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H-1 Series Industrial pH Meter

HP-200

■ Overview

●The HP-200 allows you to make a pH measurement when the pH electrode is connected.
The measured value and various parameters are displayed on the LCD part. When used with our cleaner, the HP-200 allows you to control the cleaner.
A variety of self-diagnostic capabilities is provided to allow you to detect a trouble with the pH electrode or the HP-200.

■ Measurement target

● pH of a solution

■ Measuring principle

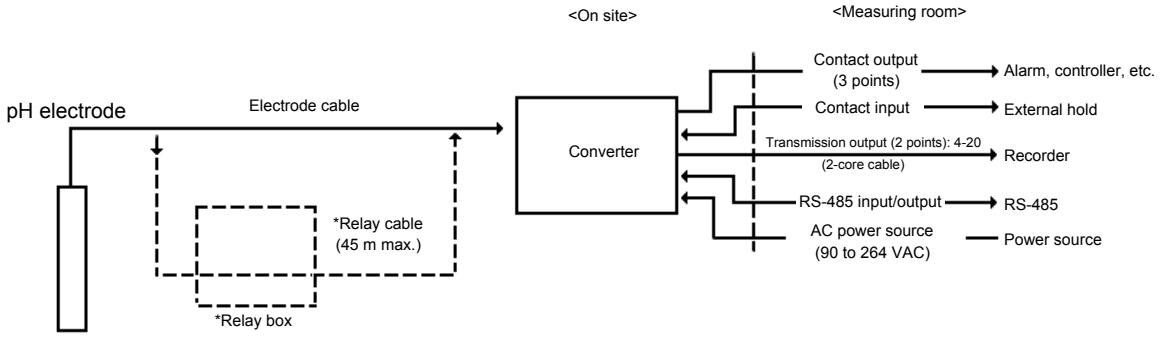
● Glass electrode type

■ Intended use

● ☞ontrol and monitoring of drainage treatment and production process

■ System configuration diagram

Standard specification



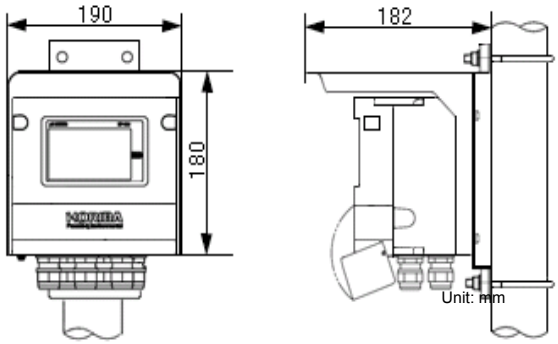
* Note: If the distance to the converter is longer than the pH electrode cable length, use the relay box and the relay cable.
The cable length between the pH electrode and the converter is 50 m maximum (including the electrode cable).

HP-200 Readout Converter

■ Features

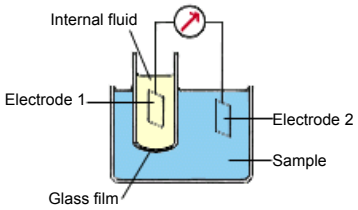
●Outdoor installation type (equivalent to IP65; splash-proof construction)
●Selectable simultaneous display of temperature
All settings available with front keys
●Applicable for 5 kinds of standard solutions (pH 7 plus one to three among pH 2, 4, 9, and 10)
●Improved maintenance feature (self-diagnostic capability)
Selectable transmission output range
●Backup of stored data
●Easy-to-read display (150% larger than former display)
●Improved operability of keys by using an emboss sheet
●Improved mode display by using icons
●4 kinds of temperature compensation electrodes (500, 6.8 k, 1 k, and 10 k) Self-detection capability provided

■ External Dimensions



■ Converter/Sensor

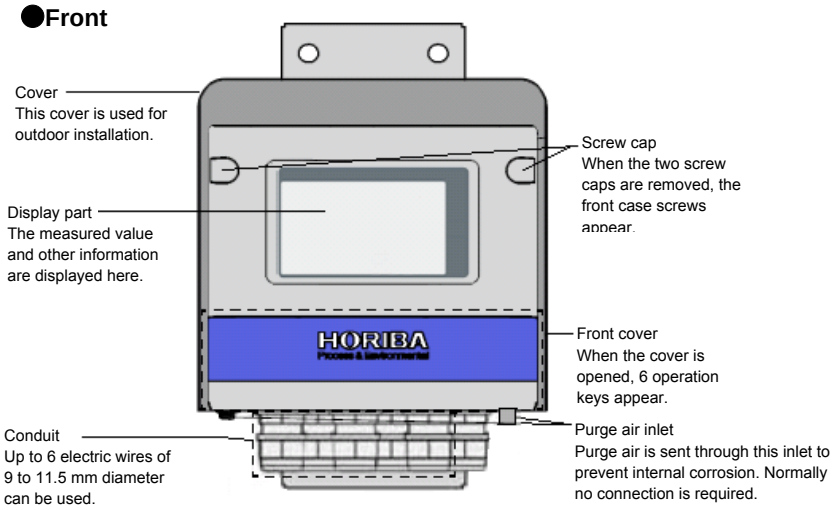
The glass electrode method uses two electrodes, i.e. the glass electrode and the comparison electrode to measure the voltage (electrical potential difference) generated between these two electrodes, thereby measuring the pH of the solution.
When there are solutions with different pH inside and outside the glass film, electromotive force is generated in proportion to the difference in pH across the film.
When the difference in pH between two solutions at 30° C is 1, electromotive force of about 60 mV is typically generated.
Since a solution of pH7 is typically used for the internal fluid in the glass electrode, the pH value of a suspected fluid can be found by measuring the electromotive force generated in the electrode film.
To measure the electromotive force generated in the electrode film of the glass electrode, another electrode is required. The other electrode paired with this glass electrode is called a comparison electrode. The comparison electrode must have very stable electric potential. For this purpose, the liquid junction is perforated or ceramic-coated.
In other words, the glass electrode is designed to accurately generate electromotive force from the difference in pH. The comparison electrode is designed to prevent electromotive force from being generated from the difference in pH.



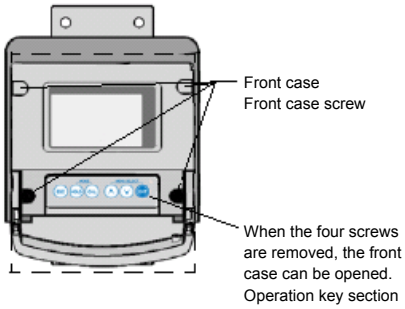
Principle diagram of glass electrode method

■ Configurations

●Front



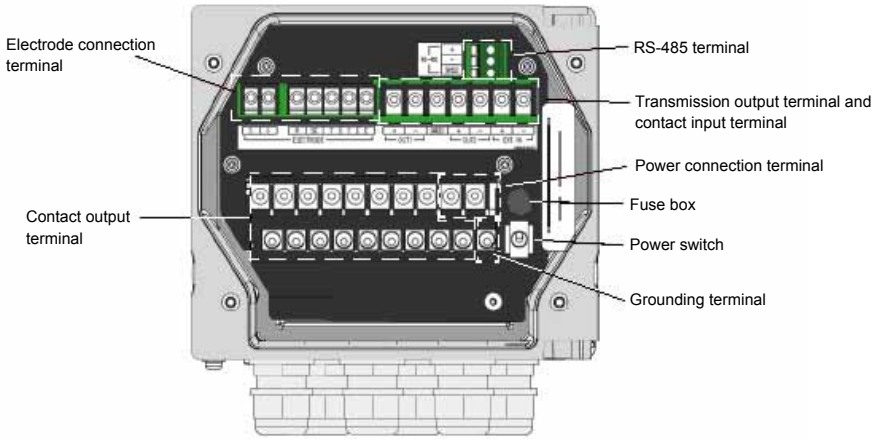
●With the front cover opened



●Display part

●Operation key section

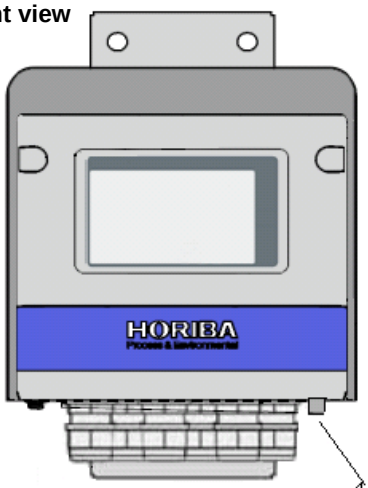
●Terminal block



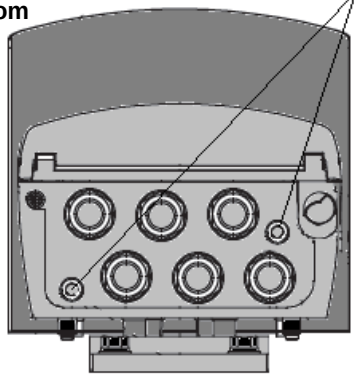
■ Air purge

An inlet is provided for purge air which is used to prevent internal corrosion. When the HP-200 is used in an environment where corrosive gas is generated, constantly send instrument air to prevent the corrosive gas from entering the inside.

Front view

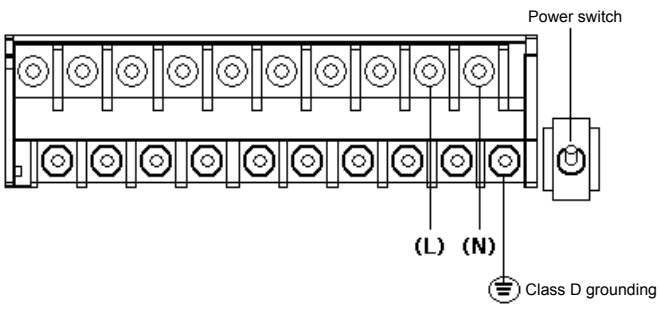


Bottom



■ Power supply

The HP-200 has a power switch. For the HP-200, use a free power source for rated voltage of 100 to 240 VAC.
Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
Also check that fluctuations of the power supply voltage fall within ±10%.
Major specifications
•The terminal screw for the contact output is of M4.
•The applicable electric wire is of 0.75 to 5.5 mm2 (AWG18 to 10).



Provide the power switch in a place near the HP-200 so that the power can be turned ON/OFF. If lightning might strike, install an arrester on the output side of the HP-200 and on the side of receiving instruments.
Be sure to ground the grounding terminal (class D grounding).

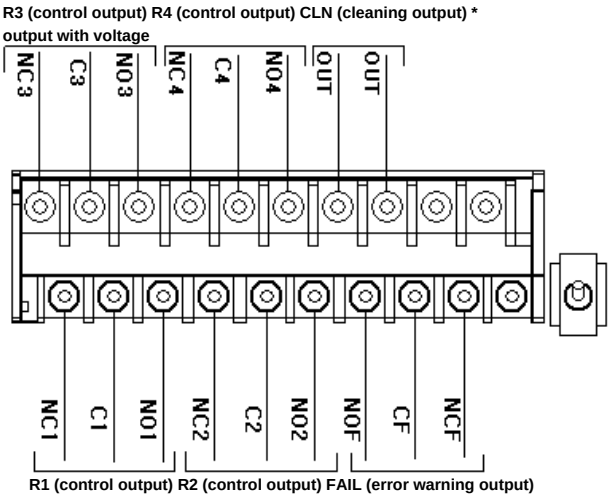
Separate this grounding from any other grounding for electric equipment such as a motor.

Power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	0.75 to 5.5 mm^2 (AWG18 to 10).

■ Contact output

The HP-200 is provided with five contact outputs as standard. The HP-200 has contact outputs including upper/lower alarm contact output, error alarm, transmission output hold, and others.

Major specifications
•The contact capacity is 250 VAC, 3 A maximum or 30 VDC, 3 A maximum for resistance load.
•The terminal screw for the contact output is of M4.
•The applicable electric wire is of 0.75 to 5.5 mm2 (AWG18 to 10).

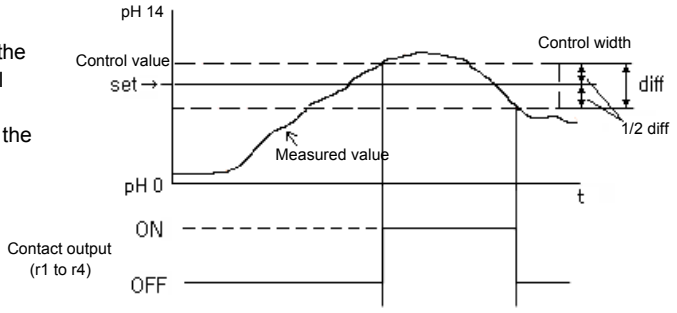


•If noise is detected from the load, use a varistor or a noise killer.
•Only the CLN output involves voltage from the connected power source. Others are no-voltage contact output.
•For the FAIL output only, NO and NC are reversed. When the HP-200 is normal (not in failure), the CF-NOF contact is open and the CF-NCF contact is short-circuited. When the power is OFF, the C-NOF contact is short-circuited.
•To connect any load exceeding the contact capacity or any induction load (e.g., a motor or a pump), be sure to use a power relay exceeding the load rating.
•When the HP-200 is OFF, the C-NC contact for R1 to R4 is short-circuited. Therefore, be careful about the connection of load.

Contact capacity	250 VAC, 3 A maximum or 30 VDC, 3 A maximum
Applicable electric wire	0.75 to 5.5 mm2 (AWG18 to 10)
Kinds of alarms	CtrL control output, alarm output Time-sharing proportional control (shift function) Time-sharing proportional control (F-zone function) Temperature alarm output, HOLD output FAIL output, Clu output

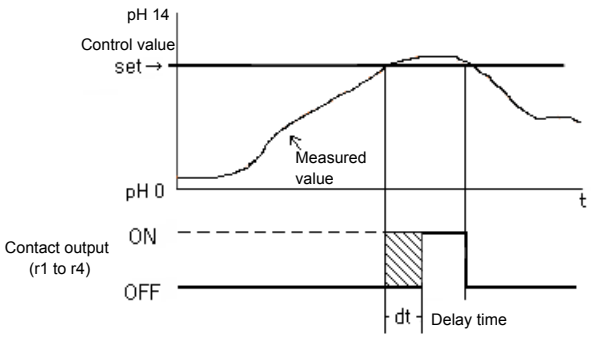
CtrL: Control output

When the measured value is larger than (control value plus control width x 1/2), the control output is turned ON. When the measured value is smaller than (control value minus control width x 1/2), the control output is turned OFl.
(The above case is applicable for the upper-limit operation; the reversed case is applicable for the lower-limit operation.)



"AL": Alarm output

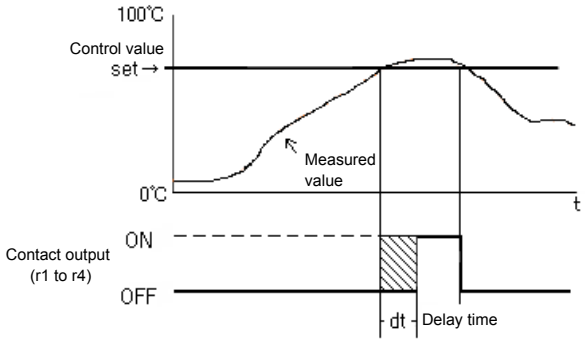
When the measured value becomes larger than the setting, the alarm output is turned ON to trigger the alarm after the delay time. When the measured value becomes smaller than the setting, the output is immediately turned OFF to cancel the alarm.
The setting of output delay time (0 to 600 seconds) is also possible.
(The above case is applicable for the upper-limit operation; the reversed case is applicable for the lower-limit operation.)



"tPS": Time-sharing proportional control (shift function)
Time-sharing proportional control means variably controlling the output by changing the ON/OFF proportion within a certain period in accordance with the deviation (difference between control value and measured value) in order to perform proportional control for a metering pump for pH control or a control device such as a solenoid valve.
Time-sharing proportional control (shift function) is an effective method when the control result does not reach the control, e.g., in a continuo treatment process.

"tPF": Time-sharing proportional control (F-zone function)
Time-sharing proportional control means variably controlling the output by changing the ON/OFF proportion within a certain period in accordance with the deviation (difference between control value and measured value) in order to perform proportional control for a metering pump for pH control or a control device such as a solenoid valve.
For pH control, it is very important to control the chemical agent when the deviation becomes smaller. Because of a characteristic specific to pH control, the injection of a small amount of chemical agent may cause the control result to exceed the control value.
Time-sharing proportional method (F-zone function) has been devised as a method to fine-tune the ON/OFF proportion by extending the OFF time for the normal time-sharing proportional control when the deviation becomes smaller. It is an effective control method for a batch treatment process.
This is an effective control method for cases where the control result greatly exceeds the control value, e.g., in a batch treatment process.

"t": Temperature alarm output
When the temperature value is higher than the setting, this output is turned ON to trigger the alarm after the delay time. When the temperature value becomes lower than the setting, the output is immediately turned OFF to cancel the alarm. The setting of output delay time (0 to 600 seconds) is also possible.
The above case is applicable for the upper-limit operation; the reversed case is applicable for the lower-limit operation.



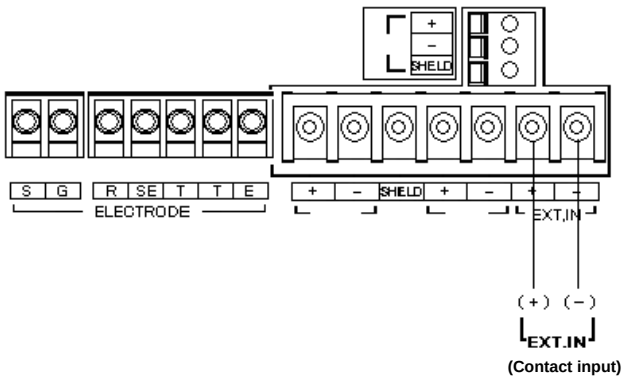
HoLd: Output during hold mode
When the measured value is held, this output is turned ON after the delay time. When the hold mode is canceled, the output is immediately turned OFF. The setting of output delay time (0 to 600 seconds) is also possible.

FAIL: FAIL output
This output is turned ON when over full-scale or system error occurs. It is also turned ON when the HP-200 malfunctions.

CLn: Cleaning output
The contact signal is output (ON) while the cleaner is operating, or for 5 seconds after the cleaner has stopped.

■ Contact input

The HP-200 is provided with contact input as standard.
The output value is held with an external signal.
Major specifications
•The terminal screws for the contact input is of M3.5.
•The applicable electric wire is of 2 mm2 (AWG14) maximum.



(Contact input)

For the cable, use a shielded cable.
When lightning might strike, install an arrestor on the output side of the HP-200 and on the side of receiving instruments.
The resistor for the contact input shall be 100Ω maximum.

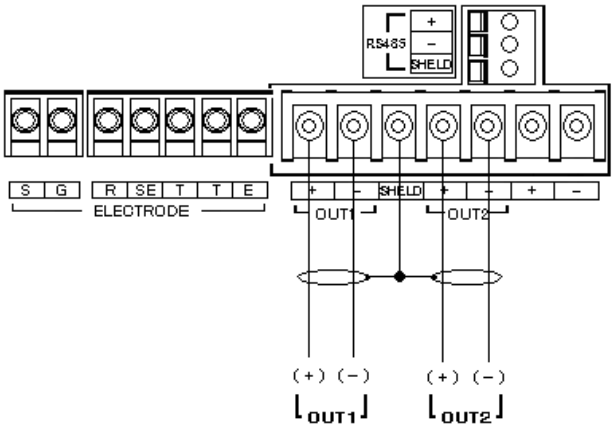
Contact input resistance	100 Ω maximum
Applicable electric wore	2mm^2 (AWG14) MAX

■ Transmission output

The HP-200 is provided with two transmission outputs (4 to 20 mA DC).
Transmission output 1 outputs pH and transmission output 2 temperature.
For both outputs, the full-scale range of transmission output may be set freely within the full-scale setting for measured value. The setting of burn-out (transmission output: 3.8 or 21 mA) is also possible. The HP-200 allows you to select whether the output value is temporarily held at the directly previous value or the preset value when the transmission output is to be held with an external signa
Example: Arbitrary setting of transmission output
When the full-scale range for pH measurements is between pH0 and pH14:
The transmission output of 4 mA may be set to pH6 and that of 20 mA to pH8.
Example: Transmission output hold
When the held value is set to the directly previous value:
If an external signal is received when the measured value is pH7.5, the transmission output maintains the output value of pH7.5.
Main specifications
•The terminal screws for the contact input is of M3.5.
•The applicable electric wire is of 2 mm^2 (AWG14) maximum.

Maximum load resistance	900Ω
Applicable electric wire	2mm^2 (AWG14) MAX

For the transmission output cable, use a shielded cable.
When lightning might strike, install an arrestor on the output side of the HP-200 and on the side of receiving instruments.
The negative terminal (OUT1) (-) and OUT2 (-) for the transmission output are internally connected and have the same electric potential.



(Transmission output)

■ RS-485

The HP-200 has an RS-485 communication terminal. To use this terminal, connect wiring.

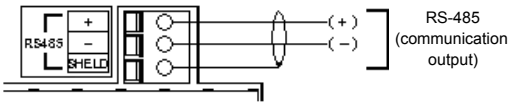
•The applicable electric wire is of 0.14 to 2.5 mm^2 (AWG26 to 14).

•For the communication output cable, use a twisted shielded pair.

•Up to 32 connections can be made including one for the host computer. Set the address.

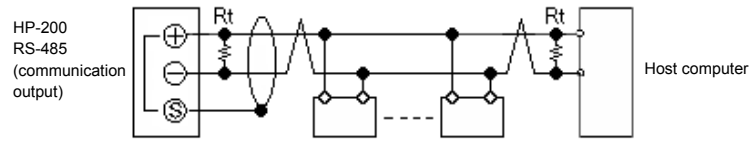
•The communication cable length is 500 m maximum.

•Use a terminating resistor (Rt: 120Ω) for any device at which the RS-485 communication line is terminated.



RS-485 communication conditions	Baud rate	19200 bps
	Character length	8 bit
	Parity	non
	Stop bit	1 bit

Example of external connection for communication



■ pH electrode

The pH electrode cable is highly insulated. In handling this cable, pay attention to the following points:

•Do not wet any cable terminal or the terminal block with water or the like; also do not soil it with dirt, oil, or the like. The insulation will otherwise deteriorate.

•The decreased insulation can cause instable readings. Maintain the electrode cable in a dry, clean state.

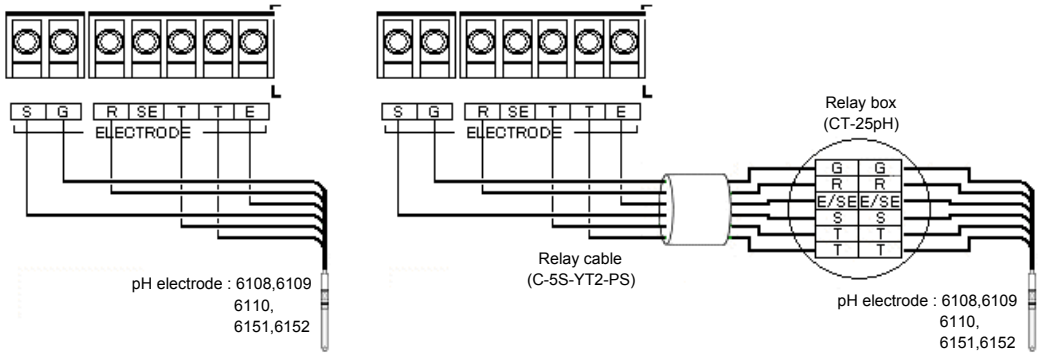
•If the electrode cable should be soiled, wipe it off with alcohol or the like and then well dry it.

•In routing the electrode cable, provide sufficient length for the calibration of standard solution and the check and replacement of the electrode.

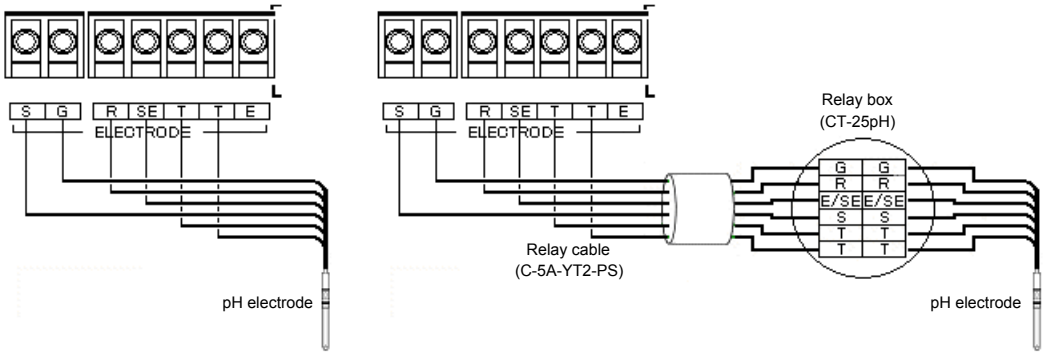
•Route the electrode cable and the relay cable by avoiding any place near inducing equipment such as a motor and keeping them away from the power cable for such equipment.

pH electrode	S: pH electrode shield drive
	G: Glass electrode terminal
	R: Reference electrode
	SE: Solution gound
	T, T: Temperature sensor
	E: Outer shield wire

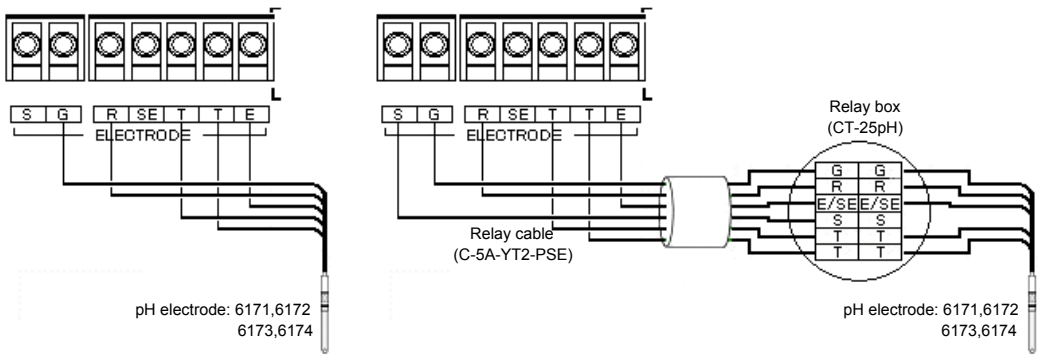
For pH electrodes with S terminal and without SE terminal, such as 6108 and 6109



For pH electrodes without S and SE terminals, such as 6110



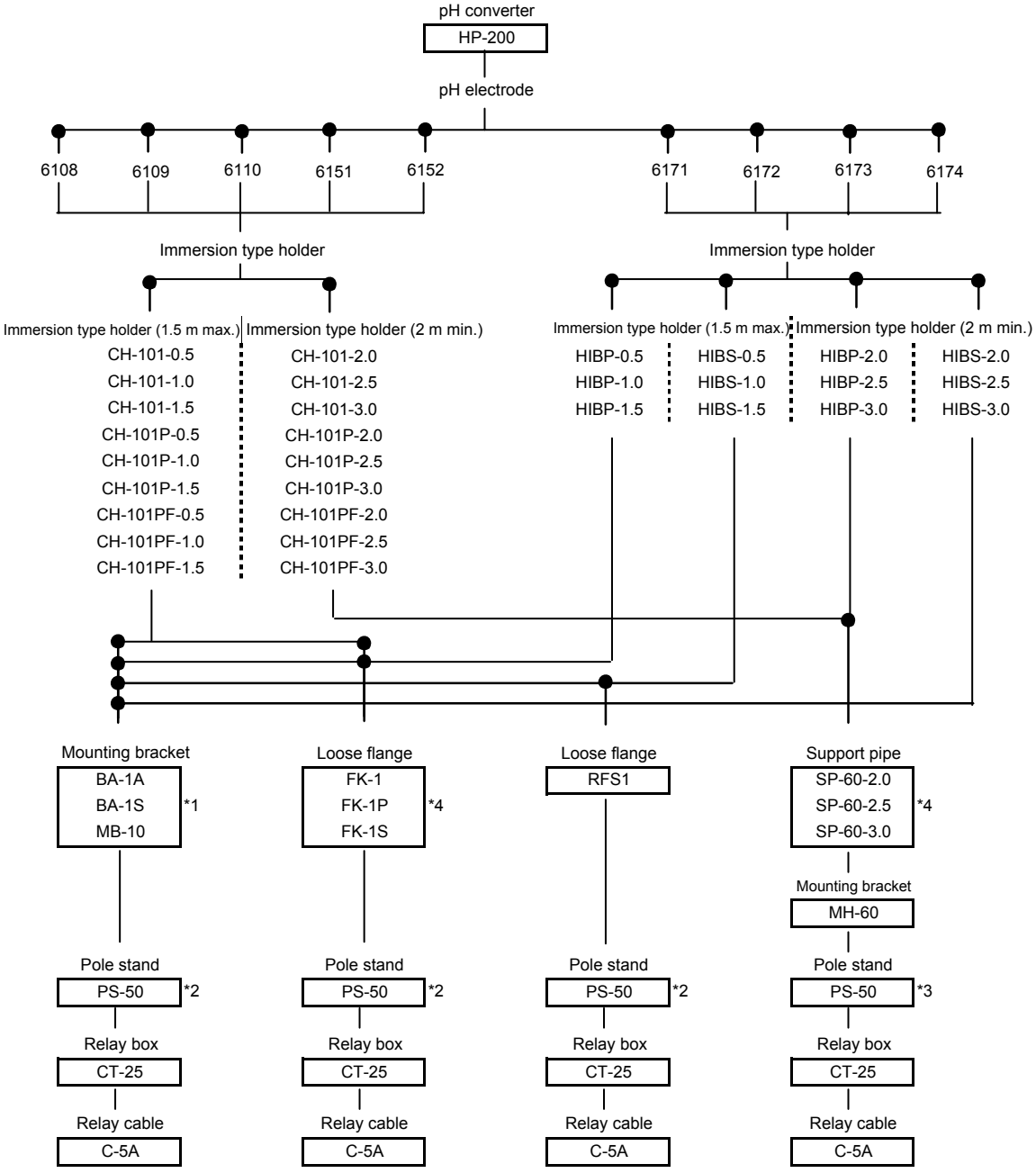
For pH electrodes with S and SE terminals, such as 6171, 6172, 6173, and 6174



■ Combinations

The following diagram shows the possible combinations of converters, electrodes, holders, and others.
For the detailed specifications, see the items of each product.

When the immersion type holder is used:



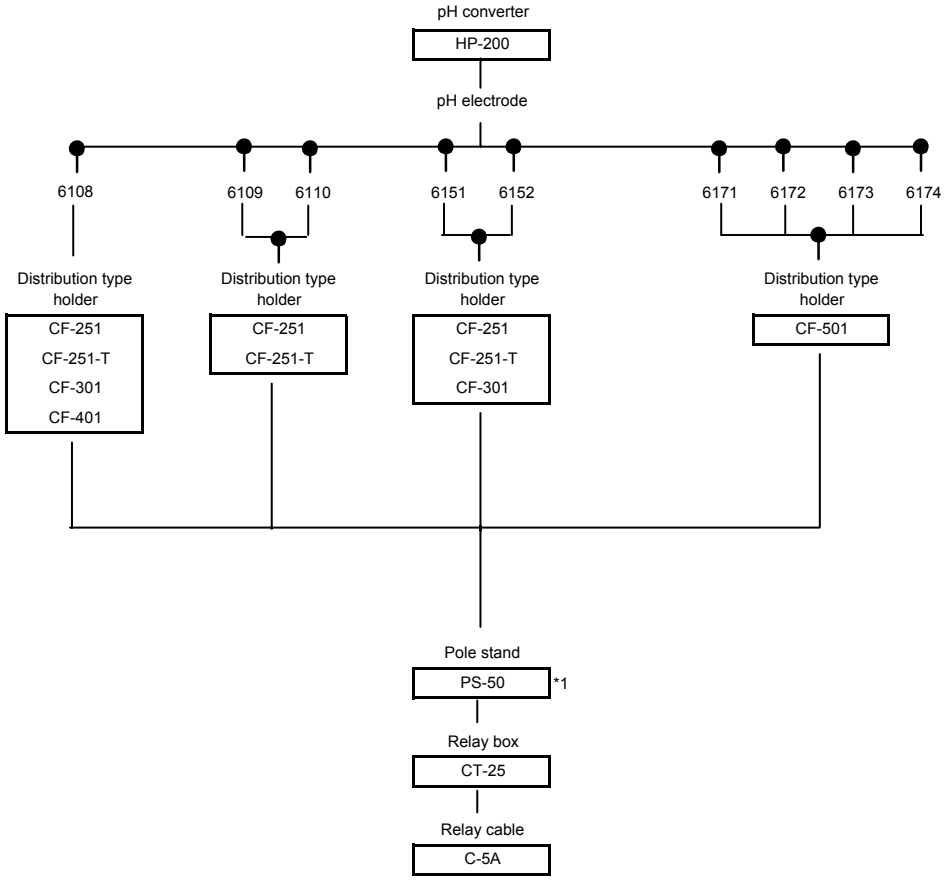
*1: For the immersion type holder HIBS, only the MB-10 is applicable.

*2: This pole stand is used to attach the converter and the CT-25 (relay box).

*3: This pole stand is used to attach the converter, the CT-25 (relay box), and the MH-60 (mounting bracket).

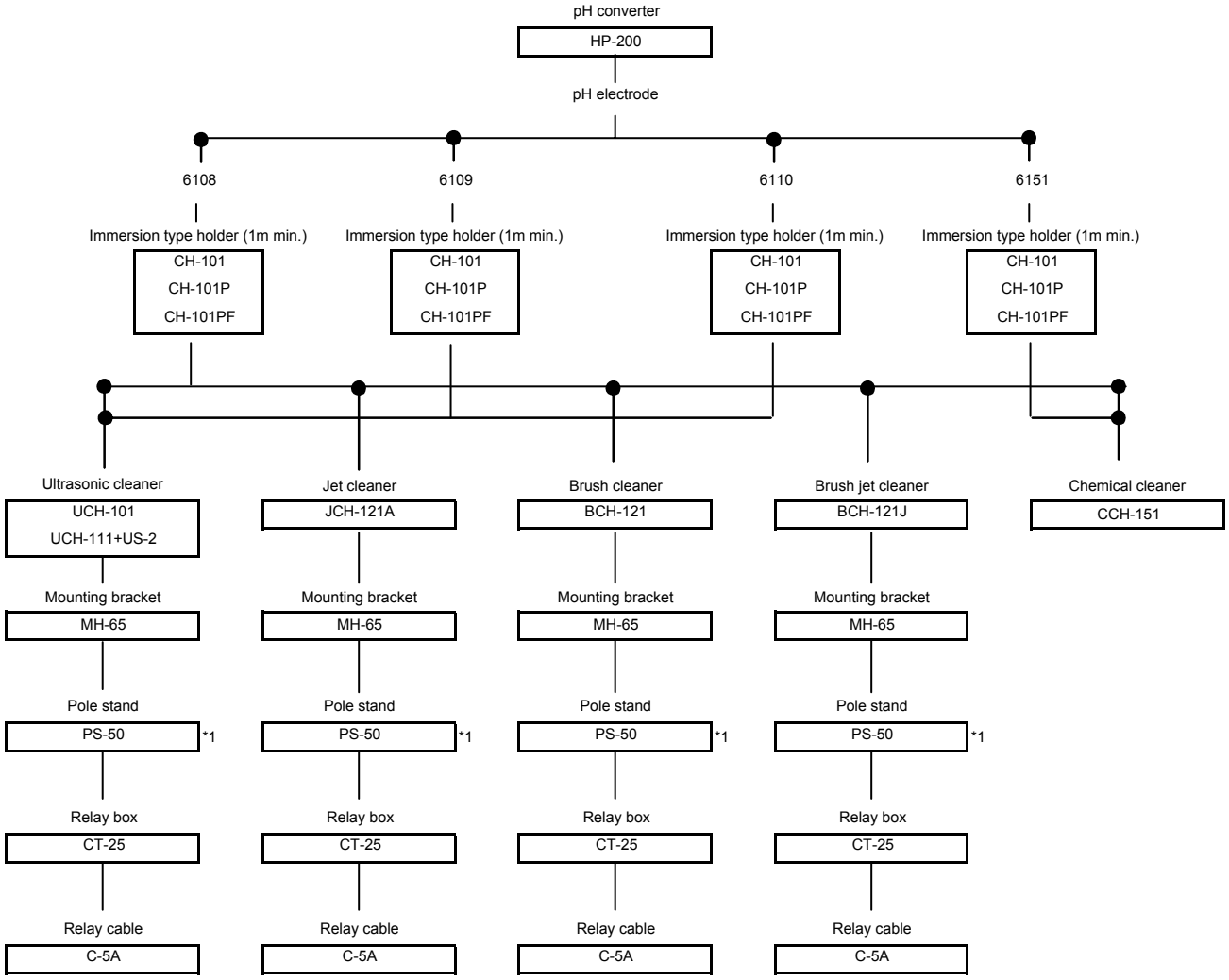
*4: For any combinations with the CH-101PF series, contact us.

When the distribution type holder is used:



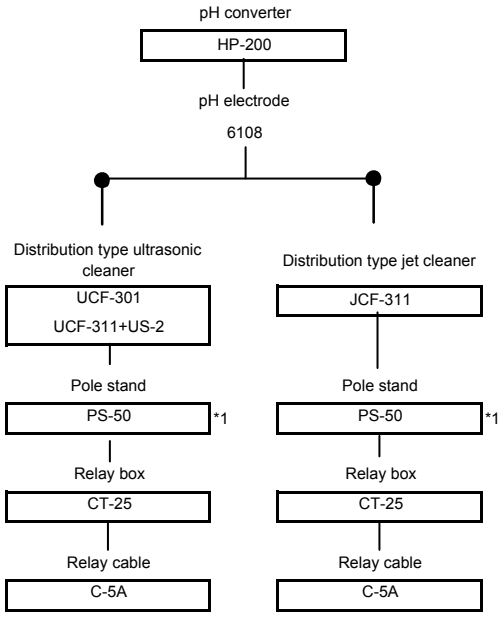
*1: This pole stand is used to attach the converter and the CT-25 (relay box).

When the immersion type cleaner is used:



*1: This pole stand is used to attach the converter, the CT-25 (relay box9, and the MH-60 (mounting bracket).

When the distribution type cleaner is used:



*1: This pole stand is used to attach the converter.

■ Specification 1

Product name	Industrial pH converter		
Model	HP-200		
Combination electrode	Glass electrode		
Measurable range	pH		pH 0 to 14 (display range: pH1 to pH15)
	Temperature		0 to 100°C When the automatic detection capability of temperature sensor types is used: Display range:-10 to 110°C When a temperature sensor type is manually specified: Display range:-20 to 130°C
Display resolution	pH		0.01pH
	Temperature		0.1℃
Performance	Concentration	Repeatability	Within ±0.03 pH (for equivalent input)
		Linearity	Within ±0.03 pH (for equivalent input)
	Temperature	Repeatability	Within ±0.3℃(for equivalent input)
		Linearity	Within ±0.3℃(for equivalent input)
Transmission output	Number of output points		2 (the negative terminals for transmission outputs are internally connected to each other and have the same electric potential.)
	Output type		4 to 20 mA DC, input/output insulation type
	Load resistance		900Ω max.
	Repeatability		Within ±0.02 mA (output only)
	Linearity		Within ±0.08 mA (output only)
	Output range	Output 1	pH: Selectable from the fixed range or freely specifiable within the measurable range.
		Output 2	Temperature: Freely specifiable within a range between -20 ℃ and 130℃
	Error output		With burn-out capability (3.8 or 21 mA)
	Hold capability		Selectable from previous value hold, arbitrary value hold, and calibration value hold
Contact output	Number of output points		5
	Output type		No-voltage contact output
	Contact type		Relay contact, SPDT (1c)
	Contact capacity		250 VAC 3 A; 30 VDC 3A (resistance load)
	Contact function	RI,R2	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, and time sharing proportional control (closed when the alarm is triggered; normally open; opened when the power is turned OFF)
		R3,R4	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, transmission output hold, and washing output (closed when the alarm is triggered; normally open; opened when the power is turned
		FAIL	Error alarm (closed when normal; opened when an error occurs; opened when the power is turned OFF)
	Description of alarm function		• Setting range: 0.00 to 14.00 pH • Delay time: 0 to 600 seconds
	Description of control function	ON/OFF	Setting range:0.00 to 14.00 pH Controllable range:0.02 to 4.00 pH (±0.01 to ±2.00 pH)
		Time-sharing proportional	Setting range :0.00 to 14.00 pH
			Proportional band :0.02 to 4.00 pH
			Frequency :5 to 300 seconds
			Control output shift function : 0 to 50 shifts of the frequency are possible. Frequency : If the deviation falls within a certain range (F-zone), the frequency is automatically extended in accordance with that deviation (this feature is disabled when the shift function is selected).
			F-zone : 1-100% of proportional zone (If the deviation falls within the above range, the frequency is automatically extended.)
			Max. frequency extension time : 0 to 300 seconds
			Max. control amount : 50-100% (valid regardless of proportional zone)
Washing output	Number of output points		1
	Output type		Voltage contact output (output of connected power supply voltage)
	Contact type		Relay contact, SPST (1a)
	Contact capacity		250 VAC 3 A; 30 VDC 3 A (resistance load)
	Contact function		Actuation of solenoid valve for washing
	Description of settings	Washing frequency	0.1 to 168.0 hours
		Washing time	2 to 600 seconds
		Hold time	2 to 600 seconds
	Timer accuracy		Within 2 minutes per month
	Description of washing		• Function as internal timer • Function as internal timer and function with external input • The internal timer is enabled only when external input is used. • Washing start signal (the internal washing sequence is started when this signal is kept ON for 2 seconds or more) Select one of the above options.

■ Specifications 2

Contact input	Number of input points	1		
	Contact type	Open collector, no-voltage a-contact		
	Conditions	ON resistance: 100Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC		
	Contact function	External input for washing		
Communication function	Method	RS-485		
	Signal type	Two-wire, input/output insulated type (not insulated from transmission output)		
Temperature compensation	Applicable temperature element	Platinum resistive element: 1 kΩ(0°C)		
		Positive temperature-sensitive resistive element: 10 kΩ(25°C), positive temperature-sensitive resistive element: 500 Ω(25°C), 6.8 kΩ(25°C), 10 kΩ(25°C)		
	Applicable temperature element	Automatic detection of automatic temperature sensor type or manual selection (omission of temperature compensation is also possible)		
	Temperature compensation range	0 to 100°C		
	Temperature calibration function	One-point calibration using comparison with reference thermometer		
Calibration	Calibration method	Automatic or manual		
	Number of calibration points	Selectable from 1, 2, and 3		
	Kinds of standard solutions	pH2, 4, 7, 9, and 10		
		Arbitrary standard solution (difference of 2 pH min.) for manual calibration		
	Additional functions	Automatic detection of kind of standard solution		
		Automatic detection of stabilization of electric potential		
		Automatic detection of calibration failure (asymmetry potential, sensitivity, and response time)		
		Calibration history (asymmetry potential, sensitivity, and number of days elapsed after last calibration)		
Self-diagnostics	Calibration errors	Asymmetry potential error, sensitivity error, response time error, and temperature calibration range error		
		Standard solution detection error		
	Electrode diagnostic error	Glass response membrane error		
		Comparison electrode impedance error (for only electrode with fluid grounding terminal)		
		Temperature sensor short-circuit, temperature sensor error, and temperature measurement range error		
	Converter error	CPU error, ADC error, and memory error		
Operating temperature range	-20**℃** to 55**℃** (without freeze)			
Operating humidity range	Relative humidity: 5% to 90% (without condensation)			
Storage temperature	-25 to 65**℃**			
Power source	Power supply voltage range	90 to 264 VAC 50/60Hz		
	Power consumption	15 VA (max)		
	Others	With built-in time lag fuse (250 V, 1 A)		
		With built-in power switch for maintenance		
Applicable standards	CE marking	EMC Directive (2004/108/EC) EN61326-1:2006		
		Low Voltage Directive (2006/95/EC) EN61010-1:2001		
		EMC Immunity Industrial location	Electrostatic discharge	IEC61000-4-2
			Radiated radiofrequency electromagnetic field	IEC61000-4-3(*1)
			Electric fast transient/burst	IEC61000-4-4
			Surge	IEC61000-4-5(*2)
			Conducted interference induced by radiofrequency	IEC61000-4-6(*1)
			Voltage dip, short-time power outage, and voltage fluctuation	IEC610000-4-11
		Emission ClassA	Radiated disturbance	CISPR 11 CLASSA
			Noise terminal voltage	CISPR 11 CLASSA
		Low voltage	Contamination level 2	
	FCC Rules	Part 15 CLASS A		
Structure	Installation	Outdoor installation type		
	Installation method	50 A pole or wall mounting		
	International protection code	IP65		
	Case material	Aluminum alloy (coated with epoxy modified melamine resin)		
	Mounting bracket material	SUS304		
	Hood material	SUS304 stainless steel (coated with epoxy modified melamine resin)		
	Readout window material	Polycarbonate		
	Readout element	Reflection type monochrome LCD		
External dimensions	180 (W) x 155 (H) x 115 (D) (excluding the mounting bracket)			
Weight	Body: Approx. 3.5 kg; hood and mounting bracket: Approx. 1 kg			

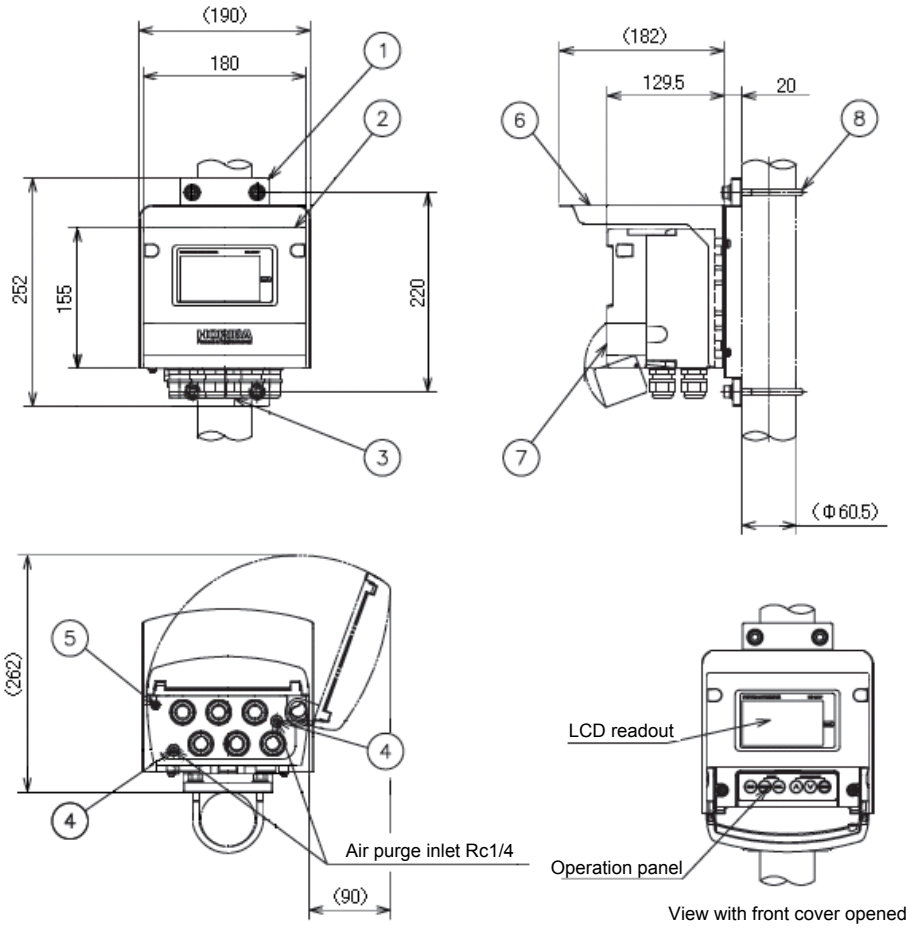
*1: The readout effect standard for the radiated radiofrequency electromagnetic field and conducted interference tests specifies the measured pH value ± 0.25 pH.

*2: When the sensor cable, the transmission cable, or the contact input cable is extended to more than 30 m, the surge test in the EMC Directive is not applicable for CE marking.

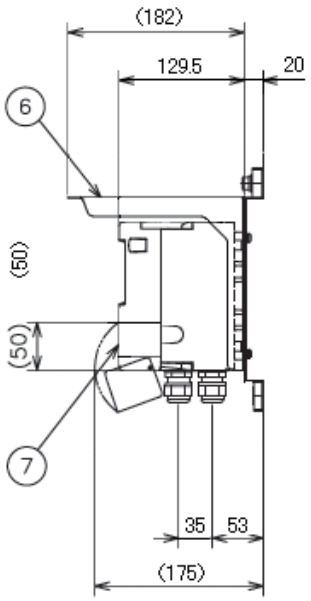
*3: An arrestor (sparkover voltage: 400 V) is provided for transmission output, contact input, and communication. However, use the most suitable surge absorption element on the connection line considering the ambient environment, the installation situation, and externally connected equipment.

■ External dimensions (HP-200 Industrial pH Meter)

(Pole mounting)



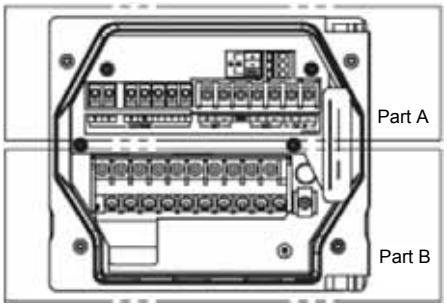
(Wall mounting)

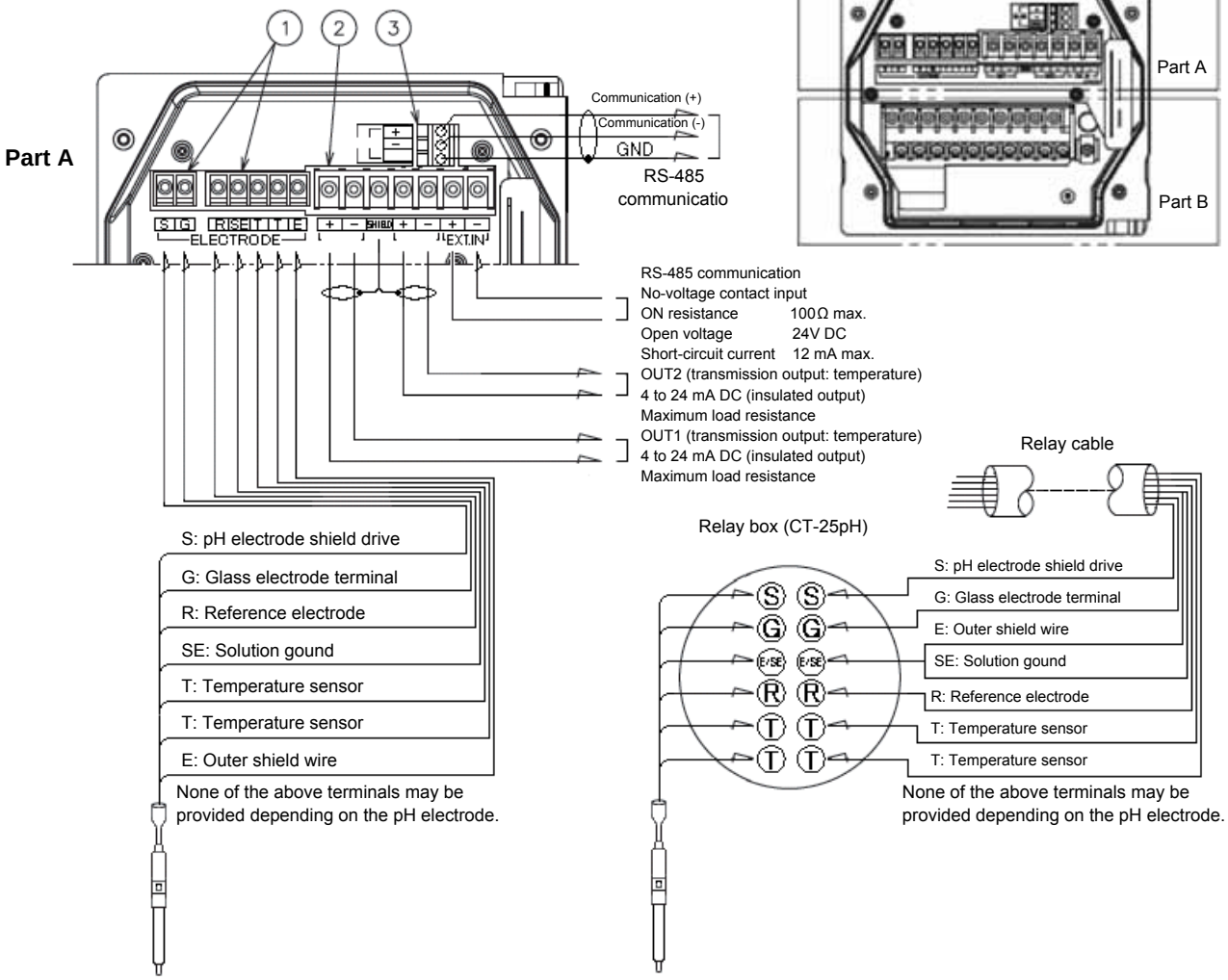


	PARTS	NOTES
(1)	Mounting plate	SUS304
(2)	Case	ADC12
(3)	Wiring hole	O.Df7 to f12cable
(4)	Plug	SUS304
(5)	Earth	SUS304 M4
(6)	Cover	SUS304
(7)	Front cover	ADC12
(8)	U-bolt	SUS304 50A MB

Coated with epoxy modified melamine resin
(Munsell 10PB/7/1)
Pole mounting type: Approx. 3.9 kg; wall mounting type: Approx. 3.7 kg
IP65 (IEC60529, JIS C0920)

■ External connection diagram 1 (HP-200)

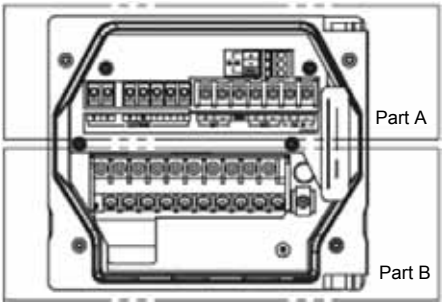


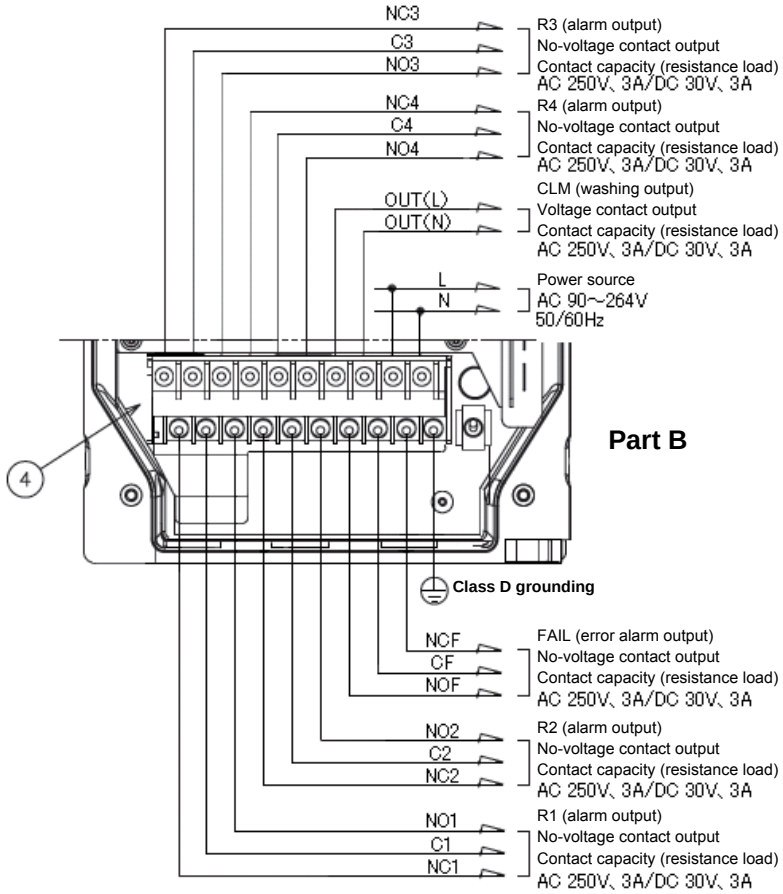


	Terminal screw	Applicable crimp-type terminal	Applicable electric wire	Screw tightening torque
①	M3	MAX6.5, MAX3.2, MAX6.2	1.25mm²/MAX (AWG16)	0.8N・m
②	M3.5	MAX6.2, MAX3.6, MAX7.2	2mm²/MAX (AWG14)	0.8~1.2N・m
③	M3	11	0.14~2.5mm² (AWG26~14) Single or stand wire	0.5~0.6N・m

Note
・The screws on the terminal block cannot be removed. To make a connection to a terminal, turn the screw until it is floated.
・The negative terminals OUT1(-) and OUT2(-) are internally connected and have the same electric potential.
・ Set "R-SE Connection Setting" in the setup menu "SENSOR" of the HP-200 to CLOSE.
(when any of the pH electrodes 6108, 6109, 6110, 6151, and 6152 is used)
・ Set "R-SE Connection Setting" in the setup menu "SENSOR" of the HP-200 to OPEN.
(when any of the pH electrodes 6171, 6172, 6173, and 6174 is used)

■ External connection diagram 2 (HP-200)

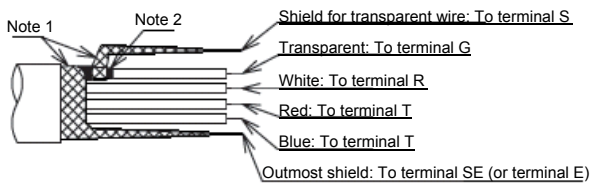




	Terminal screw	Applicable crimp-type terminal	Applicable electric wire	Screw tightening torque
④	M4	MAX8, MAX4.7, MAX8.5	5.5mm²/MAX (AWG10)	1.2~1.8N・m

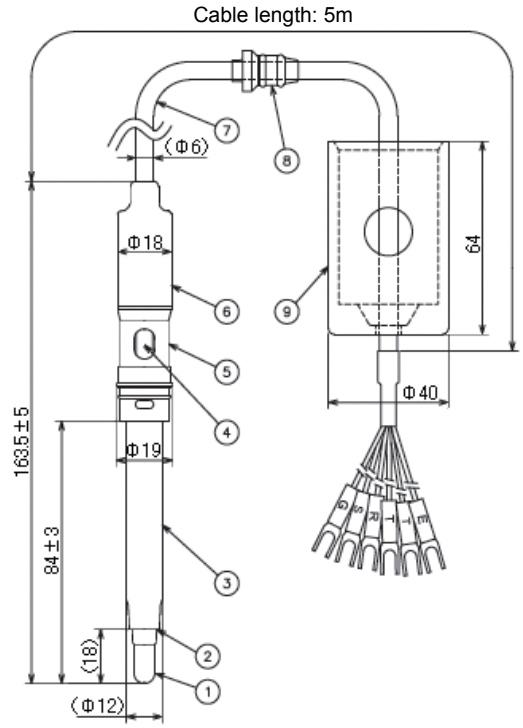
Note
The screws on the terminal block cannot be removed. To make a connection to a terminal, turn the screw until it is floated.

Relay cable termination



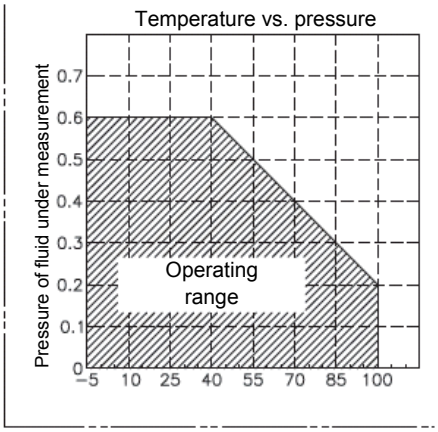
Note : Insulate the braided shields to terminals S and SE with insulating tubes or the like so that they do not come into contact with each other.
: Strip the covering (conductive plastic: black) of transparent wire up to the root.

■ pH electrode (6108)

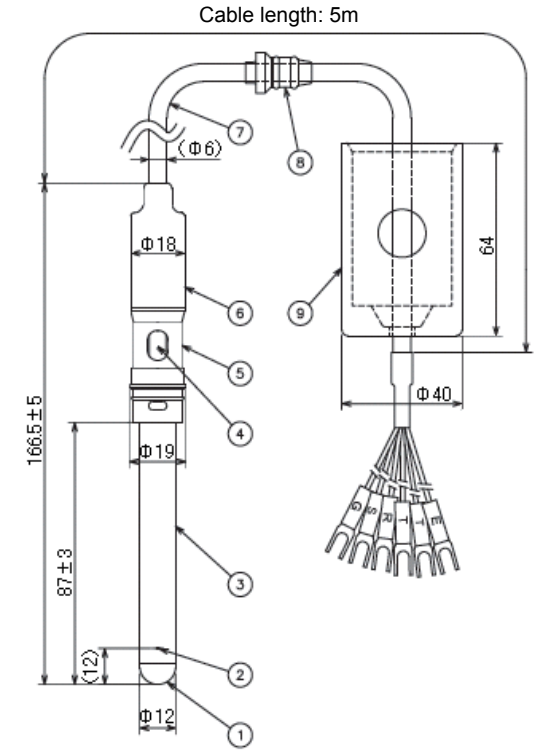


Model		6108-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10 to 100°C (without freeze)
	Pressure	0 to 0.6MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	pH response membrane	Glass
(2)	Liquid junction	Porous ceramics
(3)	Supporting tube	Glass
(4)	Internal fluid inlet	
(5)	Sensor body	PP
(6)	Sensor cap	Silicone
(7)	Cable	PVC
(8)	Cable gasket	FKM
(9)	Holder cap	EPDM



■ pH electrode (6109)

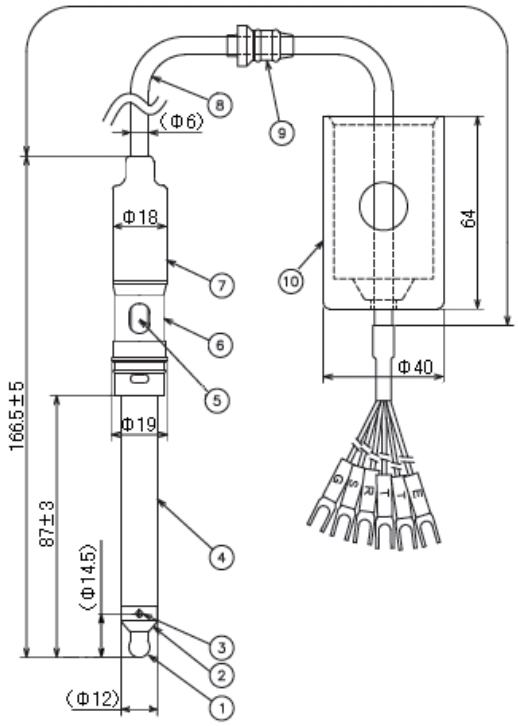


Model		6109-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10 to 80°C (without freeze)
	Pressure	0 to 0.03MPa
Comparison electrode	Liquid junction	Glass sleeve
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	pH response	Glass
(2)	Liquid junction	Glass sleeve
(3)	Supporting tube	Glass
(4)	Internal fluid inlet	
(5)	Sensor body	PP
(6)	Sensor cap	Silicone
(7)	Cable	PVC
(8)	Cable gasket	FKM
(9)	Holder cap	EPDM

■ pH electrode (6110)

Cable length: 5 m

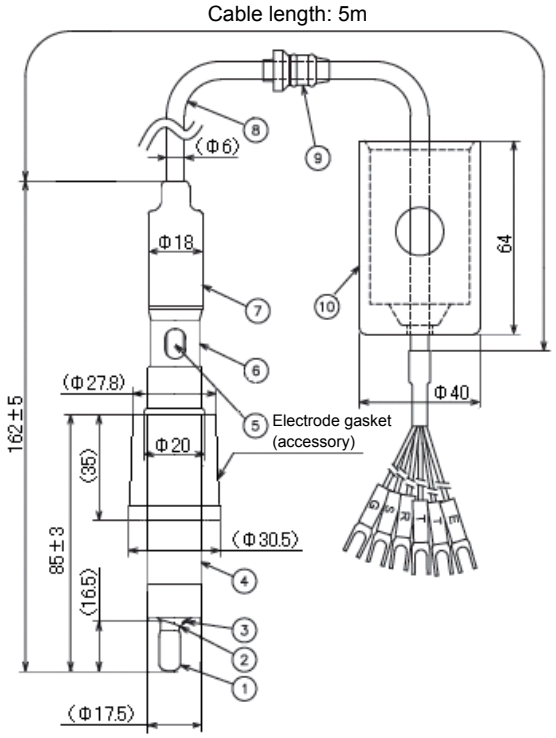


Model		6110-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	0 to 60°C (without freeze)
	Pressure	0 to 0.03MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	pH response membrane	Glass
(2)	Gasket	FKM
(3)	Liquid junction	Porous ceramics
(4)	Supporting tube	Glass
(5)	Internal fluid inlet	
(6)	Sensor body	PP
(7)	Sensor cap	Silicone
(8)	Cable	PVC
(9)	Cable gasket	FKM
(10)	Holder cap	EPDM

■ pH electrode (6151)

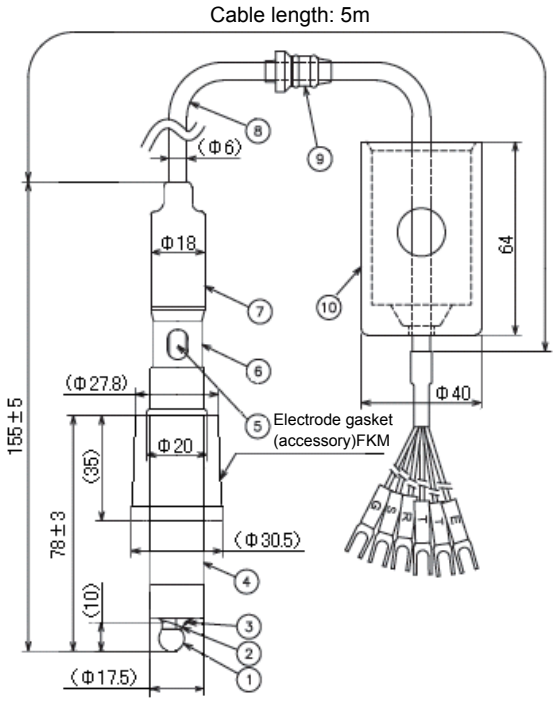
Cable length: 5m



Model		6151-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10 to 60°C (without freeze)
	Pressure	0 to 0.2MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol Kcl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	pH response membrane	Glass
(2)	Gasket	FKM
(3)	Liquid junction	Porous ceramics
(4)	Supporting tube	PSF
(5)	Glass	
(6)	Internal fluid inlet	PP
(7)	Sensor body	Sensor cap
(8)	Silicone	PVC
(9)	Cable	FKM
(10)	Cable gasket	EPDM

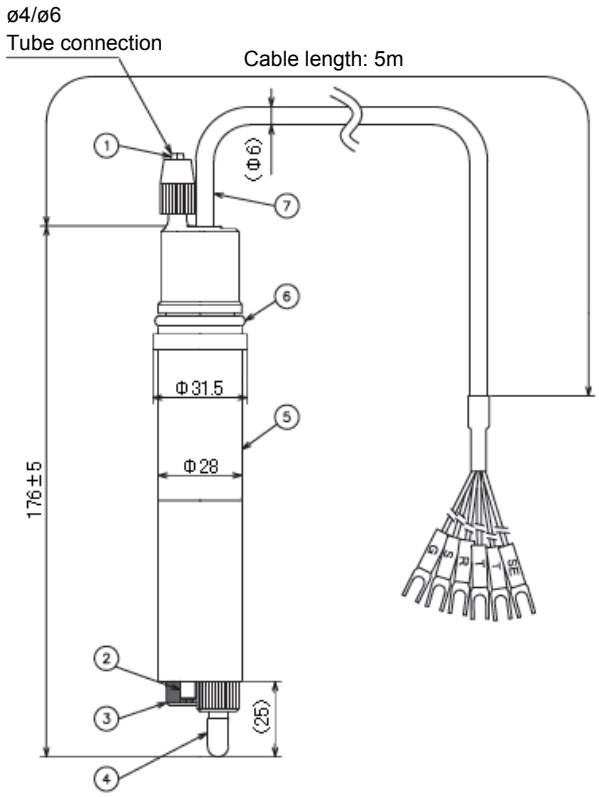
■ pH electrode (6152)



Model		6152-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10 to 60°C (without freeze)
	Pressure	0 to 0.2MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	pH response membrane	Glass
(2)	Gasket	FKM
(3)	Liquid junction	Porous ceramics
(4)	Supporting tube	PSF
(5)	Glass	
(6)	Internal fluid inlet	PP
(7)	Sensor body	Sensor cap
(8)	Silicone	PVC
(9)	Cable	FKM
(10)	Cable gasket	EPDM

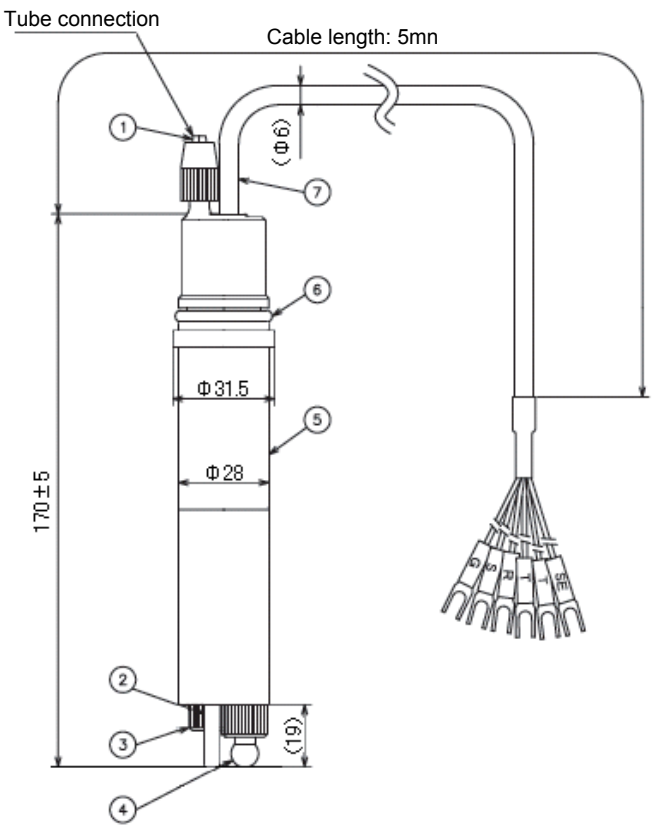
■ pH electrode (6171)



Model		6171-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10 to 60°C (without freeze)
	Pressure	0 to 0.03MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	Internal fluid inlet	PPS
(2)	Liquid junction pole	Ni-Cr arroy
(3)	Liquid junction chip	Porous ceramics
(4)	Glass sensor chip	7123
(5)	Sensor body	PPS
(6)	O-ring	FKM
(7)	Sensor cap	Silicone
(8)	Cable	PVC

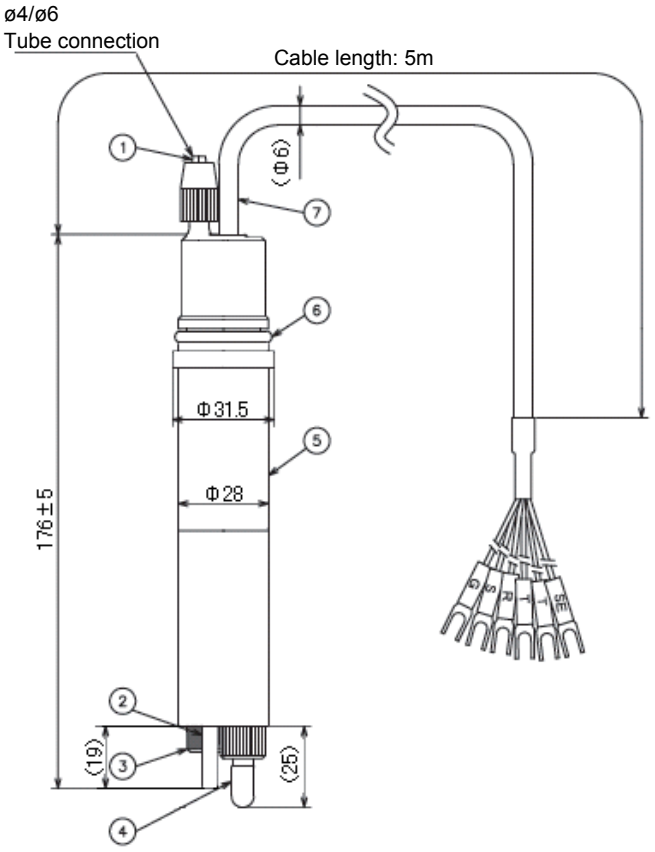
■ pH electrode (6172)



Model		6172-50B
Measuring method		Glass electrode method
Measurable range		**pH 0 to 14**
Sample water conditions	Temperature range	-10 to 60°C (without freeze)
	Pressure	0 to 0.03 MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3 mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	Internal fluid inlet	PPS
(2)	Liquid junction pole	Ti
(3)	Liquid junction chip	Porous ceramics
(4)	Glass sensor chip	7124
(5)	Sensor body	PPS
(6)	O-ring	FKM
(7)	Sensor cap	Silicone
(8)	Cable	PVC

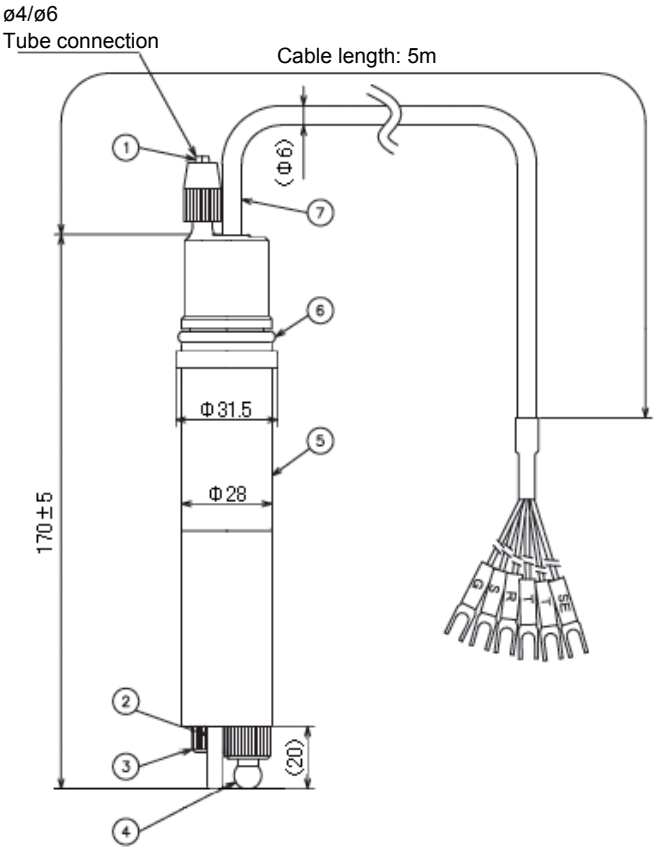
■ pH electrode (6173)



Model		6173-50B
Measuring method		Glass electrode method
Measurable range		**pH 0 to 14**
Sample water conditions	Temperature range	-10 to 60°C (without freeze)
	Pressure	0 to 0.03MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	Internal fluid inlet	PPS
(2)	Liquid junction pole	Ti
(3)	Liquid junction chip	Porous ceramics
(4)	Glass sensor chip	7123
(5)	Sensor body	PPS
(6)	O-ring	FKM
(7)	Sensor cap	Silicone
(8)	Sensor cap	PVC

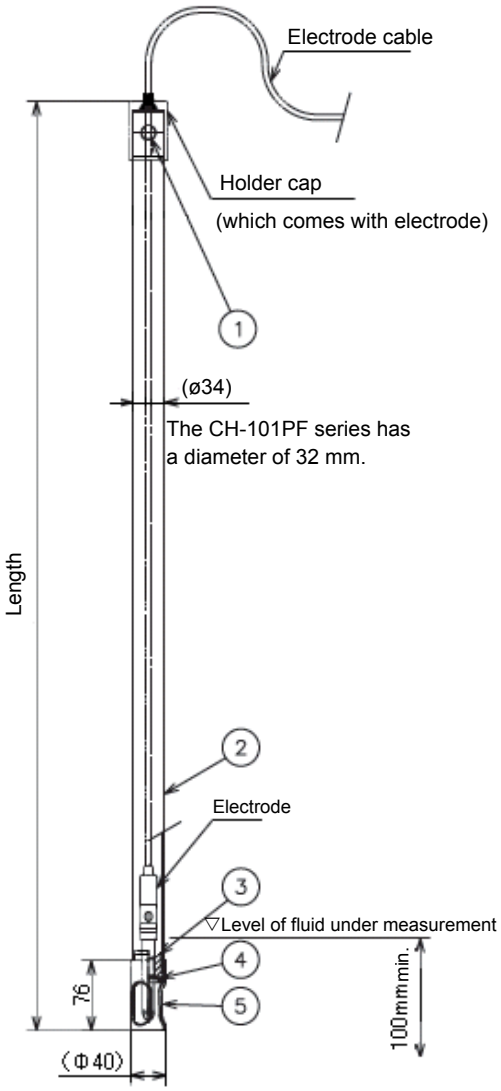
■ pH electrode (6174)



Model		6174-50B
Measuring method		Glass electrode method
Measurable range		**pH 0 to 14**
Sample water conditions	Temperature range	-10 to 100°C (without freeze)
	Pressure	0 to 0.03MPa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

	PARTS	NOTES
(1)	Internal fluid inlet	PPS
(2)	Liquid junction pole	Ti
(3)	Liquid junction chip	Porous ceramics
(4)	Glass sensor chip	7122
(5)	Sensor body	PPS
(6)	O-ring	FKM
(7)	Sensor cap	Silicone
(8)	Sensor cap	PVC

■Immersion type holder (CH-101 series): specifications and external dimensions

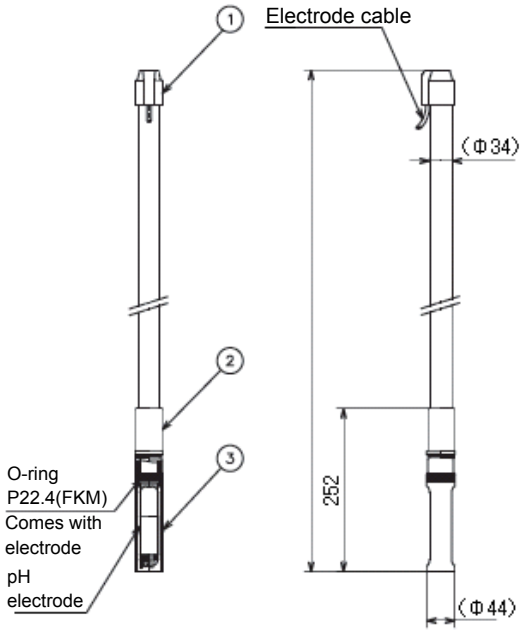


	PARTS	NOTES
(1)	Internal fluid inlet	
(2)	Holder	PP(CH-101)
		PVC(CH-101P)
		PVDF(CH-101PF)
(3)	Electrode gasket	FKM
(4)	Washer	PP(CH-101、CH-101P)
		PVDF(CH-101PF)
(5)	Protective tube	PP(CH-101、CH-101P)
		PVDF(CH-101PF)

Nominal length	Length (mm)
0.5m	500±10
1m	1000±10
1.5m	1500±10
2m	2000±10
2.5m	2500±10
3m	3000±10

Model			CH-101 series	CH-101P series	CH-101PF series
Holder material			PP	PVC	PVDF
Temperature			-5 to 80°C	-5 to 50°C	-5 to 100°C
			For the actual operating temperature range, check the specifications of the electrodes to be combined.		
Pressure			Atmospheric pressure		
Flow rate			2 m/sec. max.		
Wetted material		Electrode gasket	FKM	FKM	FKM
		Washer	PP	PP	PVDF
		Protective tube	PP	PP	PVDF
Holder length (m)			0.5, 1, 1.5, 2, 2.5, 3		
Weight (kg)	Holder length	0.5m	Approx 0.2	Approx 0.23	Approx 0.25
		1m	Approx 0.3	Approx 0.45	Approx 0.45
		1.5m	Approx 0.45	Approx 0.67	Approx 0.65
		2m	Approx 0.6	Approx 0.89	Approx 0.85
		2.5m	Approx 0.75	Approx 1.11	Approx 1.05
		3m	Approx 0.9	Approx 1.33	Approx 1.25

■ Immersion type holder (HIBP series): specifications and external dimensions

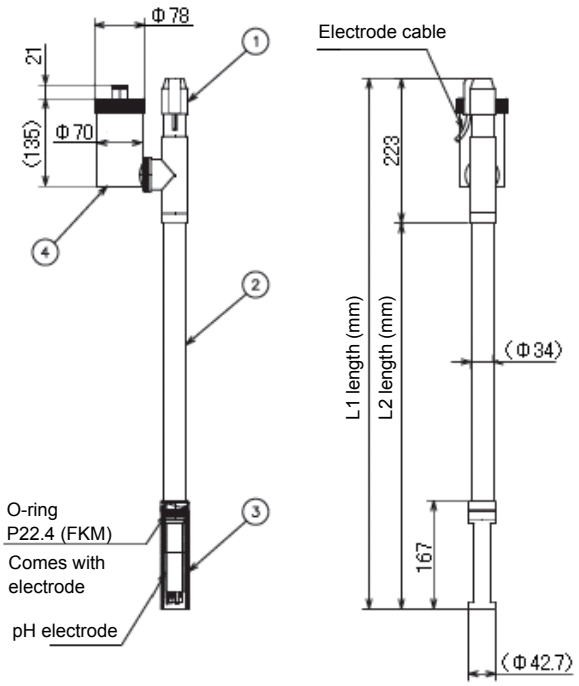


Model	HIBP
Holder material	PP
Temperature	-5 to 80°C
	For the actual operating temperature range, check the specifications of the electrodes to be combined.
Pressure	Atmospheric pressure
Flow rate	2 m/sec. max.
Wetted material	PP (excluding the electrode)

	PARTS	NOTES
(1)	Holder cap	EPT
(2)	Holder	PP
(3)	Protective tube	PP

Nominal length	Length (mm)
0.5m	772±10
1m	1272±10
1.5m	1772±10
2m	2272±15
2.5m	2772±20
3m	3272±20

■ Immersion type holder (HIBS series): specifications and external dimensions

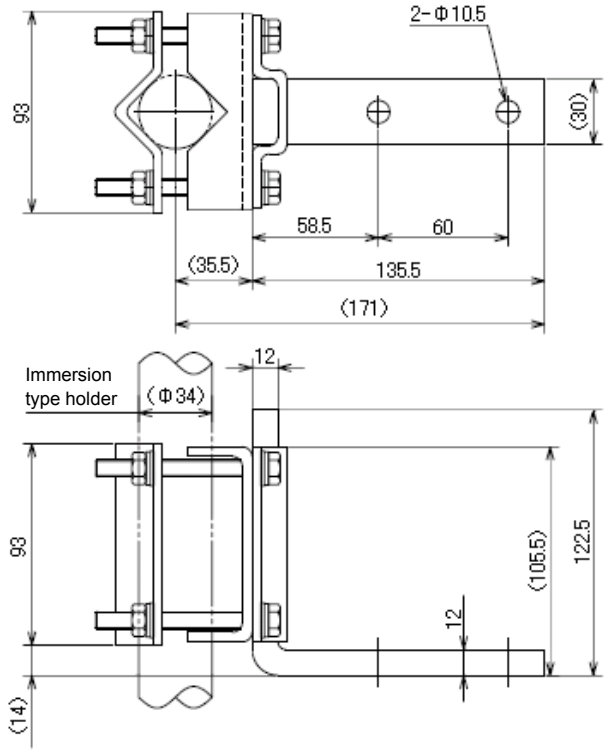


Model	HIBS
Holder material	SUS316
Temperature	-5 to 100°C
	For the actual operating temperature range, check the specifications of the electrodes to be combined.
Pressure	Atmospheric pressure
Flow rate	2 m/sec. max.
Wetted material	SUS316 (excluding the electrode)

	PARTS	NOTES
(1)	Holder cap	EPT
(2)	Holder	SUS316
(3)	Protective tube	SUS316
(4)	KCl internal solution tank	PC 300ml

Nominal length	L1 length (mm)	L2 length (mm)
0.5m	818±10	595
1m	1318±10	1095
1.5m	1818±15	1595
2m	2318±20	2095
2.5m	2818±20	2595
3m	3318±20	3095

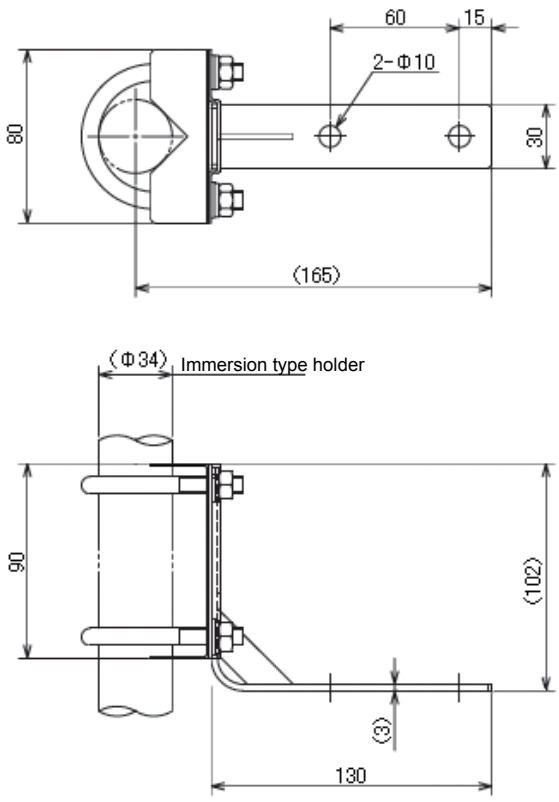
■ Mounting bracket (BA-1A): specifications and external dimensions



Model	BA-1A
Material	ABS resin
Mounting	Anchoring

Applicable for immersion type resin-made holders of 1.5 m max.

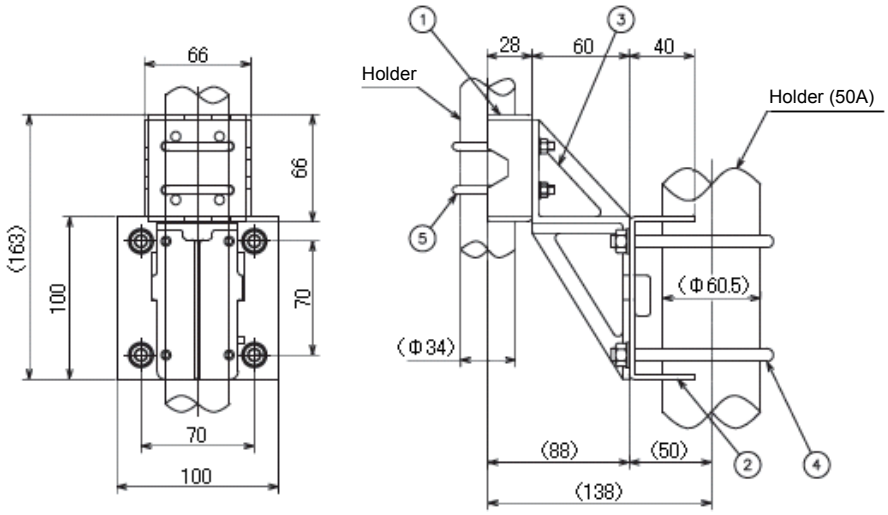
■ Mounting bracket (BA-1S): specifications and external dimensions



Model	BA-1S
Material	SUS304
Mounting	Anchoring

Applicable for immersion type resin-made holders of 1.5 m max.

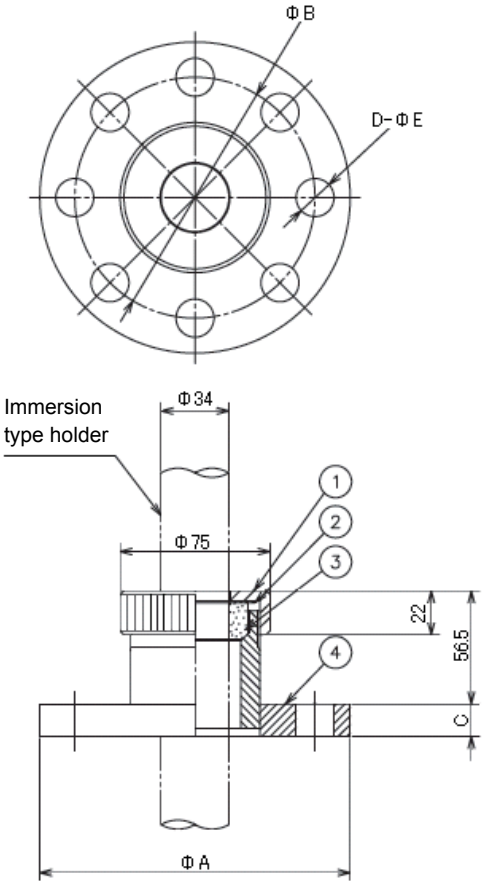
■ Mounting holder (MB-10): specifications and external dimensions



	PARTS	NOTES
(1)	Base 1	SUS304
(2)	Mounting plate	SCS13
(3)	Base 2	SUS304
(4)	U-bolt	SUS304

Mounting pipe: 50 A
*1: If any wobble or vibration occurs, the immersion type holder may drop off.
Fasten four points with M5 screws.

■ Mounting bracket (FK-1 series): specifications and external dimensions



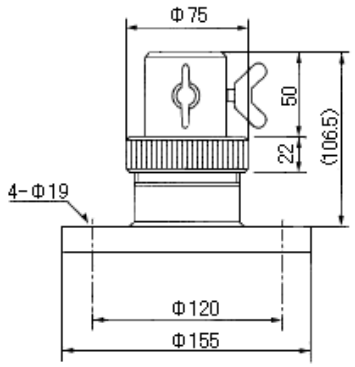
Model		FK-1	FK-1P	FK-1S
Material	Flange	PP	PVC	SUS316
	Nut	PP	PVC	SUS304
	Washer	PP	PVC	PP
	Gasket	FKM	FKM	FKM
Flange standard		JIS 10K 50A FF, etc.		

Applicable for immersion type resin-made holders of 1.5 m max.
For possible combinations with the CH-101PF, contact us.

	PARTS	NOTES
(1)	Hexagon cap nut	-
(2)	Washer	-
(3)	Gasket	FKM
(4)	Loose flange	-

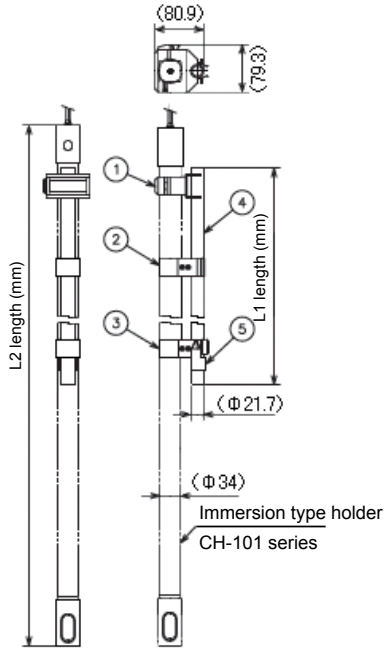
Flange standard	ΦA	ΦB	C	D-ΦE
JIS 10K 50A FF	Φ155	Φ120	16	4-Φ19
JIS 10K 100A FF	Φ210	Φ175	18	8-Φ19
JIS 10K 150A FF	Φ280	Φ240	22	8-Φ23
JIS 10K 200A FF	Φ330	Φ290	22	12-Φ23

■ Mounting bracket (RF-S1): specifications and external dimensions



Model	RF-S1
Material	SUS316
Flange standard	JIS 10K 50A FF, etc.
Applicable immersion type holders	HIBS series

■ Supporting bracket (SP-60): specifications and external dimensions



Model	SP-60
Material	SUS316
Applicable holder length	1,1.5,2,2.5,3
Applicable holder	CH-101 series

The support pipe may be required when the flow rate is fast even if the holder length is less than 1.5 m.

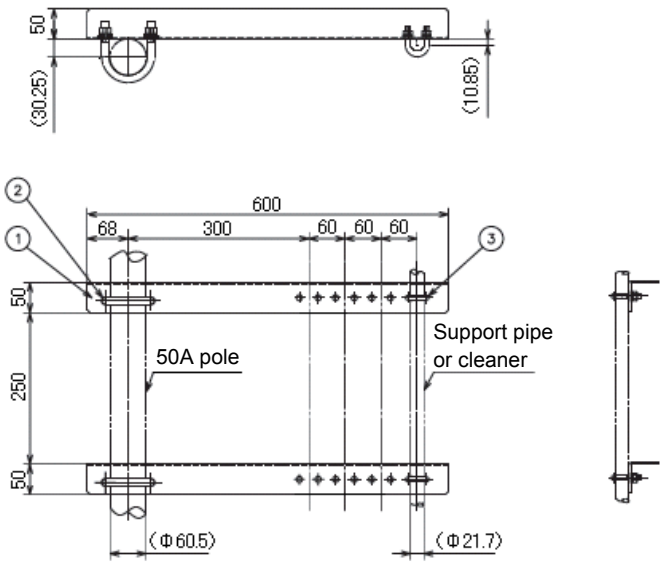
	PARTS	NOTES
(1)	Holder mounting bracket	PVC
(2)	Intermediate hook	SUS316
(3)	Hook	SUS316
(4)	Support pipe	SUS316
(5)	Stopper	SUS316

The intermediate hook is provided when the immersion type holder length is 2 m or more.

	Support type: L1 dimension (mm)	Immersion type holder: L2 dimension (mm)
For 1 m	500±10	1000 ±10
For 1.5 m	1000±10	1500 ±10
For 2 m	1500±10	2000 ±10
For 2.5 m	2000±10	2500 ±10
For 3 m	2500±10	30000 ±10

*For possible combination with the CH-101PF, contact us.

■ Mounting bracket (MH-60): specifications and external dimensions

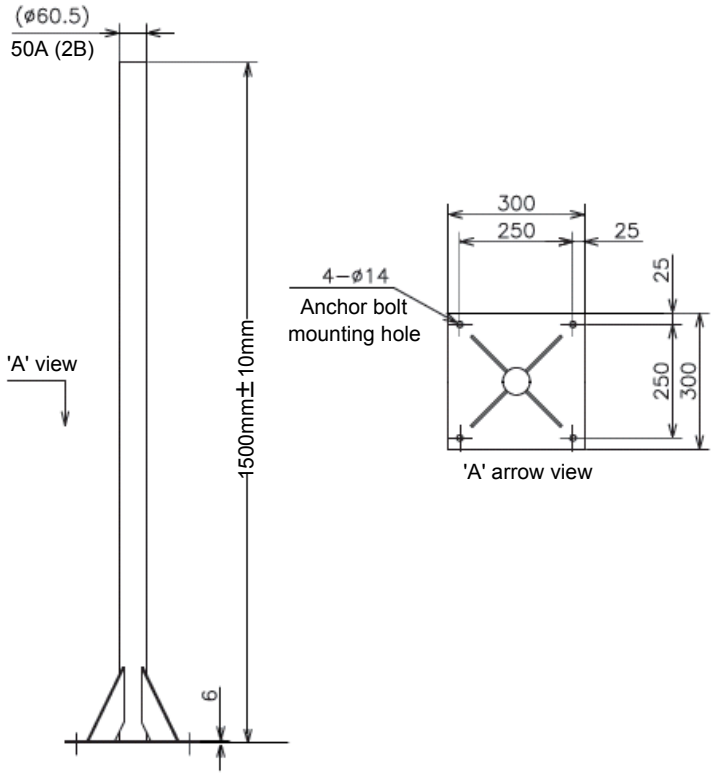


Model		MH-60
Material	Arm	SUS304
	U-bolt	SUS304
Mounting pipe		50A

Used to secure the support pipe (SP-60 series) to the pole stand.

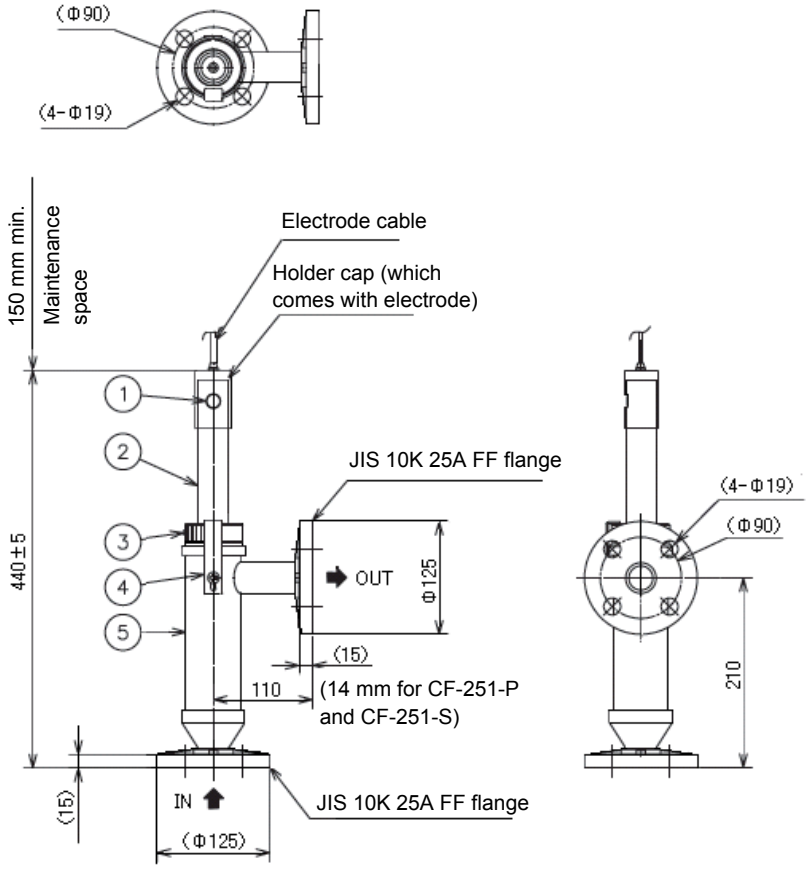
	PARTS	NOTES
(1)	**Arm**	SUS304
(2)	U-bolt	SUS304 stainless steel (for 50A)
(3)	U-bolt	SUS304 stainless steel (for 15A)

■ Pole stand (PS-50): specifications and external dimensions



Model	PS-50-300
Material	SUS304
Pipe diameter	50A

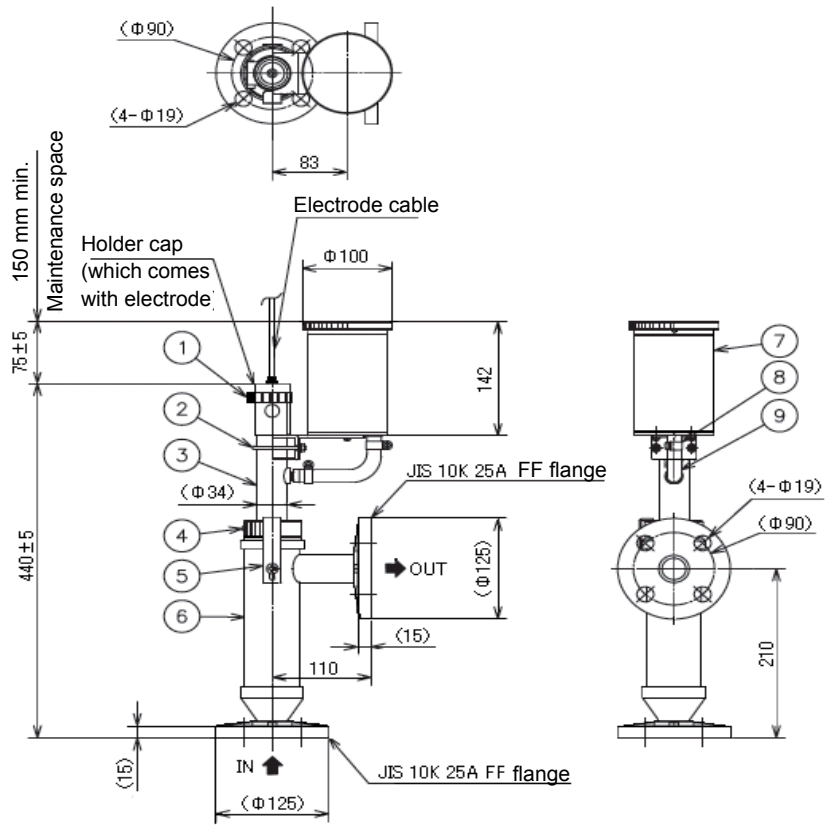
■ Distribution type holder (CF-251-T series): specifications and external dimensions



Model		CF-251	CF-251P	CF-251S
Material of distribution holder		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temperature	-5 to 80°C	-5 to 50°C	-5 to 100°C
	For the actual operating temperature range, check the specifications of electrodes to be combined.			
	Pressure	Atmospheric pressure		
	Flow Rate	0.3 to 10L/min		
Materials of Liquid Junction Section	Gasket	FKM	FKM	FKM
	Washer	PP	PP	PVDF
	Protective tube	PP	PP	PVDF
	If any problem with weatherability occurs under direct sunshine, use a holder made of PVC or a holder made of SUS316+PVDF. For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.			
Mass		Approx. 0.6 kg	Approx. 0.9 kg	Approx. 4.5 kg

	PARTS	NOTES
(1)	Internal solution refilling	
(2)	Holder	PP(CF-251)
		PVC(CF-251P)
		PVDF(CF-251S)
(3)	Tightening nut	PP(CF-251)
		PVC(CF-251P)
		SUS304(CF-251S)
(4)	Lock plate	SUS304
(5)	Distribution holder	PP(CF-251)
		PVC(CF-251P)
		SUS316(CF-251S)

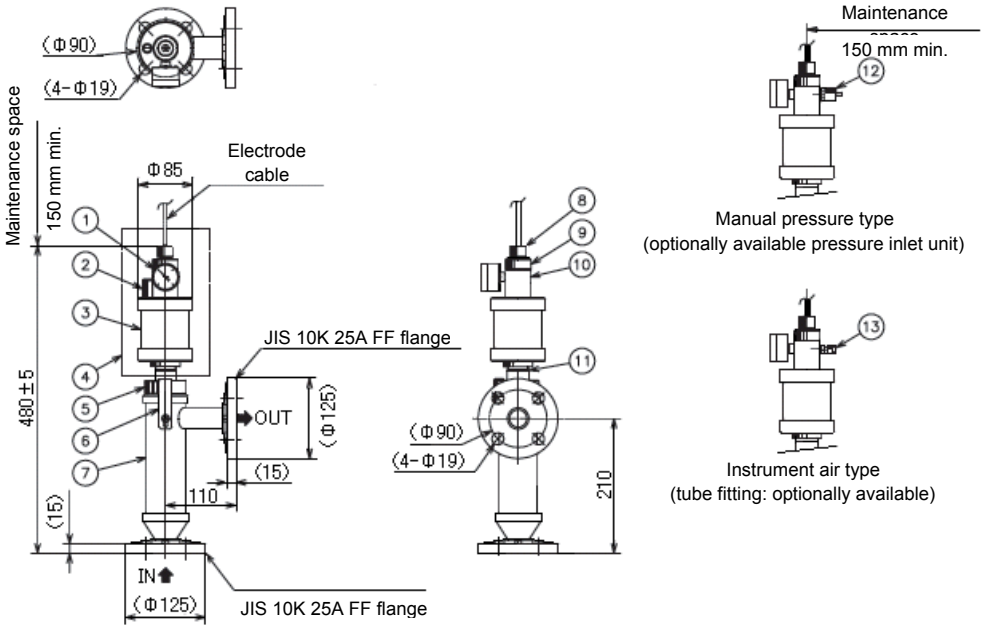
■ Distribution type holder (CF-251-T series): specifications and external dimensions



Model		CF-251-T	CF-251P-T	CF-251S-T
Holder material		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temperature	-5 to 80°C	-5 to 50°C	-5 to 100°C
	For the actual operating temperature range, check the specifications of electrodes to be combined.			
	Pressure	Atmospheric pressure		
	Flow Rate	0.3 to 10L/miln		
Materials of Liquid Junction Section	Gasket	FKM	FKM	FKM
	Washer	PP	PP	PVDF
	Protective tube	PP	PP	PVDF
	If any problem with weatherability occurs under direct sunshine, use a holder made of PVC or a holder made of SUS316+PVDF. For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.			
Mass		Approx.1.3kg	Approx.1.6kg	Approx.5.2kg

	PARTS	NOTES
(1)	Tightening band	SUS304
(2)	Mounting bracket	SUS304
(3)	Holder	PP(CF-251-T)
		PVC(CF-251P-T)
		PVDF(CF-251S-T)
(4)	Tightening nut	PP(CF-251-T)
		PVC(CF-251P-T)
		SUS304(CF-251S-T)
(5)	Locking plate	SUS304
(6)	Distribution holder	PP(CF-251-T)
		PVC(CF-251P-T)
		SUS316(CF-251S-T)
(7)	KCl tank	PVC
(8)	Hose band	SUS304
(9)	Hose	PVC

■Distribution type holder (CF-301 series): specifications and external



	PARTS	NOTES
(1)	Pressure gauge	0 to 0.5MPa
(2)	KCl inlet	PVC
(3)	KCl tank	PVC (CF-301/CF-301P)
		PP (CF-301S)
(4)	Pressure holder	
(5)	Tightening nut	PP (CF-301)
		PVC (CF-301P)
		SUS304 (CF-301S)
(6)	Locking plate	SUS304

	PARTS	NOTES
(7)	Distribution holder	PP (CF-301)
		PVC (CF-301P)
		SUS316 (CF-301S)
(8)	Cable cap	PPO
(9)	Holder cap	PPO
(10)	Pressure mating screw	Rc1/8
(11)	Holder	PP (CF-301)
		PVC (CF-301P)
		SUS316 (CF-301S)
(12)	Pressure union	C3604
(13)	Fitting	for tube PVDF of 6 mm o.d./4 mm i.d.

Model		CF-301	CF-301P	CF-301S
Material of distribution holder		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temp	-5 to 80°C	-5 to 50°C	-5 to 100°C
		For the actual operating temperature range, check the specifications of electrode to be combined.		
	Pressure	-5 to 40°C: 0.30 MPa 40 to 60°C: 0.22 MPa 60 to 80°C: 0.15 MPa	-5 to 40°C: 0.30 MPa 40 to 50°C: 0.15 MPa	-5 to 40°C: 0.30 MPa 40 to 60°C: 0.25 MPa 60 to 80°C: 0.20 MPa 80 to 100°C: 0.15 MPa
	Flow Rate	0.3 to 10 L/min		
Materials of Liquid Junction Section	Gasket	FKM	FKM	FKM
	Washer	PP	PP	PVDF
	Protective tube	PP	PP	PVDF
	If any problem with weatherability occurs under direct sunshine, use a holder made of PVC or a holder made of SUS316+PVDF. For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.			
Bore Size of Measured Liquid Connection		JIS 10K 25A FF flange		
Pressurizing Inlet for Holder's Internal Pressure (*1)		Rc 1/8		
Mass		Approx. 1.2 kg	Approx. 1.5 kg	Approx. 5.1 kg

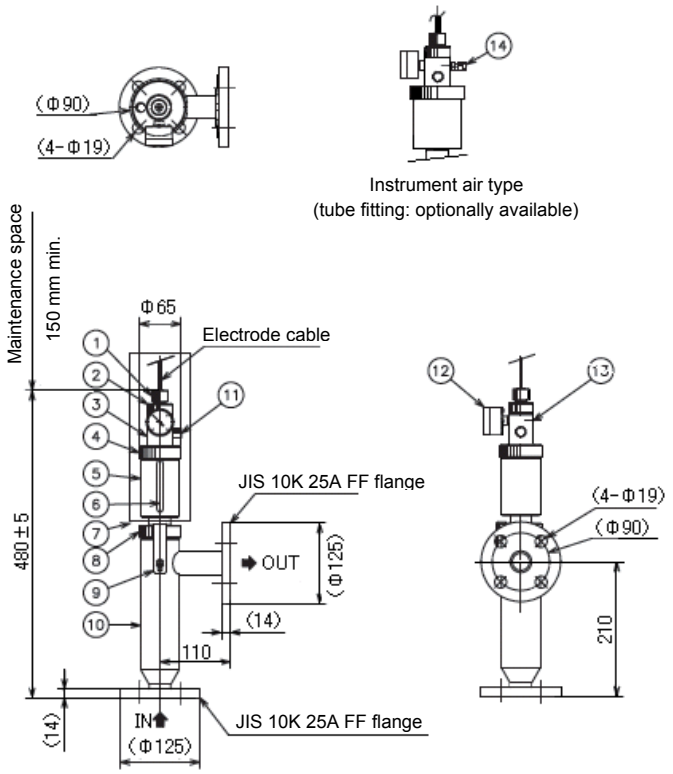
*1 Maintain a pressure in the Pressurizing Holder at the level of 0.03 to 0.05 MPa higher than a measured liquid pressure at all times.

• If periodical pressurization is manually performed, separately place a purchase order for optional parts: pressurizing inlet and hand pump.

• Holders are detached at the time of maintenance. So use a flexible pipe for instrument air.

• Provide a regulator with a mist cap and a filter to an instrument air line.

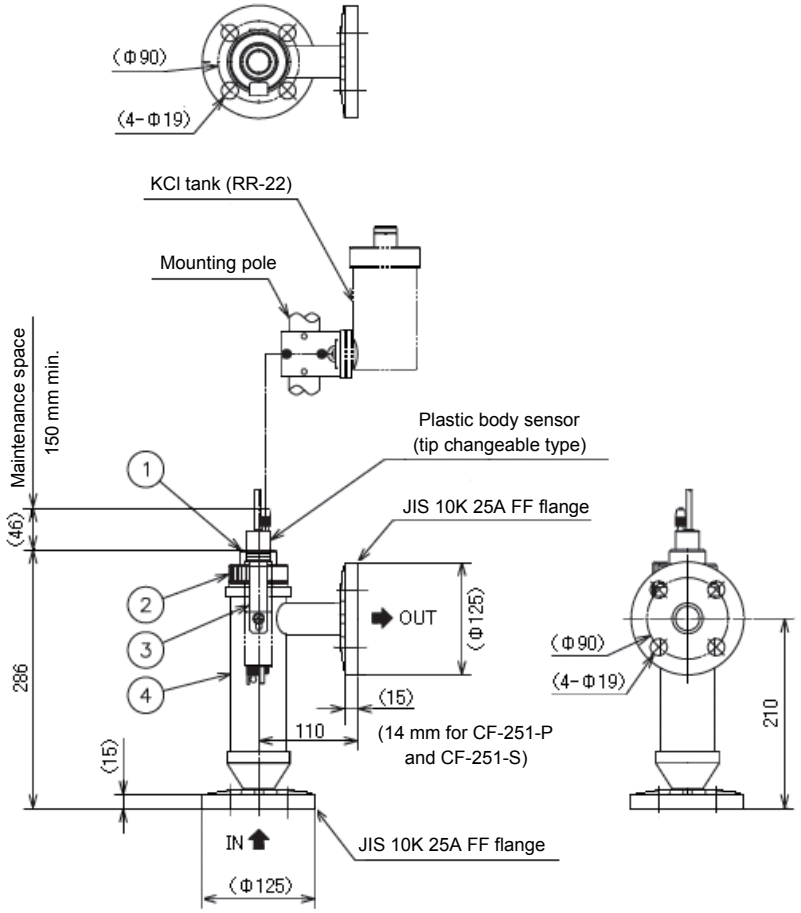
■ Distribution type holder (CF-401S): specifications and external dimensions



	PARTS	NOTES
(1)	Cable cap	PPO
(2)	Holder cap	PPO
(30	Pressure block	PVDF
(4)	Nut	SUS304
(5)	KCl tank cover	SUS304
(6)	KCl tank	PC
(7)	Pressure holder	
(8)	Tightening nut	SUS304
(9)	Locking plate	SUS304
(10)	Distribution holder	SUS316
(11)	KCl inlet	PVC
(12)	Pressure gauge	0 to 0.5 MPa
(13)	Pressure mating screw	Rc1/8
(14)	Fitting	for tube PVDF of 6 mm o.d./4 mm i.d.

Model		CF-401S
Ambient Temperature		-5 to 60℃
Conditions for measurement solution	Temperature	-5℃ to 100℃ (non-freezing)
		Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode. Moreover, measurements cannot be made when a measured liquid is in a freezing or boiling state.
	Pressure	-5 to 40℃: 0.6 MPa 40 to 60℃: 0.46 MPa 60 to 90℃: 0.26 MPa 90 to 100℃: 0.2 MPa
	Flow rate	0.5 to 10 L/min
Materials of Liquid Junction Section		SUS316, FKM
		For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.
Bore Size of Measured Liquid Connection(*)		JIS 10K 25A FF flange
Pressurizing Inlet for Holder's Internal Pressure		Rc 1/8
Mass		Approx. 9.0kg
Special Note		• Avoid manual pressurization at 0.4 MPa or higher because it may cause an accident. (Use instrument air for pressurization operation.) • Holders are detached at the time of maintenance. So use a flexible pipe for instrument air. • Provide a regulator with a mist cap and a filter to an instrument air line. • Install this Product at a location where corrosive gas (organic solvent-based gas that affects polycarbonate) is not existent in the surroundings environment. • This Product is supplied with holders, but electrodes are not supplied. • Maintain a pressure in the Pressurizing Holder at the level of 0.1 MPa to 0.05 MPa higher than a measured liquid pressure at all times.

■Distribution type holder (CF-501 series): specifications and external



Distribution type holder: CF-501

	PARTS	NOTES
(1)	Sensor adaptor	PP
(2)	Tightening nut	PP
(3)	Locking plate	SUS304
(4)	Distribution holder	PP

Distribution type holder: CF-501P

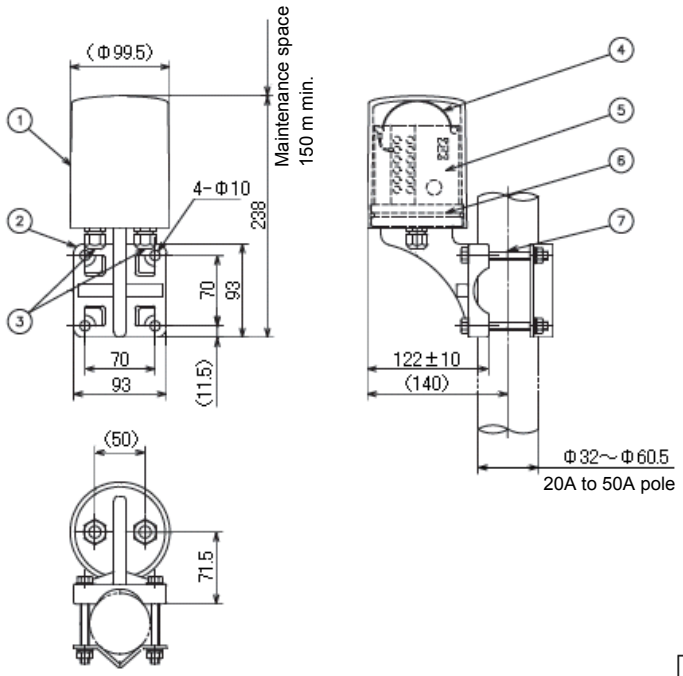
	PARTS	NOTES
(1)	Sensor adaptor	PVC
(2)	Tightening nut	PVC
(3)	Locking plate	SUS304
(4)	Distribution holder	PVC

Distribution type holder: CF-501S

	PARTS	NOTES
(1)	Sensor adaptor	PPS
(2)	Tightening nut	SUS304
(3)	Locking plate	SUS304
(4)	Distribution holder	SUS316

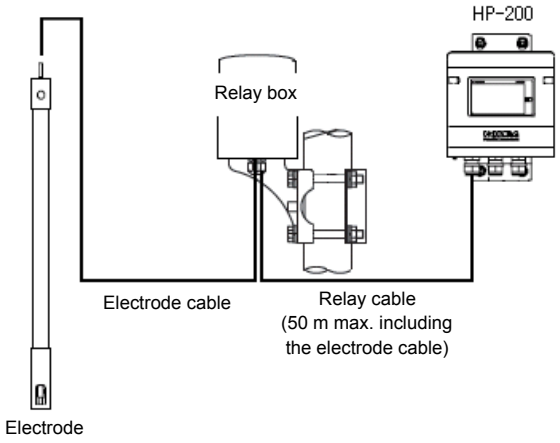
Model		CF-501	CF-501P	CF-501S
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temperature	-5 to 80°C	-5 to 60°C	-5 to 100°C
		Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode. Moreover, measurements cannot be made when a measured liquid is in a freezing or boiling state.		
	Pressure	Atmospheric pressure (with outlet being open)		
	Flow rate	0.3 to 10 L/miln		
Materials of Liquid Junction Section		PP, FKM	PVC, PP, FKM	SUS316, PPS, FKM
Bore Size of Measured Liquid Connection		JIS 10K 25A FF flange		
Mass		Approx. 0.6 kg	Approx. 0.9 kg	Approx. 4.2 kg
Special Note		• Be sure to use it in combination with the KCl Tank (RR-22). • This product is not supplied with the electrode/KCl tank. • If any problem with weatherability occurs under direct sunshine, use a holder made of PVC or a holder made of SUS316+PVDF. For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.		

■ Relay box (CT-25pH): specifications and external dimensions

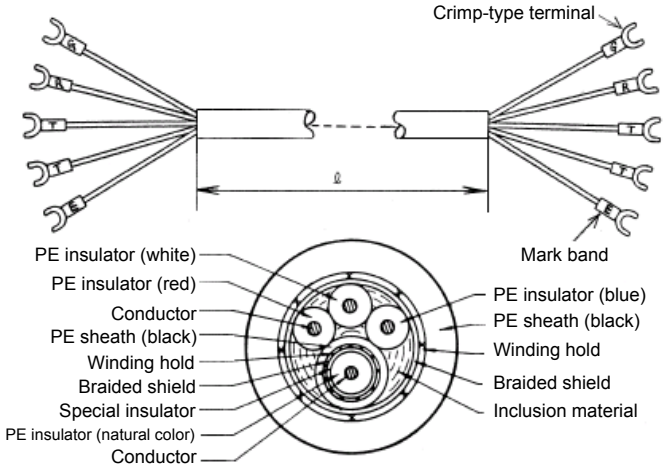


	PARTS	NOTES
(1)	Cover	ABS
(2)	Bracket	ABS
(3)	Wiring hole	
(4)	Spring	SUS304
(5)	Terminal board	ABS
(6)	O-ring	NBR
(7)	Bolt (provided)	SUS304 M8

- If the distance between the electrode and the converter is longer than the electrode cable length, be sure to use the relay box.
- For wiring, be sure to use the relay cable. Do not use any general cable or splice the cable.
- The relay box is designed as rainproof.



■ Extension cable (C-5A): specifications and external dimensions



Characteristics	
Conductor resistance	63.2Ω/km max.
Withstand voltage Shall withstand	1000 VAC for 1 minute.
Insulation resistance	10000MΩ/km
Rated temperature	90°C
Capacitance	150 PF/m max.

- Use this extension cable when you want to extend your cable exceeding the standard lead of 5 m for the pH electrode.
- For wiring, be sure to use the dedicated cable. Do not use any general cable or splice the cable.
- To extend the cable, use the relay box.

■ Installation (power source, transmission, etc.)

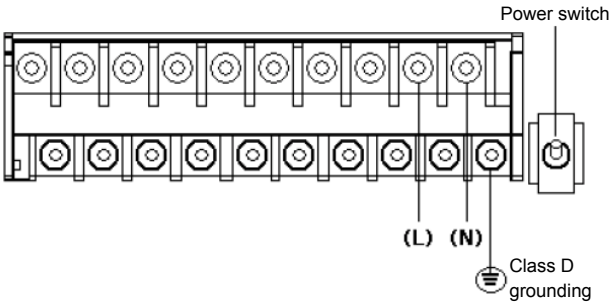
The description of the following installation (power source, transmission, etc.) assumes that the HP-200 is of the standard specification.
For the HP-200, the optionally available cleaner may be installed.
The installation of the HP-200 with the cleaner will be described in the section for the cleaner.

Carry out the installation of execution of work while paying attention to the following points:

Power source

- The HP-200 has a power switch.
- Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
- Check that fluctuations of the power supply voltage fall within ±10%.
- Provide the power switch in a place near the HP-200 so that the power can be turned ON/OFF. If lightning might strike, install an arrester on the output side of the HP-200 and on the side of receiving instruments.
- Be sure to ground the grounding terminal (class D grounding).
- Separate this grounding from any other grounding for electric equipment such as a motor.

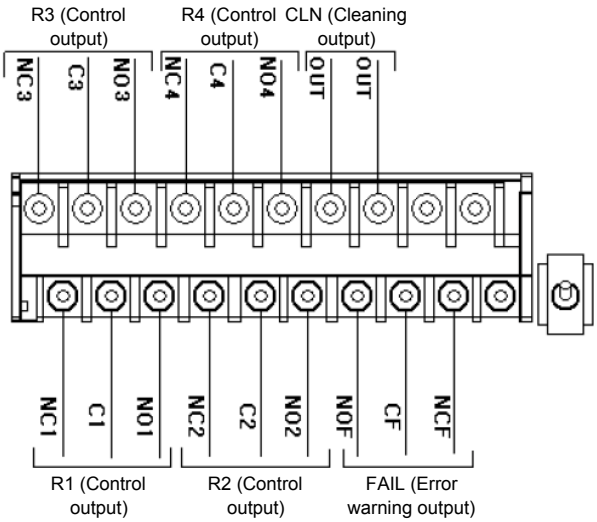
Power supplied	Voltage : 100 to 240VAC
	Frequency : 50/60Hz
Terminal screw	M4
Applicable electric wire	0.75 to 5.5 mm^2 (AWG18 to 10)



Output terminal

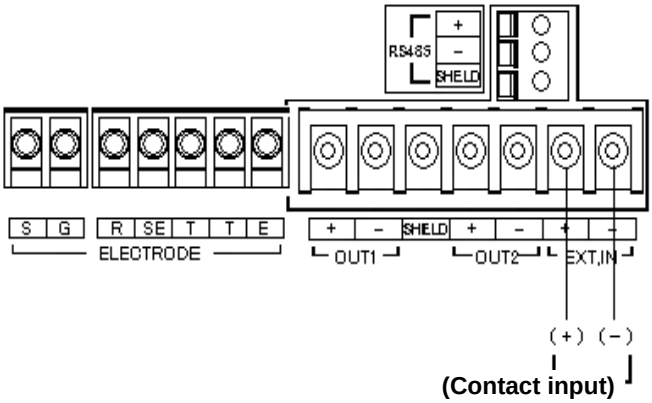
- If noise is detected from the load, use a varistor or a noise killer.
- Only the CLN output involves voltage from the connected power source. Others are no-voltage contact output.
- For the FAIL output only, NO and NC are reversed. When the HP-200 is normal (not in failure), the CF-NOF contact is open and the CF-NCF contact is short-circuited. When the power is OFF, the C-NOF contact is short-circuited.
- The vacant terminals are internally connected; do not connect anything to those terminals.
- To connect any load exceeding the contact capacity or any induction load (e.g., a motor or a pump), be sure to use a power relay exceeding the load rating.
- When the HP-200 is OFF, the C-NC contact for R1 to R4 is short-circuited. Therefore, be careful about the connection of load.

Contact point capacity	250 VAC, 3A max. Or 30 VDC, 3A max.
Terminal screw	M4
Applicable power cable	0.75 to 5.5 mm^2 (AWG18 to 10)



Contact input
• Use a shielded cable.
• When lightning might strike, install an arrestor on the output side of the HP-200 and on the side of receiving instruments.

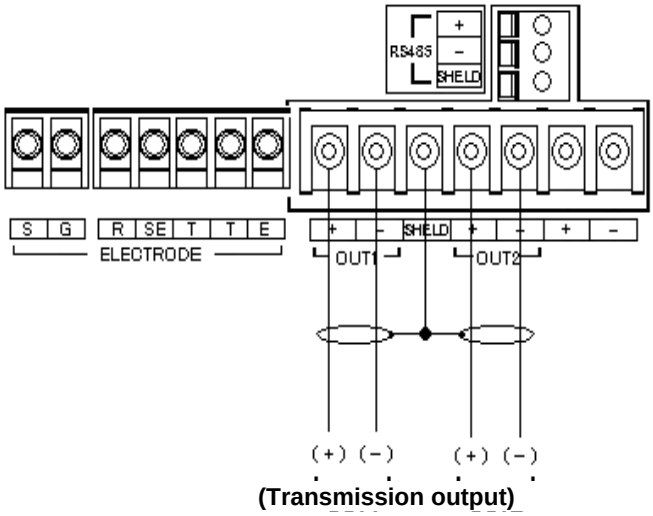
Contact input resistance	100Ω/km max.
Terminal screw	M3.5
Applicable power cable	0.75 to 5.5 mm^2 (AWG18 to 10)



(Contact input)

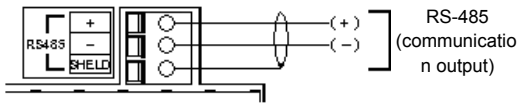
Transmission output
• For the transmission output cable, use a shielded cable.
• When lightning might strike, install an arrestor on the output side of the HP-200 and on the side of receiving instruments.
• The negative terminal (OUT1) (-) and OUT2 (-) for the transmission output are internally connected and have the same electric potential.

Maximum load resistance	900Ω
Terminal screw	M3.5
Applicable power cable	2 mm^2 (AWG14) MAX



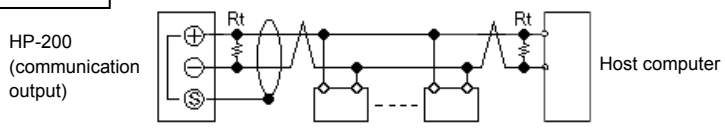
(Transmission output)

RS-485
• For the communication output cable, use a twisted shielded pair.
• The communication cable length is 500 m maximum.
• Use a terminating resistor (Rt: 120Ω) for any device at which the RS-485 communication line is terminated.
• Up to 32 connections can be made including one for the host computer. Set the address.



RS-485 communication conditions	Baud rate	19200 bps
	Character lengt	8 bit
	Parity	non
	Stop bit	1 bit

Example of external connection for communication



Electrode cable

The electrode cable is highly insulated. In handling this cable, pay attention to the following points:

• Do not wet any cable terminal or the terminal block with water or the like; also do not soil it with dirt, oil, or the like. The insulation will otherwise deteriorate.

The decreased insulation can cause instable readings. Maintain the electrode cable in a dry, clean state.

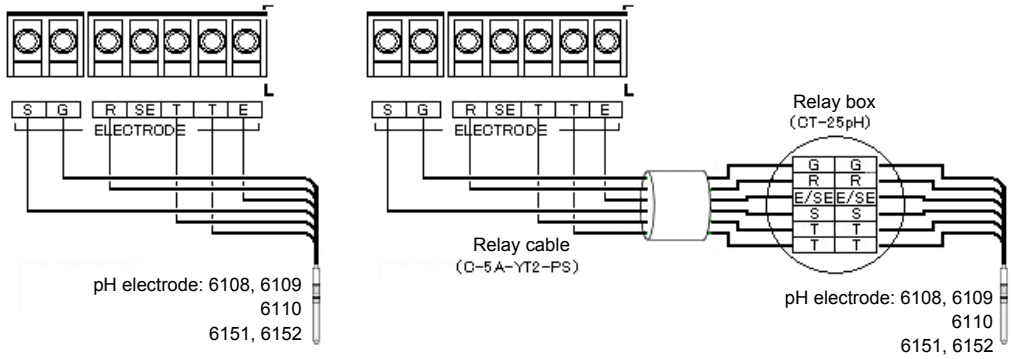
If the electrode cable should be soiled, wipe it off with alcohol or the like and then well dry it.

• In routing the electrode cable, provide sufficient length for the calibration of standard solution and the check and replacement of the pH electrode.

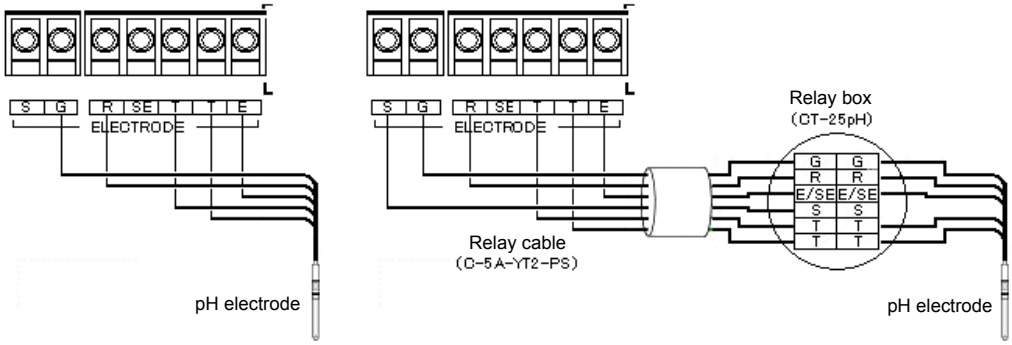
• Route the pH electrode cable and the relay cable by avoiding any place near inducing equipment such as a motor and keeping them away from the power cable for such equipment.

pH electrode	S: pH electrode shield drive
	G: Glass electrode terminal
	R: Reference electrode
	SE: Solution gound
	T, T: Temperature sensor
	E: Outer shield wire

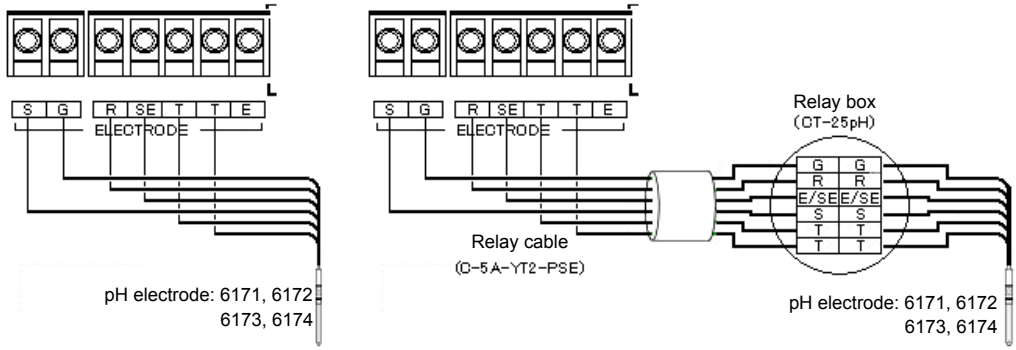
For pH electrodes with S terminal and without SE terminal, such as 6108, 6109, and 6110



For pH electrodes without S and SE terminals



For pH electrodes with S and SE terminals, such as 6171, 6172, 6173, and 6174



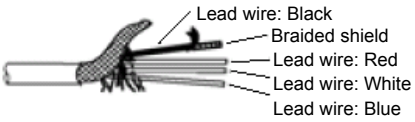
Extending the sensor cable

• Be sure to use replay cable and relay box.

• Relay cable (C-5A)
• Relay box (CT-25pH)

• The cable is extendable up to 50 meters between the HP-200 and the pH electrode.
• It is recommended that the dedicated relay cable be housed in a conduit pipe to prevent static electricity from being generated due to induction, vibration, or any other reason. In this case, pass the wiring near the HP-200 through a flexible tube.

Procedure for terminal treatment of replay cable



Strip covering of the lead wire (black) up to a place near the remaining covering of the electrode cable and then take out the braided shield for that lead wire.

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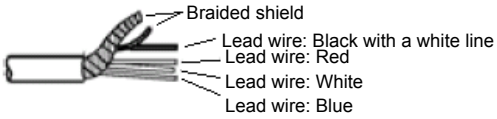
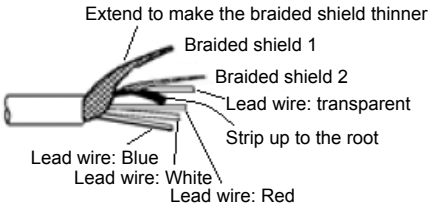


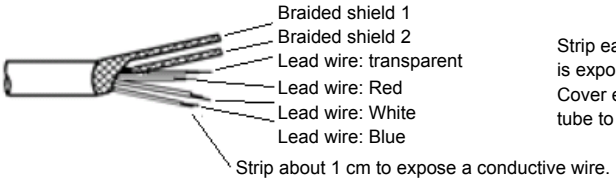
Strip covering of the lead wire (black with a white line).

↓



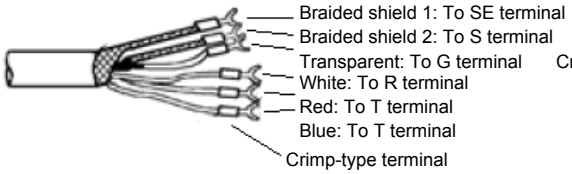
Strip covering of the lead wire (black with a white line) and strip covering (conductive plastic: black with a white line) up to the root of the transparent lead wire.

↓



Strip each of the lead wires so that its copper wire end is exposed about 1 cm.
Cover each of braided shields 1 and 2 with a shrinking tube to avoid short-circuit.

↓

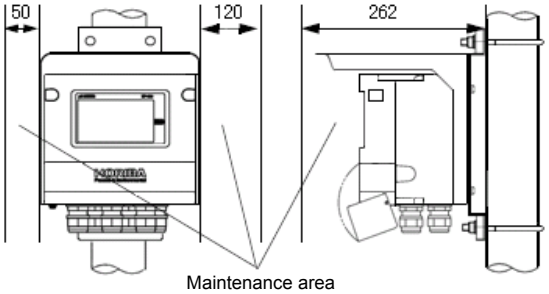


Crimp the conductive wire with a crimp tool.

■ Installation (mounting)

The description of the following installation (mounting) assumes that the HP-200 is of the standard specification.
For the HP-200, the optionally available cleaner may be installed.
The installation of the HP-200 with the cleaner will be described in the section for the

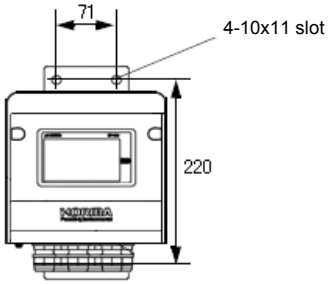
Body (for pole mounting)



Unit: mm

• The body may be mounted on the pole or the wall.
• For pole mounting, use a 50A pole.
• In either case, mount the body considering maintenance space.

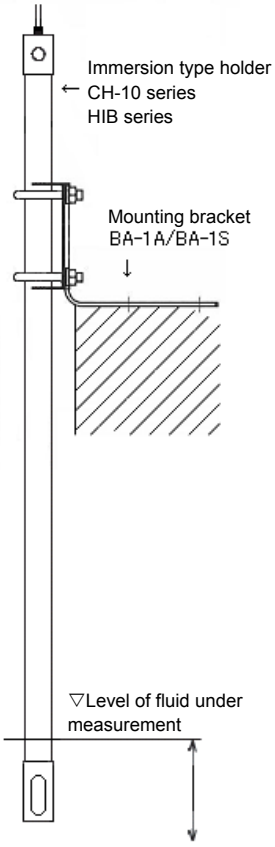
Body (for wall mounting)



Immersion type holder + mounting bracket (BA-1A or BA-1S)

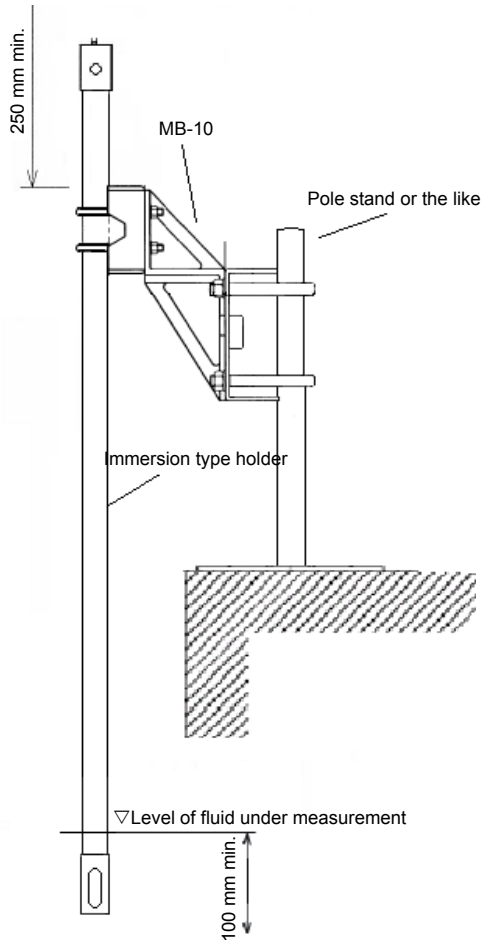
• The mounting bracket BA-1A or BA-1S should be secured with 2-Φ10 bolts.
• The immersion type holder should be mounted 250 mm minimum above the slab.
• In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.

• The mountable immersion type holder (made of resin) is limited to 1.5 m.



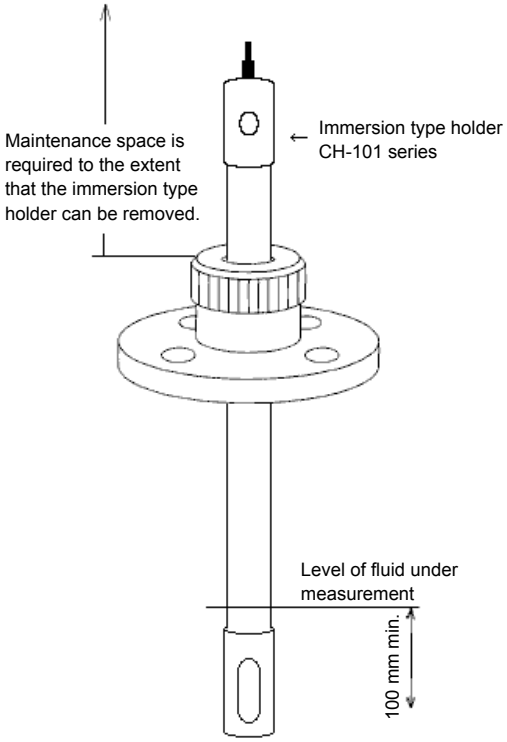
Immersion type holder + mounting bracket (MB-10)

• The mounting bracket MB-10 should be secured to the 50A pole.
• In mounting the immersion type holder with the MB-10, position it about 250 mm above the U-bolt on the MB-10.
• In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.



Immersion type holder + loose flange (FK-1 series)

• For the FK-1 series, JIS 10K 50A FF is the basic size. To use any special type of loose flange, check its size before installation.
• In mounting the immersion type holder with the FK-1 series, position it 200 mm minimum above the top of the hexagon cap nut on the loose flange.
• In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.
• The mountable immersion type holder is limited to 1.5 m.

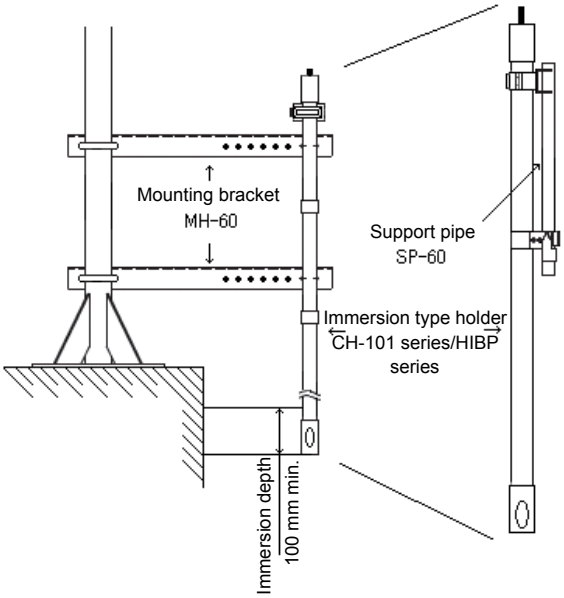


* For use with the CH-101PF, contact us.

Immersion type holder + support pipe (SP-60 series) + mounting bracket (MH-60)

• When the immersion type holder of 1.5 m minimum is used, it is recommended that the support pipe be used to secure the immersion type holder.
• Before using the support pipe, check the length of the immersion type holder.
(The length enabling the use of the immersion type holder and the support pipe is determined.)
• To use the immersion type holder, secure it to the support pipe.
• To use the support pipe, secure it with the mounting bracket (MH-60).
• The mounting bracket MB-60 should be secured to the 50A pole.
• Position the immersion type holder so that its lower part of 100 mm minimum is immersed in sample water.

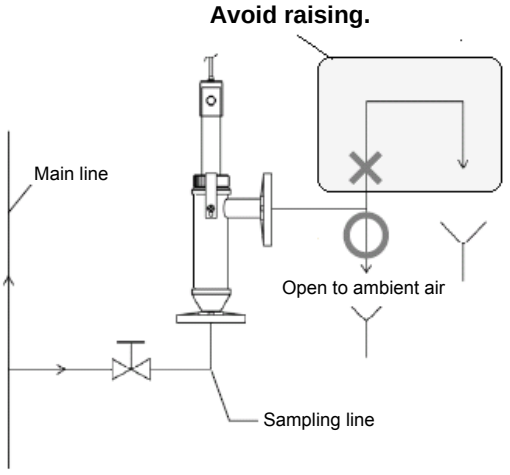
• For use with the CH-101PF, contact us.

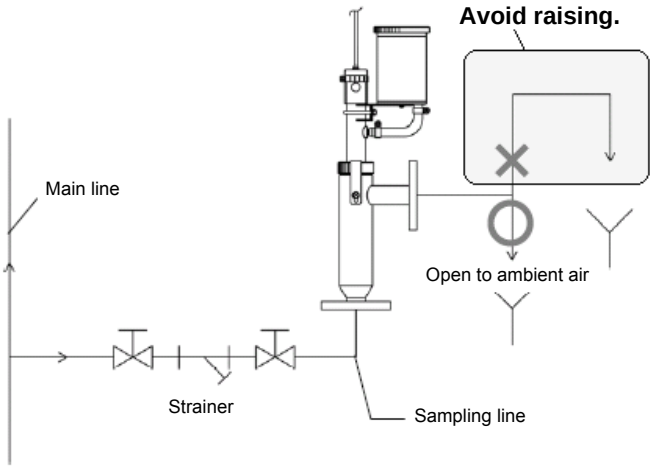


Distribution type holder

• The CF-251 and CF-501 series of distribution type holders assume JIS 10K 25A FF as their basic sizes. Before installing any special type of distribution holder, check its size.
• Make sure that the holder is installed upright.
CF-251 series/CF-501 series
• Install a valve at the inlet of the distribution holder.
• In order to prevent back pressure from being applied, minimize the length of piping at the outlet (the outlet is open to air).
• Do not use a riser for outlet piping.
The inside of the Distribution Holder is held under back pressure, thus causing a reverse-leak of measured liquid to the inside of an electrode. It becomes impossible to make accurate measurements.

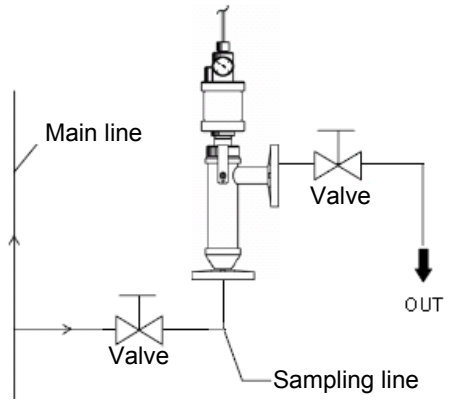
• Provide a bypass line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder.
• Be sure to provide a pipe on the inflow side. If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the pH electrode's liquid junction section is pressurized by flow velocity.
If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid.
• If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Distribution Holder.



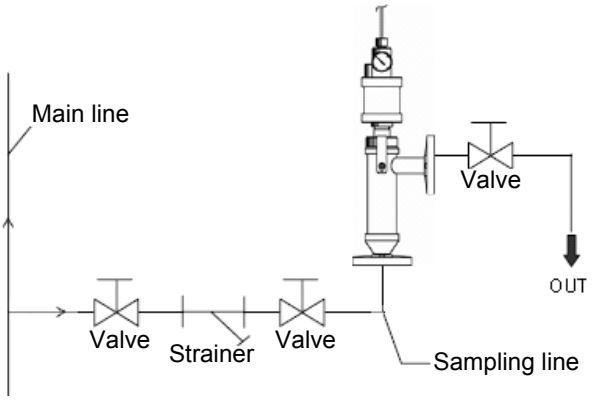


Distribution type holder

• The CF-301 and CF-401S series of distribution type holders are designed to be internally pressurized when sample water has pressure. They assume JIS 10K 25A FF as their basic sizes. Before using any special type of distribution type holder, check its size.
• Make sure that the holder is installed upright.
CF-301 series/CF-401S series
• Install a valve both at the inlet and outlet of the distribution type holder.
• Maintain the pressure in the pressurized holder at 0.03 to 0.05 MPa.
• To use instrument air, use a flexible hose considering maintenance easiness.

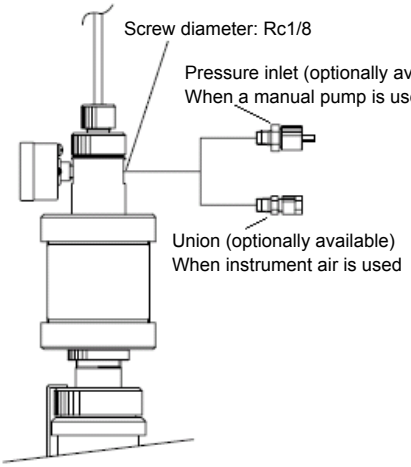


• Provide a bypass line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder.
• Be sure to provide a pipe on the inflow side. If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the pH electrode's liquid junction section is pressurized by flow velocity.
If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid.
• If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Distribution Holder.

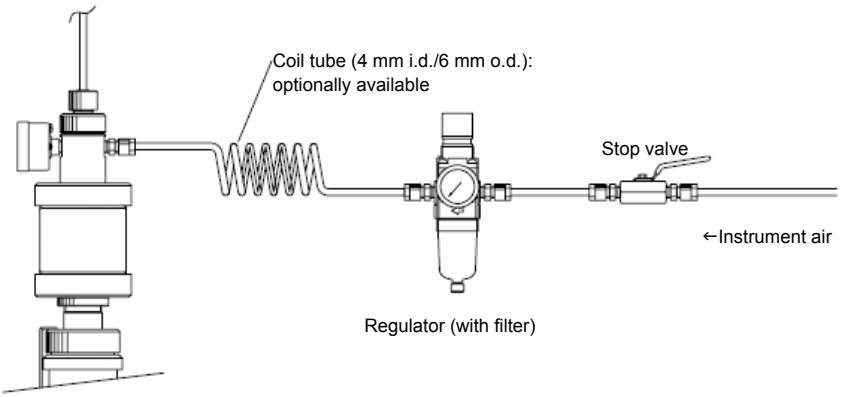


Pressurization

• For pressurization with an inflator, use the pressure inlet.
• Maintain the pressure in the pressurized holder in 0.03 to 0.05 MPa higher than sample water pressure.
• To use instrument air, use a flexible hose considering maintenance easiness.



• For pressurization with instrument air, use a union.
• Maintain the pressure in the pressurized holder in 0.03 to 0.05 MPa higher than sample water pressure.
• To use instrument air, use a flexible hose considering maintenance easiness.
• Provide a regulator (with a filter) near the distribution type holder and connect it to the pressurized holder with a tube of 4 mm i.d./6 mm o.d.



Immersion type ultrasonic cleaner for H-1 series

UCH-series

■ Overview

● The ultrasonic cleaner removes dirt adhering to the electrode or prevents dirt from adhering to the electrode. The electrode is irradiated with ultrasonic waves and this cavitation effect removes dirt adhering to the electrode. In order to improve the cleaning effect, ultrasonic waves are intermittently oscillated (burst oscillation).

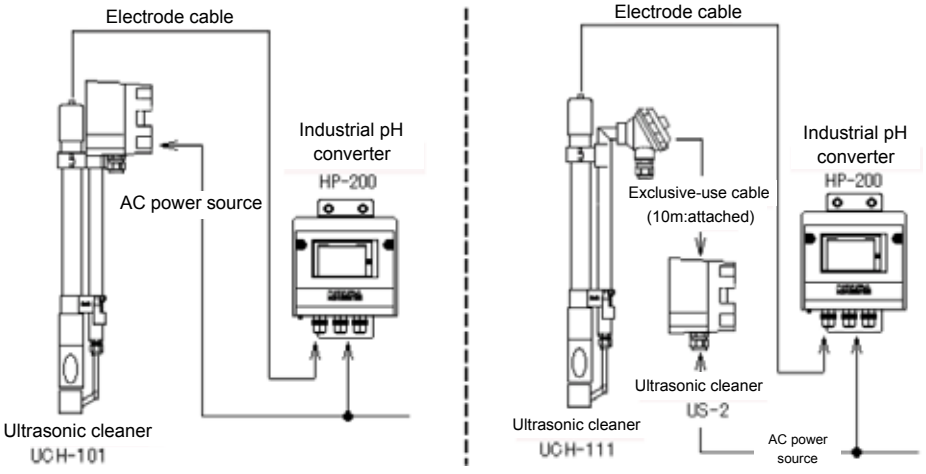
■ Objects

The Ultrasonic Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

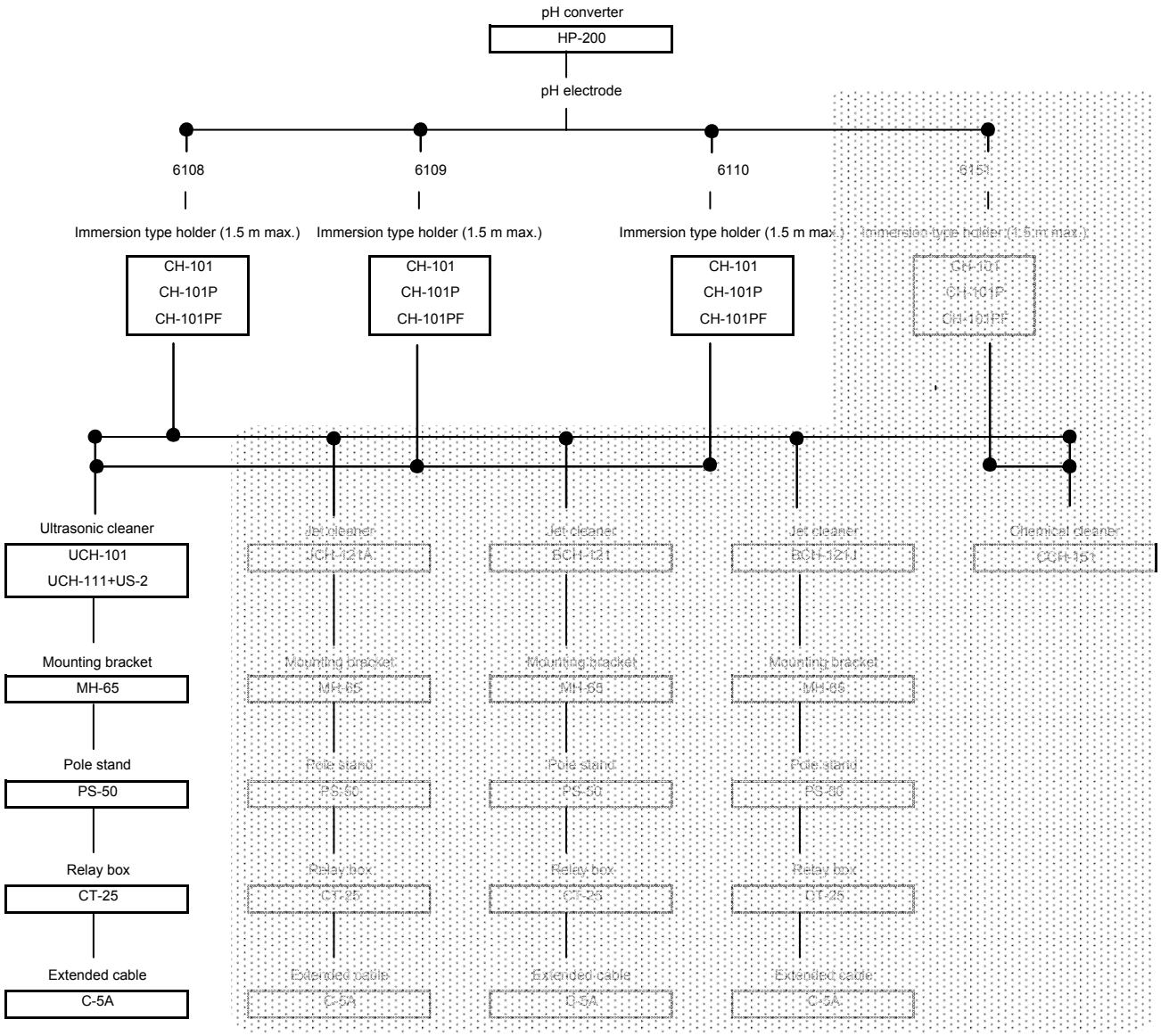
Properties Classification	Objects	
Slime	food, paper, pulp, algae	○
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	×
Suspended Matters	earth and sands	◎
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment CaCO3, etc.	○

◎:Good ○:Acceptable ×:Not Acceptable

■ System configuration



■ Combinations



■ Specifications (UCH-101 • UCH-

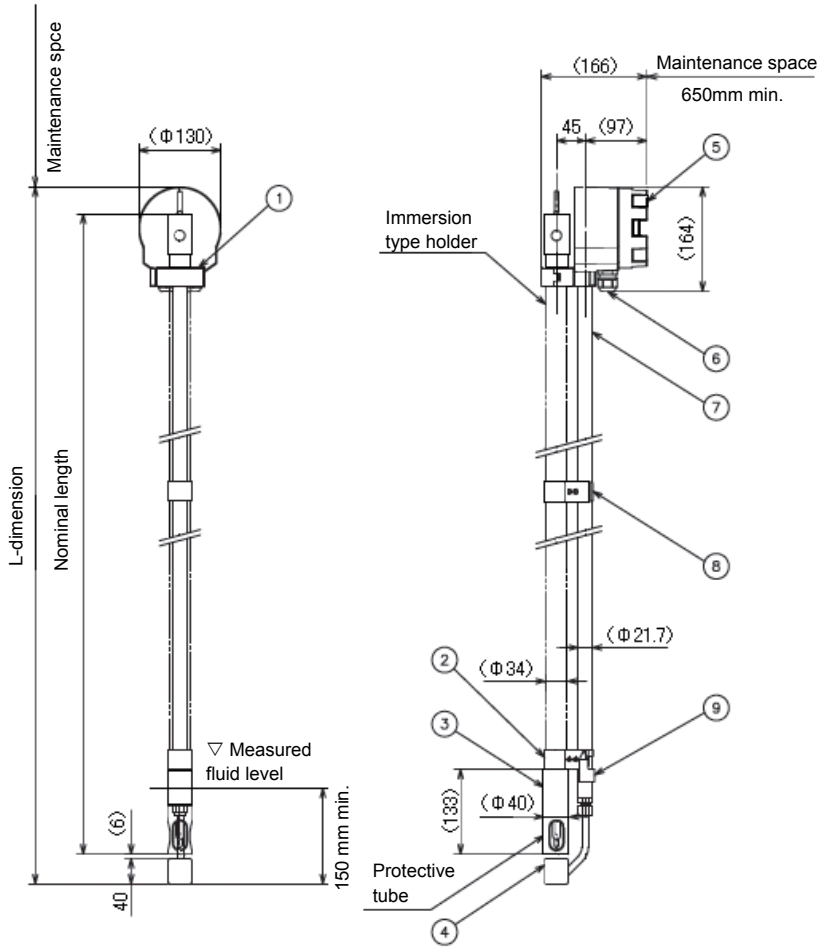
Product Name		Immersion Type Ultrasonic Cleaner (ultrasonic oscillator-integrated)
Model		UCH-101
Supply Voltage		AC 100 to 240V　50/60Hz
Permissible Voltage Variation Range		90% to 110% of supply voltage
Power Consumption		10VA
Cleaning Method		Ultrasonic wave continuous irradiation system
Control System		Burst system by oscillation time control
Oscillation Frequency		Approx. 70 kHz
Ambient Temperature		-5 to 50°C
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *1		5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec or less
Measured Liquid Pressure		Atmospheric pressure
Materials for Liquid Junction Section		SUS316 (not including an electrode and materials for Immersion Holders)
Mass		Approx. 4.0 kg (holder length: 1m)
Oscillator Case	Protection Class	IP54 (IEC60529, JIS C0920) (Category 2)
	Materials	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This Product does not come with electrodes and an Immersion Holder.

*1 A working temperature range varies with a combinational electrode and an Immersion Holder. Check a working temperature for each product.

Product Name		Immersion Type Ultrasonic Cleaner (ultrasonic oscillator-separately installed)
Model		UCH-111
Supply Voltage		AC 100 to 240V　50/60Hz
Permissible Voltage Variation Range		90% to 110% of supply voltage
Power Consumption		10VA
Cleaning Method		Ultrasonic wave continuous irradiation system
Control System		Burst system by oscillation time control
Oscillation Frequency		Approx. 70 kHz
Ambient Temperature		-5 to 50°C
-5°C to 50°C		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *1		-5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec or less
Measured Liquid Pressure		Atmospheric pressure
Materials for Liquid Junction Section		SUS316 (not including an electrode and materials for Immersion Holders)
Mass	Oscillator	Approx. 2.0 kg
	Oscillator Holder	Approx. 2.5 kg (holder length: 1m)
Oscillator Case	Protection Class	IP54 (IEC60529, JIS C0920) (Category 2)
	Materials	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This Product does not come with electrodes and an Immersion Holder.

*1 A working temperature range varies with a combinational electrode and an Immersion Holder. Check a working temperature for each product.

■External dimensions (UCH-101)



	PARTS	NOTES
(1)	Electrode holder mounting bracket	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Ultrasonic vibrator	SUS316
(5)	Ultrasonic oscillator	AC4C
(6)	Piping slot	O.D Φ7 to 12 cable
(7)	Vibrator holder	SUS316
(8)	Support hook	SUS316
(9)	Stopper	SUS316

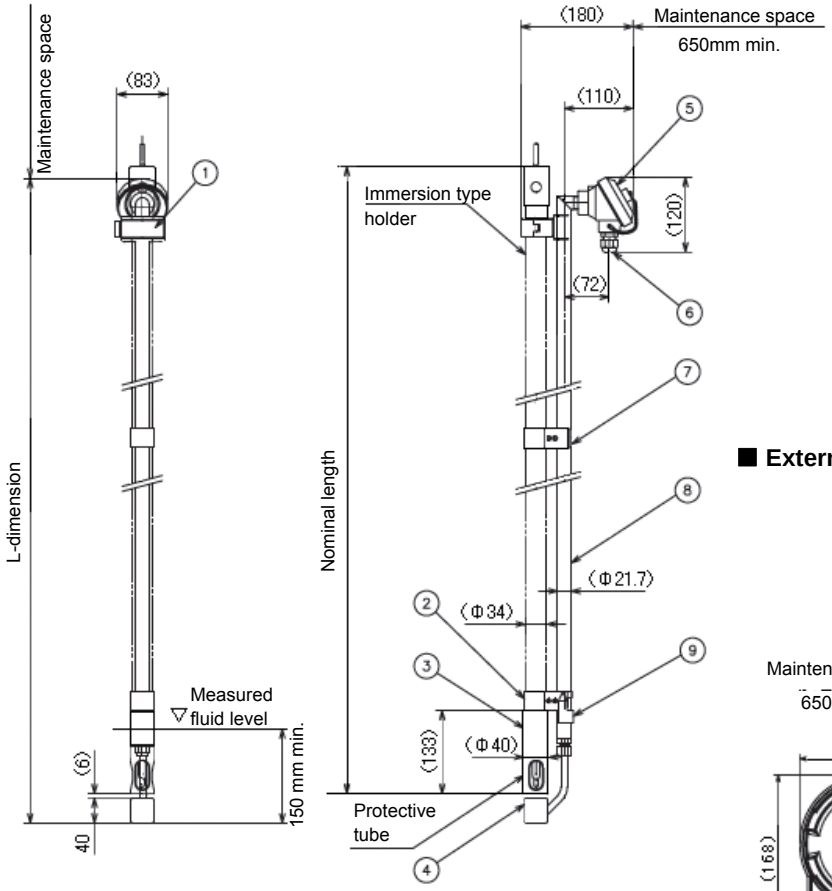
• No support hook is provided on the cleaner of 1.5 m or less.

The L-dimension and tolerance of UCH-101 immersion type ultrasonic cleaner are shown in the following table.

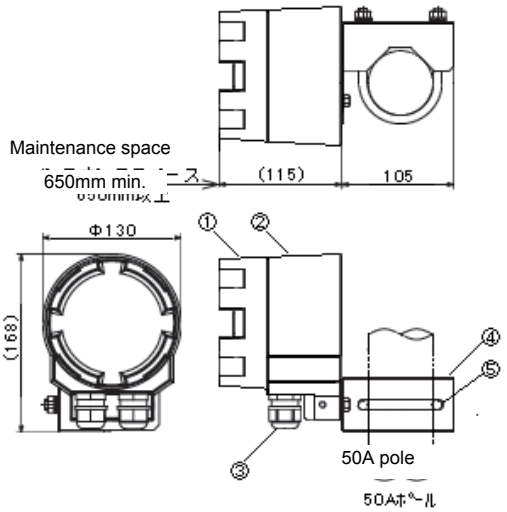
Nominal length (m)	L-dimension (mm)	Maintenance space (mm)
0.5	588±10	500 or more
1	1088±10	1000 or more
1.5	1588±10	1500 or more
2	2088±10	2000 or more
2.5	2588±10	2500 or more
3	3088±10	3000 or more

The maintenance space must be provided above the ultrasonic oscillator.

■External dimensions (UCH-111)



■ External dimensions (US-2)



	PARTS	NOTES
(1)	Immersion holder fixinging bracket	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Ultrasonic vibrator	SUS316
(5)	Relay terminal box	Al
(6)	Piping slot	O.D Φ7 to 12 cable
(7)	Vibrator holder	SUS316
(8)	Support hook	SUS316
(9)	Stopper	SUS316

• No support hook is provided on the cleaner of 1.5 m or less.

The L-dimension and tolerance of UCH-101 immersion type ultrasonic cleaner are shown in the following table.

Nominal length (m)	L-dimension (mm)	Maintenance space (mm)
0.5	528±10	500 or more
1	1028±10	1000 or more
1.5	1528±10	1500 or more
2	2028±10	2000 or more
2.5	2528±10	2500 or more
3	3028±10	3000 or more

The maintenance space must be provided above the ultrasonic oscillator.

No	PARTS	NOTES
(1)	Oscillator cover	AC4C
(2)	Oscillator case	AC4C
(3)	Wiring hole	O.D Φ7 to 12 cable
(4)	Mounting bracket SUS304	SUS304
(5)	U bolt	SUS304 M8

Mass: Approx. 2.0 kg
Protection Class: IP 54
(IEC60529, JIS C0920) (Category 2)
Finish: Epoxy degenerated melamine resin painting
(Munsell 10PB5/1)

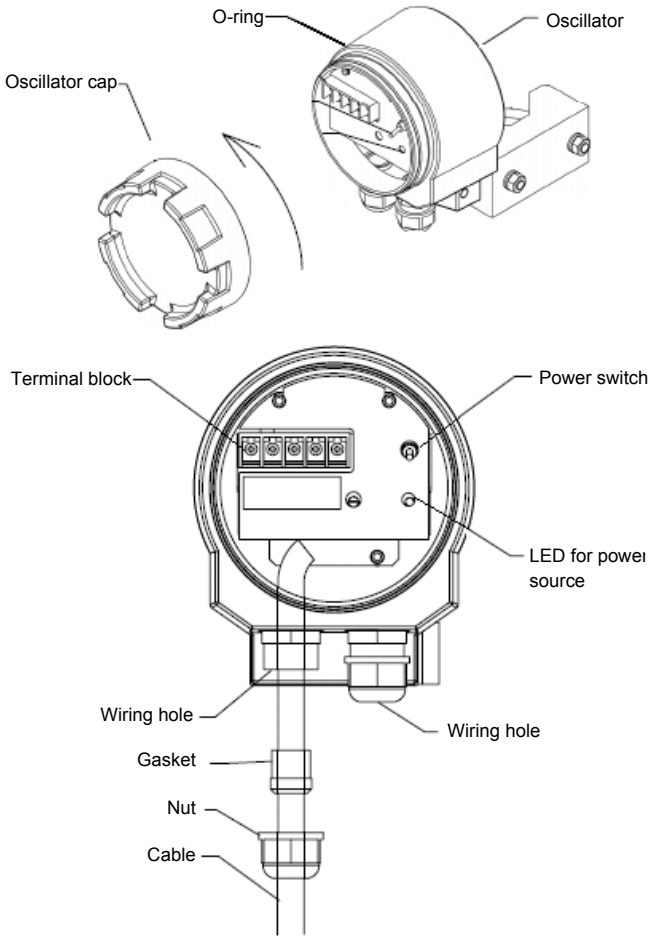
■Installation (UCH-101) (connections)

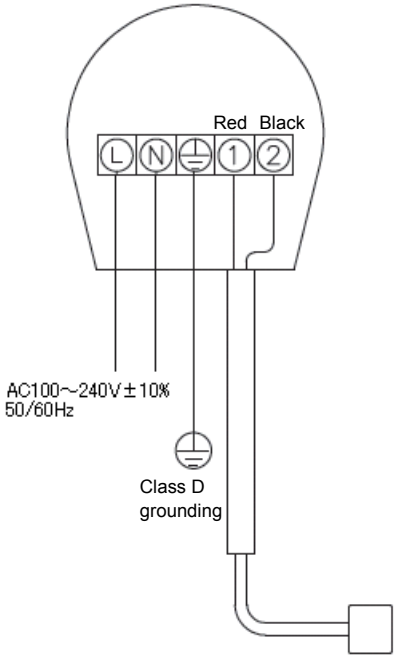
Carry out installation and execution of work while paying attention to the following points:

Power source

• This ultrasonic cleaner has a power switch. Ensure that the power switch is OFF during work.
• If the ultrasonic cleaner is operated at non-rated voltage, it may malfunction. Check the power supply voltage.
• Carefully check that the power supply voltage fluctuations fall within a range of ± 10%.
• Be sure to ground the earth terminal for safety (class D grounding).
• The applicable cable diameter for the wiring hole is 7 to 12 mm.
• After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.
• The ultrasonic vbrator is already connected to the corresponding terminal.

Electric power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	7 to 12 mm dia.



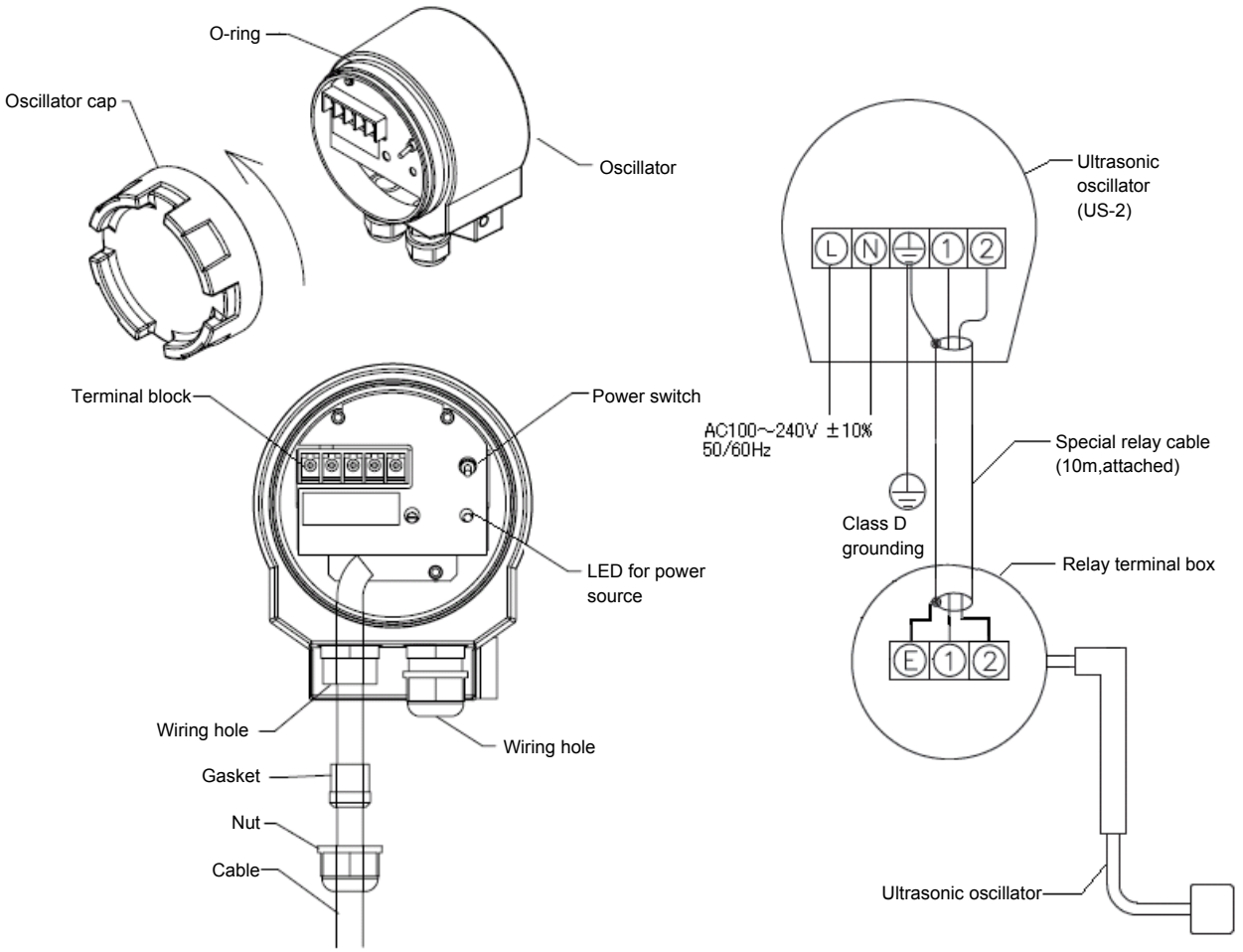


■Installation (UCH-111) (connections)

Carry out installation and execution of work while paying attention to the following points:

Power source
• This ultrasonic cleaner has a power switch. Ensure that the power switch is OFF during work.
• If the ultrasonic cleaner is operated at non-rated voltage, it may malfunction. Check the power supply voltage.
• Carefully check that the power supply voltage fluctuations fall within a range of±10%.
• Be sure to ground theearth terminal for safety (class D grounding).
• The applicable cable diameter for the wiring hole is 7 to 12 mm.
• After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.
The ultrasonic vibratoris already connected to the corresponding terminal.

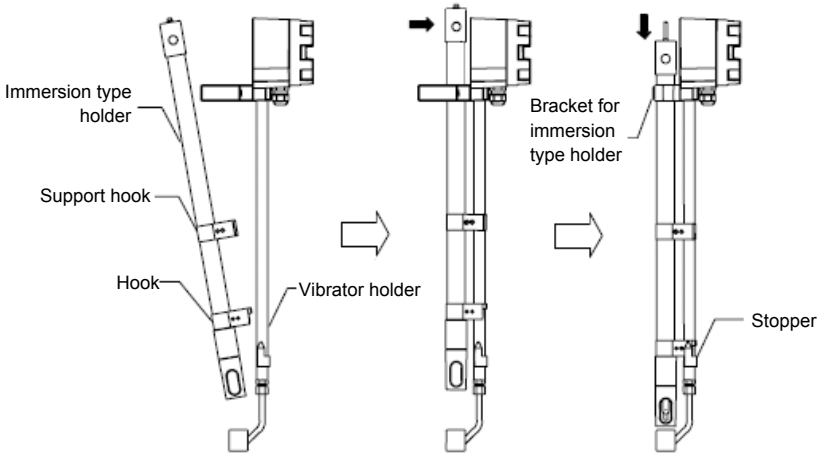
Electric power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	7 to 12 mm dia.



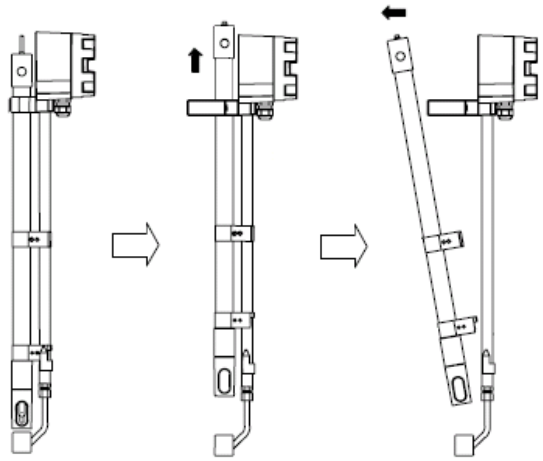
■Installation (ultrasonic cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation
• Attach the hook to the immersion type holder.
• Slowly move down the hook along the vibrator holder.
• Once the hook is caught by the stopper of the vibrator holder, secure the bracket for the immersion type holder.

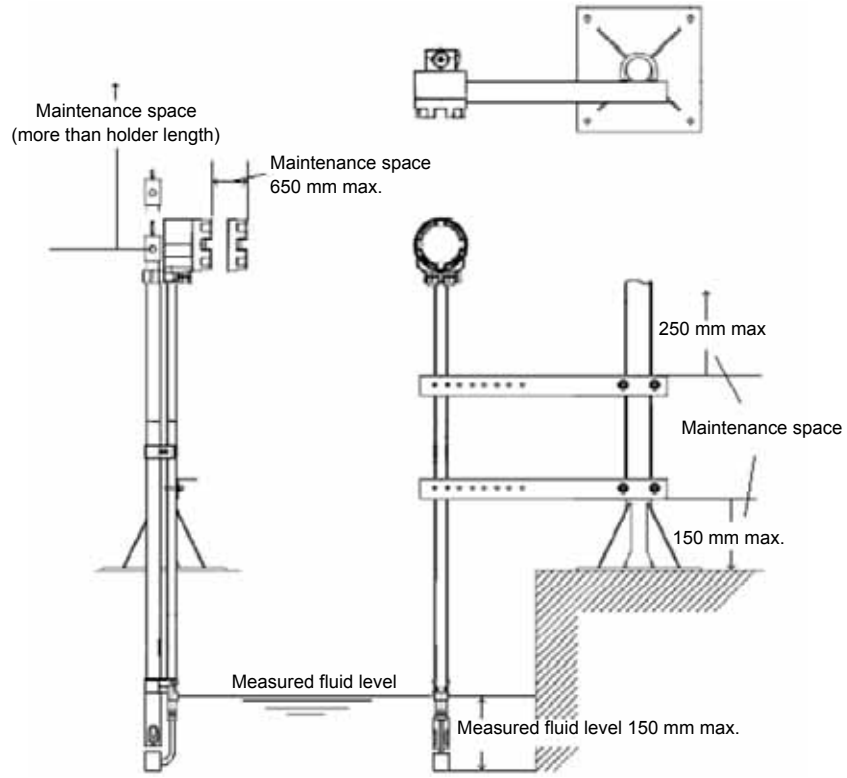


Removal
• Remove the bracket for the immersion type holder.
• Moves up the immersion type holder.
• Remove the hook and the support hook from the vibrator holder.



■ Installation

Installation environment
• Install the Cleaner at a location where maintenance work can be easily performed.
• Install the Cleaner at a height where an electrode is always immersed in measured liquid even if a measured liquid level changes.
• Avoid installing the Cleaner at a location exposed to corrosive fluid and gas. etc.
• Avoid installing the Cleaner at a location where a surface temperature and an ambient temperature are 50℃ or higher in the vicinity of a heat source.



H-1 series Immersion Jet Cleaner

JCH-121A

■ Overview

● This Cleaner can intermittently clean any dirt off the pH electrode with a jet flow of cleaning water or air. This Cleaner does not have the timer functions. So the timer functions of a converter is used to make settings for cleaning interval and cleaning time.

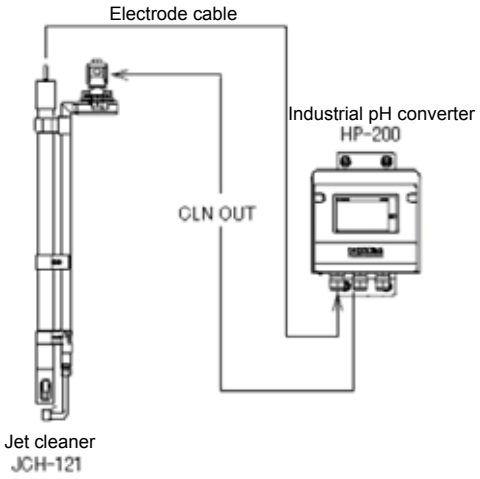
■ Objects

The Ultrasonic Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

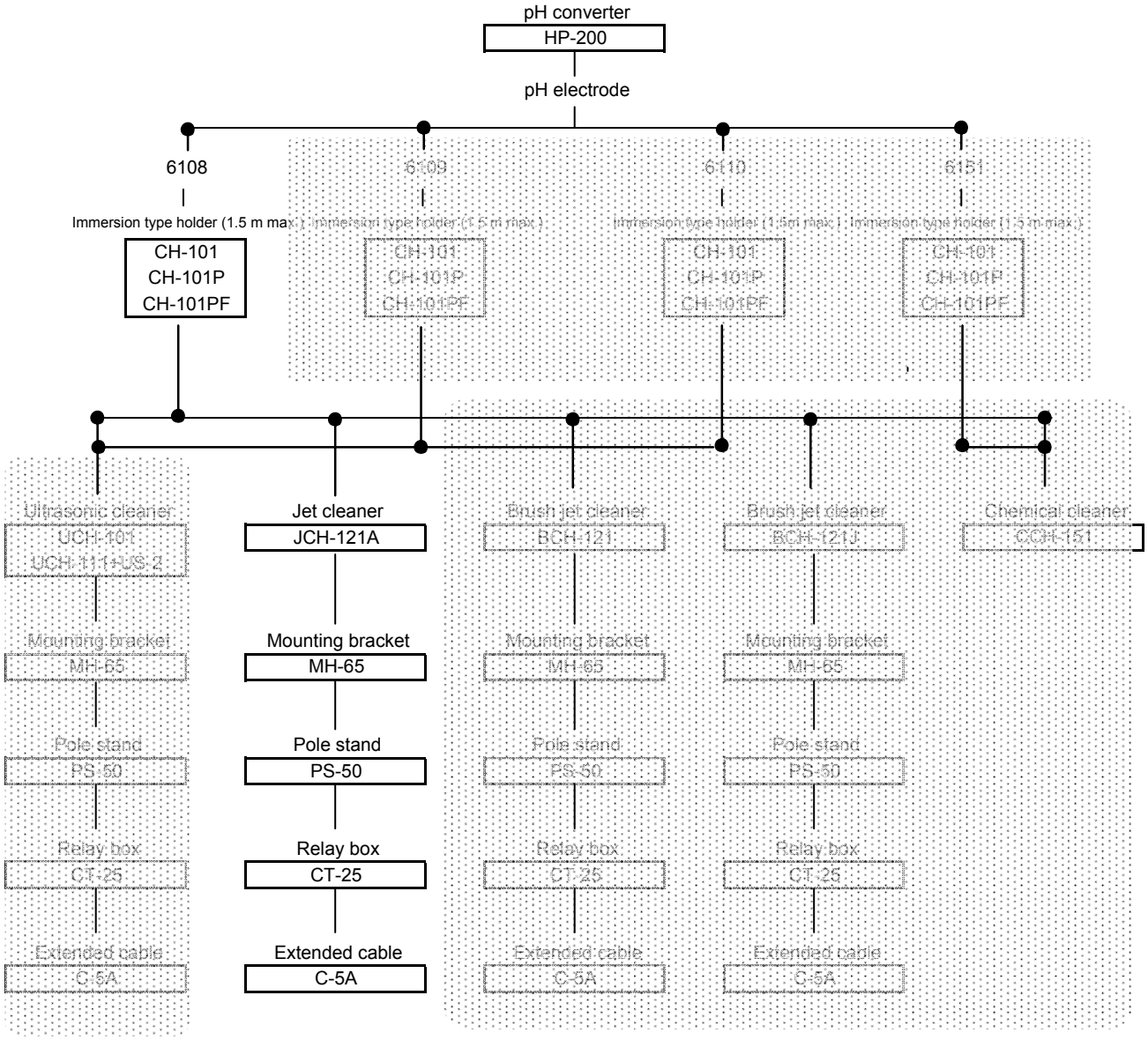
Properties Classification	Objects	
Slime	food, paper, pulp, algae	⊙
Microorganism	bacteria (activated sludge), slag	⊙
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment CaCO3, etc.	○

⊙：Good ○：Acceptable ×：Not Acceptable

■ System configuration



■ Combinations (Immersion jet cleaner)



■ Specifications (JCH-121A)

Product Name		Immersion Type Ultrasonic Cleaner (ultrasonic oscillator-integrated)
Model		JCH-121A
Supply Voltage (*1)		100 VAC 50/60Hz
Permissible Voltage Variation Range		90% to 110% of supply voltage
Power Consumption		Max. 30VA
Cleaning Method		Intermittent water jet/air jet cleaning
Ambient temperature		-5 to 50°C
Ambient humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *2		5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec or less
Measured Liquid Pressure		Atmospheric pressure
Cleaning pressure	Water	0.05 MPs to 0.5MPs (consumption: approx. 4L/min)(*3)
	Air	0.05MPs to 0.2MPs(consumption: approx. 90L/min)
Bore diameter connected for cleaning		Rc 1/2
Materials of Liquid Junction Section		SUS316, PP (not including an electrode and an Immersion Holder)
Mass		Approx. 3.5 kg (immersion type holder length: 1m)
Protection Class		IP54 (IEC60529, JIS C0920) (Category 2)
Special Note		This product is not supplied with an electrode and a holder.

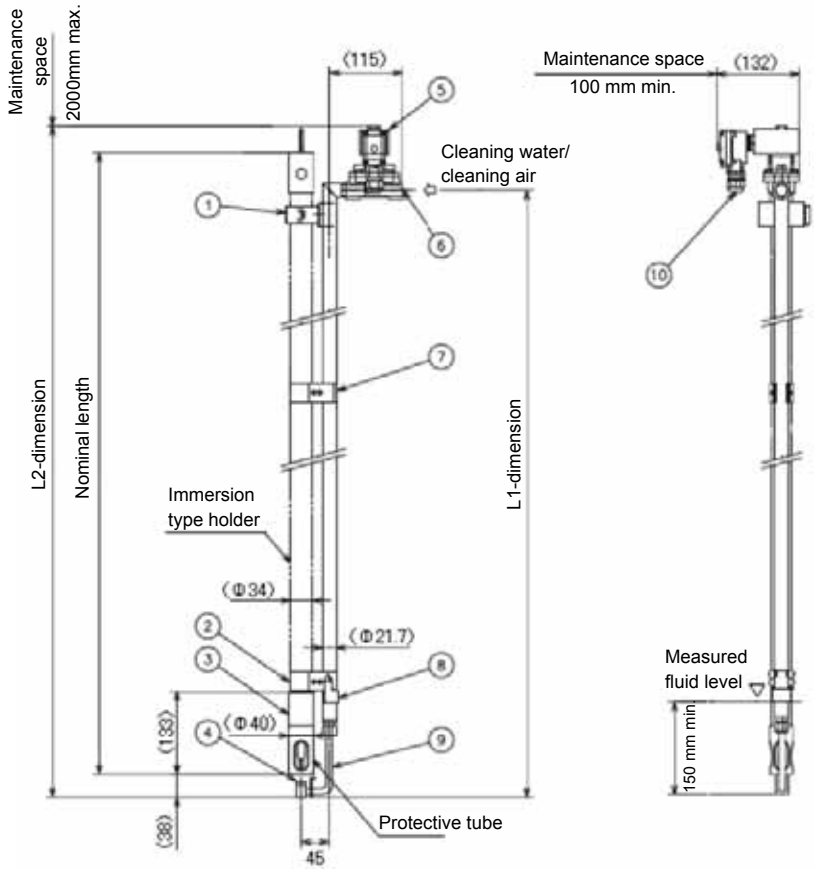
*1 A supply voltage of 200 V AC is optional. For any other voltages, please consult with HORIBA Advanced Techno.

*2 A working temperature range varies with a combinational electrode and an Immersion Holder. Check a working temperature for each product.

*3 If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaningwater directly from a tap water pipe.

Separate a cleaning water pipe from a general tap water pipe by using a tap water pressurizing device, etc.
Moreover, if cleaning water may be frozen, provide heat insulated piping against warm and cold weather.

■ External dimensions (JCH-121A)



	PARTS	NOTES
(1)	Immersion holder mounting bracket	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Nozzle	SUS316
(5)	Solenoid valve	
(6)	Cleaning water/air inlet	Rc1/2
(7)	Support hook	SUS316
(8)	Stopper	SUS316
(9)	Nozzle holder	SUS316
(10)	Piping slot	O.D Φ7 to Φ12 cable

• No support hook is provided on the cleaner of 1.5 m or less.

Nominal length (m)	L1-dimension	Maintenance space	L2-dimension
1	977±10	1000 or more	1085
1.5	1477±10	1500 or more	1585
2	1977±10	2000 or more	2085
2.5	2477±10	2500 or more	2585
3	2977±10	3000 or more	3085

Unit: mm

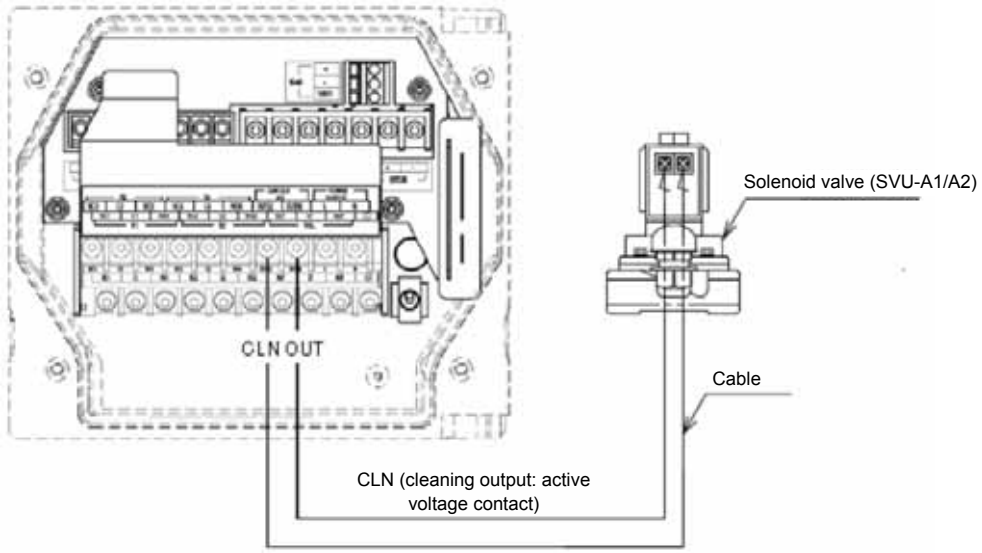
The L1-dimension, L2-dimension and tolerance of JCH-121 immersion type jet cleaner are shown in the following table.
The maintenance space must be provided above the solenoid valve.

■ Installation (JCH-121A) (connections)

Carry out installation and execution of work while paying attention to the following points:

Connections
- Be sure to ground the earth terminal for safety (class D grounding).
- The applicable cable diameter for the wiring hole is 7 to 12 mm.
- An active voltage is output from the CLN OUT terminal of the converter.

Applicable electric wire	7 to 12 mm dia., 0.75 mm^2 min.

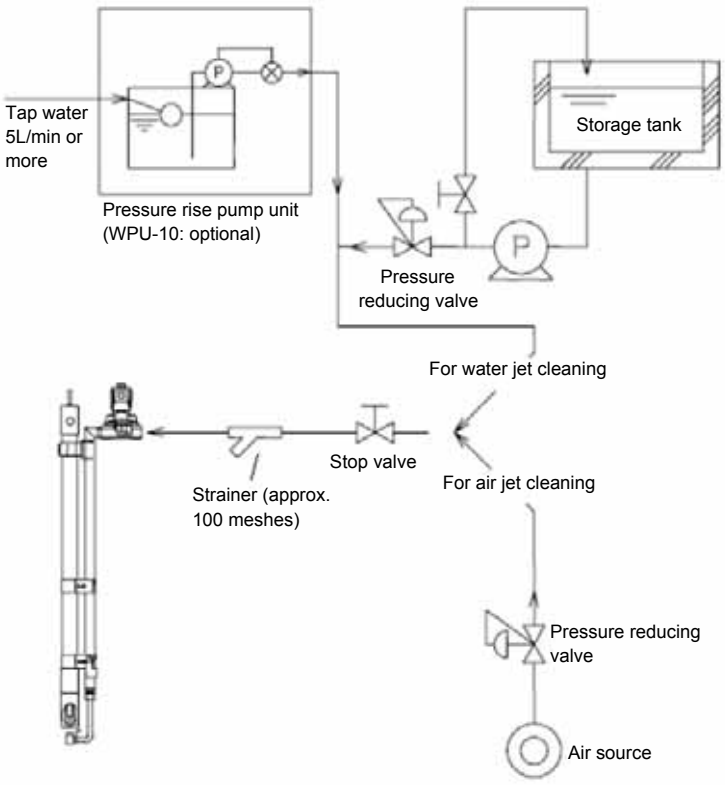


■ Installation (JCH-121A) (piping)

Carry out installation and execution of work while paying attention to the following points:

Piping
- Since the Cleaner may be detached for a maintenance purpose, use a flexible pipe that can allow enough room for its length.
- Before connecting a pipe to the Cleaner, be sure to pour water into the pipe to flush garbage inside the pipe.
- With the regulator, adjust the cleaning water to a specified pressure.
- It is prohibited under the Water Supply Law to connect a cleaning-water pipe directly to a tap-water main pipe.

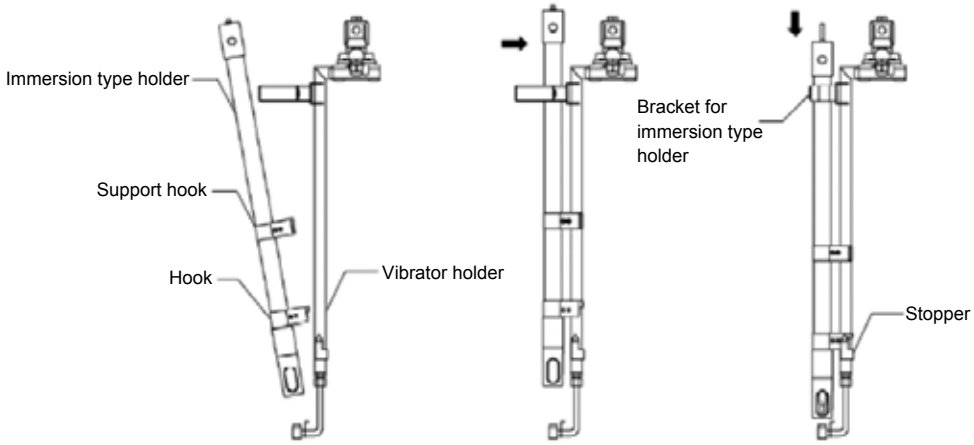
Adopt a method by which the cleaning water is received in a water tank and is pressurized with a pump.
However, your own industrial water (tertiary treatmer water) pipe may be connected directly to a tap wat main pipe.
Moreover, a tap water pipe may be connected if the tap water is isolated and supplied via a water tank located on a rooftop.



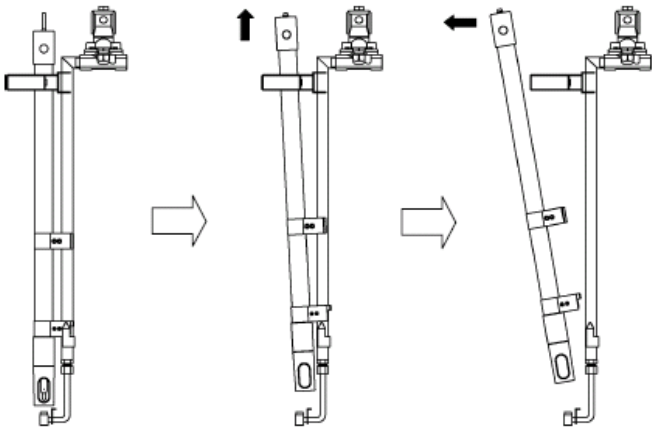
■ Installation (jet cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation
• Attach the hook to the immersion type holder.
• Slowly move down the hook along the nozzle holder.
• Once the hook is caught by the stopper of the nozzle holder, secure the bracket for the immersion type holder.

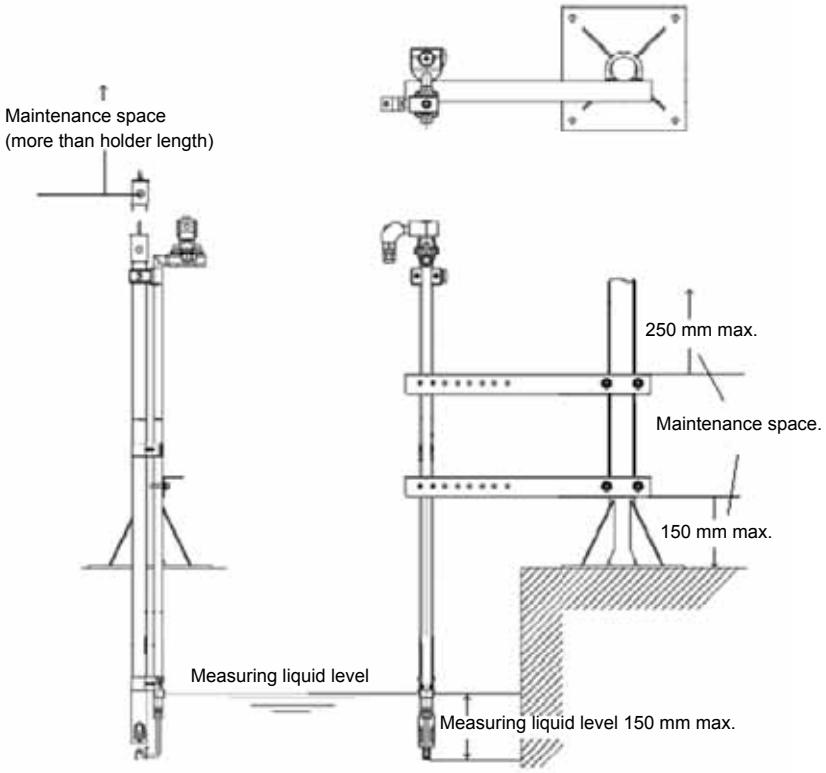


Removal
• Remove the bracket for the immersion type holder.
• Moves up the immersion type holder.
• Remove the hook and the support hook from the vibrator holder.



■ Installation

Installation environment
• Install the Cleaner at a location where maintenance work can be easily performed.
• Install the Cleaner at a height where an electrode is always immersed in measured liquid even if a measured liquid level changes.
• Avoid installing the Cleaner at a location exposed to corrosive fluid and gas. etc.
• Avoid installing the Cleaner at a location where a surface temperature and an ambient temperature are 50℃ or higher in the vicinity of a heat source.



H-1 series Immersion Brush Cleaner

BCH-121

■ Overview

● This Brush Cleaner can intermittently clean any dirt off the pH electrode by brushing. This Cleaner does not have the timer functions. So the timer functions of a converter is used to make settings for cleaning interval and cleaning time.

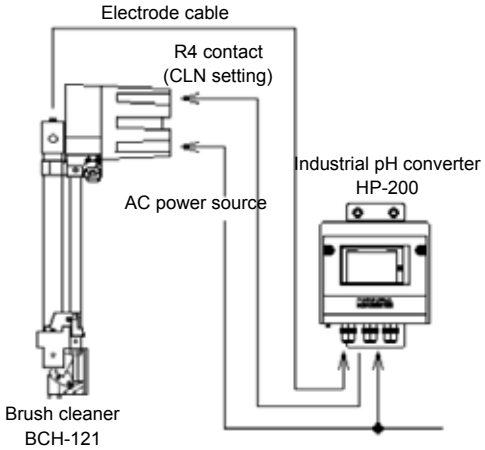
■ Objects

The Brush Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

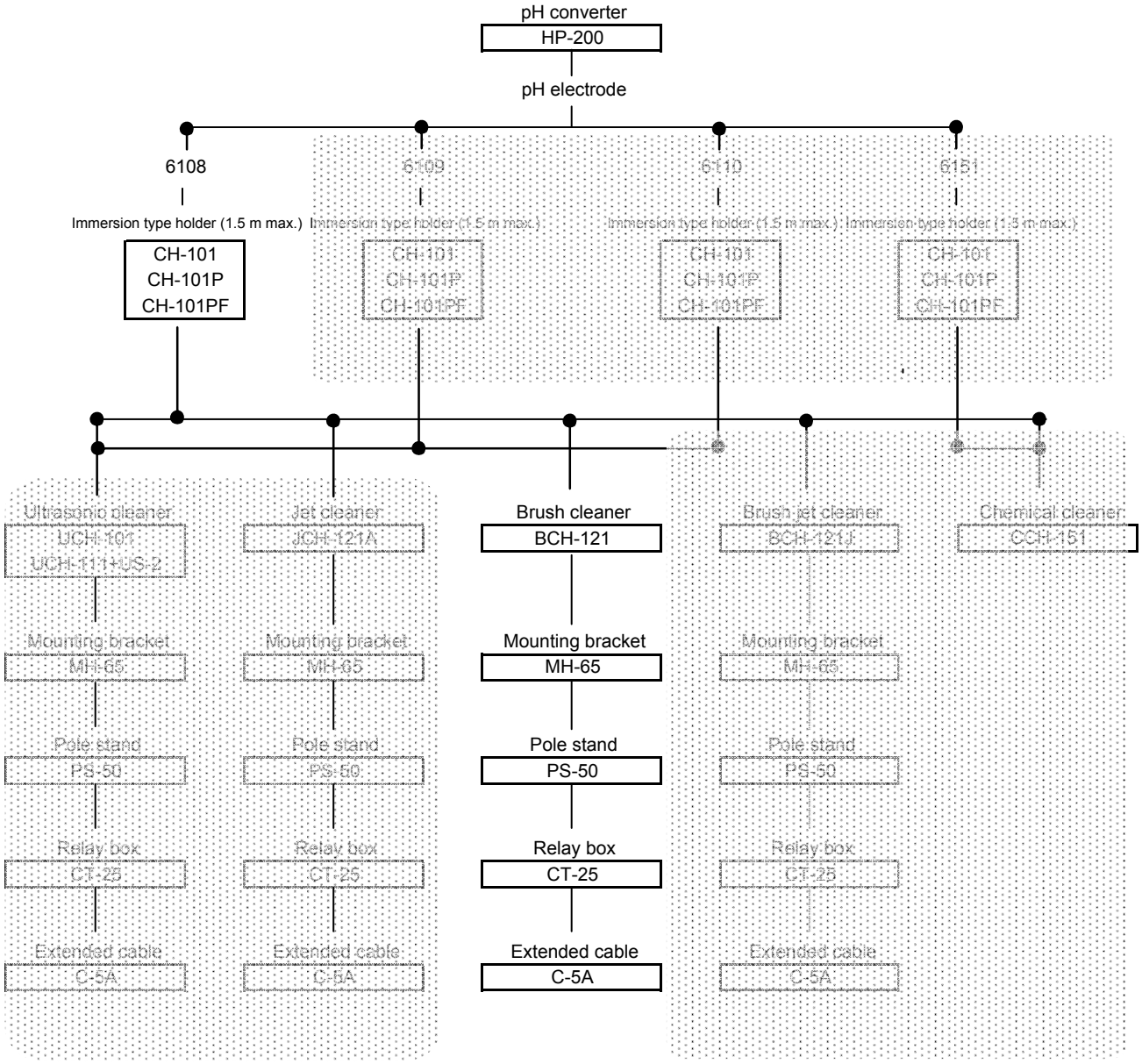
Properties Classification	Objects	
Slime	food, paper, pulp, algae	⊙
Microorganism	bacteria (activated sludge), slag	⊙
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	×
	metallic minute powder	×
	clay, calcareous	×
Scale	coagulated deposit and neutralized effluent treatment CaCO3, etc.	×

⊙:Good ○:Acceptable ×:Not Acceptable

■ System configuration



■ Combinations (Immersion jet cleaner)



■Specifications (BCH-121)

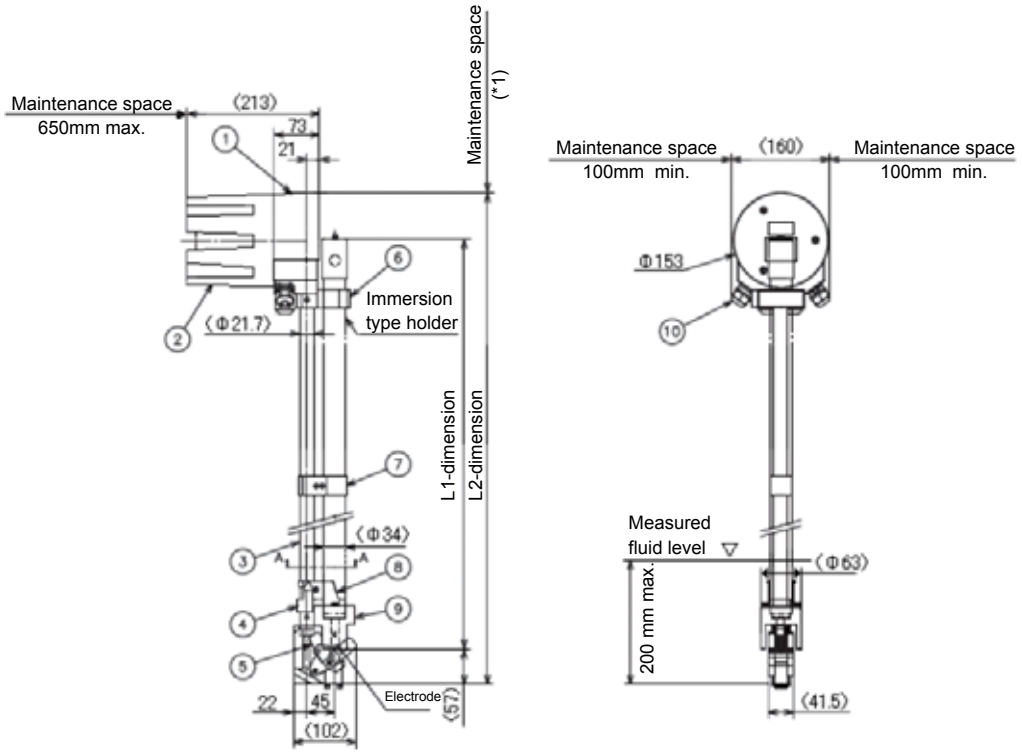
Product Name		Immersion Type Brush Cleaner
Model		BCH-121
Supply Voltage (*1)		100VAC 50/60Hz
Permissible Voltage Vari		90% to 110% of supply voltage
Power Consumption		Max. 25VA
Cleaning Signal Output	Contact Form	Relay contact SPDT (1c)
	Contact Capacity	250 V AC 3 A, 30 V DC 3 A (resistance load)
	Conditions	Short-circuited between NO-COM. Opened between NC-COM
External Cleaning Start Input	Contact Form	No-voltage contact
	Contact Capacity	300 mA. Voltage is the same of power voltage.
	Conditions	Pulse input, closed time of 100 msec or more
Cleaning Stop Signal Input *2	Contact Form	No-voltage contact
	Contact Capacity	250 mA Voltage is the same of power voltage.
	Conditions	Continuous input, stopped at open
Cleaning Method		Intermittent cleaning with a swing brush
Ambient temperature		-5 to 50℃
Ambient humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *3		5°C to 80°C (without dew condensation)
Measured Liquid Flow Velocity		2 m/sec or less
Measured Liquid Pressure		Atmospheric pressure
Materials of Liquid Junction Section		SUS316, PP (not including an electrode and an Immersion Holder)
Mass		Approx. 7.0 kg (holder length of 1.0 m)
Terminal box	Protection Class	IP54 (IEC60529, JIS C0920) (Category 2)
	Materials	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This product is not supplied with an electrode and a holder.

*1 A supply voltage of 200 V AC is optional. For any other voltages, please consult with HORIBA Advanced Techno.

*2 Terminals have been short-circuited at the time of shipment of products. For a purpose of inputting a cleaning stop signal, remove a short-circuit line.

*3 A working temperature range varies with a combinational electrode and an Immersion Holder. Check a working temperature for each product.

■External dimensions (BCH-121)



	PARTS	NOTES
(1)	Terminal box	AC4C
(2)	Terminal box cover	AC4C
(3)	Brush holder	SUS316
(4)	Stopper	SUS316
(5)	Brush	PP
(6)	Immersion holder mounting bracket	PVC
(7)	Support hook	SUS316
(8)	Hook	SUS316
(9)	Protective tube	PP
(10)	Piping slot	O.D Φ7 to Φ12 cable

• No support hook is provided on the cleaner of 1.5 m or less.

Nominal length (m)	L1-dimension	Maintenance space	L2-dimension
1	993±10	995max.	1125±10
1.5	1493±10	1495max.	1625±10
2	1993±10	1995max.	2125±10
2.5	2493±10	2495max.	2625±10
3	2993±10	2995max.	3125±10

Unit: mm

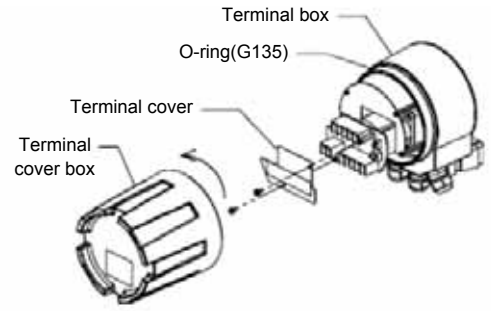
The maintenance space must be provided above the timer unit.

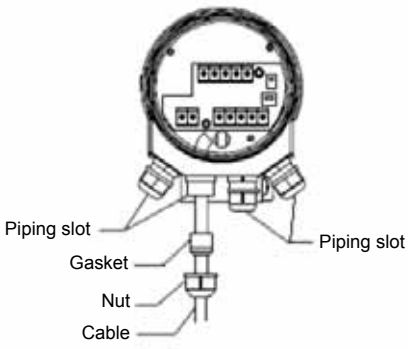
■Installation (BCH-121) (connections)

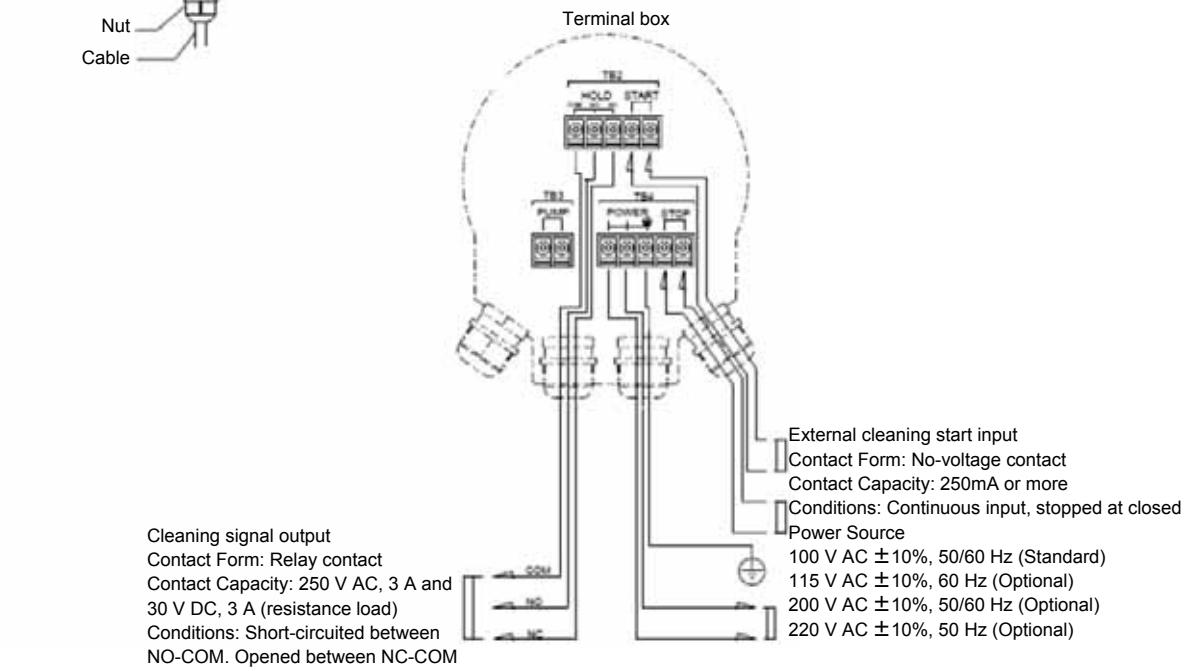
Carry out installation and execution of work while being careful about the following points:

Connections
• For the safety reason, do not turn ON the power until the operation is started.
• Do not input any power supply other than the rated voltage. Otherwise, the relay and the motor will be damaged.
• In order to prevent electric shocks, be sure to ground the protective earth terminal (class-D grounding).
• The applicable diameter of the cable at the wiring slot ranges from 7 mm to 12 mm.
• Upon completion of work, be sure to put the terminal cover to prevent electric shocks.

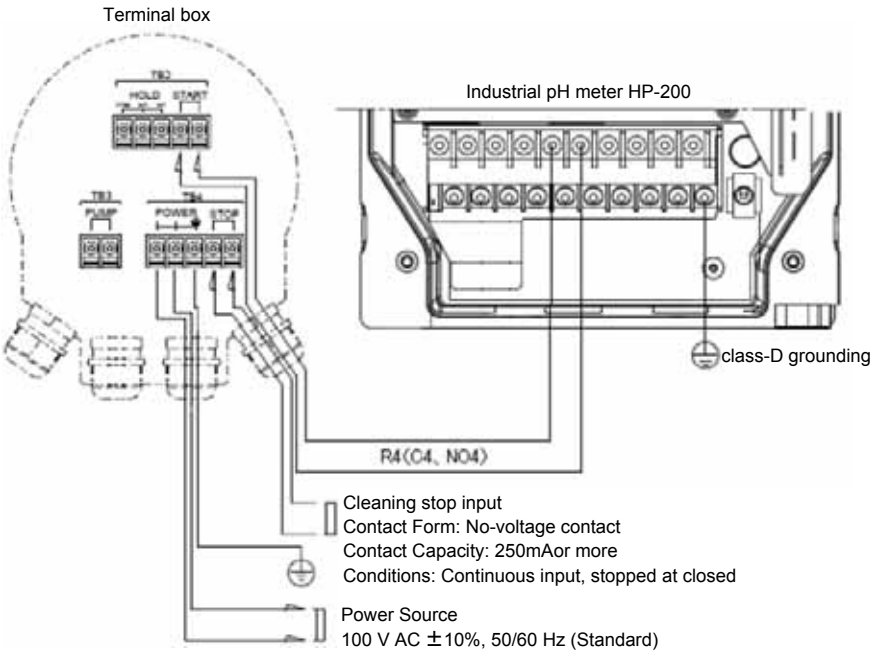
Applicable electric wire	7 to 12 mm; 0.75 mm^2 min.



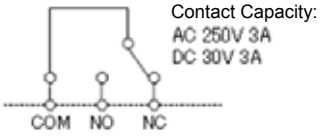




■Installation (BCH-121) (general connections)

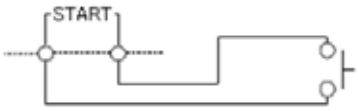


Wiring of HOLD (cleaning signal output (hold signal output))
• Contact capacity under resistance load is 250 V AC, 3 A and 30 V DC, 3 A (resistance load).
• Cleaning signal output can be produced from the "COM, NO, and NC" Terminals in the Terminal Block.



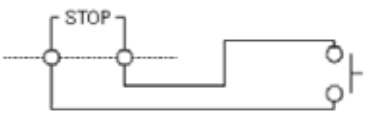
COM, NO ••• "ON" at cleaning
COM, NO ••• "OFF" at cleaning

Wiring of START (external cleaning start input)
• Cleaning operation can be started from the outside by using the external cleaning start input line.
• Produce an input of "Closed" signal of 100 ms or more to the "START" Terminal in the Terminal Block.
• For the above setting, set R4 of HP-200 to "Cleaning Output"/



Closed Time:
No-voltage contact pulse input of 100 ms or more
Close •••••• Cleaning "ON"
Open •••••• Cleaning "OFF"
Load relay:
Max. 30 mA (Voltage is the same of power voltage.)

Wiring of STOP (cleaning stop signal input)• Cleaning operation can be stopped by using the "STOP" Terminal.
• This "STOP" terminal is arranged in series with the power supply line to the motor.
• If the "STOP" Terminal is set to "OPEN", an electric current will not be passed to the motor (solenoid valve) so that cleaning operation can be stopped.
The "STOP" Terminal is usually short-circuited with a short bar.

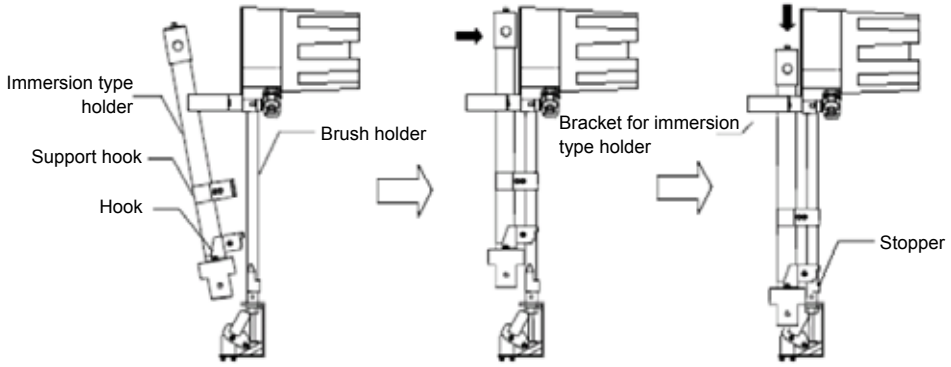


Cleaning stop signal
Close •••••• Cleaning "ON"
Open •••••• Cleaning "OFF"
Load relay:
Max. 30 mA (Voltage is the same of power voltage.)

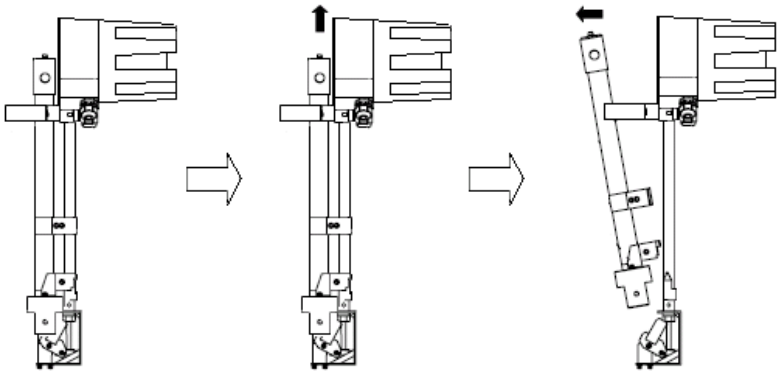
■Installation (brush jet cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation
- Attach the hook and support hook to the brush holder.
- Slowly move down the hook along the brush holder.
- Once the hook is caught by the stopper, secure the bracket for the immersion type holder.



Removal
- Remove the bracket for the immersion type holder.
- Moves up the immersion type holder.
- Remove the hook and the support hook from the brush holder.



■ Installation

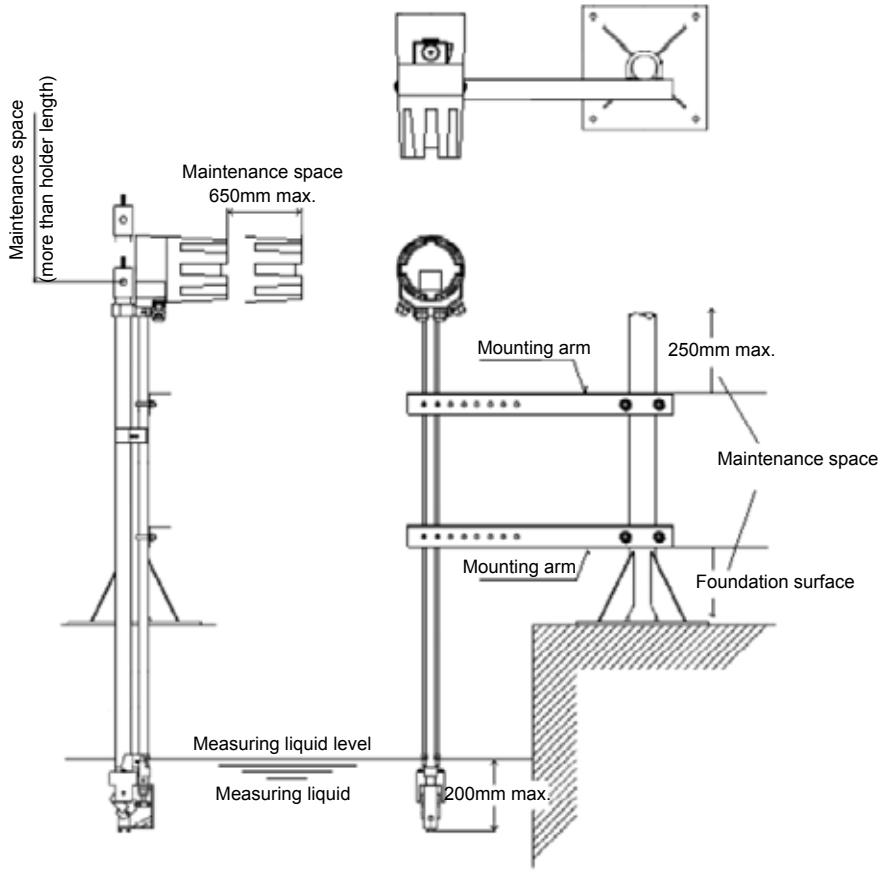
Installation environment

• Install the Cleaner at a location where maintenance work can be easily performed.

• Install the Cleaner at a height where an electrode is always immersed in measured liquid even if a measured liquid level changes.

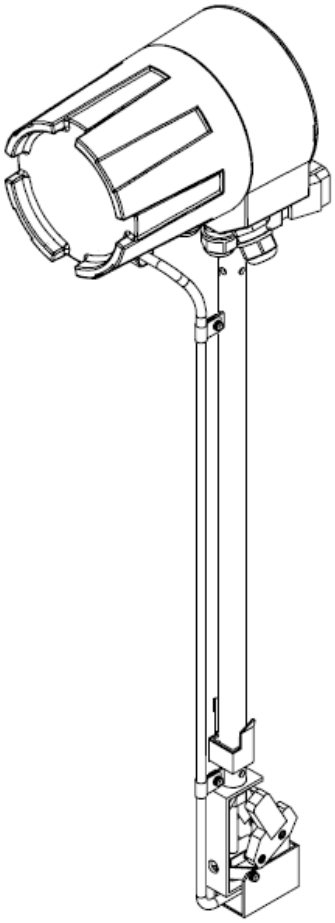
• Avoid installing the Cleaner at a location exposed to corrosive fluid and gas. etc.

• Avoid installing the Cleaner at a location where a surface temperature and an ambient temperature are 50℃ or higher in the vicinity of a heat source.



H-1 series Immersion Brush Jet Cleaner

BCH-121J



■ Overview

● This Cleaner can intermittently clean any dirt off the glass film and liquid junction section of an electrode by brushing and by running a jet flow of cleaning water at the same time. This Cleaner does not have the timer functions. So the timer functions of a converter is used to make settings for cleaning interval and cleaning time.

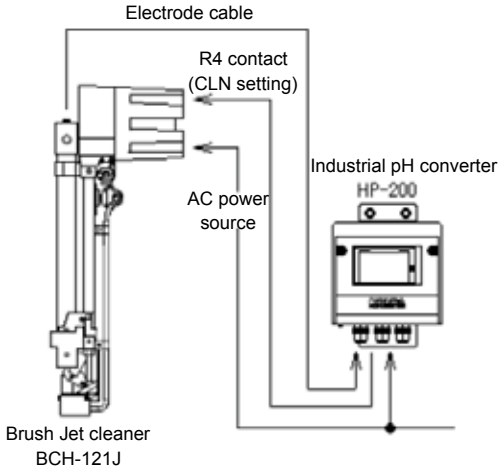
■ Objects

The Brush Jet Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

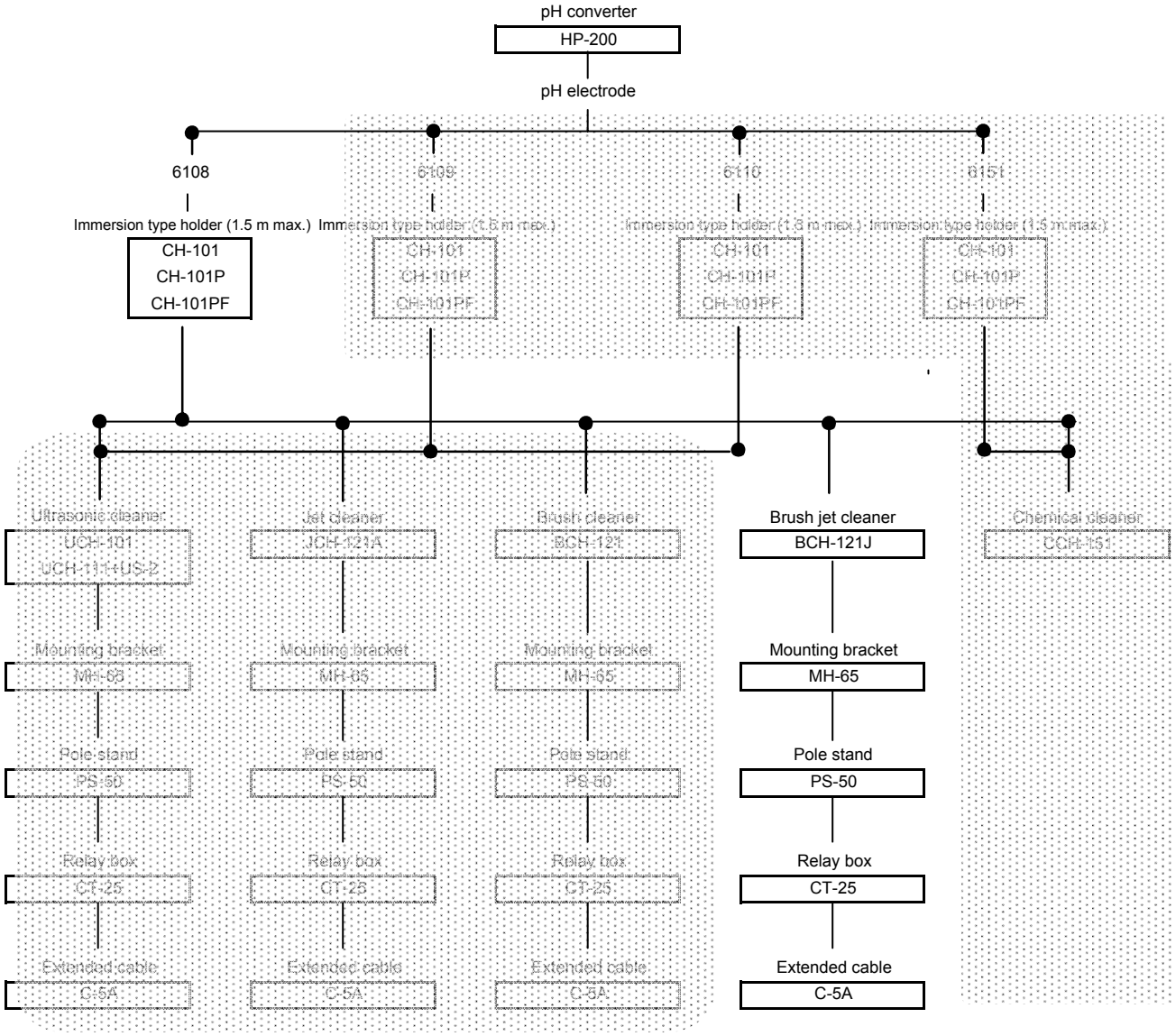
Properties	Objects	
Slime	food, paper, pulp, algae	⊙
Microorganism	bacteria (activated sludge), slag	⊙
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment CaCO3, etc.	○

⊙:Good ○:Acceptable ×:Not Acceptable

■System configuration



■Combinations (Immersion jet cleaner)



■Specifications (BCH-121J)

Product Name		Immersion Type Brush Jet Cleaner
Model		BCH-121J
Supply Voltage (*1)		100 VAC 50/60Hz
Permissible Voltage Variat		90% to 110% of supply voltage
Power Consumption		Max. 25VA
Cleaning Signal Output	Contact Form	Relay contact SPDT (1c)
	Contact Capacity	250 V AC 3 A, 30 V DC 3 A (resistance load)
	Conditions	Short-circuited between NO-COM. Opened between NC-COM
External Cleaning Start Input	Contact Form	No-voltage contact
	Contact Capacity	300 mA. Voltage is the same of power voltage.
	Conditions	Pulse input, closed time of 100 msec or more
Cleaning Stop Signal Input *2	Contact Form	No-voltage contact
	Contact Capacity	250 mA. Voltage is the same of power voltage.
	Conditions	Continuous input, stopped at open
Cleaning Method		Intermittent cleaning with a swing brush and water jet
Ambient temperature		-5 to 50°C
Ambient humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *3		5°C to 80°C (without dew condensation)
Measured Liquid Flow Velocity		2 m/sec or less
Measured Liquid Pressure		Atmospheric pressure
Cleaner pressure		0.1 to 0.5 MPa
Cleaning water quality		Equivalent to tap water
Cleaning water consumption		Approx. 4 L/min
Bore diameter connected for cleaning (*4)		Rc1/4
Materials of Liquid Junction Section		SUS316, PP (not including an electrode and an Immersion Hc
Mass		Approx. 8.0 kg (holder length of 1.0 m)
Terminal box	Protection Class	IP54 (IEC60529, JIS C0920) (Category 2)
	Materials	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This product is not supplied with an electrode and a holder.

*1 A supply voltage of 200 V AC is optional. For any other voltages, please consult with HORIBA Advanced Techno.

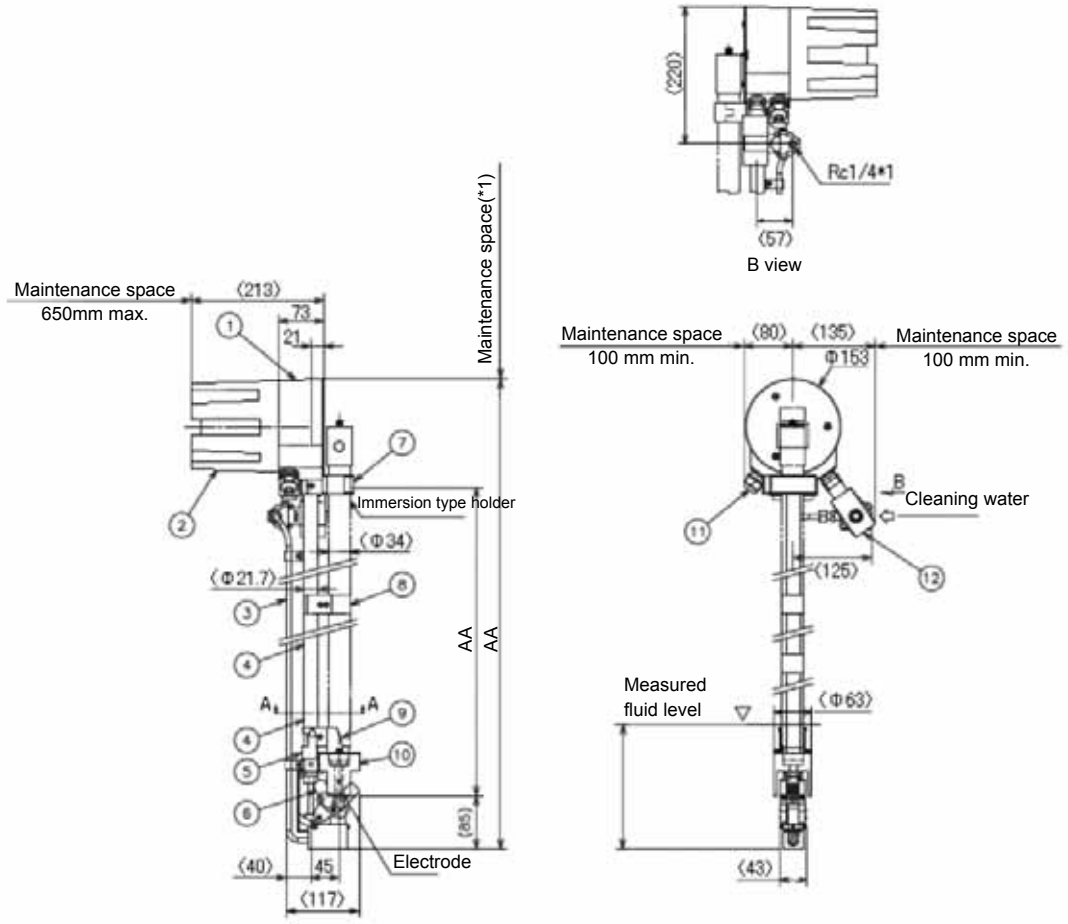
*2 Terminals have been short-circuited at the time of shipment of products. For a purpose of inputting a cleaning stop signal, remove a short-circuit line.

*3 A working temperature range varies with a combinational electrode and an Immersion Holder. Check a working temperature for each product.

*4 If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaning water directly from a tap water pipe. Separate a cleaning water pipe from a general tap water pipe by using a tap water pressurizing device, etc.

Moreover, if cleaning water may be frozen, provide heat insulated piping against warm and cold weather.

■External dimensions (BCH-121J)



	PARTS	NOTES
(1)	Timer unit	AC4C
(2)	Timer unit cover	AC4C
(3)	Pipe	SUS316
(4)	Brush holder	SUS316
(5)	Stopper	SUS316
(6)	Brush	PP
(7)	Immersion holder mounting bracket	PVC
(8)	Support hook	SUS316
(9)	Hook	SUS316
(10)	Protective tube	PP
(11)	Piping slot	O.D Φ7toΦ12cable
(12)	Solenoid valve	

• No support hook is provided on the cleaner of 1.5 m or less.

Nominal length (m)	L1-dimension	Maintenance space(*1)	L2-dimension
1	993±10	995 or more	1153±10
1.5	1493±10	1495 or more	1653±10
2	1993±10	1995 or more	2153±10
2.5	2493±10	2495 or more	2653±10
3	2993±10	2995 or more	3153±10

Unit: mm

The L-dimension and tolerance of BCH-121J immersion type brush jet cleaner are shown in the following table.

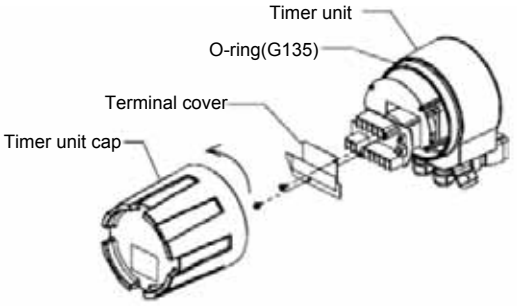
The maintenance space must be provided above the solenoid valve.

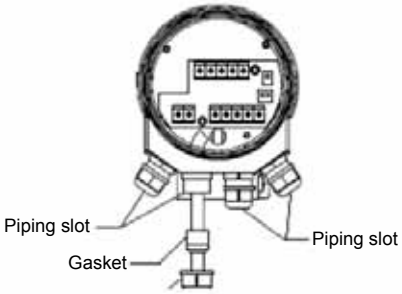
■ Installation (BCH-121J) (connections)

Carry out installation and execution of work while being careful about the following points:

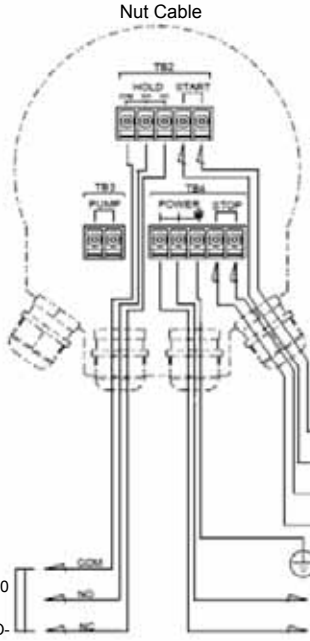
Connections
• For the safety reason, do not turn ON the power until the operation is started.
• Do not input any power supply other than the rated voltage. Otherwise, the relay, timer and the motor will be damaged.
• In order to prevent electric shocks, be sure to ground the protective earth terminal (class-D grounding).
• The applicable diameter of the cable at the wiring slot ranges from 7 mm to 12 mm.
• Upon completion of work, be sure to put the terminal cover to prevent electric shocks.

Applicable electric wire	7 to 12 mm; 0.75 mm^2 min.





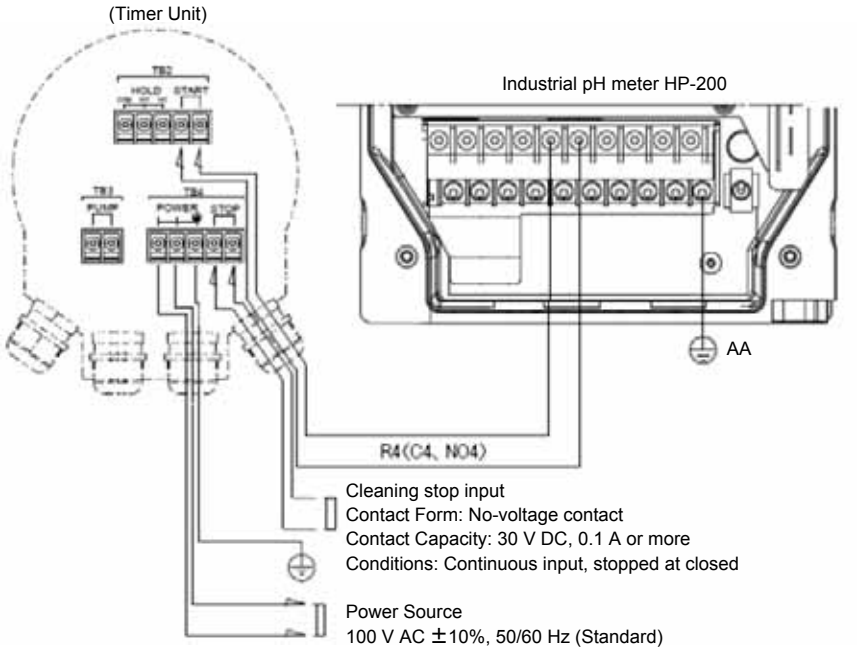
Nut Cable



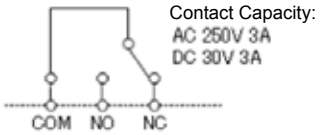
Cleaner (Timer Unit)
Cleaning signal output
Contact Form: Relay contact
Contact Capacity: 250 V AC, 3 A and 30 V DC, 3 A (resistance load)
Conditions: Short-circuited between NO-COM. Opened between NC-COM

External cleaning start input
Contact Form: No-voltage contact
Contact Capacity: 30 V DC, 0.1 A or more
Conditions: Pulse input, closed time of 100 ms or more
Cleaning stop input
Contact Form: No-voltage contact
Contact Capacity: 30 V DC, 0.1 A or more
Conditions: Continuous input, stopped at closed
Power Source
100 V AC ±10%, 50/60 Hz (Standard)
115 V AC ±10%, 60 Hz (Optional)
200 V AC ±10%, 50/60 Hz (Optional)
220 V AC ±10%, 50 Hz (Optional)

■Installation (BCH-121J) (general connections)

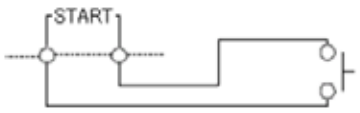


Wiring of HOLD (cleaning signal output (hold signal output))
• Contact capacity under resistance load is 250 V AC, 3 A and 30 V DC, 3 A (resistance load).
• Cleaning signal output can be produced from the “COM, NO, and NC" Terminals in the Terminal Block.



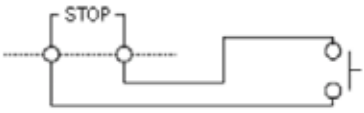
COM, NO ••• “ON” at cleaning
COM, NO ••• “OFF” at cleaning

Wiring of START (external cleaning start input)
• Cleaning operation can be started from the outside by using the external cleaning start input line.
• Produce an input of "Closed" signal of 100 ms or more to the “START” Terminal in the Terminal Block.
• For the above setting, set R4 of HP-200 to“Cleaning Output”/



Closed Time:
No-voltage contact pulse input of 100 ms or more
Close •••••• Cleaning “ON”
Open •••••• Cleaning “OFF”
Load relay:
Max. 30 mA (Voltage is the same of power voltage.)

Wiring of STOP (cleaning stop signal input)
• Cleaning operation can be stopped by using the“STOP” Terminal.
• This "STOP" terminal is arranged in series with the power supply line to the motor.
• If the "STOP" Terminal is set to "OPEN", an electric current will not be passed to the motor (solenoid valve) so that cleaning operation can be stopped.
• The “STOP” Terminal is usually short-circuited with a short bar.

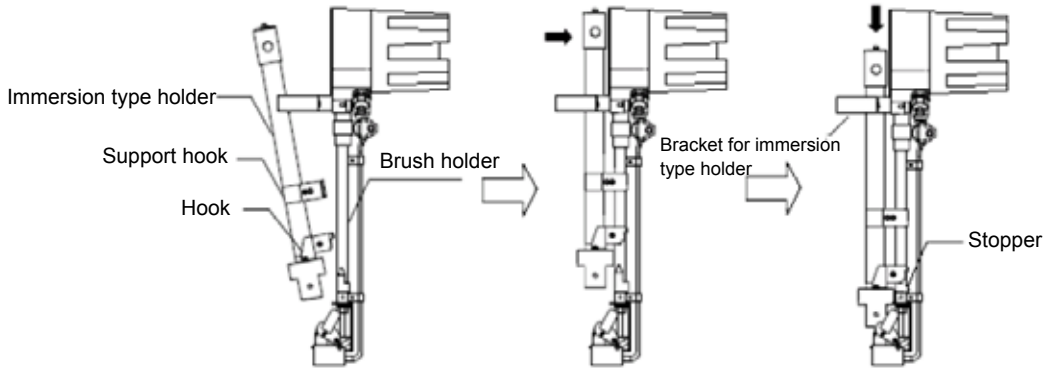


Cleaning stop signal
Close •••••• Cleaning “ON”
Open •••••• Cleaning “OFF”
Load relay:
Max. 30 mA (Voltage is the same of power voltage.)

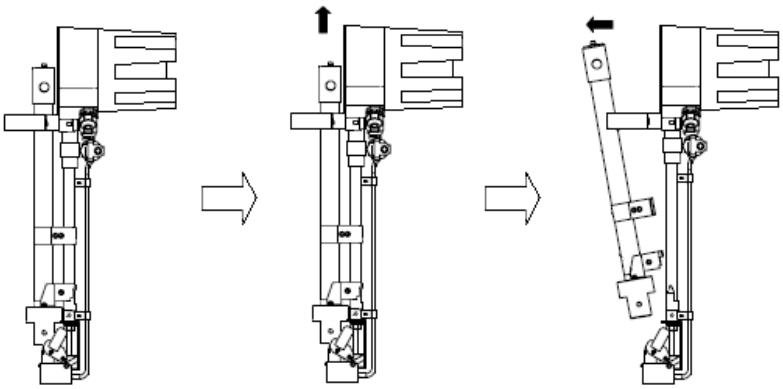
■ Installation (brush jet cleaner and holder)

Carry out installation and execution of work as illustrated

Installation
• Attach the hook and support hook to the brush holder.
• Slowly move down the hook along the brush holder.
• Once the hook is caught by the stopper, secure the bracket for the immersion type holder.



Removal
• Remove the bracket for the immersion type holder.
• Moves up the immersion type holder.
• Remove the hook and the support hook from the brush holder.

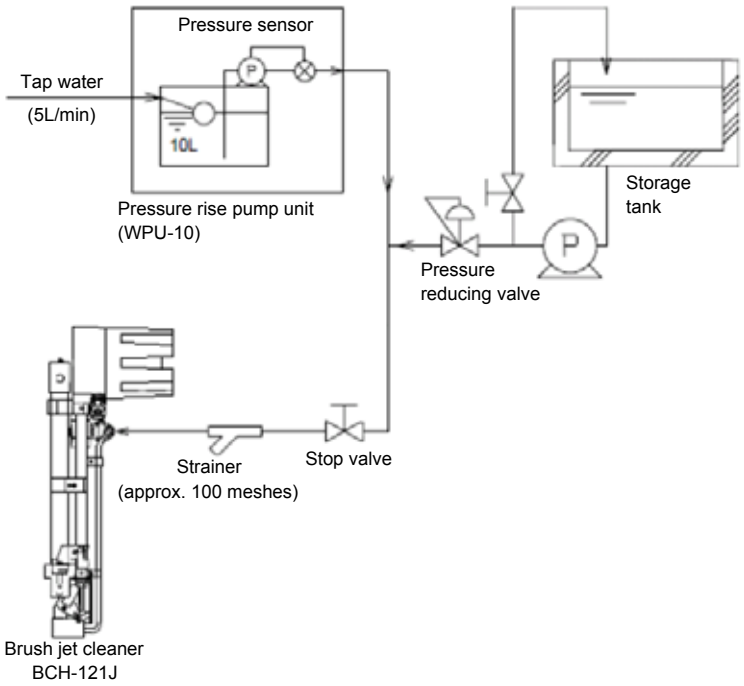


■ Installation (BCH-121J) (piping)

Carry out installation and execution of work while being careful about the following points:

Piping

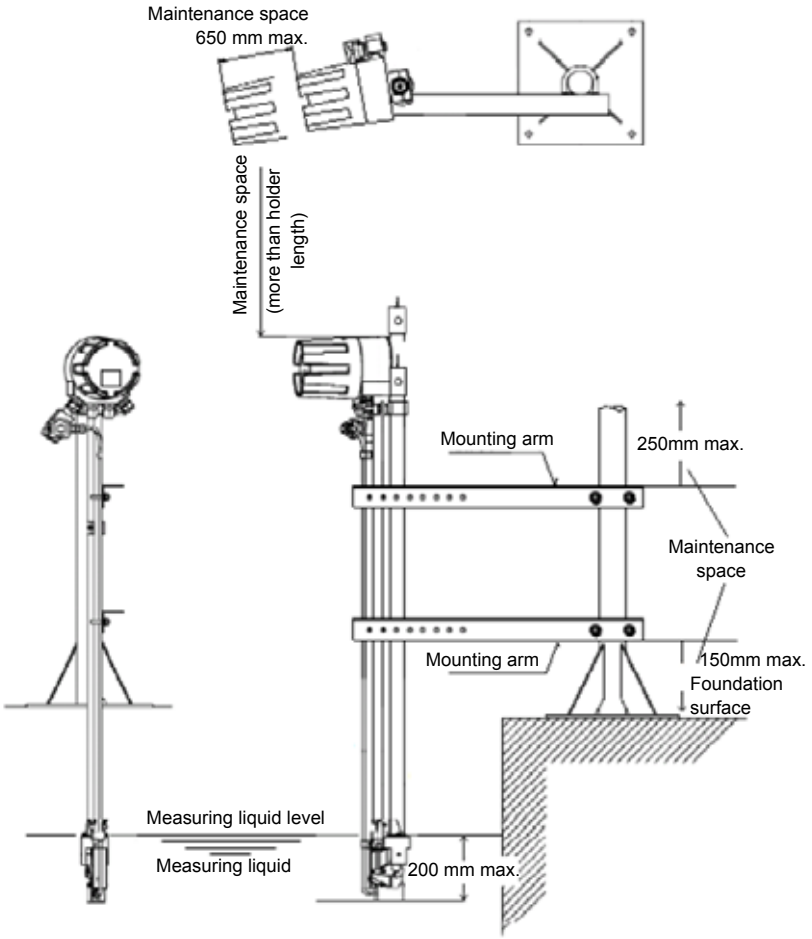
• Since the Cleaner may be detached for a maintenance purpose, use a flexible pipe that can allow enough room for its length.
• Before connecting a pipe to the Cleaner, be sure to pour water into the pipe to flush garbage inside the pipe.
• With the regulator, adjust the cleaning water to a specified pressure.
• It is prohibited under the Water Supply Law to connect a cleaning-water pipe directly to a tap-water main pipe.Adopt a method by which the cleaning water is received in a water tank and is pressurized with a pump.However, your own industrial water (tertiary treatment water) pipe may be connected directly to a tap water main pipe.Moreover, a tap water pipe may be connected if the tap water is isolated and supplied via a water tank located on a rooftop.



■Installation

Installation environment

・Install the Cleaner at a location where maintenance work can be easily performed.
・Install the Cleaner at a height where an electrode is always immersed in measured liquid even if a measured liquid level changes.
・Avoid installing the Cleaner at a location exposed to corrosive fluid and gas. etc.
・Avoid installing the Cleaner at a location where a surface temperature and an ambient temperature are 50 ° C or higher in the vicinity of a heat source.



Distribution type ultrasonic cleaner for H-1

UCF series

■ Overview

• The ultrasonic cleaner removes dirt adhering to the electrode or prevents dirt from adhering to the electrode by combining the pH electrode.
The electrode is irradiated with ultrasonic waves and this cavitation effect removes dirt adhering to the electrode.
In order to improve the cleaning effect, ultrasonic waves are intermittently oscillated (burst oscillation).

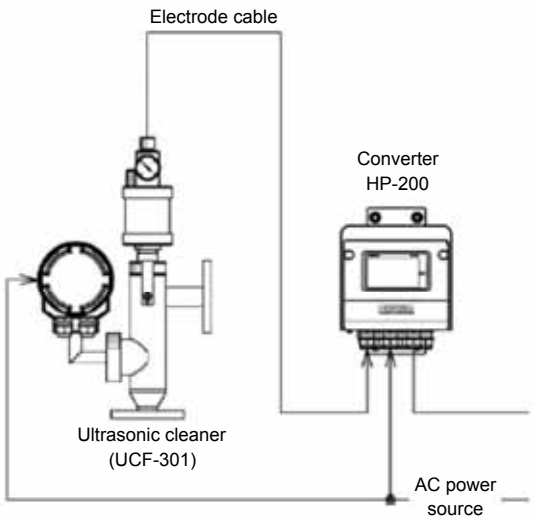
■ Objects

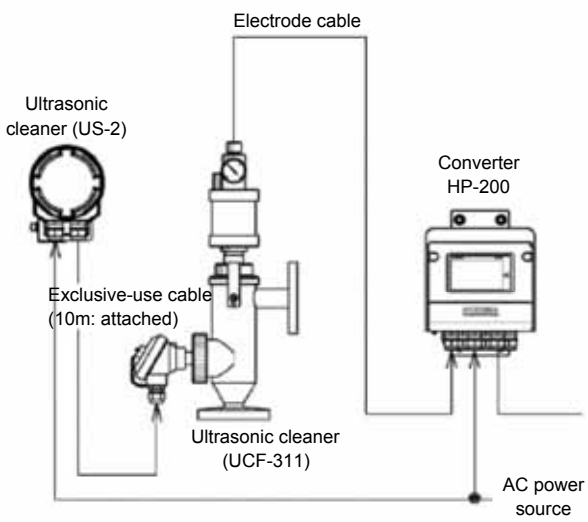
The Ultrasonic Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

Properties Classification	Objects	
Slime	food, paper, pulp, algae	○
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	×
Suspended Matters	earth and sands	◎
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment	○

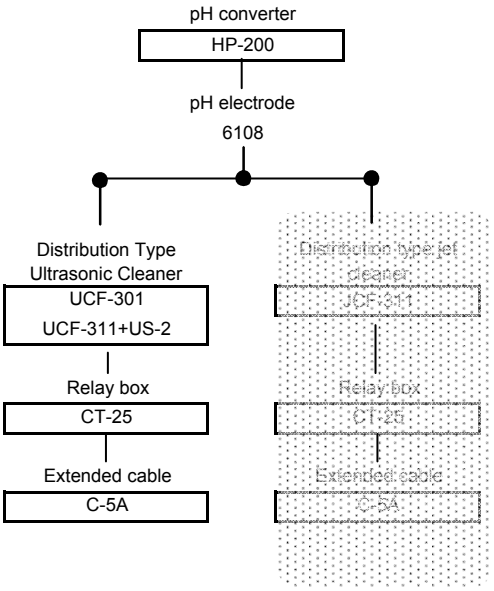
⊙:Good ○:Acceptable ×:Not Acceptable

■ System configuration





■Combinations (Distribution Type Ultrasonic Cleaner)



■ Specifications (UCF-301• UCF-311)

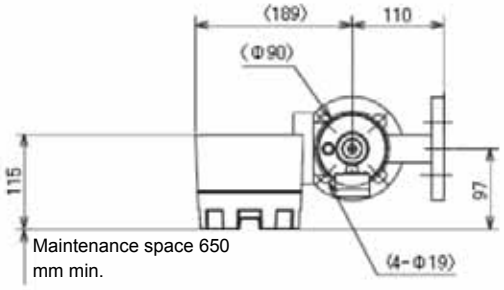
Product Name		Distribution Type Ultrasonic Cleaner (ultrasonic oscillator-integrated)	Distribution Type Ultrasonic Cleaner (ultrasonic oscillator-separately installed)
Model		UCF-301	UCF-311
Ambient Temperature		-5 to 50ºC	
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensation)	
Measured liquid conditions	Temperature *1	5°C to 80°C (without dew condensation)	
	Pressure	-5 to 40ºC:0.30MPa 40 to 60ºC:0.22MPa 60 to 80ºC:0.15MPa	
	Flow rate	0.3 to 10L/min	
Materials for Liquid Junction Section(*2)		SUS316, PP, FKM (not including an electrode materials)	
Supply Voltage		AC 100 to 240V 50/60Hz	
Permissible Voltage Variation Range		90% to 110% of supply voltage	
Power Consumption		10VA	
Cleaning Method		Ultrasonic wave continuous irradiation system	
Control System		Burst system by oscillation time control	
Oscillation Frequency		Approx. 70 kHz	
Oscillator Case	Protection Class	IP54 (IEC60529, JIS C0920) (Category 2)	
	Materials	AC4C	
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)	
Bore diameter connected for cleaning		JIS 10K 25A FF flange	
Applied pressure port in holder internal pressure (*3)		Rc1/8	
Mass		Approx. 7.0 kg	Oscillator : Approx. 2.0 kg Cleaning unit : Approx. 3.0 kg
Special Note		• If periodical pressurization is manually performed, separately place a purchase order for optional parts: pressurizing inlet and hand pump. • Holders are detached at the time of maintenance. So use a flexible pipe for instrument air. • Provide a regulator with a mist cap and a filter to an instrument air line. • This Product is supplied with holders, but electrodes are not supplied.	

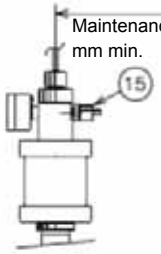
*1:Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode. Moreover, a measured liquid in a frozen state cannot be measured.

*2:For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.

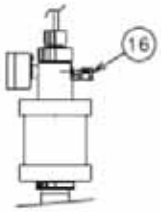
*3:Maintain a pressure in the Pressurizing Holder at the level of 0.03 MPa to 0.05 MPa higher than a measured liquid pressure at all times.

■External dimensions (UCF-301)

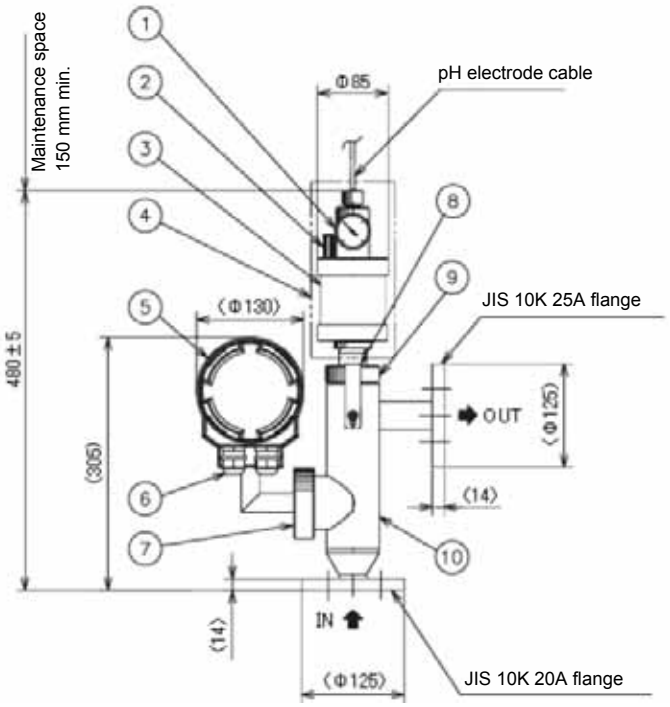


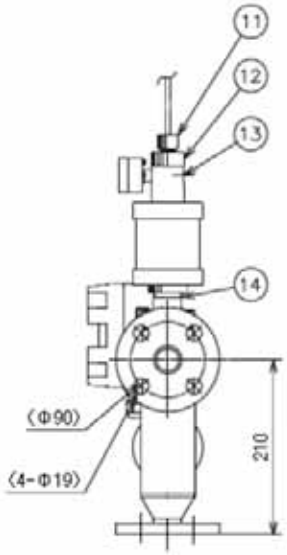


Manual pressurization specifications (Pressurization unit: optional)



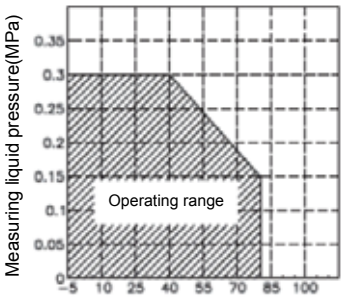
Instrumental air specifications (Tube joint: optional)



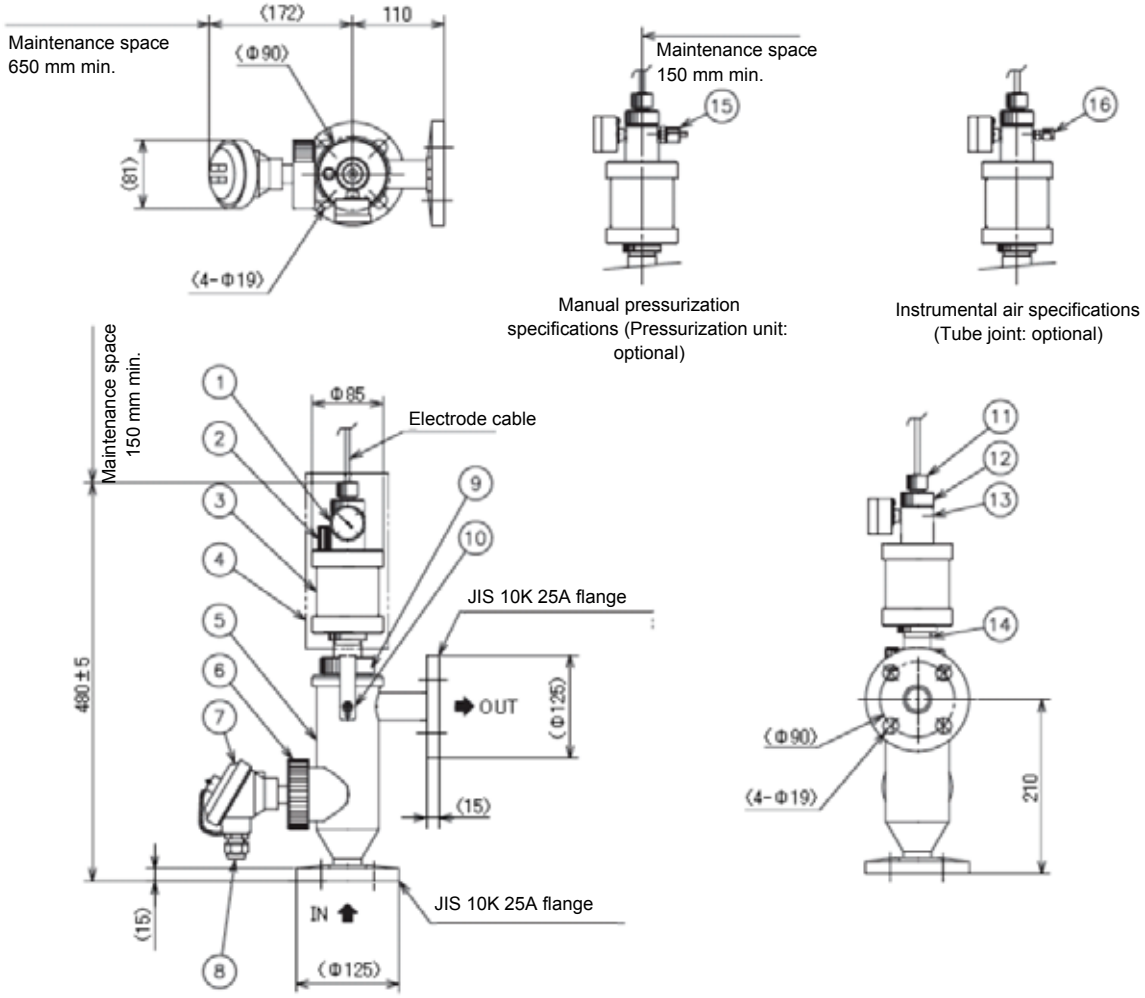


	PARTS	NOTES	
(1)	Pressure gauge	0 to 0.5 MPa SUS304	
(2)	KCl filling port	PVC	
(3)	KCl tank	PVC	
(4)	Pressurization holder		
(5)	Ultrasonic oscillator	AC4C	
(6)	Piping slot	O.D Φ7 to 12 cable	
(7)	Vibration mounting nut	SUS304	
(8)	Lock plate	SUS304	
(9)	Tightening nut	SUS304	
(10)	Distribution holder	SUS316	
(11)	Cable cap	PPO	
(12)	Holder cap	PPO	
(13)	Pressurization interface screw	Rc1/8	
(14)	Holder	PP	
(15)	Pressurization union	C3604	←Optional
(16)	Joint	For Φ6/Φ4 tube PVDF	←Optional

Relation between temperature and pressure

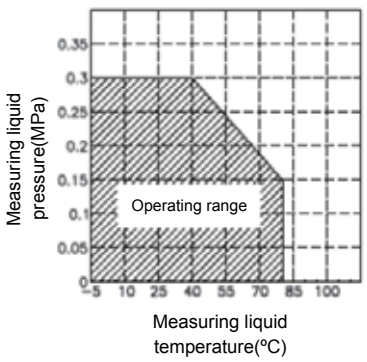


■External dimensions (UCF-311)



	PARTS	NOTES	
(1)	Pressure gauge	0 to 0.5 MPa SUS304	
(2)	KCl filling port	PVC	
(3)	KCl tank	PVC	
(4)	Pressurization holder		
(5)	Distribution holder	PPO	
(6)	Vibration mounting nut	PP	
(7)	Relay box	Al	
(8)	Piping slot	O.D Φ7 to Φ12 Cable	
(9)	Vibration mounting nut	PP	
(10)	Lock plate	SUS316	
(11)	Cable cap	PPO	
(12)	Holder cap	PPO	
(13)	Pressurization interface screw	Rc1/8	
(14)	Holder	PPO	
(15)	Pressurization union	C3604	←Optional
(16)	Joint	For Φ6/Φ4 tube PVDF	←Optional

Relation between temperature and pressure



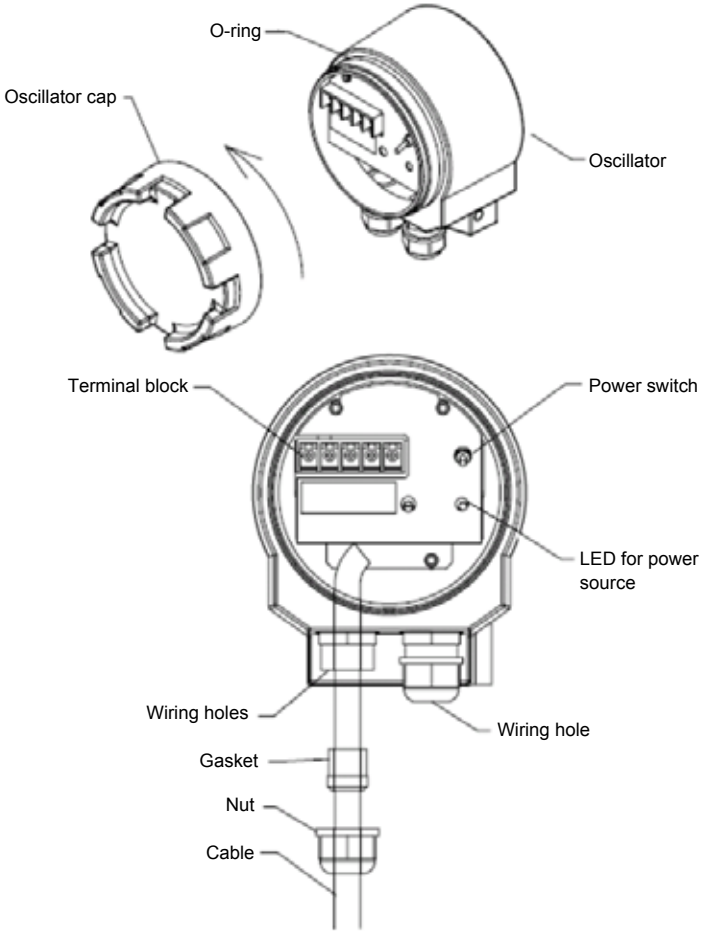
■ Installation (UCF-301) (connections)

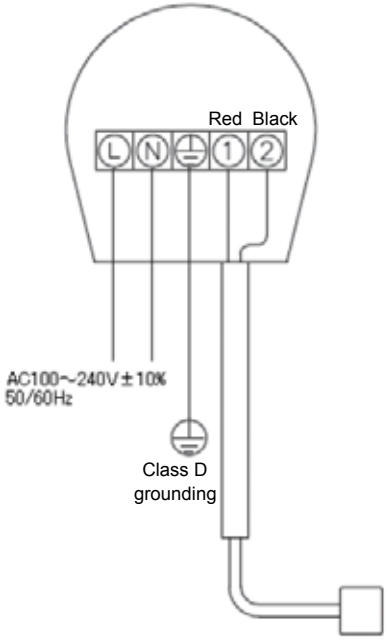
Carry out installation and execution of work while paying attention to the following points:

Power source

- This ultrasonic cleaner has a power switch. Ensure that the power switch is OFF during work.
- If the ultrasonic cleaner is operated at non-rated voltage, it may malfunction. Check the power supply voltage.
- Carefully check that the power supply voltage fluctuations fall within a range of ±10%.
- Be sure to ground the earth terminal for safety (class D grounding).
- The applicable cable diameter for the wiring hole is 7 to 12 mm.
- After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.
- The ultrasonic vibrator is already connected to the corresponding terminal.

Electric power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	7 to 12 mm dia.





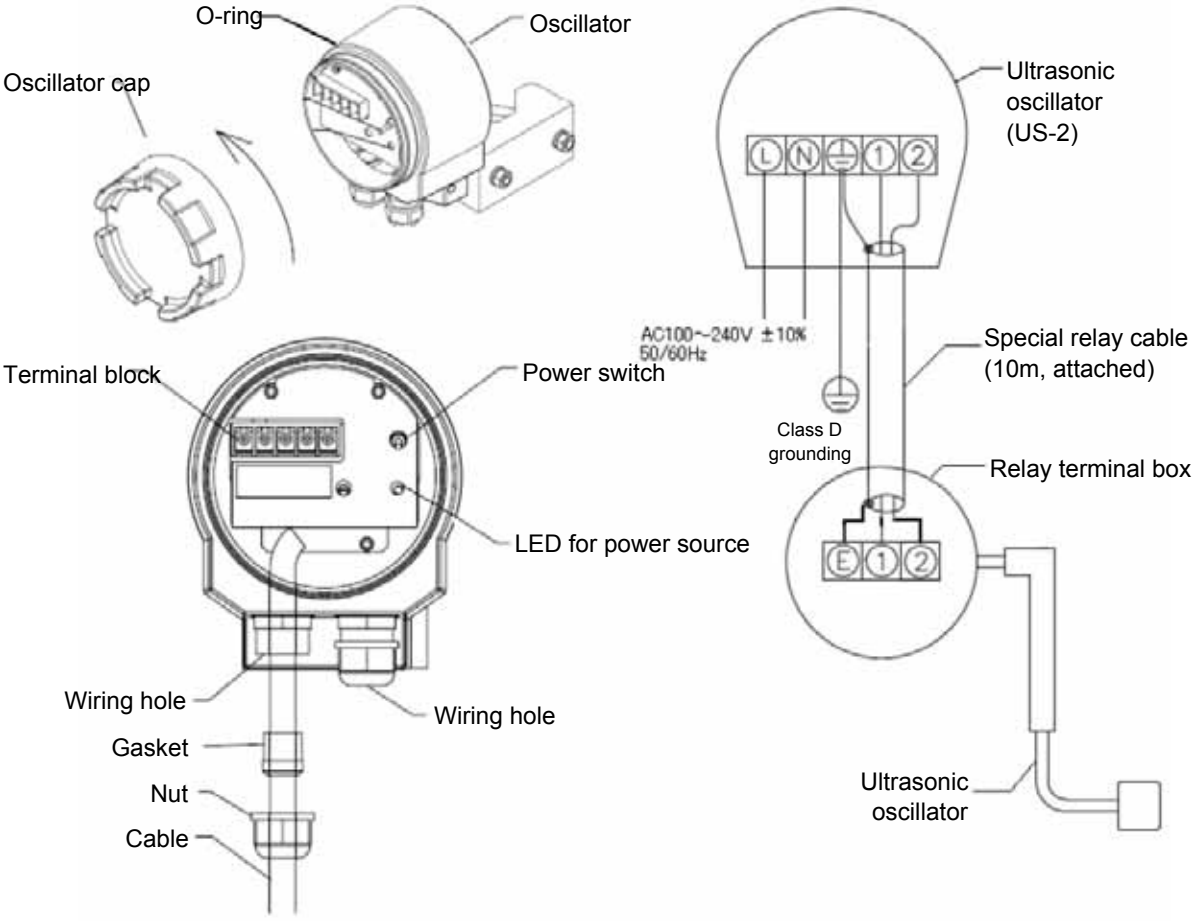
■ Installation (UCF-311) (connections)

Carry out installation and execution of work while paying attention to the following points:

Power source

• This ultrasonic cleaner has a power switch. Ensure that the power switch is OFF during work.
• If the ultrasonic cleaner is operated at non-rated voltage, it may malfunction. Check the power supply voltage.
• Carefully check that the power supply voltage fluctuations fall within a range of ±10%.
• Be sure to ground the earth terminal for safety (class D grounding).
• The applicable cable diameter for the wiring hole is 7 to 12 mm.
• After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.

Electric power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	7 to 12 mm dia.



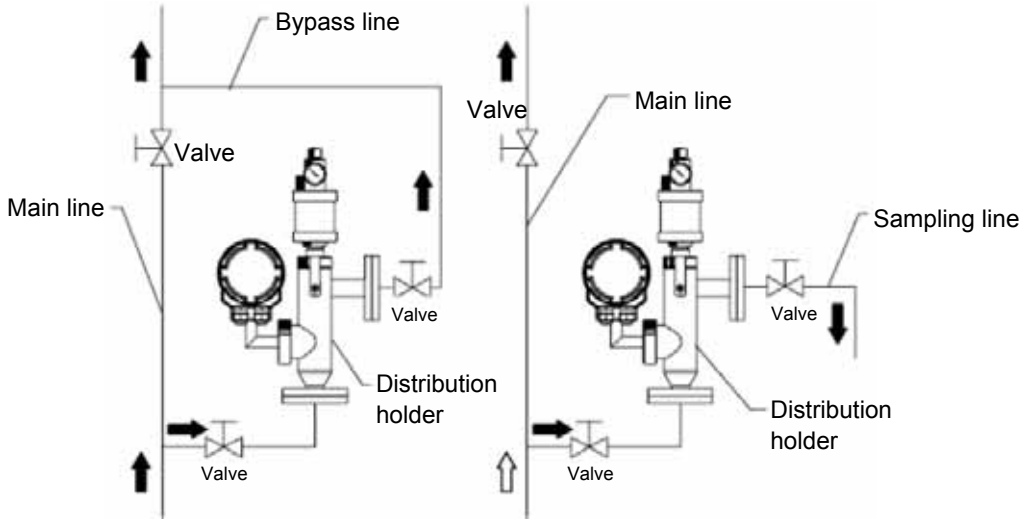
■ Installation (UCF-301)

Be sure to following the following instructions for setup.

Installation environment

• Install the Distribution Holder at a location where maintenance work can be easily performed.
• Leave a maintenance space of 15 cm or more on the top of the Pressurization Holder. Moreover, give room to an electrode cable so that it can be detached easily.
• Avoid installing the Distribution Holder at a location exposed to violent vibrations or heavy dust.
• Attach an electrode so that it does not float up in the air even when the supply of an internal liquid is stopped and the intern liquid in the pipeline is drawn out.
• Avoid installing the Distribution Holder. at a location exposed to corrosive liquid or gas.

• Avoid installing the Distribution Holder. at a location where a surface temperature and an ambient temperature are 50℃ or higher in the vicinity of a heat source.
• If measured liquid contains air bubbles, slurry and solids that may cause damage to an electrode, eliminate them from the measured liquid in advance.
• Do not connect the Distribution holder to the main line. Be sure to provide a bypass line or a sampling line to connect it to the Distribution Holder (Maintenance work cannot be performed without closing the main line.)



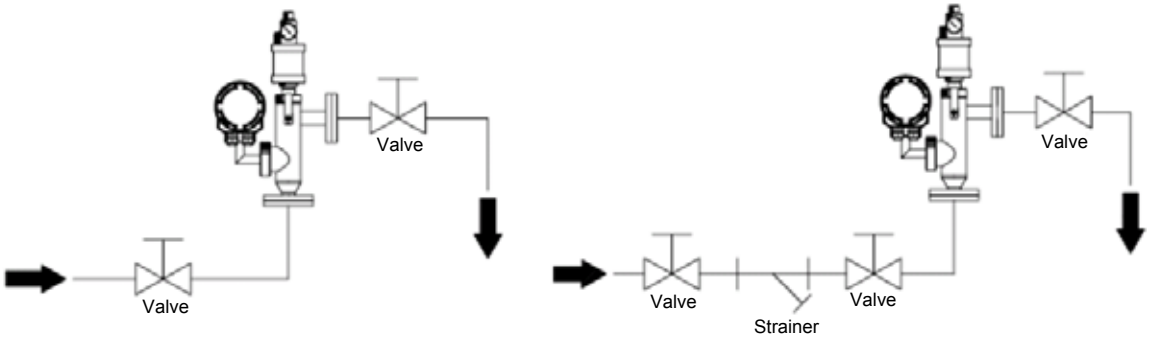
Piping

For installation of the Distribution Holder, provide a bypass line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder.
Be sure to provide valves on the inflow and outflow sides respectively.
See Fig. 1.

If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the electrode's liquid junction section is pressurized by flow velocity. If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to
the conditions of measured liquid.
If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Distribution Holder. See Fig. 2.

Fig. 1

Fig. 2

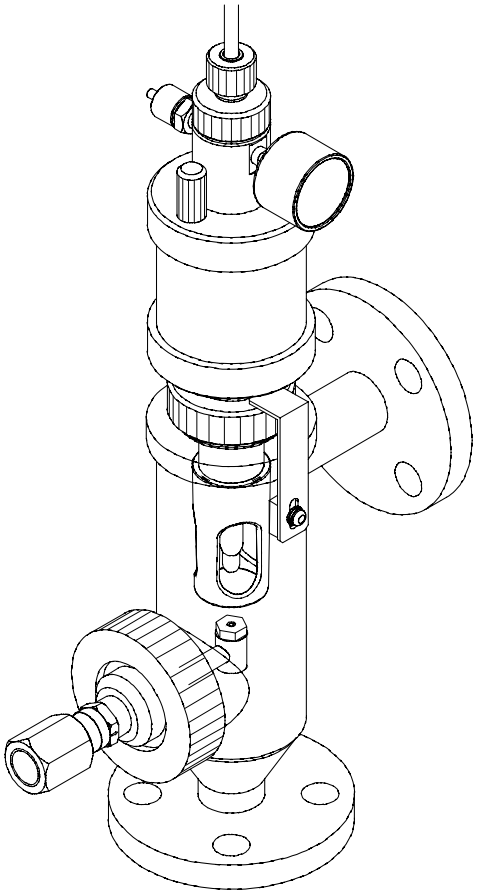


Distribution type jet cleaner for H-1 series

JCF-series

■ Overview

● The jet cleaner removes dirt adhering to the electrode or prevents dirt from adhering to the electrode by combining the pH electrode.
This Jet Cleaner can intermittently clean any dirt off the glass film and liquid junction section of an electrode with a jet flow of cleaning water or air
The Timer in the Timer Unit is used to make settings for cleaning interval and cleaning time.
This Jet Cleaner is comparatively effective against the following objects.
However, its effect differs with various conditions and is not guaranteed.



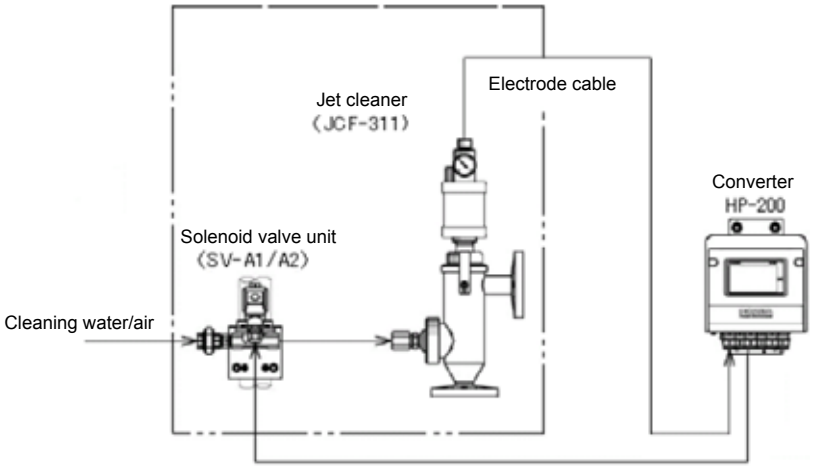
■ Objects

The Ultrasonic Cleaner is relatively effective to the following objects.
However, its effect differs with various conditions and is not guaranteed.

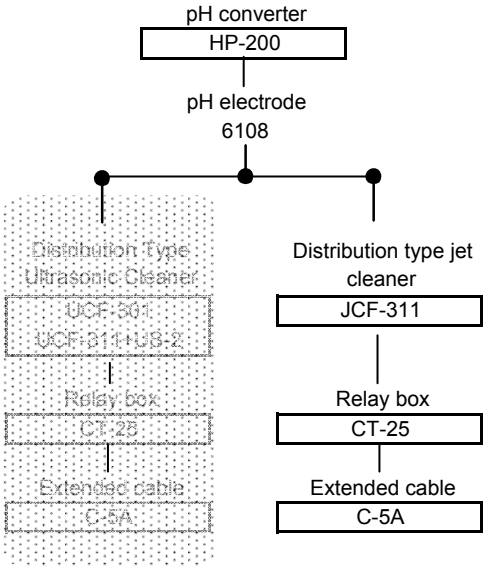
Properties Classification	Objects	
Slime	food, paper, pulp, algae	◎
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment CaCO3, etc.	○

⊙:Good ○:Acceptable ×:Not Acceptable

■ System configuration



■ Combinations (Distribution Type Ultrasonic Cleaner)

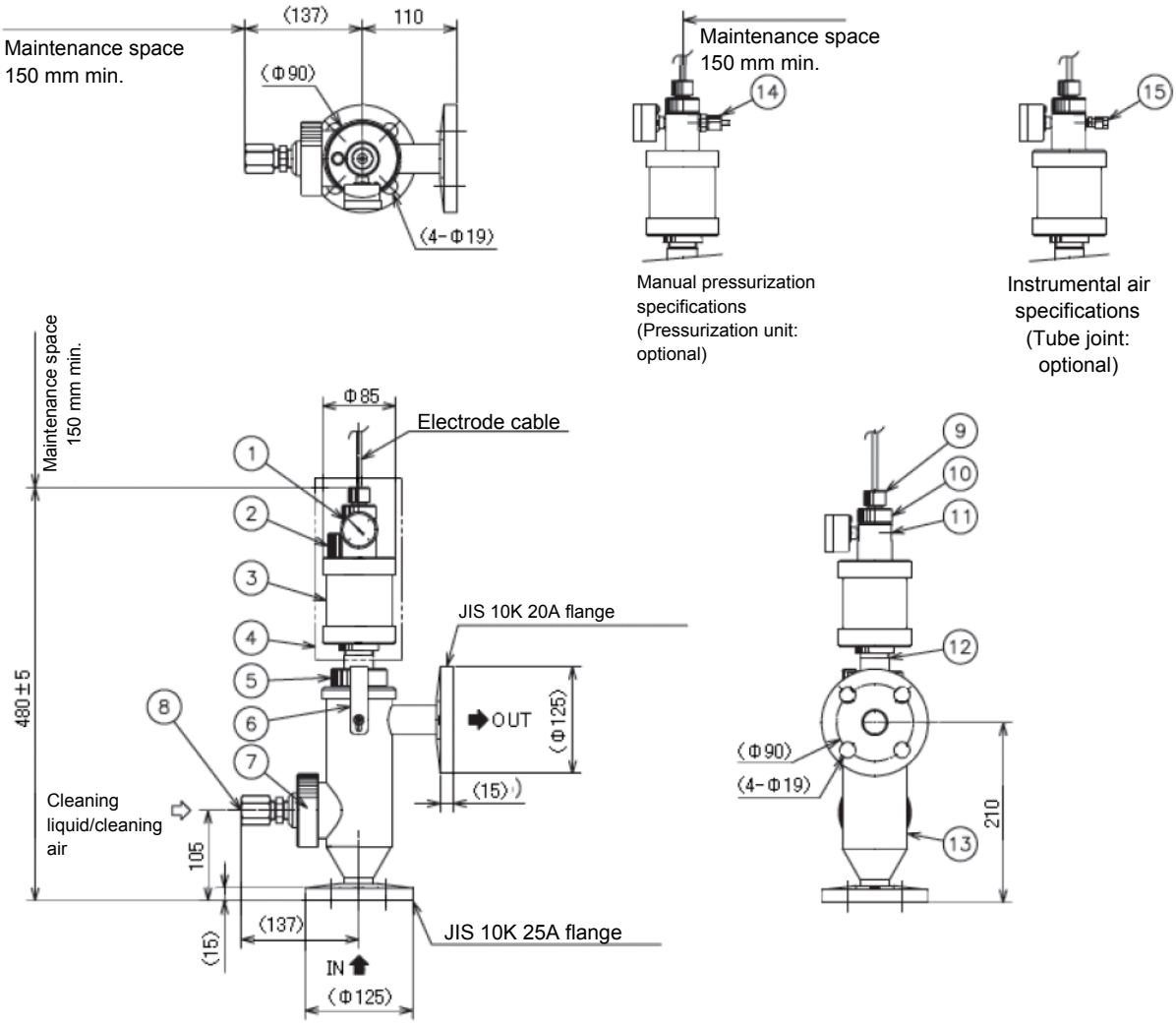


■ Specifications (JCF-311)

Product Name		Distribution Type Jet Cleaner (timer unit-separately installed)
Model		JCF-311
Ambient Temperature		-5 to 50°C
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured liquid conditions	Temperature *1	5°C to 80°C (without dew condensation)
	Pressure	-5 to 40°C：0.30MPa 40 to 60°C：0.22MPa 60 to 80°C：0.15MPa
	Flow rate	0.3 to 10L/min
Materials for Liquid Junction Section *2		SUS316, PP, FKM (not including an electrode materials)
Cleaning pressure		Water/air: 0.05 MPa to 0.5 MPa (*3) Adjust a cleaning pressure to a measured liquid pressure + 0.05 MPa to 0.2 MPa.
Bore Diameter Connected for Cleaning		Rc1/2
Bore Size of Measured Liquid Connection		JIS 10K 25A FF flange
Pressurizing Inlet for Holder's Internal Pressure (*4)		Rc1/8
Mass		Approx. 3.0 kg
Special Note		• If periodical pressurization is manually performed, separately place a purchase order for optional parts: pressurizing inlet and hand pump. • Holders are detached at the time of maintenance. So use a flexible pipe for instrument air. • Provide a regulator with a mist cap and a filter to an instrument air line. • This Product is supplied with holders, but electrodes are not supplied.

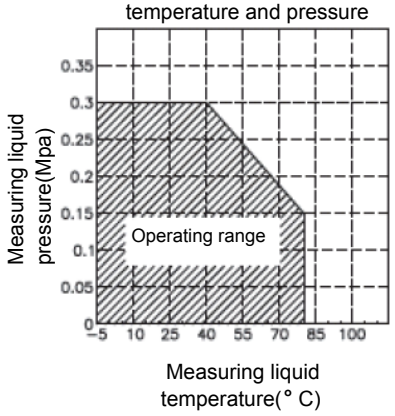
*1 Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode.
Moreover, a measured liquid in a frozen state cannot be measured.
*2 For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.
*3 If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaning water directly from a tap water pipe. Separate a cleaning water pipe from a general tap water pipe by using a tap water pressurizing device, etc.
Moreover, if cleaning water may be frozen, provide heat insulated piping against warm and cold weather.
*4 Maintain a pressure in the Pressurizing Holder at the level of 0.03 MPa to 0.05 MPa higher than a measured liquid pressure at all times.

■ External dimensions (JCF-311)



	PARTS	NOTES	
(1)	Pressure gauge	0 to 0.5 MPa SUS304	
(2)	KCl filling port	PVC	
(3)	KCl tank	PVC	
(4)	Pressurization holder		
(5)	Tightening nut	PP	
(6)	Lock plate	SUS304	
(7)	Nozzle mounting nut	PP	
(8)	Cleaning water/air inlet	Rc1/2	
(9)	Cable cap	PPO	
(10)	Holder cap	PPO	
(11)	Pressurization interface screw	Rc1/8	
(12)	Holder	PP	
(13)	Distribution holder	PP	
(14)	Pressurization union	C3604	←Optional
(15)	Joint	For Φ6/Φ4 tube PVDF	←Optional

Relation between temperature and pressure



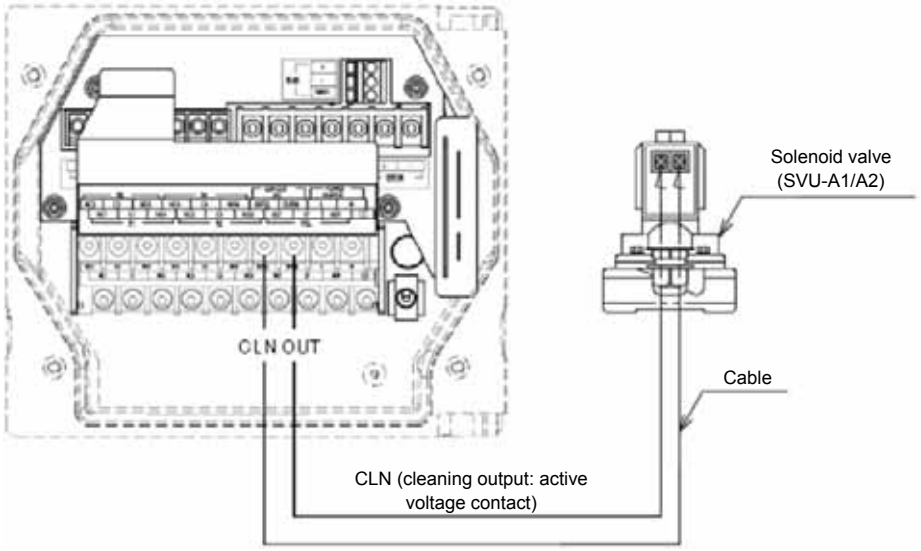
■ Installation (JCF-311) (connections)

Carry out installation and execution of work while paying attention to the following points:

Connections

- Be sure to ground the earth terminal for safety (class D grounding).
- The applicable cable diameter for the wiring hole is 7 to 12 mm.
- An active voltage is output from the CLN OUT terminal of the converter.

Applicable electric wire	7 to 12 mm dia., 0.75 mm^2 min.



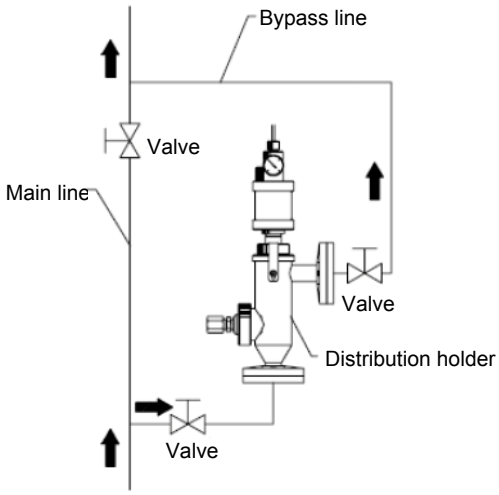
■ Installation (JCF-311) (piping)

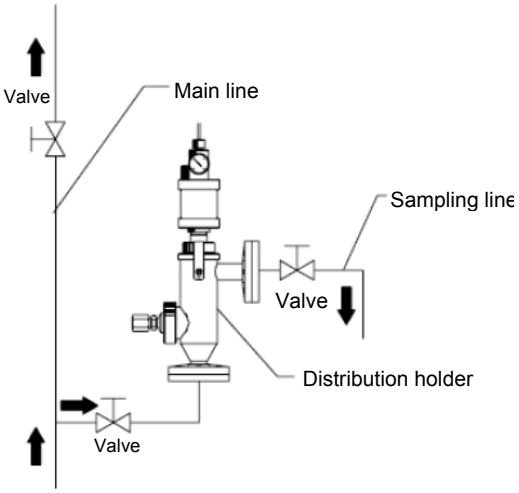
Carry out installation and execution of work while paying attention to the following points:

Installation environment

• Install the Distribution Holder at a location where maintenance work can be easily performed.
• Leave a maintenance space of 15 cm or more on the top of the Pressurization Holder. Moreover, give room to an electrode cable so that it
can be detached easily.
• Avoid installing the Distribution Holder at a location exposed to violent vibrations or heavy dust.
• Attach an electrode so that it does not float up in the air even when the supply of an internal liquid is stopped and the internal liquid in the pipeline is drawn out.
• Avoid installing the Distribution Holder. at a location exposed to corrosive liquid or gas.

• Avoid installing the Distribution Holder. at a location where a surface temperature and an ambient temperature are 50 ° C or higher in the vicinity of a heat source.
• If measured liquid contains air bubbles, slurry and solids that may cause damage to an electrode, eliminate them from the measured liquid in advance.
• Do not connect the Distribution holder to the main line. Be sure to provide a bypass line or a sampling line to connect it to the Distribution Holder. (Maintenance work cannot be performed without closing the main line.)





Piping

For installation of the Distribution Holder, provide a bypass line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder.
Be sure to provide valves on the inflow and outflow sides respectively. See Fig. 1.

If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the electrode's liquid junction section is pressurized by flow velocity. If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid.
If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Distribution Holder. See Fig. 2.

Fig. 1

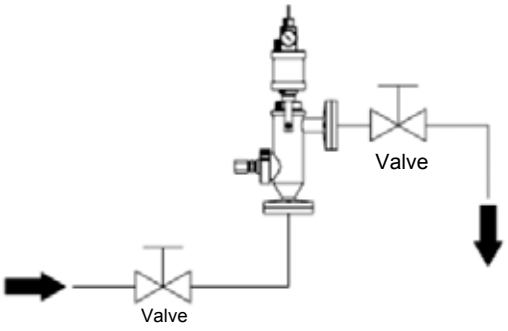
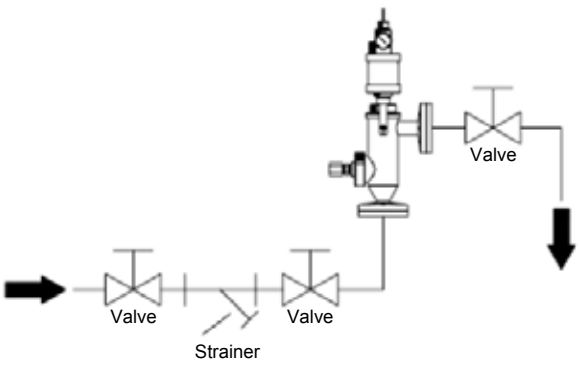


Fig. 2



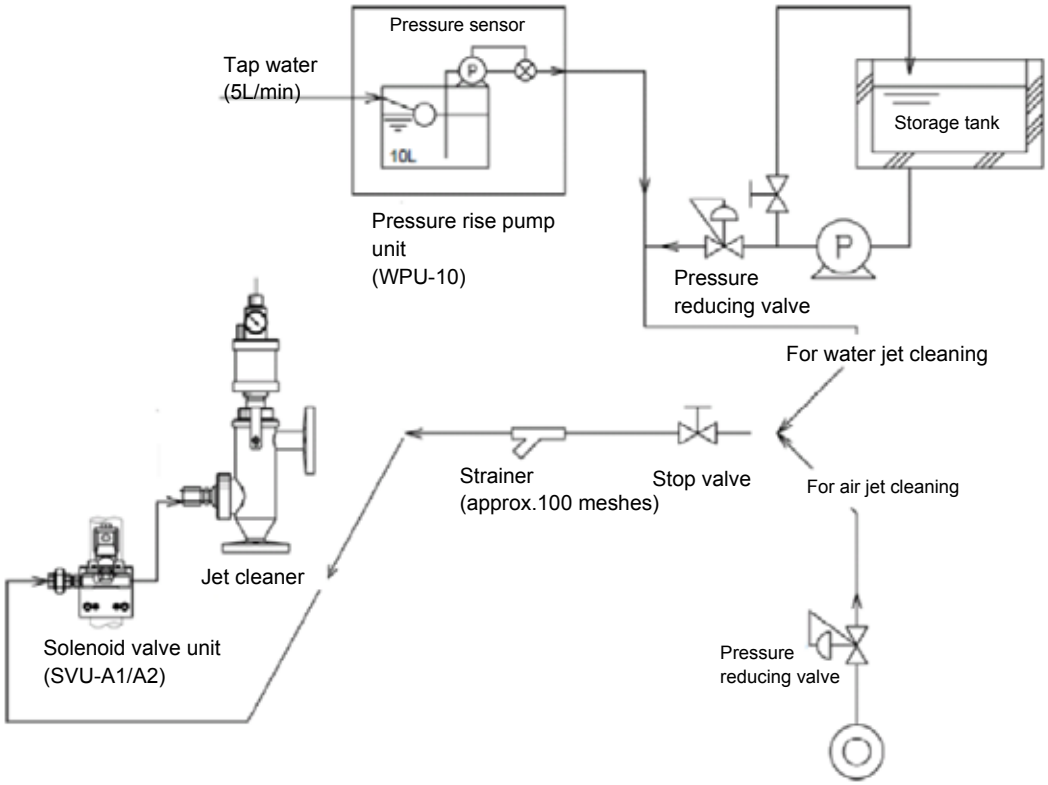
■ Installation (JCF-311) (piping)

Carry out installation while being careful about the following points:

Piping

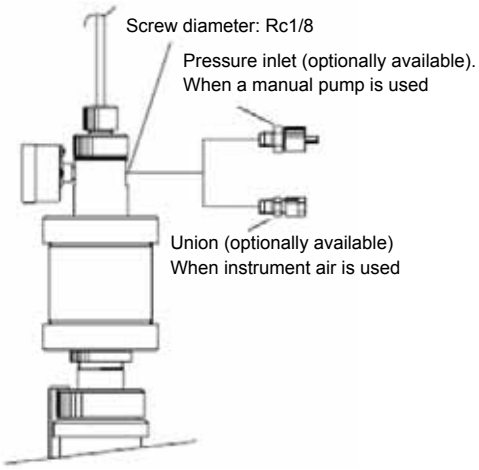
• Since the Cleaner may be detached for a maintenance purpose, use a flexible pipe that can allow enough room for its length.
• Before connecting a pipe to the Cleaner, be sure to pour water into the pipe to flush garbage inside the pipe.
• With the regulator, adjust the cleaning water to a specified pressure.
• It is prohibited under the Water Supply Law to connect a cleaning-water pipe directly to a tap-water main pip

Adopt a method by which the cleaning water is received in a water tank and is pressurized with a pump.
However, your own industrial water (tertiary treatment water) pipe may be connected directly to a tap water main pipe.
Moreover, a tap water pipe may be connected if the tap water is isolated and supplied via a water tank located on a rooftop.



Pressurized piping

• For pressurization with an inflator, use the pressure inlet.
• Maintain the pressure in the pressurized holder in 0.03 to 0.05 MPa higher than sample water pressure.
• To use instrument air, use a flexible hose considering maintenance easiness.



• For pressurization with instrument air, use a union.
• Maintain the pressure in the pressurized holder in 0.03 to 0.05 MPa higher than sample water pressure.
• To use instrument air, use a flexible hose considering maintenance easiness.
• Provide a regulator (with a filter) near the distribution type holder and connect it to the pressurized holder with a tube of 4 mm i.d./6 mm o.d.