-	-	-	-	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.

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.)
	-	-	-	-	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.

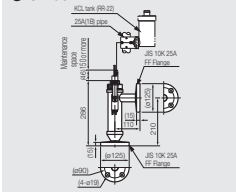
## For tip replaceable electrode

### CF-501(PP)



### Dimensional outline (Unit: mm)

#### CF-501



## [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)

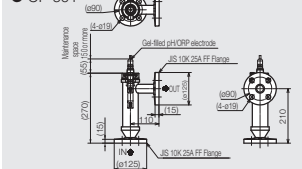
## For gel-filled electrode

### CF-601(PP)



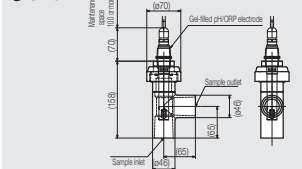
### Dimensional outline (Unit: mm)

#### CF-601



### Dimensional outline (Unit: mm)

#### CF-6P



## [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

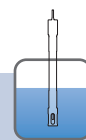
## [For gel-filled electrode/Code table]

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.

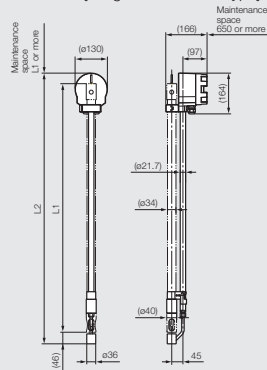
## ■ Immersion type

### ■ Ultrasonic cleaner for immersion holder UCH-101



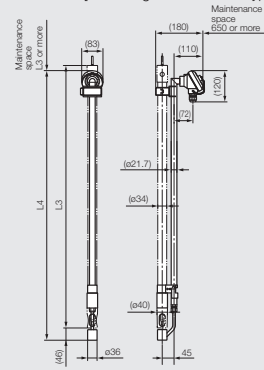
#### ■ Dimensional outline (Unit: mm)

##### ● UCH-101 [Integrated oscillator type]

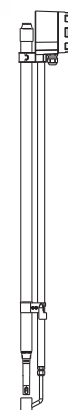


#### ■ Dimensional outline (Unit: mm)

##### ● UCH-111 [Non-integrated oscillator type]

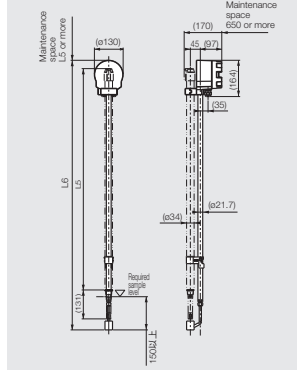


### ■ Ultrasonic cleaner for immersion holder UCH-201



#### ■ 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 <sup>*1</sup>
	-0.5	0.5m
	-1.0	1.0m
	-1.5	1.5m
	-2.0	2.0m
	-2.5	2.5m
	-3.0	3.0m

<sup>\*1</sup> 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]

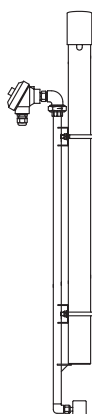
Compatible electrode: 6155/6855

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

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

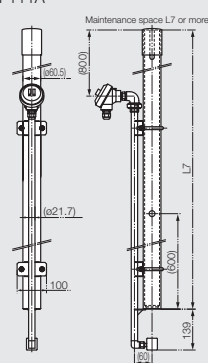
## ■ Drop-in type

### ■ 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 <sup>*1</sup>
			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)

<sup>\*</sup> The drop-in holder NH-10 is included.

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

<sup>\*1</sup> 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.  
<sup>\*2</sup> 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)

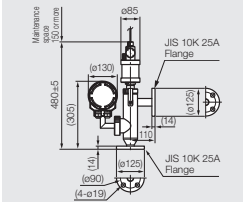
## ■ Flow-through type

### ■ Ultrasonic cleaner for flow-through holder UCF-301



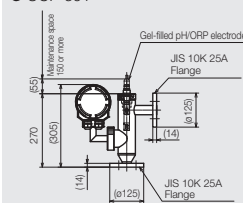
#### ■ Dimensional outline (Unit: mm)

##### ● UCF-301

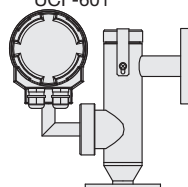


#### ■ Dimensional outline (Unit: mm)

##### ● UCF-601

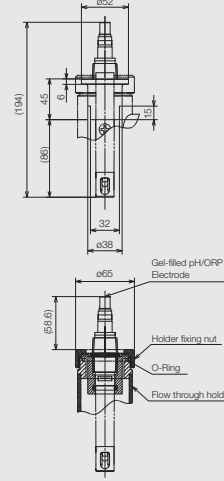


### ■ Ultrasonic cleaner for flow-through holder UCF-601



#### ■ 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)

<sup>\*</sup> 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

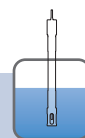
#### [Ultrasonic cleaner for flow-through holder/Code table]

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.





Immersion Type	Immersion Level	Immersion Duration	Immersion Frequency	Immersion Location	Immersion Method	Immersion Outcome
Full Immersion	High	24 hours	Once	Language Center	Language Immersion Program	High proficiency in language
Partial Immersion	Medium	12 hours	Twice	Language Center	Language Immersion Program	Medium proficiency in language
Low Immersion	Low	6 hours	Once	Language Center	Language Immersion Program	Low proficiency in language



## Flow-through Type

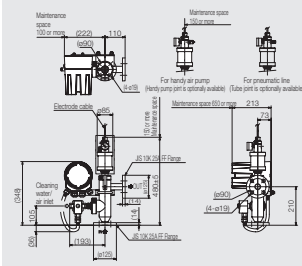
- **Flow-through type**

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



■ Dimensional outline (Unit: mm)

● JCF-301



Notes on selection (see p. 38 for details)

- 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  $\pm 10\%$  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 jet cleaner <integrated timer unit type>/Code table]

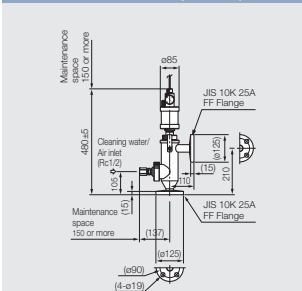
Compatible electrode: 6805/6815/6108/6155/6855

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: PF
		-				AC100V±10% 50/60Hz <sup>*1</sup>
p. 38 for details)						0.1 to 3.0 hours <sup>*2</sup>
The electrode must be pressurized to			-			R1/8 Screw diameter
in the electrode. For manual				-		JIS 10K 25A FF flange (JIS Standard)
pressurizing inlet for a hand pump. If					-	
is performed by instrument air, use a tube						

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



■ Dimensional outline (Unit: mm)



Notes on selection (see p. 38 for details)

- Pressurizing inlet (hand pump): 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 tube for cleaning.
- 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 for 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

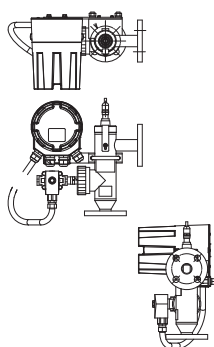
[Table2]

Compatible transmitter: HP-200

Model	Specification	Code
JH-W5	Water piping kit (hose nipple (SUS304, R1/2"x16), 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

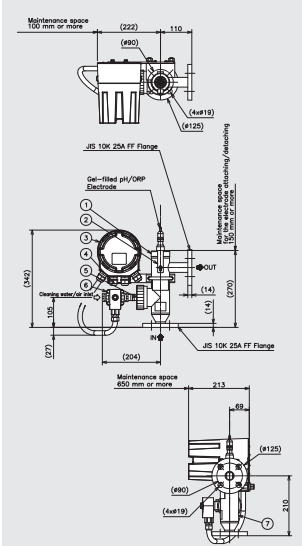
\*1 The solenoid valve unit or timer unit should be installed within a hose length of 5 m from the chamber/holder installation location.

■ 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]

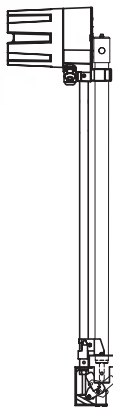
Compatible electrode: 6155/6855

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

## Brush/brush jet cleaner

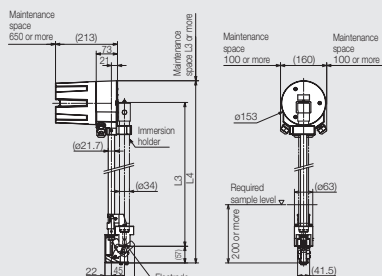
- Immersion type (for pH meter)

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

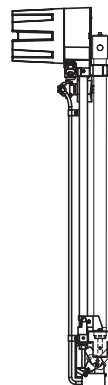


■ Dimensional outline (Unit: mm)

- BCH-121

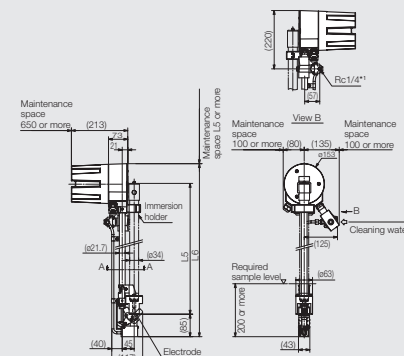


- Immersion type brush jet cleaner (for 2 wire transmitter)  
BCH-101J



■ 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

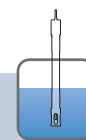
\*1 A cleaning cycle time of 1.0 to 12.0 hours is also available. (Made-to-order) For details, please contact our sales representative.

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

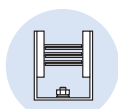


Immersion  
Type

### ■ Immersion type (for pH meter)

- Immersion type jet propulsion brush cleaner  
BH-111A

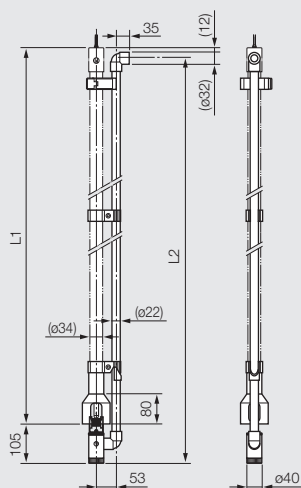
For 6108 electrode



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]

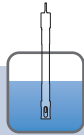
Model	Specification
Brush unit	For BH-111A

#### [Combination]

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

\* This holder is partially made of metal.





Immersion  
Type

# Chemical cleaner

[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)						
				-O (without pole stand)						
					-M (with Bracket)					
					-O (without Bracket)					
					-AR (with air regulator)					
					-O (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)	
									-O (without air pump)	
									-Y(assembled)	
									--N10(Not assembled)	

## Combination example

[For 4-Wire Transmitter]  
CCH-151-1.0-N3-4-PE-PS-M-O-O-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 '-O' for no air regulator unit.)

\*2 When specifying '-O' 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.)

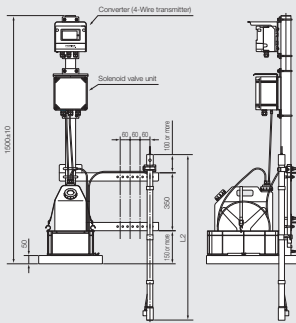
\* Electrodes that can be paired: 6108/6151/6152 \* Please separately prepare transmitters and electrodes.

## Immersion type

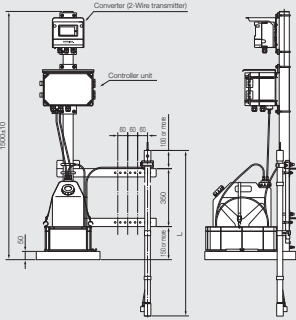
- Immersion type chemical cleaner
- CCH-151 Series

### Dimensional outline (Unit: mm)

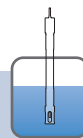
- CCH-151 Series (With solenoid valve unit)  
[For 4-Wire Transmitter]



- 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.

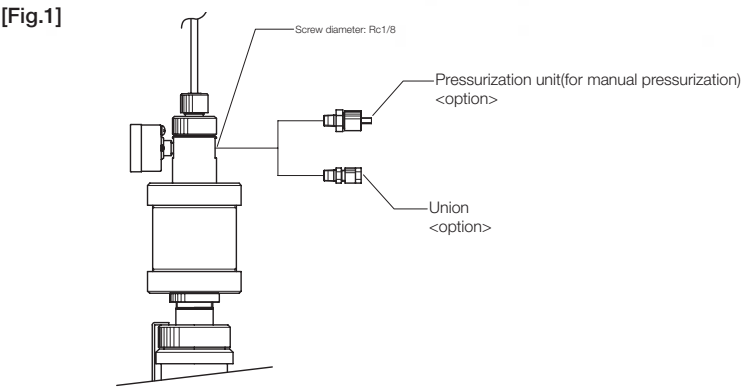
### [Accessories for explosion-proof transmitter/Code table]

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

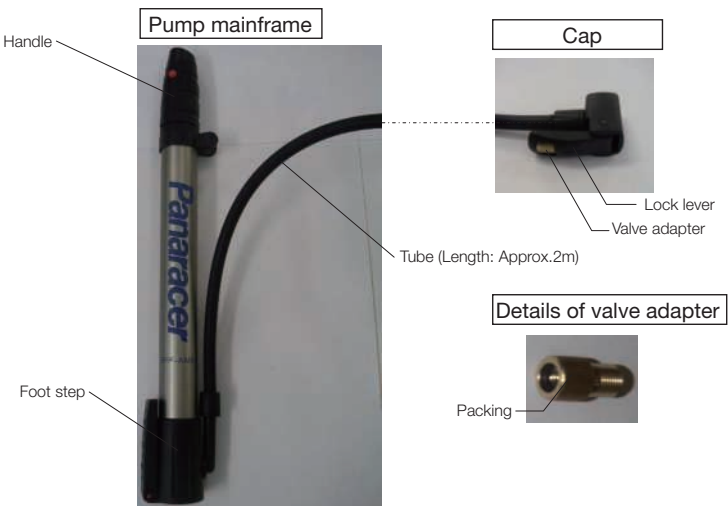
- Pressurizing inlet shape: The electrode must be pressurized to prevent backflow of KCL in the electrode. (See [Fig. 1].)  
For manual pressurization, use a pressurizing inlet for a hand pump. If automatic pressurization is performed by instrument air, use a tube fitting from the following.  
Manual 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



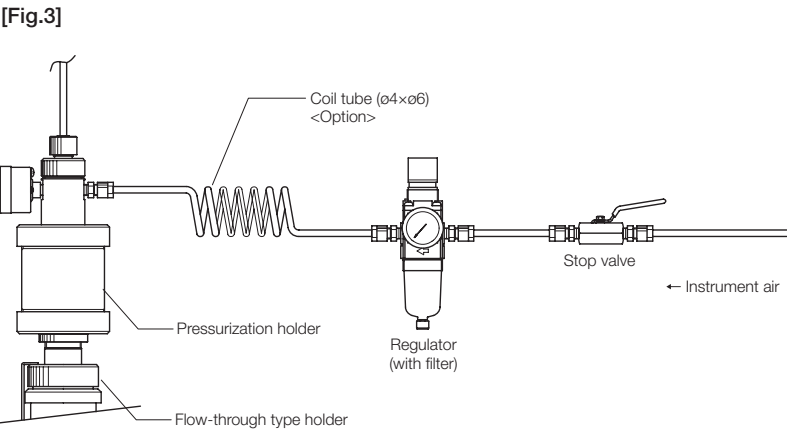
- Hand pump: Select the following hand pump [Fig. 2] for manual pressurization. [Fig.2]  
If you will provide your own hand pump, there is no need to select one here.  
Manual pressurization (by hand pump) is not recommended for CF-401S.

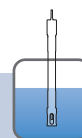
Model	Code
Hand pump	3200295722



- 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





Immersion/  
Drop-in Type

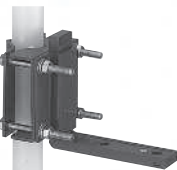
## Holder accessory

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

#### ■ Bracket

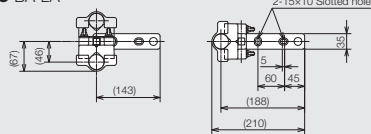
BA-2A (ABS)  
BA-1S (SUS)

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



Dimensional outline  
(unit: mm)

#### ● BA-2A



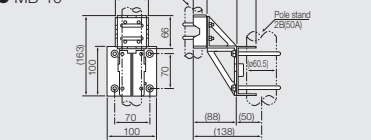
#### ■ Bracket MB-10

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



Dimensional outline  
(unit: mm)

#### ● MB-10



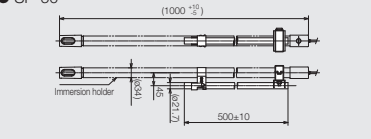
#### ■ Support pipe SP-60

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

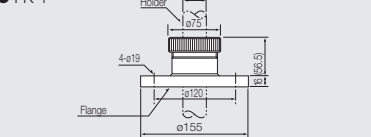
Fastens the immersion holder with flange.

FK-1



Dimensional outline  
(unit: mm)

#### ● FK-1

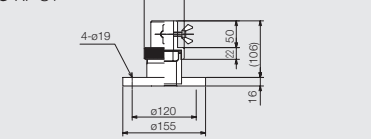


RF-S1



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.

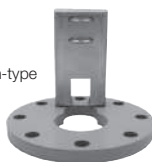
#### [For loose flange (HIBS)/Code table]

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

### For immersion cleaner/support pipe (SP-60)

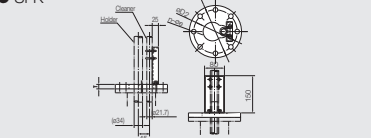
#### ■ Flange bracket SFK-100

Fastens the immersion-type cleaner with flange.



Dimensional outline  
(unit: mm)

#### ● SFK



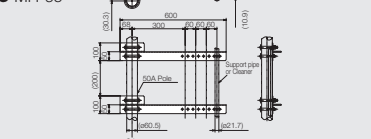
#### ■ Bracket MH-65

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)

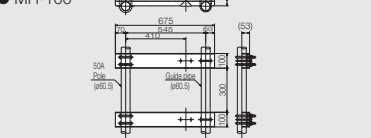
#### ■ Bracket MH-100

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

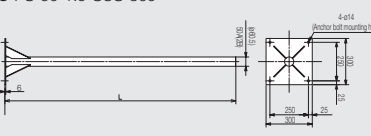
#### ■ Pole stand PS-50-1.5-SUS-300

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



Dimensional outline  
(unit: mm)

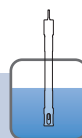
#### ● PS-50-1.5-SUS-300



#### [Pole stand/Code table]

Model	Specification	Code
PS-50-1.5-SUS-300	Material: SUS304, 50A, 1.5m, pole base: 300x300	3030047360
PS-50-1.7-SUS-300	Material: SUS304, 50A, 1.7m, pole base: 300x300	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.



### [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)

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

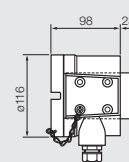
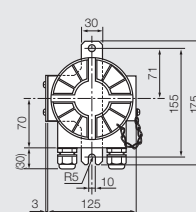
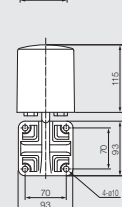
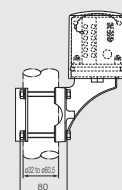
Model	outer diameter
C-5A	ø10
C-2A	ø5



### ■ Dimensional outline (Unit: mm)

● CT-50pH

● TB-25pH



### [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

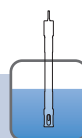
Model	Specification	Code
C-50B-VP8	Cable length: 5m	3200805229
C-100B-VP8	Cable length: 10m	3200805231
C-150B-VP8	Cable length: 15m	3200805232
C-200B-VP8	Cable length: 20m	3200805233

### 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



## ORP

This image shows a full page of a worksheet designed for handwriting practice. It features ten sets of horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

pH

ORP

[illegible]

# MEMO

pH

ORP







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.**

●The specifications, appearance or other aspects of products in this catalog are subject to change without notice. ●Please contact us with enquiries concerning further details on the products in this catalog. ●The color of the actual products may differ from the color pictured in this catalog due to printing limitations. ●It is strictly forbidden to copy the content of this catalog in part or in full. ●The screen displays shown on products in this catalog have been inserted into the photographs through compositing. ●All brand names, product names and service names in this catalog are trademarks or registered trademarks of their respective companies.

#### **HORIBA Advanced Techno, Co., Ltd.**

**Japan**

##### **Head Office**

2 Miyahogigashi-cho, Kisshoin, Minami-ku, Kyoto, 601-8551, Japan  
Phone: 81 (75) 321-7184 Fax: 81 (75) 321-7291  
www.horiba.com/water-liquid/

#### **HORIBA (China) Trading Co., Ltd.**

**China**

Unit D, 1F, Building A, Synnex International Park, 1068 West Tianshan Road, 200335, Shanghai, China  
Phone: 86 (21) 6289-6060 Fax: 86 (21) 6289-5553

##### **Beijing Branch**

12F, Metropolis Tower, No.2, Haidian Dong 3 Street, Beijing, 100080, China

Phone: 86 (10) 8567-9966 Fax: 86 (10) 8567-9066

##### **Guangzhou Branch**

Room 1611/1612, Goldlion Digital Network Center, 138 Tiyu Road East, Guangzhou, 510620, China  
Phone: 86 (20) 3878 1883 Fax: 86 (20) 3878 1810

#### **HORIBA (Thailand) Limited**

**Thailand**

46/8 Rungrojthanakul Bld., 1st, 2nd Floor, Ratchadapisek Road., Huai Khwang Bangkok 10310  
Phone: +66 (0) 2 861 59 95 ext.123 Fax: +66 (0) 2 861 52 00

#### **HORIBA Instruments (Singapore) Pte Ltd.**

**Singapore**

3 Changi Business Park Vista #01-01, Singapore 486051  
Phone: 65 (6) 745-8300 Fax: 65 (6) 745-8155

##### **West Office**

83 Science Park Drive, #02-02A, The Curie, Singapore 118258  
Phone: (65)-6-908-9660

#### **HORIBA Instruments (Singapore) Pte Ltd.**

**Philippines**

##### **Manila Office**

27/F Tower 2, The Enterprise Center, 6766 Ayala Avenue corner Paseo de Roxas, Brgy. San Lorenzo, Makati City, Philippines, 1226  
Phone: 63 (2) 8885 8468

#### **HORIBA Vietnam Company Limited.**

**Vietnam**

Lot 3 and 4, 16 Floor, Detech Tower II, No. 107 Nguyen Phong Sac Street, Dich Vong Hau Ward, Cau Giay District, Hanoi, Vietnam  
Phone: 84 (24) 3795 8552 Fax: 84 (24) 3795 8553

##### **Ho Chi Minh Branch Office**

Level 7, Saigon Finance Center, 9 Dinh Tien Hoang, ĐaKao Ward, District 1. Ho Chi Minh City, Viet Nam  
Phone: +84-28-3829-9636 Fax: +84-28-3827-3068

#### **PT HORIBA Indonesia**

**Indonesia**

Jl. Jalur Sutra Blok 20A, No.16-17, Kel. Kunciran, Kec. Pinang Tangerang-15144, Indonesia  
Phone: 62 (21) 3044-8525 Fax: 62 (21) 3044-8521

#### **HORIBA KOREA Ltd.**

**Korea**

25, 94-Gil, Iljik-Ro, Manan-Gu, Anyang-Si, Gyeonggi-Do, 13901, Korea  
Phone: 82 (31) 296-7911 Fax: 82 (31) 296-7913

#### **HORIBA Taiwan, Inc.**

**Taiwan**

8F.-8, No.38, Taiyuan St., Zhubei City, Hsinchu County, 30265, Taiwan (R.O.C)  
Phone: 886 (3) 560 0606 Fax: 886 (3) 560 0550

##### **Tainan Office**

1F., No.90 Ziyou Rd., Shanhuia Dist., Tainan City, 74158, Taiwan (R.O.C)  
Phone: (886)6-581-1108 Fax: (886)6-581-1160

#### **HORIBA India Private Limited**

**India**

246, Okhla Industrial Estate, Phase 3 New Delhi-110020, India  
Phone: 91 (11) 4646-5000 Fax: 91 (11) 4646-5020  
Email: customercare-pe.hin@horiba.com

##### **Technical Center**

D-255, Chakan MIDC Phase-II, Bhamboli Village, Pune-410501, India  
Phone: 91 (21) 3567-6000

##### **Bangalore Office**

3rd, No.504, 22nd Cross HSR Club Road Sector-3, Bengaluru, Karnataka, 560102, INDIA  
Phone: 91 (80) 4127-3637

#### **HORIBA Instruments Incorporated**

**USA**

##### **Houston Office**

5390 Bay Oaks Drive, Pasadena, TX 77505  
Phone: 1 (281) 482-4334 Fax: 1 (281) 674-6058

#### **HORIBA Instruments Brasil, Ltda.**

**Brazil**

Rua Presbitero Plinio Alves de Souza, 645, Loteamento Multivias, Jardim Ermdia II - Jundiai Sao Paulo - CEP 13.212-181 Brazil  
Phone: 55 (11) 2923-5400 Fax: 55 (11) 2923-5490

#### **HORIBA Europe Research Center**

**France**

14, Boulevard Thomas Gobert - Passage Jobin Yvon CS 45002-91120 Palaiseau-France  
Phone: 33 (1) 69-74-72-00 Fax: 33 (1) 69-31-32-20

#### **HORIBA UK Limited**

**UK**

Kyoto Close Moulton Park, Northampton NN3 6FL, UK  
Phone: 44 (0) 1604 542 500 Fax: 44 (0) 1604 542 699

#### **HORIBA Europe GmbH**

**Germany**

Hans-Mess-Str.6 D-61440 Oberursel Germany  
Phone: 49 (6172) 1396-0 Fax: 49 (6172) 1373-85

#### **HORIBA Tocadero GmbH**

**Germany**

Johann-Hittorf-Str. 8, 12489 Berlin, Germany  
Phone: 49 (0)30 6392 3150 Fax: 49 (0)30 6392 3151

#### **HORIBA (Austria) GmbH**

**Austria**

Kaplanstrasse 5, A-3430 Tulln, Austria  
Phone: 43 (2272) 65225 Fax: 43 (2272) 65225 45



**Worldwide locations of HORIBA**