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H-1 Series Two-Wire Type pH Meter for Industrial Use

HP-300



Overview

- The HP-300 is designed to transmit the measured pH value as a signal of 4 to 20 mADC over the supply power line when a pH electrode and a power source of 21 to 32 VDC are connected.
- The measured value and various parameters are displayed on the LCD part. When used with our cleaner, the transmission output during cleaning may be held.
- A variety of self-diagnostic capabilities is provided to allow you to detect a trouble with the pH electrode or the HP300.

Measurement target

- pH of a solution

Measuring principle

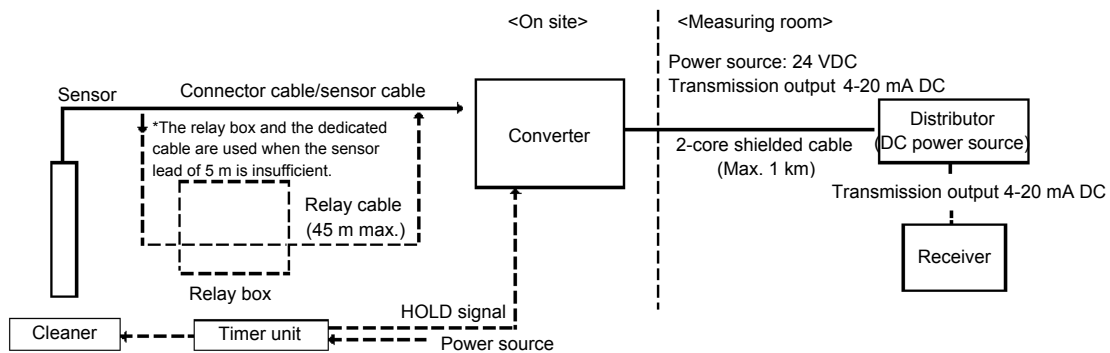
- Glass electrode type

Intended use

- Control and monitoring of drainage treatment and production process

System configuration diagram

Standard specification



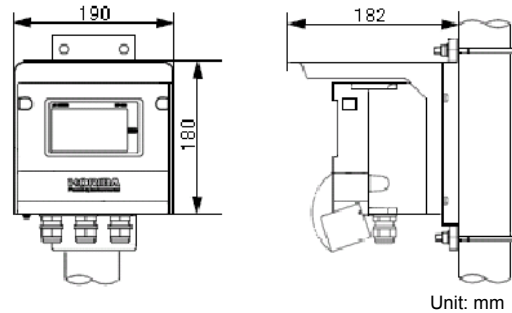
H-1 Series Two-Wire Type pH Meter for Industrial Use

HP-300 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
- Two-wire transmission type (21 to 32 VDC)
- Backup of stored data
- Easy-to-read display (150% larger than former display)
- Improved operability of keys by using an emboss sheet
- 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 a glass electrode and a comparison electrode to find the voltage (potential difference) generated between these two electrodes, thereby measuring the pH value of a solution.

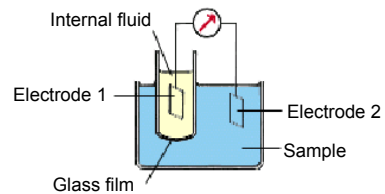
When there are solutions with different pH values inside and outside a glass thin film, the film has electromotive force generated in proportion to the pH difference. This film is called an electrode film.

When the solutions are at 30 °C, a difference of 1 in pH between the two solutions generates electromotive force of about 60 mV.

Since a solution of pH 7 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.

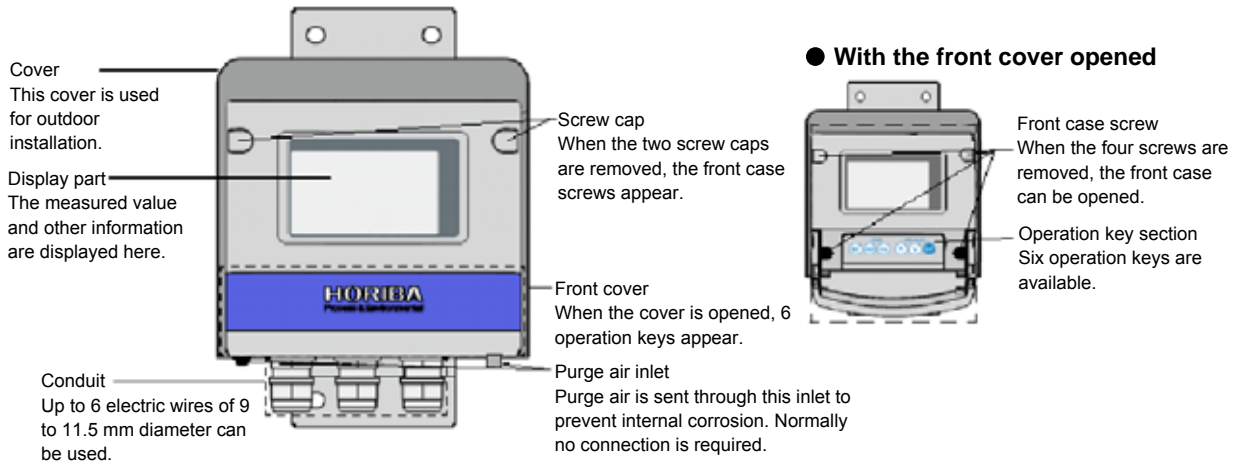
In other words, the glass film is an electrode which is designed to accurately generate electromotive force with a pH difference. The comparison electrode is designed to prevent electromotive force from being generated from the difference in pH.



Principle diagram of glass electrode method

■ Configurations

● Front



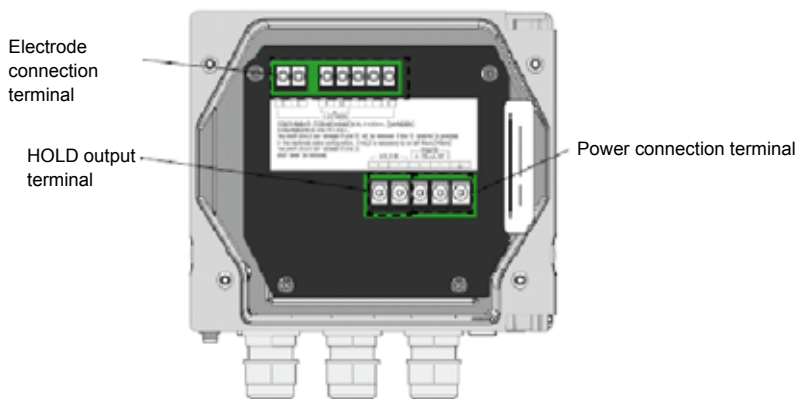
● Display part



● Operation key section

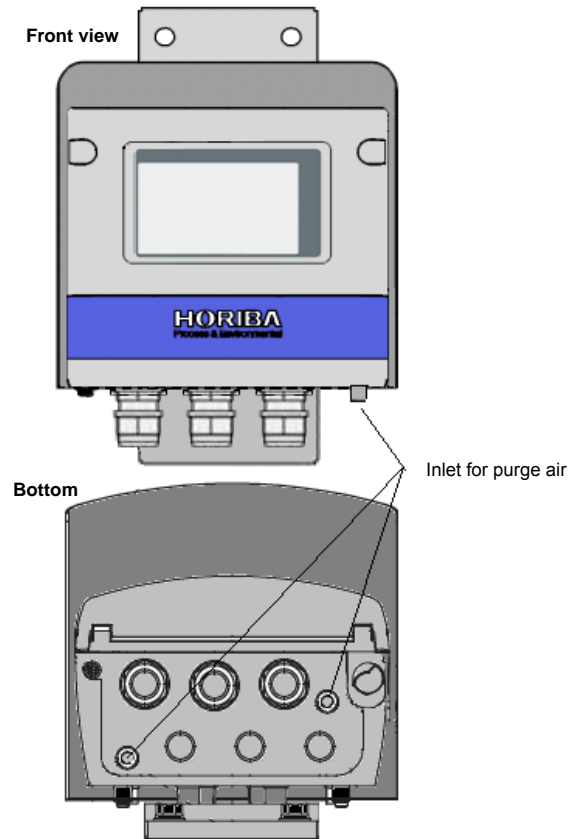


● Terminal block



■ **Air purge**

An inlet is provided for purge air which is used to prevent internal corrosion. To use the HP-300 in an environment where corrosive gas is generated, prevent corrosive gas from entering the inside by constantly sending instrument air.

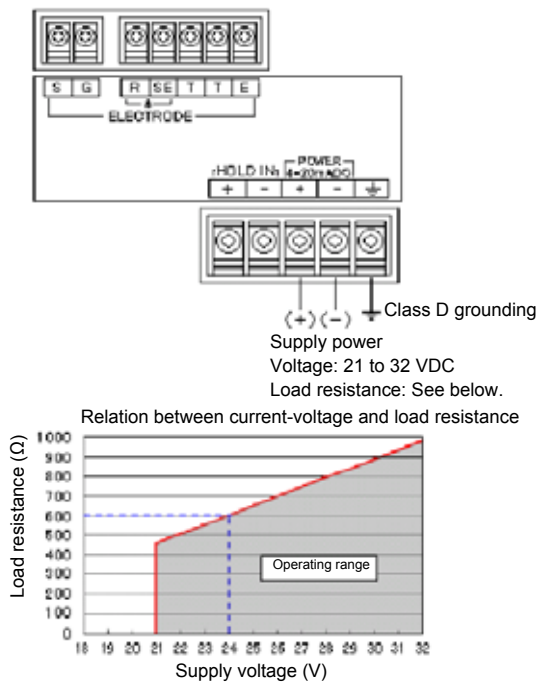


Power supply

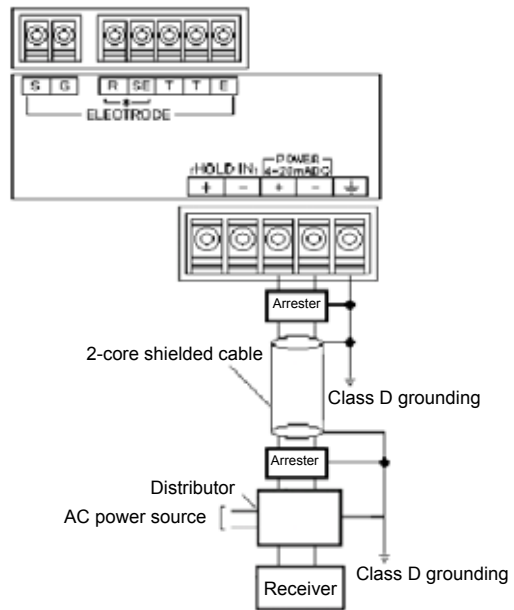
- The HP-300 has no power switch. Provide a power switch near the HP-300 so that the power can be turned ON/OFF.
- For power supply, use a two-wire transmission power source of 21 to 32 VDC.
- Operation outside the rated range can cause a fault. Therefore, check the power supply voltage. Make sure that the voltage fluctuations of the power source fall within a range between 21 and 32 VDC.
- Use a two-core shielded cable.
- If lightning strike might occur, install an arrester in two locations between the HP-300 and the distributor.

- Be sure to ground the grounding terminal (class D grounding). Separate this grounding from any other grounding for electric equipment such as a motor.

Electric power supplied	Current: 24 VDC
Applicable power cable	0.75 to 5.5 mm ² (AWG18 to 10).



Recommended typical connections



Recommended parts to be connected

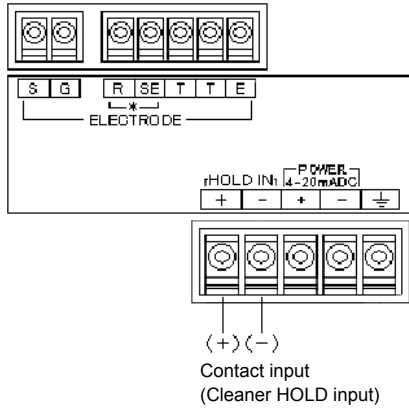
Item name	Model	Remarks
Distributor	DS-24-B	For 100 VAC
Arrester	MDP-24-1	For signals

Manufacturer: M-System Co., Ltd.

■ Entering HOLD for cleaning

- To use the HP-300 with the cleaner, connect the cleaner. When the HOLD contact signal from the cleaner turns ON, the transmission output is held.
The holding mode may be changed by a setting.
- Limit the resistance of contact input (HOLD input to the cleaner) to 40Ω maximum.

Holding mode
 The holding mode may be changed by a setting.
 HoLd: The previous value is held for output.
 PrES: A freely specified value is output.



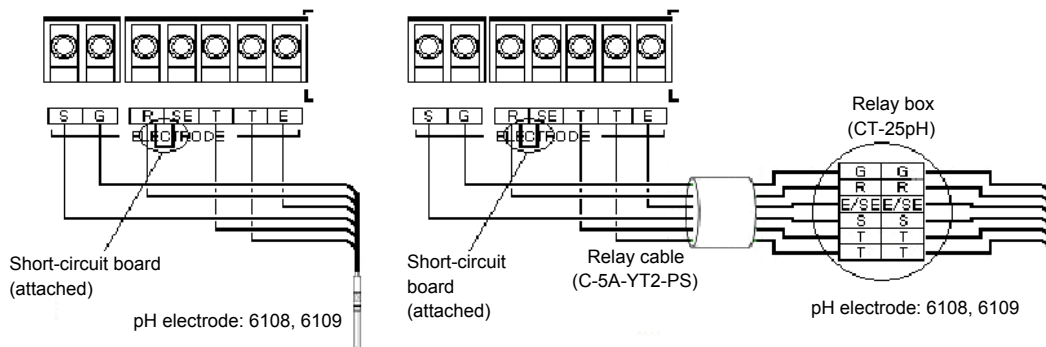
■ Sensor

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

- Do not wet the terminals and terminal block for cables with water or the like or contaminate them with your hand or oil. 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.
- For the purposes of calibration with a standard solution and the checks and replacement of electrodes, carry out wiring with an allowance given to the electrode cable length.
- In wiring the electrode cable and the relay cable, keep them away from inducting equipment such as a motor and is power cable.

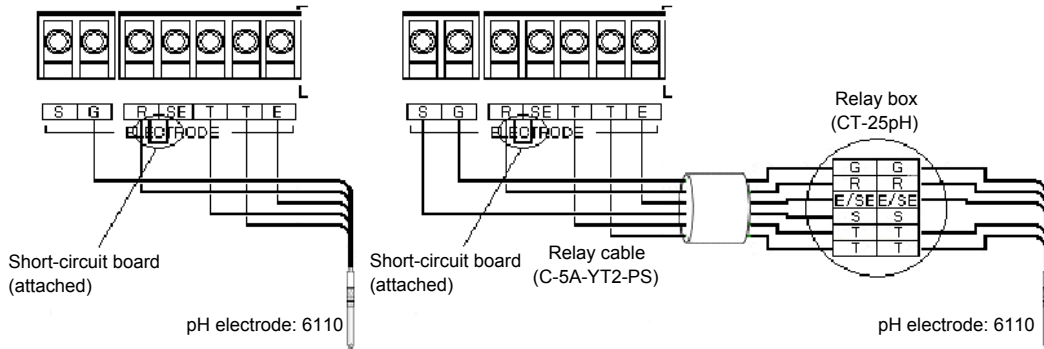
pH electrode	S: pH electrode shield drive
	G: Glass electrode terminal
	R: Reference electrode
	SE: Solution ground
	T, T: Temperature sensor
E: Outer shield wire	

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



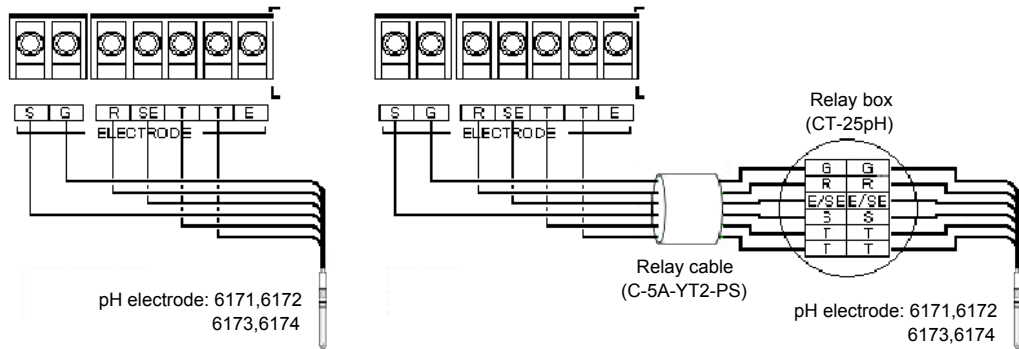
Attach the provided short-circuit plate between R and SE.

Connecting a pH electrode without the S and SE terminals, such as the 6110



Attach the provided short-circuit plate between R and SE.

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



Remove the provided short-circuit plate between R and SE.

Function (self-diagnostic function for pH electrode)

The HP-300 has a self-diagnostic function for the pH electrode.

The self-diagnostic function detects any cracking in the glass response film of the electrode and any clogging of the comparison electrode (liquid junction).

This function may not work depending on the electrode types and the operating environment.

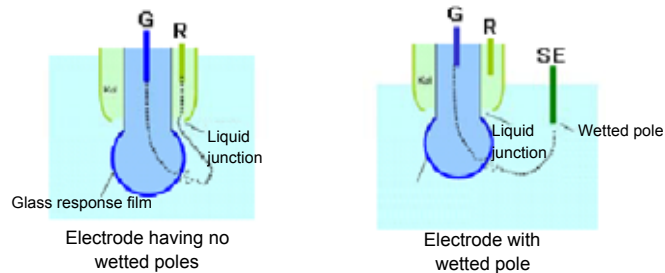
This section describes the self-diagnostic function.

The self-diagnostics of the pH electrode are applicable for the following two detections:

- Detection of cracking in the glass response film (glass film error)

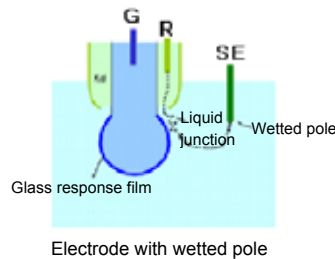
The impedance (resistance) between the glass response film and the wetted electrode or the comparison electrode is measured by applying AC voltage between the glass response film and the wetted electrode or the comparison electrode

When the measured resistance becomes below a threshold, the E-71 alarm (response film error) is triggered.



- Detection of liquid junction resistance error (comparison electrode error)

The impedance (resistance) between the comparison electrode and the wetted pole is measured by applying AC voltage between them.



- Description of self-diagnostics of each pH electrode type

- pH electrodes without wetted pole (6110, 6108, 6109, 6151, 6152, 8200, 8300, etc.)

For this electrode type, only cracking of the glass response film can be detected.

- pH electrodes with wetted pole (6171, 6172, 6173, 6174, etc.)

For this electrode, both clacking of the glass response film and the liquid junction resistance error can be detected.

- The self-diagnostics may not normally work depending on the electrode type and the operating environment.

- The self-diagnostic function does not work when the electrode is not wetted with the solution under measurement or when the electrode is not exposed to the sample.

Even if the glass response film has cracking, the response film error (E-71) does not occur.

Even if the comparison electrode is normal, the comparison electrode error (E-72) can occur.

- When an air layer is included in the glass response film:

When an air layer is included in the response film even if the glass response film cracks, the response film error (E-71) does not occur because the resistance between the poles is not successfully measured due to air insulation.

- When the liquid junction is clogged in an electrode without a wetted pole:

When the liquid junction is clogged in an electrode without a wetted pole:

Even if the glass response film has cracking, the response film error (E-71) does not occur so far as the resistance of the liquid junction is large enough.

- When a crack occurs in the support pipe for a comparison electrode with a wetted pole:

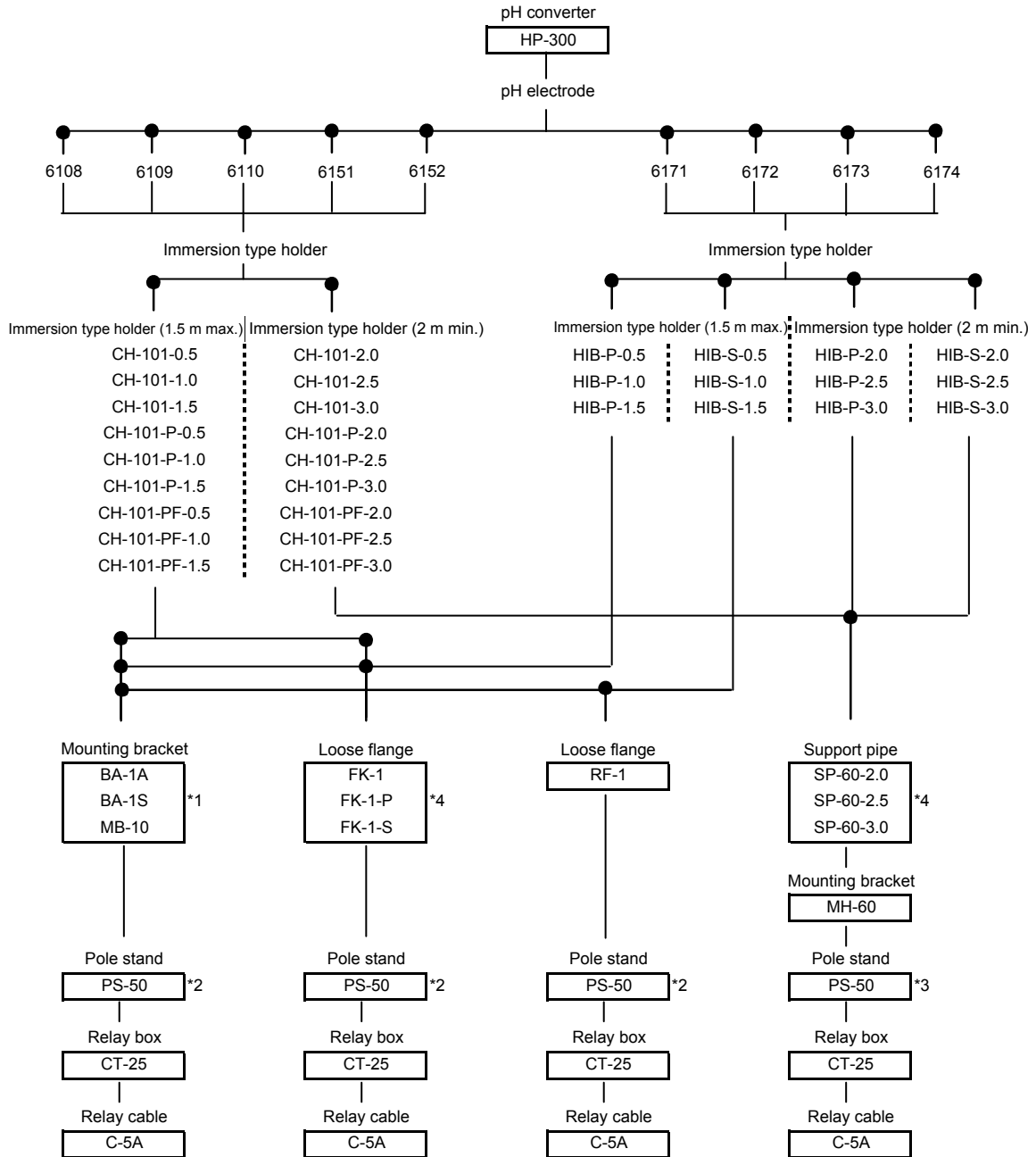
When a crack occurs in the support pipe for a comparison electrode with a wetted pole:

The comparison electrode error (E-72) does not occur because the liquid junction resistance becomes smaller.

Combinations

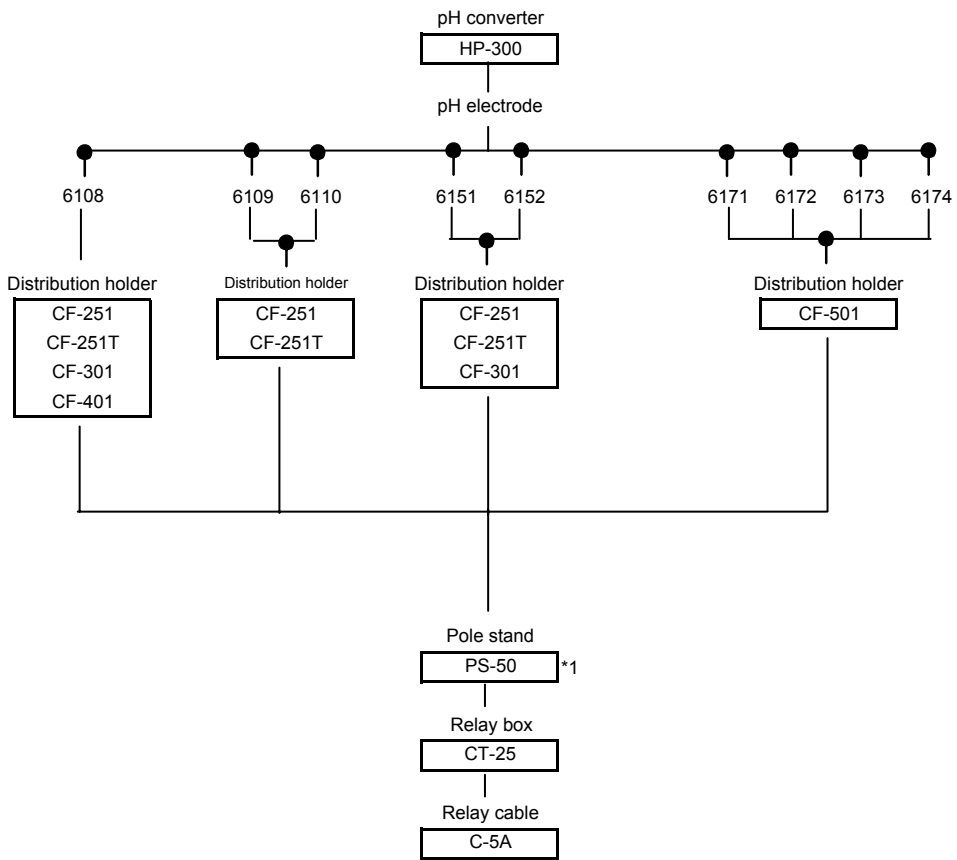
The following diagram shows the possible combinations of converters, electrodes, holders, and others.
For the detailed specifications, see the items of each product.

When the immersion type holder is used:



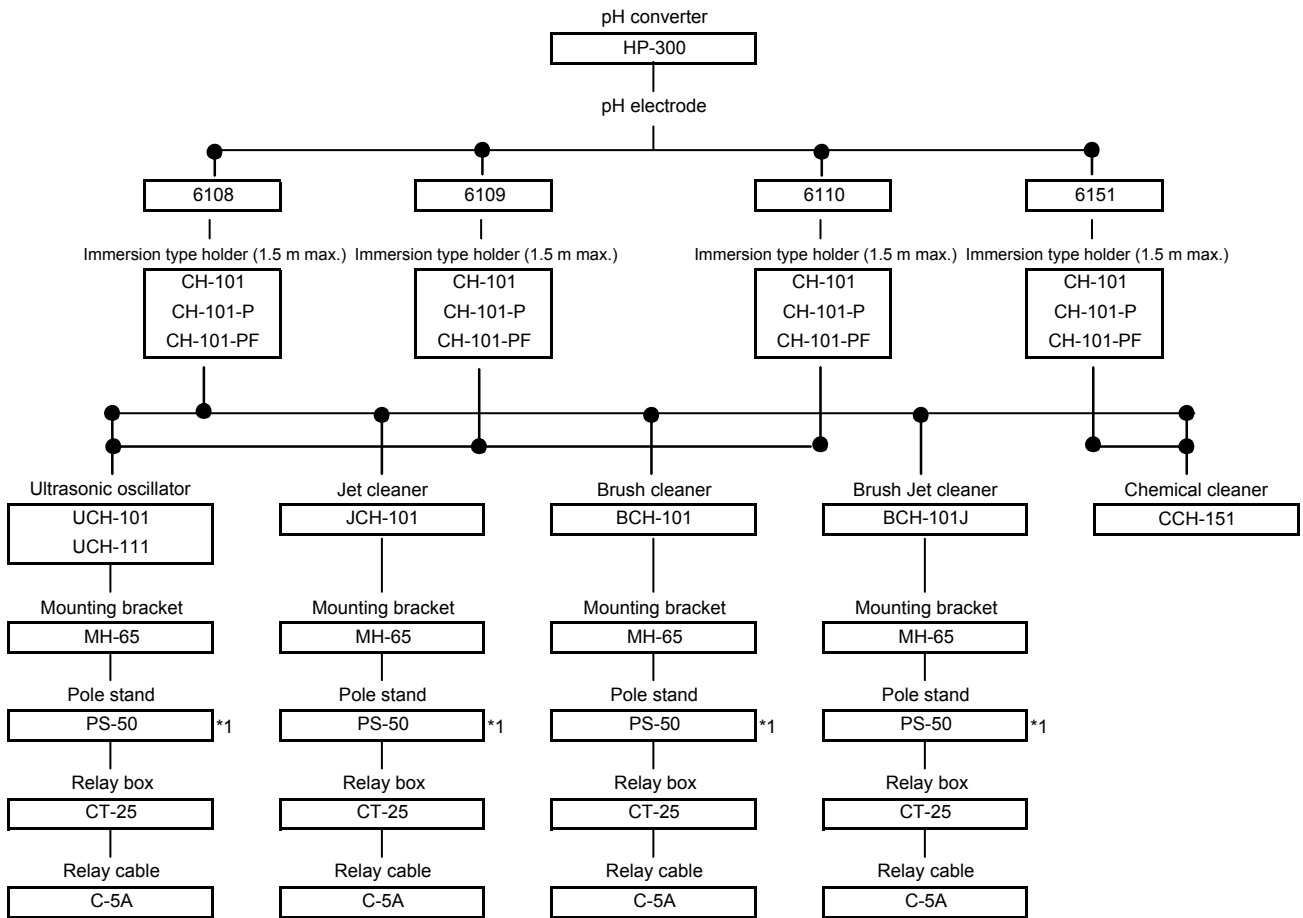
*1: For the immersion type holder HIBS, only the MB-10 is applicable.
 *2: This pole stand is used to attach the converter and the CT-25 (relay box).
 *3: This pole stand is used to attach the converter, the CT-25 (relay box), and the MH-60 (mounting bracket).
 *4: For any combinations with the CH-101PF series, contact us.

When the distribution type holder is used:



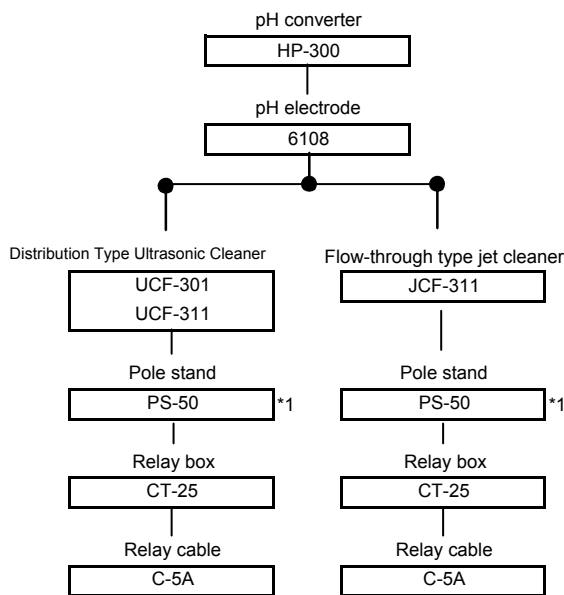
*1: This pole stand is used to attach the converter and the CT-25 (relay box).

When using an immersion type cleaner



*1: This pole stand is used to attach the converter, the CT-25 (relay box), and the MH-65 (mounting bracket).

When the distribution type cleaner is used:



*1: This pole stand is used to attach the converter, the CT-25 (relay box), and the MH-65 (mounting bracket).

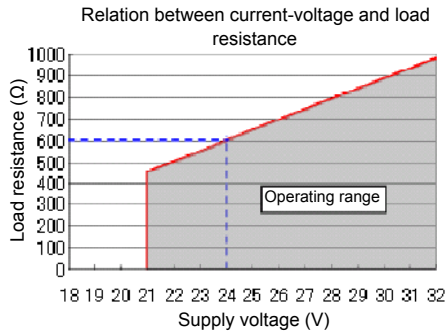
■ Specifications 1 (HP-300 pH meter for industrial use)
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Product Name	Two-wire type pH converter for industrial use			
Model	HP-300			
Combination electrode	Glass electrode			
Measurable range	pH	pH 0 to 14 (readout range: pH 1 to 15)		
	Temp	0 to 100°C When the automatic detection capability of temperature sensor types is used: 10~110°C When a temperature sensor type is manually specified: Display range: 20~130°C		
Display resolution	pH	0.01 p H		
	Temp	0.1°C		
Performance	Concentration	Repeatability	Within ±0.03 pH (for equivalent input)	
		Linearity	Within ±0.03 pH (for equivalent input)	
	Temp	Repeatability	Within ±0.3 °C(for equivalent input)	
		Linearity	Within ±0.3 °C(for equivalent input)	
Transmission output	Output type	4-20 mADC input/output insulated type (two-wire transmission type)		
	Load resistance	600Ω max. (*1)		
	Repeatability	Within ±0.02 mA (output only)		
	Linearity	Within ±0.08 mA (output only)		
	Output range	pH: pH: Selectable from the fixed range or freely specifiable within the measurable range.		
	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 input	Number of input points	1 points		
	Contact Form	Open collector, no-voltage a-contact		
	Conditions	ON resistance: 40Ω Open voltage: 1.2 V Short-circuit current: 21 mADC max.		
	Contact function	When a closed contact signal is input, transmission output is held.		
Temperature compensation	Applicable temperature element	Platinum resistive element: 1 kΩ(0 °C) Positive-characteristic temperature-sensitive resistor: 500Ω (25 °C), 6.8 kΩ (25°C), 10 kΩ (25°C)		
	Element selection method	Automatic detection of automatic temperature sensor type or manual selection (omission of temperature compensation is also possible)		
	Temperature compensation range	0~100°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°C to 55°C (without freeze)			
Operating humidity range	Relative humidity: 5% to 90% (without condensation)			
Storage temperature	-25~65°C			
Power Source	Rated voltage	24 VDC (operating voltage range: 21-32 VDC) (*1)		
	Power Consumption	0.6 W max.		
Applicable standards	CE marking	EMCDirective(2004/108/EC) EN61326-1:2006		
	EMC	Immunity Industrial location	Electrostatic discharge	IEC61000-4-2
			Radiated radiofrequency electromagnetic field	IEC61000-4-3 (*Note 2)
			Electric fast transient/burst	IEC61000-4-4
			Surge	IEC61000-4-5 (*Note 3)
			Conducted interference induced by radiofrequency	IEC61000-4-6 (*Note 2)
		Emission class A	Radiated disturbance	CISPR 11 CLASSA
FCC Rules	Part 15 CLASS A			

■ Specifications 1 (HP-300 pH meter for industrial use)

Structure	Installation	Outdoor installation type
	Installation method	50 A pole or wall mounting
	Protection Class	IP65 IEC60529,JIS C0920
	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)	
Mass	Body: Approx. 6.17lb; hood and mounting bracket: Approx. 1 kg	

*1: The maximum load resistor may be used in the following range depending on the power supply voltage.

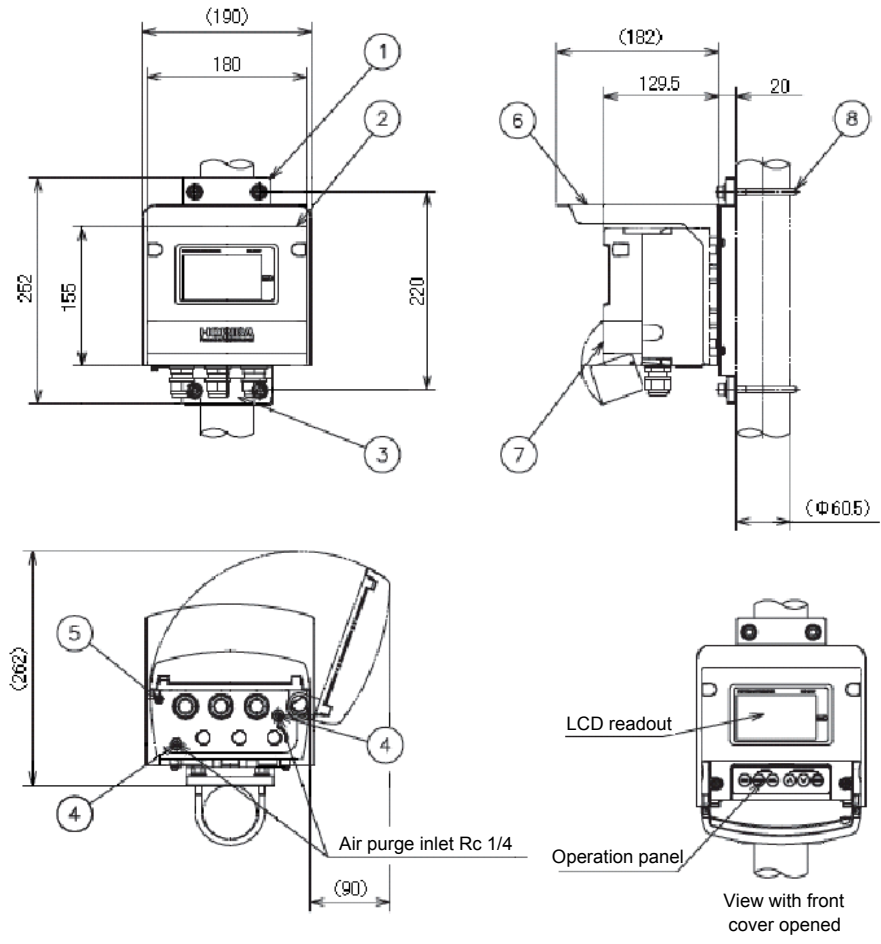


*2: The readout effect standard for the radiated radiofrequency electromagnetic field and conducted interference tests specifies the measured pH value ± 0.25 pH.

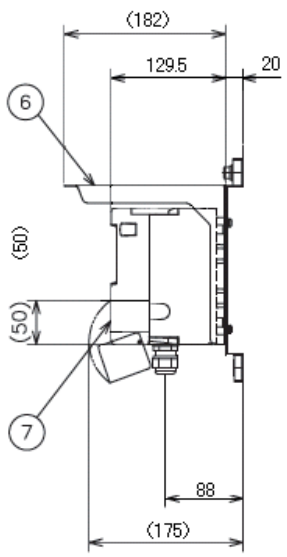
*3: When the sensor cable, the transmission cable, or the contact input cable is extended to more than 32.81 yd, the surge test in the EMC Directive is not applicable for CE marking.

*4: For the transmission output, an arrester (sparkover voltage: 400 V) is provided. Yet install the most suitable surge absorption element on the connected line considering the ambient environment, the equipment installation situation, and the externally connected equipment.

External dimensions (HP-300 Industrial pH Meter)



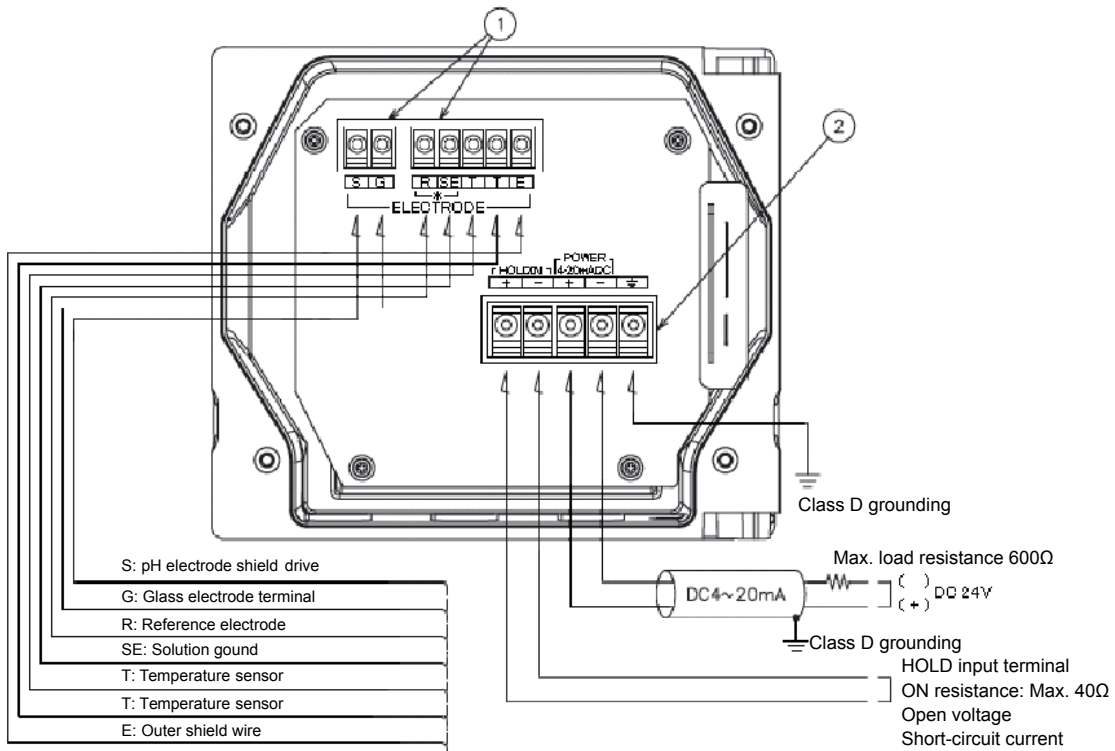
Drawing for external dimensions of HP-300 pH meter for industrial use (wall-mounted)
(The other dimensions are as shown above.)



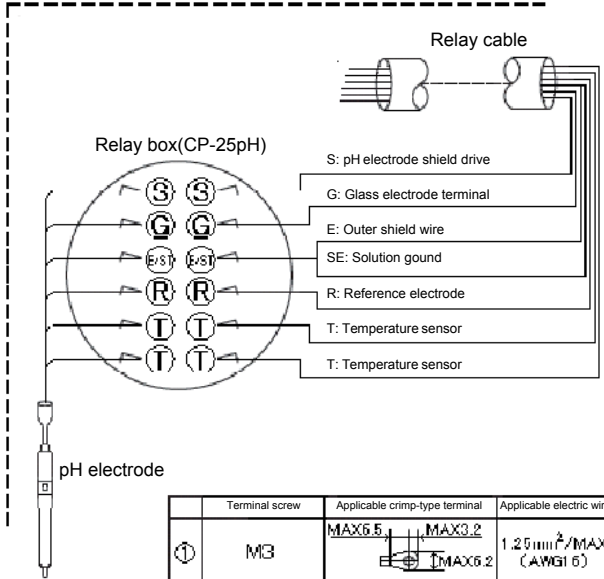
	PARTS	NOTES
(1)	Mounting plate	SUS304
(2)	Case	ADC12
(3)	Wiring hole	O.DΦ7~Φ12cable
(4)	Plug	SUS304
(5)	Earth	SUS304 M4
(6)	Cover	SUS304
(7)	Front cover	ADC12
(8)	U bolt	SUS304 50A MB

Coated with epoxy modified melamine resin
(Munsell 10PB/7/1)
Approx. 4.1 kg
IP65 (IEC60529, JIS C0920)

External connection diagram (HP-300 pH meter for industrial use)

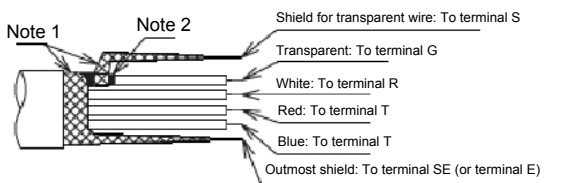


Note
 :The screws on the terminal block are designed as non-removable.
 To connect a cable to a terminal, turn the screw until it is floated.



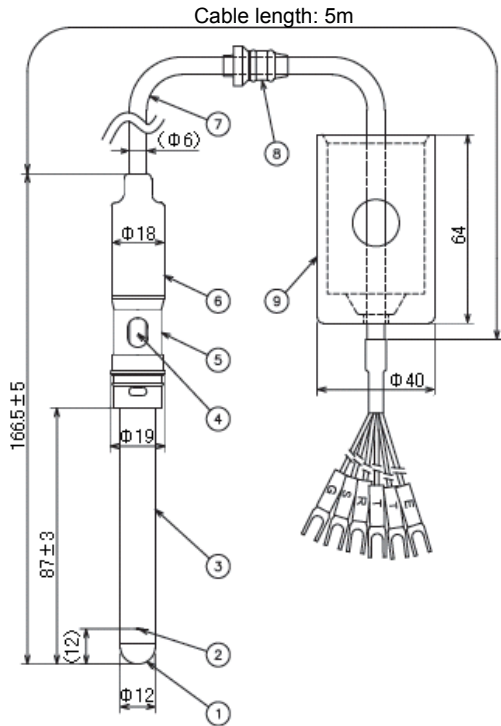
Terminal screw	Applicable crimp-type terminal	Applicable electric wire	Screw tightening torque
① M3	MAX5.5 MAX3.2 MAX5.2	1.25mm ² /MAX (AWG16)	0.8N·m
② M4	MAX7.6 MAX4.2 MAX8.5	3.6mm ² /MAX (AWG12)	1.2N·m

Relay cable termination method



Note
 :Insulate the braided shields for the S and SE terminals with insulation tubes or the like so that they do not come into contact with each other
 :Be sure to strip off the covering (conductive plastic: black) on the transparent wire up to its root.

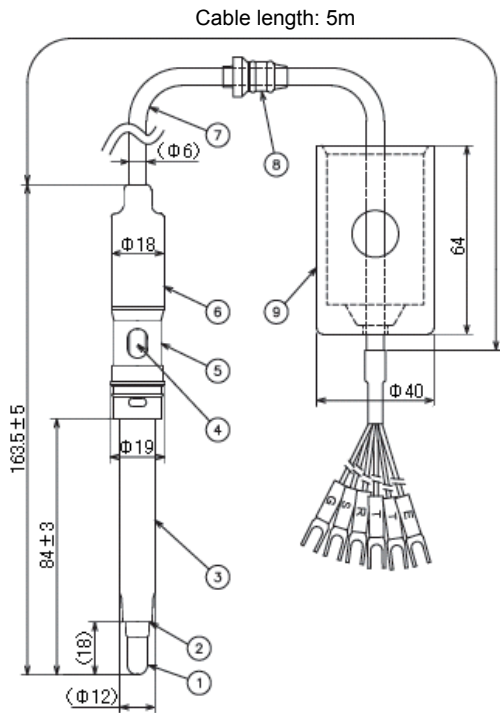
■ pH electrode (6108)



Model		6108-50B
Measuring method		Glass electrode method
Measurable range		pH 0 to 14
Sample water conditions	Temperature range	-10~100°C (without freeze)
	Flow rate	Pressure: 0 MPa to 0.6 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol 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)	Glass	
(5)	Internal fluid inlet	PP
(6)	Sensor body	Sensor cap
(7)	Silicone	PVC
(8)	Cable	FKM
(9)	Cable gasket	EPDM

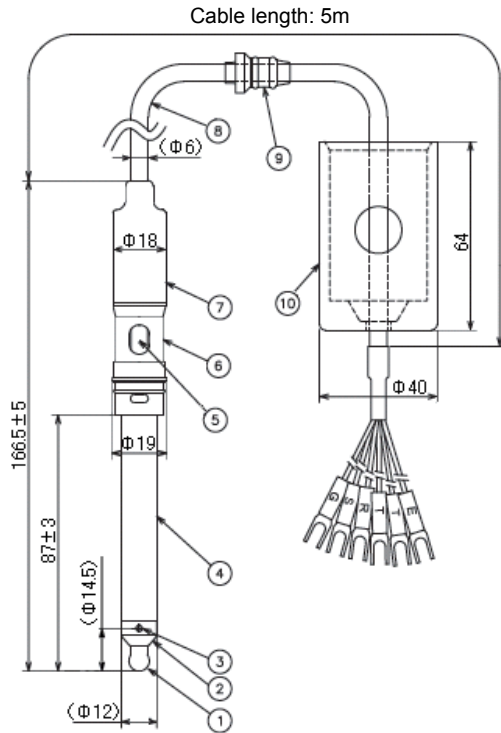
■ pH electrode (6109)



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)
	Flow rate	Pressure: 0 Mpa to 0.03 Mpa
Comparison electrode	Liquid junction	Glass sleeve
	Internal fluid	3.3mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

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

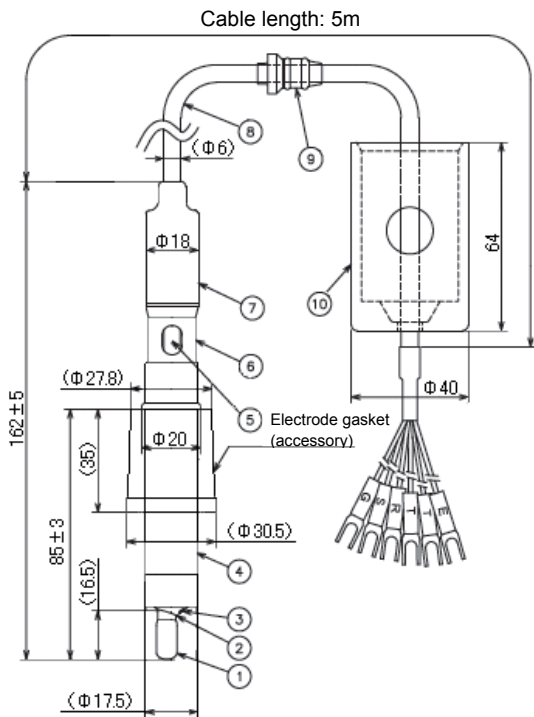
■ pH electrode (6110)



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)
	Flow rate	Pressure: 0 Mpa to 0.03 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol 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)	Glass	
(6)	Internal fluid inlet	PP
(7)	Sensor body	Sensor cap
(8)	Silicone	PVC
(9)	Cable	FKM
(10)	Cable gasket	EPDM

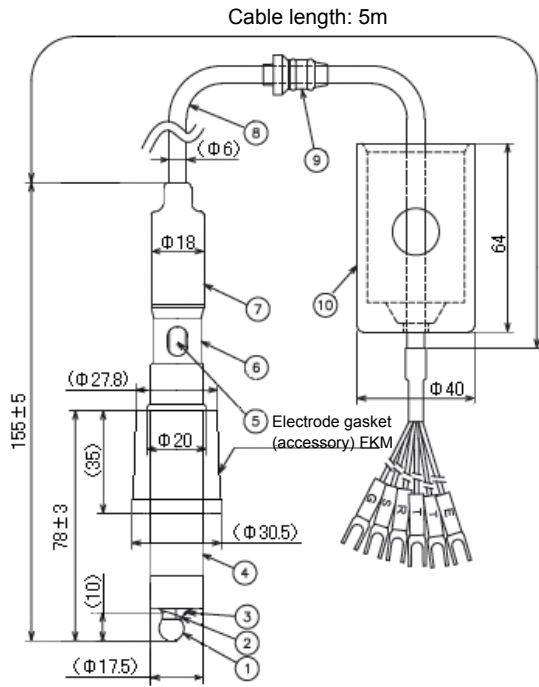
■ pH electrode (6151)



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)
	Flow rate	Pressure: 0 MPa to 0.2 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol 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

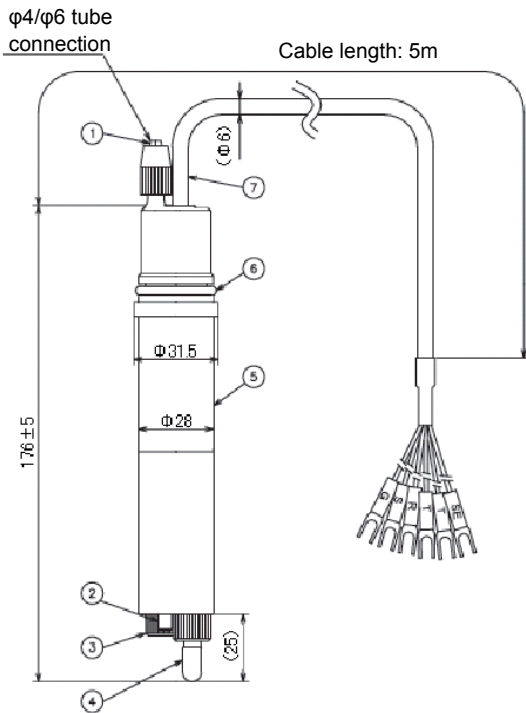
■ pH electrode (6152)



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)
	Flow rate	Pressure: 0 MPa to 0.2 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol 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

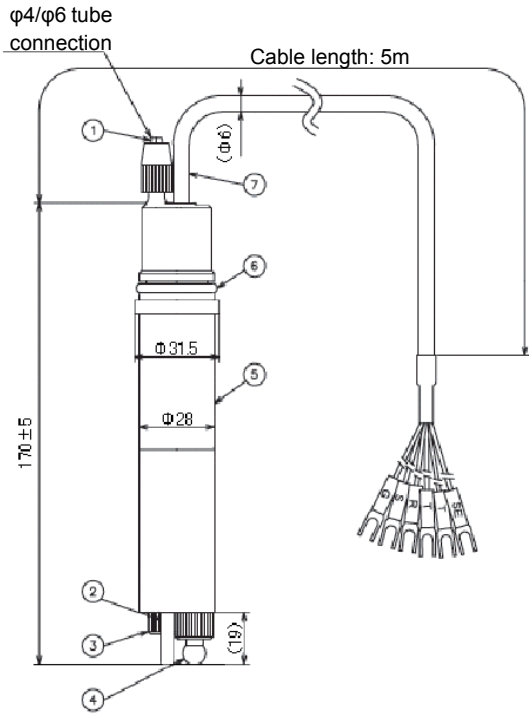
■ pH electrode (6171)



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)
	Flow rate	Pressure: 0 MPa to 0.03 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

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

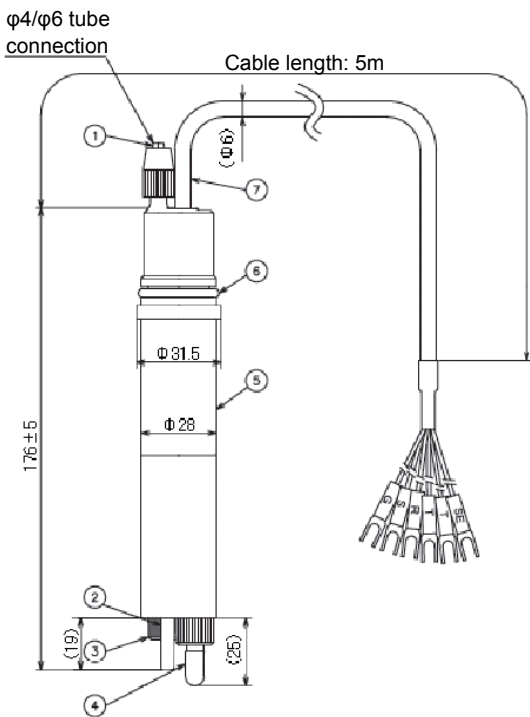
■ pH electrode (6172)



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)
	Flow rate	Pressure: 0 MPa to 0.03 Mpa
Comparison electrode	Liquid junction	Porous ceramics
	Internal fluid	3.3mol KCl (filling type)
Cable length		Standard: 5 m (+5%)

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

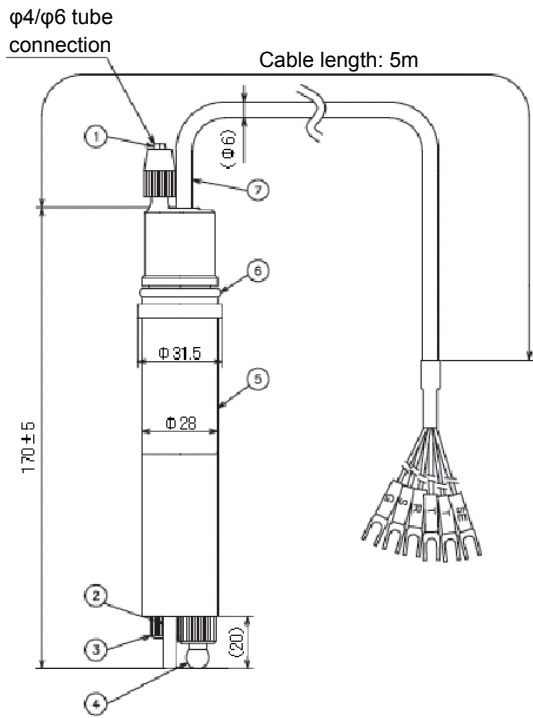
■ pH electrode (6173)



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

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

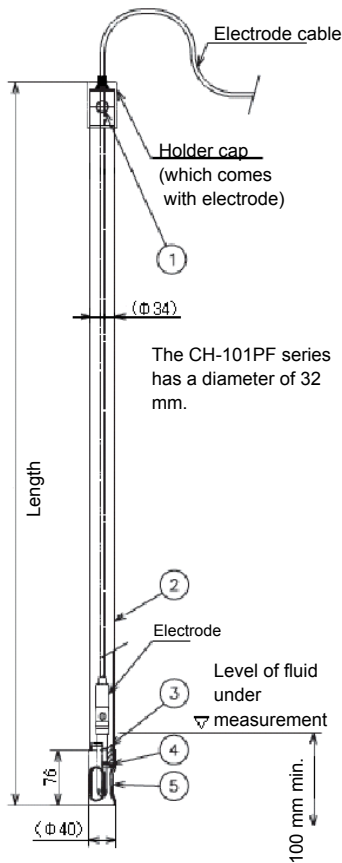
■ pH electrode (6174)



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

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

Specifications and shapes of immersion holders (CH-101 series)



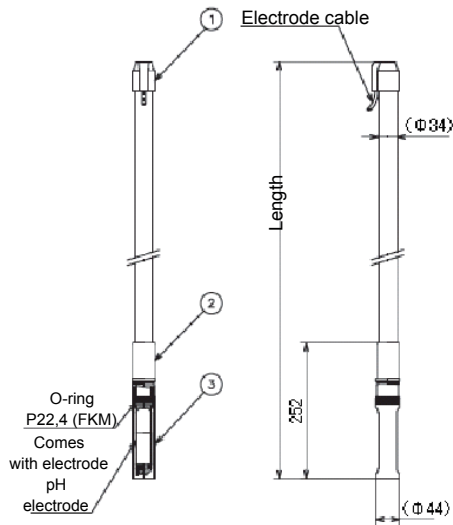
The CH-101PF series has a diameter of 32 mm.

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

Nominal length	L-dimension (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-101-P series	CH-101-PF series	
Holder material		PP	PVC	PVDF	
Temp		-5 to 80°C	-5 to 50°C	-5 to 100°C	
Flow rate		Atmospheric pressure			
Flow rate		2 m/sec or less			
Materials of Liquid Junction Section	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			
Mass (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. 0.85
		3m	Approx. 0.9	Approx. 1.33	Approx. 1.25

■ Specifications and shapes of immersion holders (HIB series)

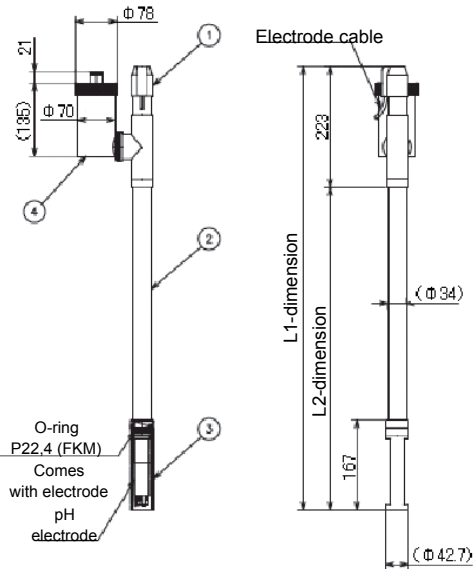


Model	HIB-P
Holder material	PP
Temp	-5 to 80°C For the actual operating temperature range, check the specifications of the electrodes to be combined.
Flow rate	Atmospheric pressure
Flow rate	2 m/sec or less
Materials of Liquid Junction Section	PP (excluding the electrode)

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

Nominal length	L-dimension (mm)
0.5m	772±10
1m	1272±10
1.5m	1772±10
2m	2272±10
2.5m	2772±10
3m	3272±10

■ Specifications and shapes of immersion holders (HIBS series)

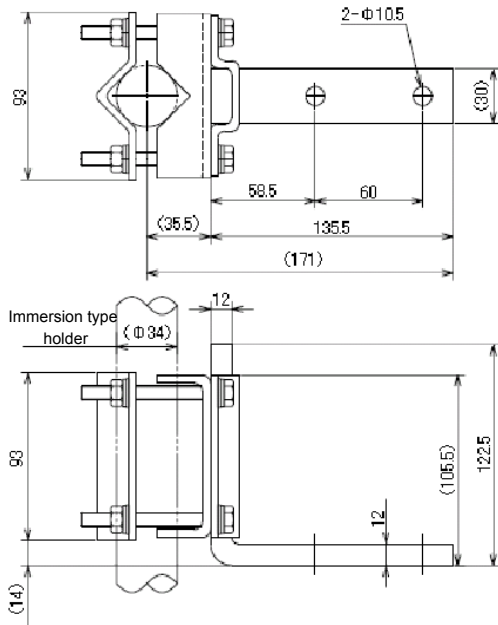


Model	HIB-S
Holder material	SUS316
Temp	-5 to 100°C For the actual operating temperature range, check the specifications of the electrodes to be combined.
Flow rate	Atmospheric pressure
Flow rate	2 m/sec or less
Materials of Liquid Junction Section	SUS316 (excluding the electrode)

	PARTS	NOTES
(1)	Cable gasket	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

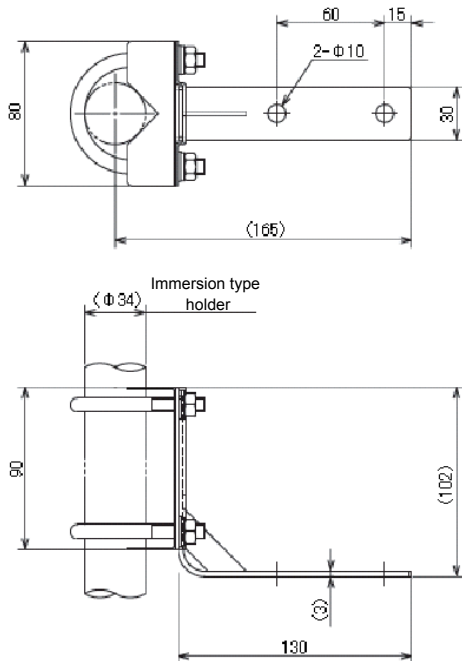
■ Mounting bracket (BA-1A): specifications and external



Model	BA-1A
Materials	ABS resin
Mounting pipe	50A

This product is applicable for immersion holders of 1.5 m maximum.

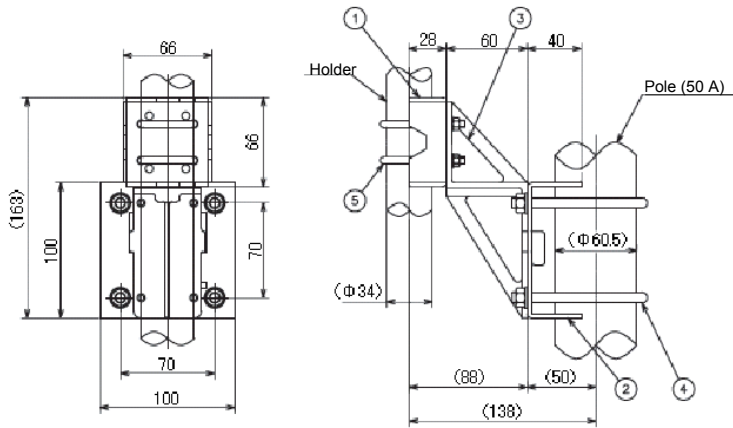
■ Mounting bracket (BA-1S): specifications and external



Model	BA-1S
Materials	SUS-304
Mounting pipe	50A

This product is applicable for immersion holders of 1.5 m maximum.

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

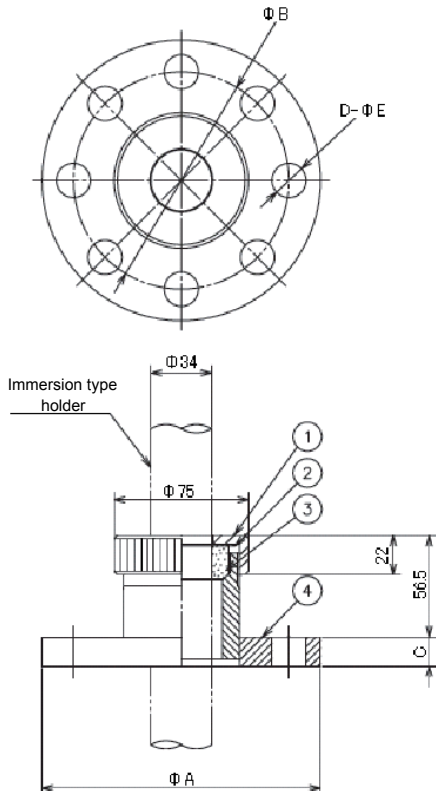


	PARTS	NOTES
(1)	Base 1	SUS304
(2)	Mounting plate	SCS13
(3)	Base 2	SUS304
(4)	U bolt	SUS304

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



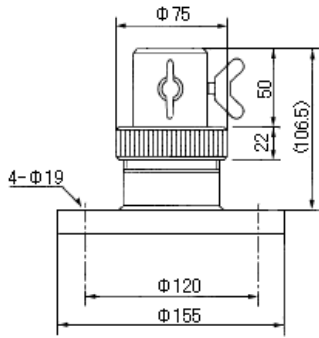
Model	FK-1	FK-1P	FK-1S	
Materials	Flange	PP	PVC	SUS316
	Nut	PP	PVC	SUS304
	Washer	PP	PVC	PP
	Gasket	FKM	FKM	FKM
Flange standard		JIS 10K 50A FF, etc.		

This product is applicable for immersion holders of 1.5 m maximum. For possible combinations with the CH-101PF, contact us.

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

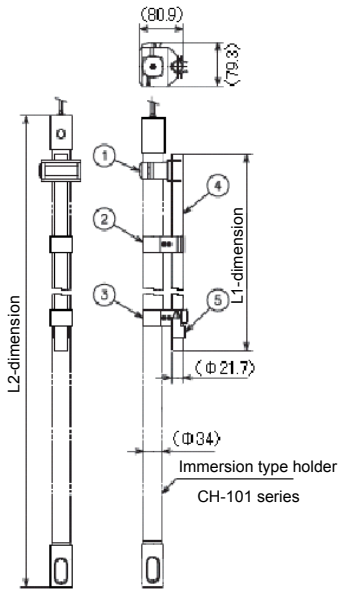
Flange standard	ΦA	ΦB	C	D-ΦE
JIS 10K 50A FF, etc.	Φ155	Φ120	16	4-Φ19
JIS 10K 100A FF, etc.	Φ210	Φ175	18	8-Φ19
JIS 10K 150A FF, etc.	Φ280	Φ240	22	8-Φ23
JIS 10K 200A FF, etc.	Φ330	Φ290	22	12-Φ23

Specifications and shapes of mounting brackets (RF-1 series)



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

Supporting bracket (SP-60): specifications and external



Model	SP-60
Materials	SUS-316
Applicable holder length	1, 1.5, 2, 2.5, 3
Applicable holder	CH-101 series

The support pipe may be required if the holder length is 1.5 m maximum or if the flow rate is fast.

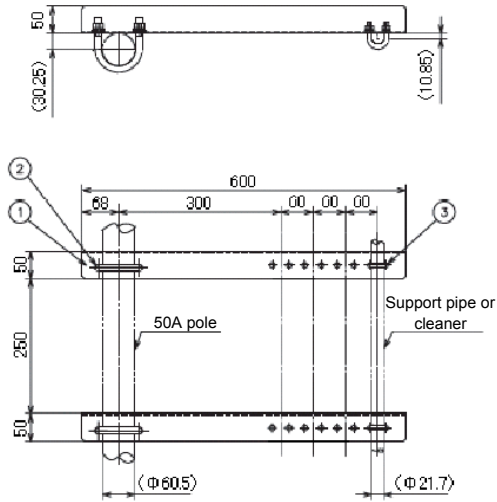
	PARTS	NOTES
(1)	Holder mounting bracket	PVC
(2)	Intermediate hook	SUS316
(3)	Hook	SUS316
(4)	Support pipe	SUS316
(5)	Stopper	SUS316

The intermediate hook is provided when the immersion type holder length is 1.64yd or more.

	Support pipe L1(mm)	Immersion type holder L2 length (mm)
For 1m	500±10	990±10
For 1.5m	1000±10	1490±10
For 2m	1500±10	1990±10
For 2.5m	2000±10	2490±10
For 3 m	2500±10	2990±10

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

Mounting bracket (MH-60): specifications and external

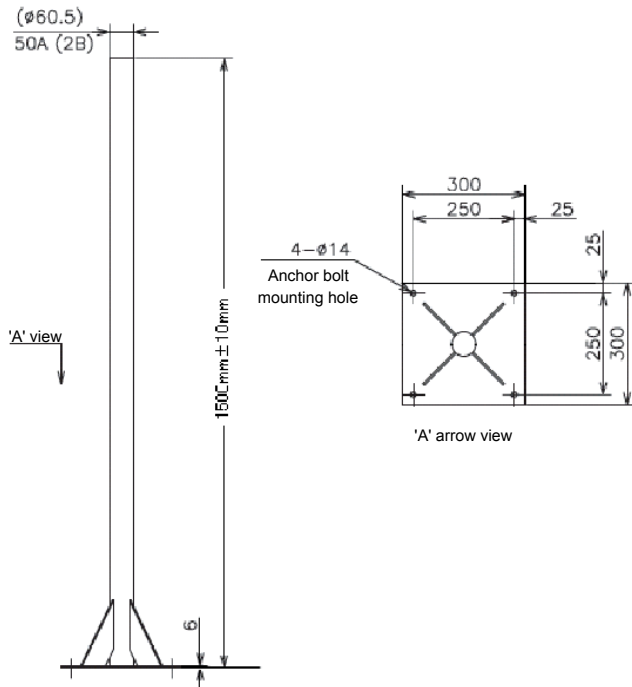


Model	MH-60	
Materials	Arm	SUS-304
	U-bolt	SUS-304
Mounting pipe	50A	

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

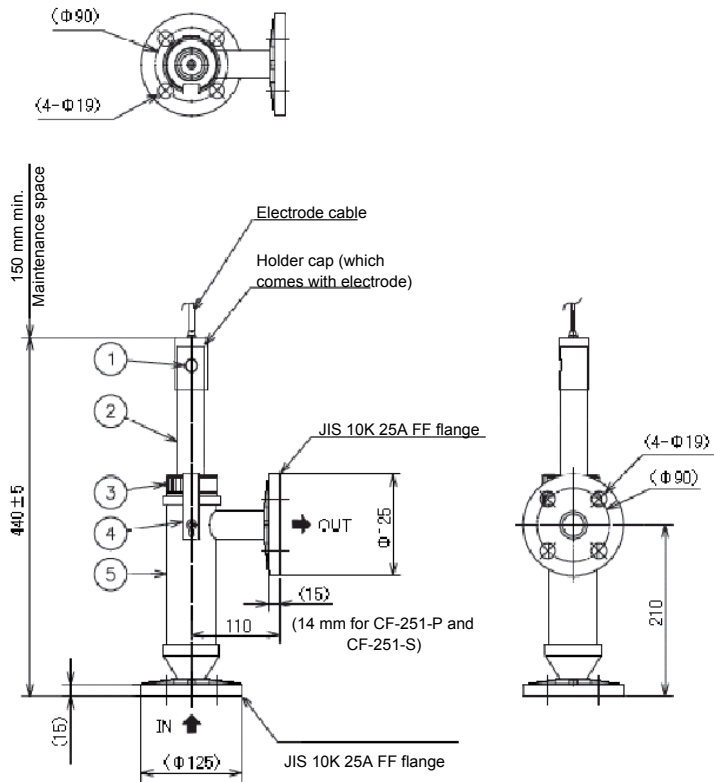
	PARTS	NOTES
(1)	Arm	SUS304
(2)	U bolt	SUS304 stainless steel (for 50A)
(3)	U bolt	SUS304 stainless steel (for 15A)

Pole stand (PS-50): specifications and external



Model	PS-50-300
Materials	SUS-304
Pipe diameter	50A

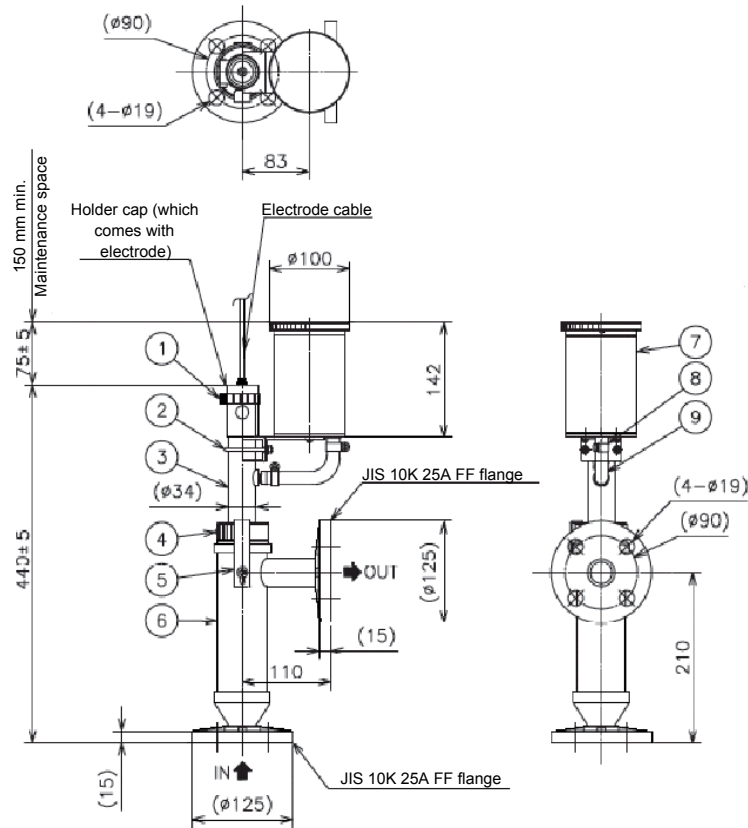
Specifications and shapes of flow-through holders (CF-251 series)



Model	CF-251	CF-251-P	CF-251-S
Holder material	PP	PVC	SUS316
Ambient temperature	-5 to 60°C	-5 to 50°C	-5 to 60°C
Measured liquid conditions	Temp	-5 to 80°C	-5 to 100°C
	Flow rate	Atmospheric pressure	
	Materials for Liquid Junction Section	0.3 to 10L/min	
Materials of Liquid Junction Section	Gasket	FKM	FKM
	Washer	PP	PVDF
	Protective tube	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. 1.32lb	Approx. 1.98lb	Approx. 9.92lb

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

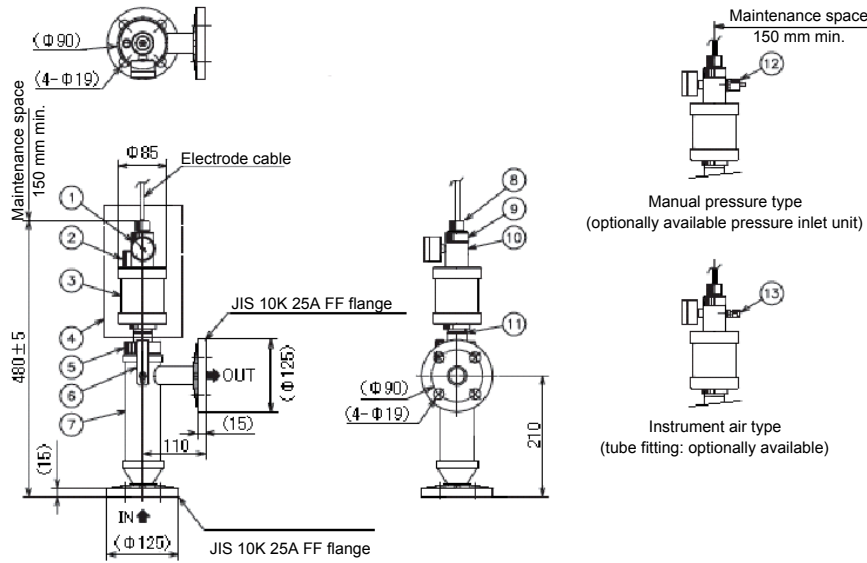
Specifications and shapes of flow-through holders (CF-251-T series)



Model	CF-251-T	CF-251-P-T	CF-251-S-T	
Holder material	PP	PVC	SUS316	
Ambient temperature	-5 to 60°C	-5 to 50°C	-5 to 60°C	
Measured liquid conditions	Temp	-5 to 80°C	-5 to 100°C	
	Working temperature ranges vary with combinational electrodes. Check the working temperature of an electrode.			
	Flow rate	Atmospheric pressure		
Materials of Liquid Junction Section	Materials for Liquid Junction Section	0.3 to 10L/min		
	Gasket	FKM	FKM	FKM
	Washer	PP	PP	PVDF
Materials of Liquid Junction Section	Protective tube	PP	PP	PVDF
	If a problem arises with weather resistance under direct sunlight, use a model made of PVS or SUS 316 stainless steel plus PVDF. For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.			
Mass	Approx. 2.87lb	Approx. 3.53lb	Approx. 11.46lb	

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

Specifications and shapes of flow-through holders (CF-301 series)



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

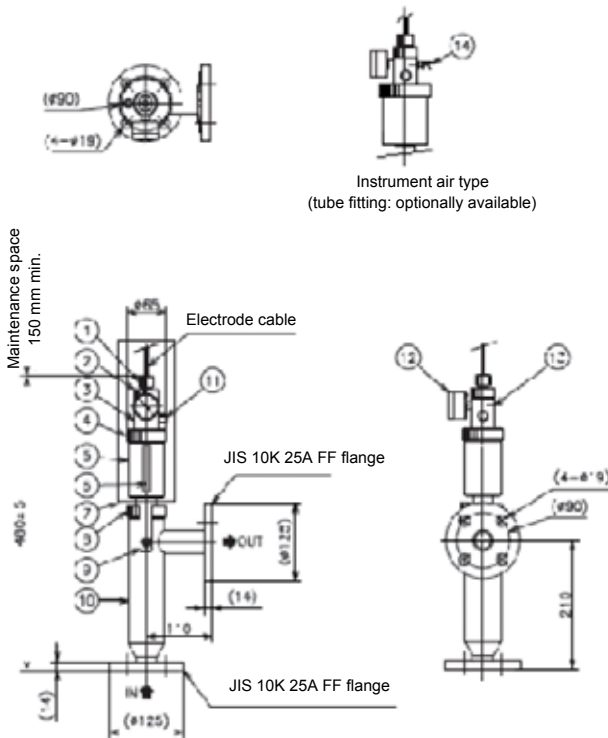
PARTS	NOTES
(7) Distribution holder	PP(CF-301) PVC(CF-301P) SUS316(CF-301S)
(8) Cable cap	PPO
(9) Cable gasket	PPO
(10) Pressurization interface screw	Rc1/8
(11) Holder	PP(CF-301) PVC(CF-301P) SUS316(CF-301S)
(12) Pressurization union	C3604
(13) Joint	For Φ6/Φ4 tube PVDF

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	
Measured liquid conditions	Temp	-5 to 80°C	-5 to 50°C	-5 to 100°C
	Flow rate	-5 to 40°C: 0.6MPa 40 to 60°C: 0.46MPa 60 to 80°C: 0.26MPa	-5 to 40°C: 0.6MPa 40 to 50°C: 0.46MPa	-5 to 40°C: 0.6MPa 40 to 60°C: 0.46MPa 60 to 80°C: 0.26MPa 80 to 100°C: 0.2MPa
	Materials for Liquid Junction Section	0.3~10L/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.				
Bore Size of Measured Liquid Connection	JIS 10K 25A FF flange			
Pressurizing Inlet for Holder's Internal Pressure (*1)	Rc 1/8			
Mass	Approx. 2.65lb	Approx. 3.31lb	Approx. 11.24lb	

*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.

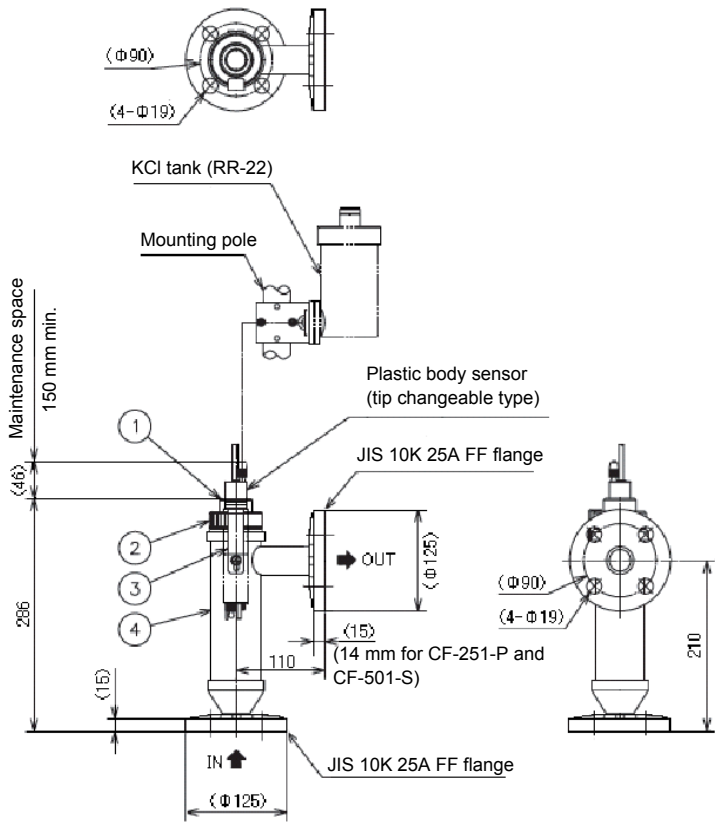
Specifications and shapes of flow-through holders (CF-401S series)



	PARTS	NOTES
(1)	Cable cap	PPO
(2)	Cable gasket	PPO
(3)	Pressure block	PVDF
(4)	Nut	SUS304
(5)	KCl tank cover	SUS304
(6)	KCl tank	PC
(7)	Pressurization holder	
(8)	Tightening nut	SUS304
(9)	Locking plate	SUS304
(10)	Distribution holder	SUS316
(11)	KCl filling port	PVC
(12)	Pressure gauge	Pressure: 0 MPa to 0.5 Mpa
(13)	Pressurization interface screw	Rc1/8
(14)	Joint	For φ6/φ4 tube PVDF

Model		CF-401S
Ambient temperature		-5 to 60°C
Measured liquid conditions	Temp	-5 to 100°C (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.
	Flow rate	-5 to 40°C:0.6MPa 40 to 60°C:0.46MPa 60 to 90°C:0.26MPa 90 to 100°C:0.2MPa
	Materials for Liquid Junction Section	0.5 to 10L/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. 19.84lb
Special Note		<ul style="list-style-type: none"> • Avoid using manual pressure of 0.4 MPa or more because an accident may result. (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.

Specifications and shapes of flow-through holders (CF-501 series)



Flow-through holders CF-501

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

Flow-through holders CF-501P

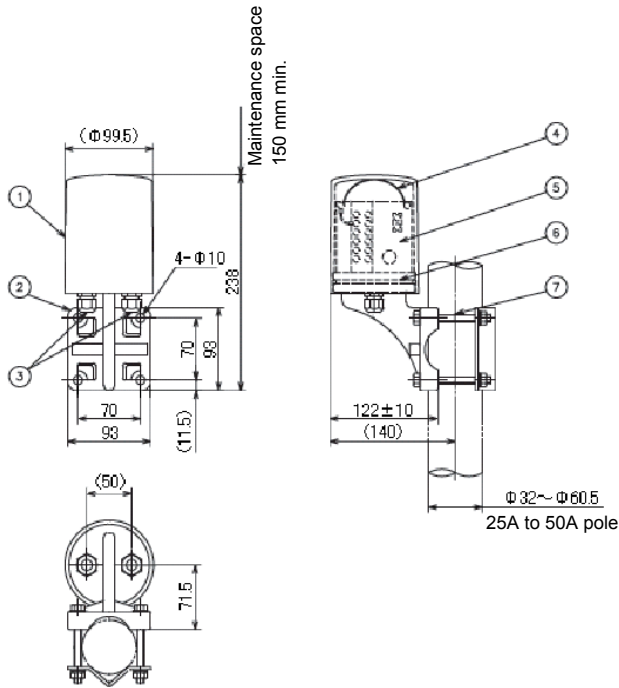
	PARTS	NOTES
(1)	Sensor adaptor	PVC
(2)	Tightening nut	PVC
(3)	Locking plate	SUS304
(4)	Distribution holder	PVC

Flow-through holders CF-501S

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

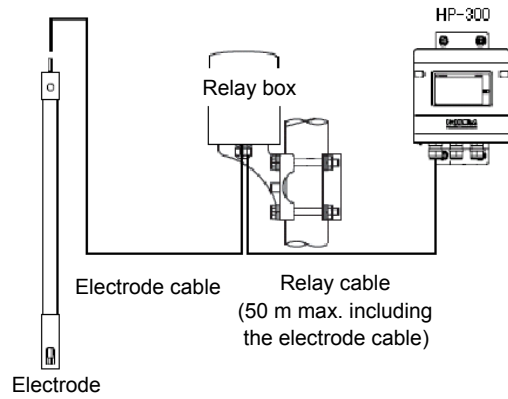
Model	CF-501	CF-501P	CF-501S
Ambient temperature	-5 to 60°C	-5 to 50°C	-5 to 60°C
Measured liquid conditions	Temp	-5 to 80°C	-5 to 60°C
	Flow rate	Atmospheric pressure (with outlet being open)	
	Materials for Liquid Junction Section	0.3 to 10L/min	
Materials of Liquid Junction Section	PP, FKM	PVC, PP, FKM	SUS316, PPS, FKM
Bore Size of Measured Liquid Connection	JIS 10K 25A FF flange		
Mass	Approx. 1.32lb	Approx. 1.98lb	Approx. 9.26lb
Special Note	<ul style="list-style-type: none"> • 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

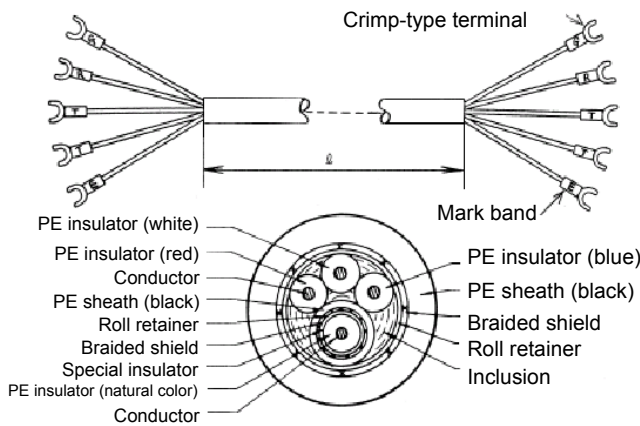


	PARTS	NOTES
(1)	Cover	ABS
(2)	Bracket	ABS
(3)	Wiring hole	
(4)	Spring	SUS304
(5)	Terminal board	ABS
(6)	O-ring	NBR
(7)	Bolt (provided)	SUS304 M8

- Be sure to use the relay box when the distance between the sensor and the converter is longer than the sensor cable length.
- For wiring, be sure to use the dedicated 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



- Characteristics
- Conductor resistance 63.2Ω/hm max.
 - Withstand voltage Shall withstand 1000 VAC for 1 minute.
 - Insulation resistance 10000MΩ/hm
 - Rated temperature 90
 - Capacitance 150 PP/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-300 is of the standard specification.

For the HP-300, the optionally available cleaner may be installed.

The installation of the HP-300 with the cleaner will be described in the section for the

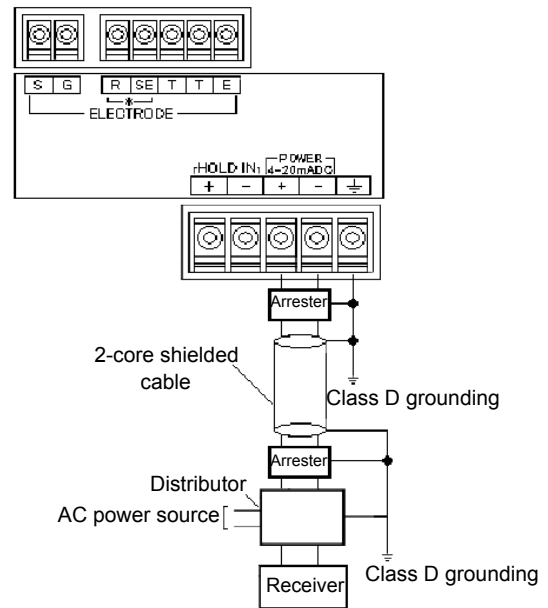
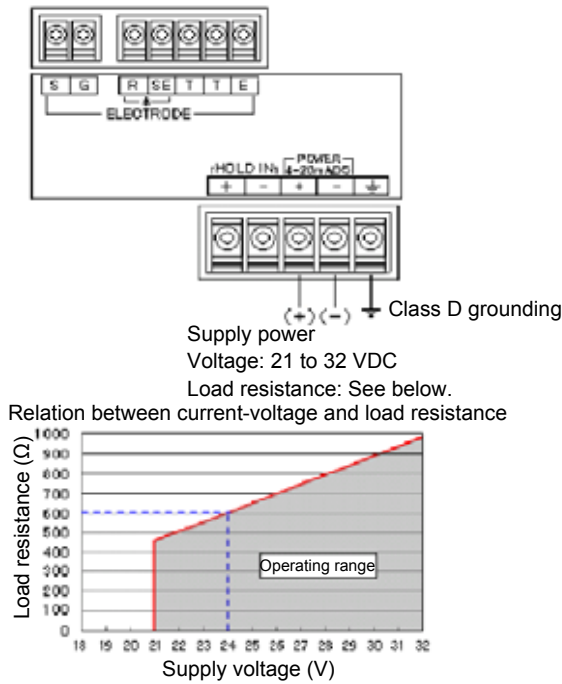
Carry out installation and execution of work while paying attention to the following points:

Power Source

- The HP-300 has no power switch. Provide a power switch near the HP-300 so that the power can be turned ON/OFF.
- For power supply, use a two-wire transmission power source of 21 to 32 VDC.
- Operation outside the rated range can cause a fault. Therefore, check the power supply voltage. Make sure that the voltage fluctuations of the power source fall within a range between 21 and 32 VDC.
- Use a two-core shielded cable.
- If lightning strike might occur, install an arrester in two locations between the HP-300 and the distributor.
- Be sure to ground the grounding terminal (class D grounding).
- Separate this grounding from any other grounding for electric equipment such as a motor.

Electric power supplied	Current: 24 VDC
Applicable power cable	0.75 to 5.5 mm ² (AWG18 to 10).

Recommended typical connections



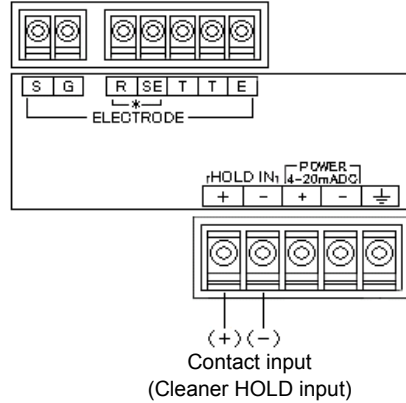
Recommended parts to be connected

Item name	Model	Remarks
Distributor	DS-24-B	For 100 VAC
Arrester	MDP-24-1	For signals

Manufacturer: M-System Co., Ltd.

Cleaning hold

- To use the HP-300 with the cleaner, connect the cleaner. When the HOLD contact signal from the cleaner turns ON, the transmission output is held. The holding mode may be changed by a setting.
- Limit the resistance of contact input (HOLD input to the cleaner) to 40Ω maximum.

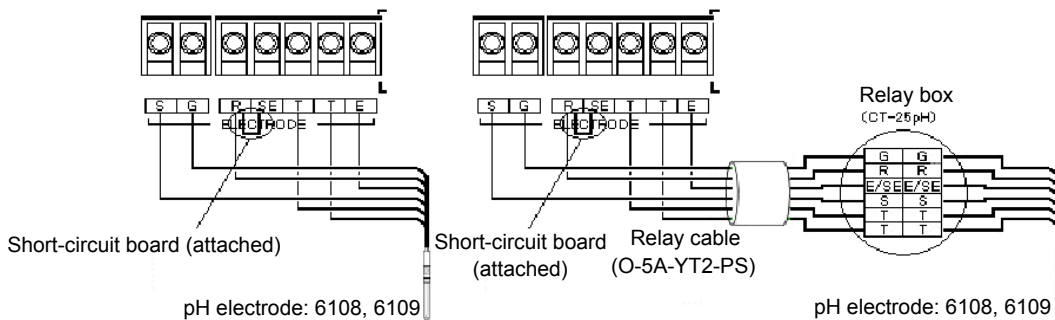


Electrode cable

- The electrode cable is highly insulated. Exercise care in handling the sensor cable.
- 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 wiring the sensor, give a margin to the sensor cable length for the purposes of calibration with standard solutions and of the checks and replacement of the sensor.
 - Keep the wiring of the sensor cable and the relay cable away from electromagnetic induction devices such as a motor and their power cables.

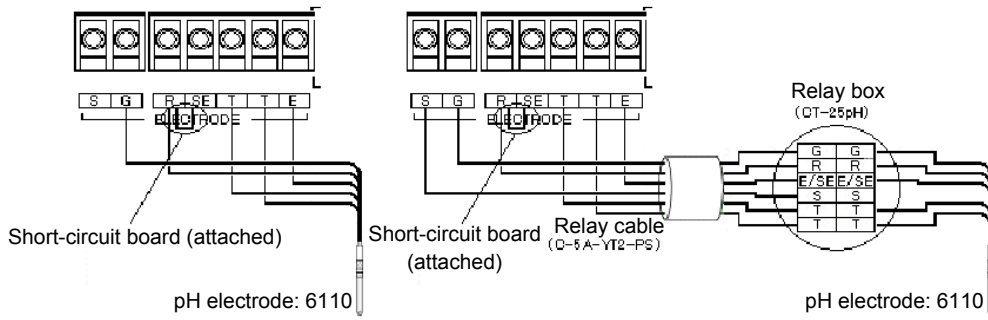
pH electrode	S: pH electrode shield drive
	G: Glass electrode terminal
	R: Reference electrode
	SE: Solution ground
	T, T: Temperature sensor
	E: Outer shield wire

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



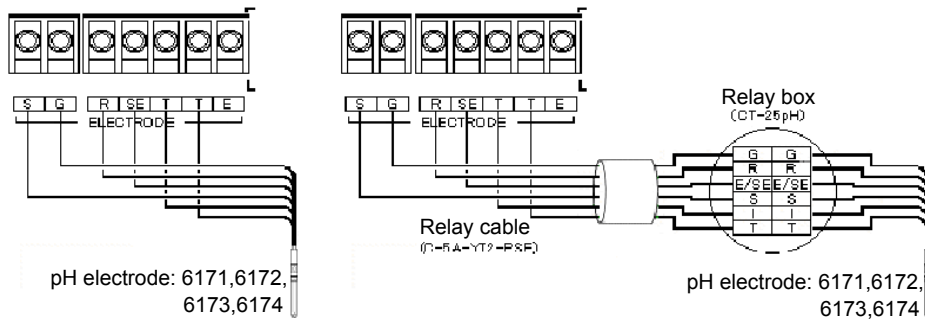
Attach the provided short-circuit plate between R and SE

Connecting a pH electrode without the S and SE terminals, such as the 6110



Attach the provided short-circuit plate between R and SE

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

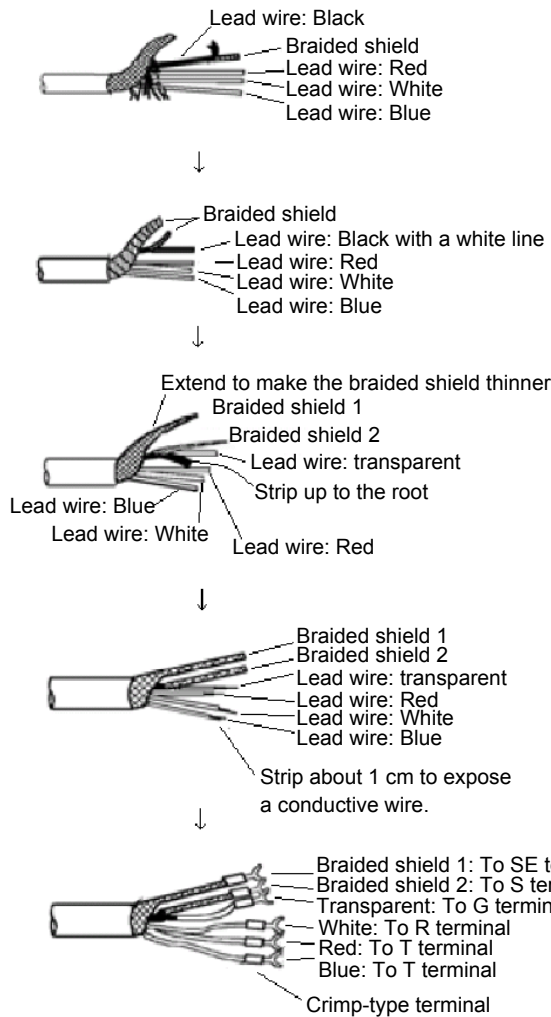


Remove the provided short-circuit plate between R and SE

Extending the sensor cable

- Be sure to use replay cable and relay box.
- Extension cable (C-5A) exclusively for electrode cable
- Dedicated relay box (CT-25pH)
- The maximum extension distance between the HP-300 and the electrode is 50 m.
- It is recommended that the dedicated relay cable be placed in a conduit pipe in order to prevent static electricity from being generated with induction, vibration, or the like. In this case, pass the wiring near the HP300 through a flexible tube.

Termination method for extension 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.

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.

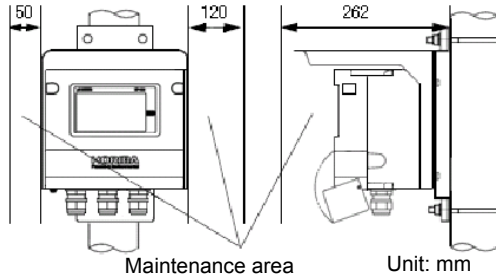
■ Installation (mounting)

The description of the following installation (mounting) assumes that the HP- 300 is of the standard specification.

For the HP-300, the optionally available cleaner may be installed.

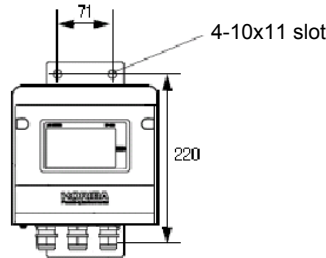
The installation of the HP-300 with the cleaner will be described in the section for the cleaner.

Body (for pole mounting)



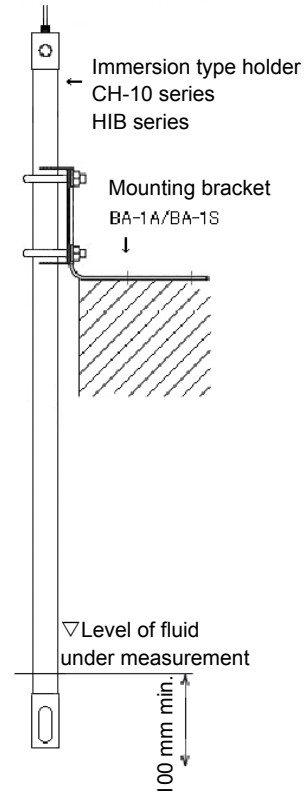
- The body may be mounted on the pole or the wall.
- For pole-mounting, use a 50A pole.
- In either case, install the HP-300 with maintenance space taken into consideration.

Body (to be wall-mounted)



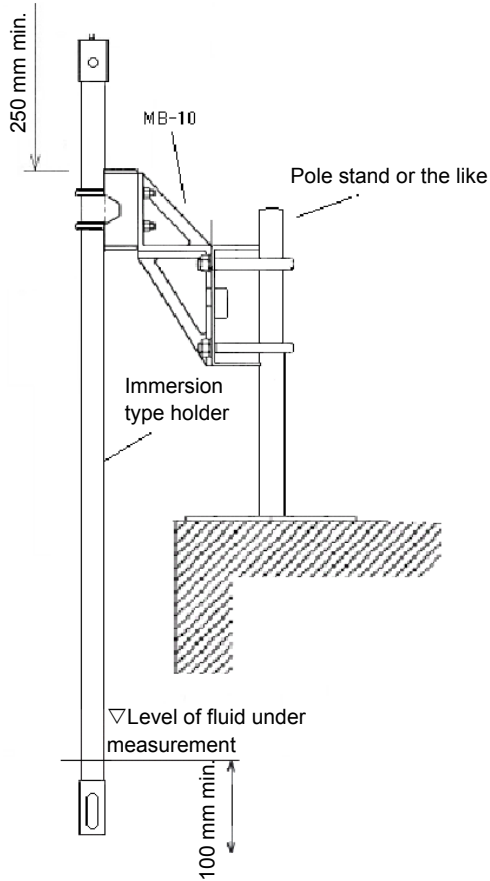
Immersion holder + mounting bracket (BA-1A/BA1S)

- The mounting bracket BA-1A or BA-1S should be secured with 2- Φ 10 bolts.
- To install an immersion holder, position it 250 mm minimum above slab.
- Install the immersion holder at such a level as cause its lower part of 100 mm minimum to be immersed in water.
- The mountable immersion type holder is limited to 1.5 m.



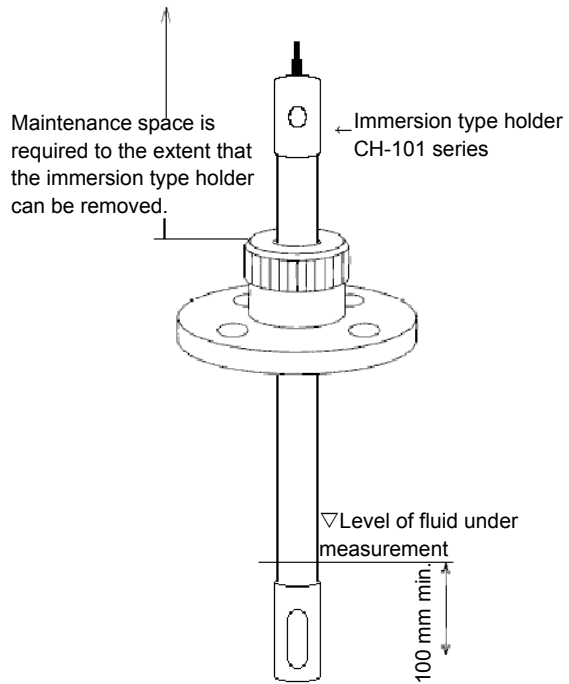
Immersion holder + mounting bracket (MB-10)

- 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.
- Install the immersion holder at such a level as cause its lower part of 100 mm minimum to be immersed in water.
- The mountable immersion type holder is limited to 1.5 m.



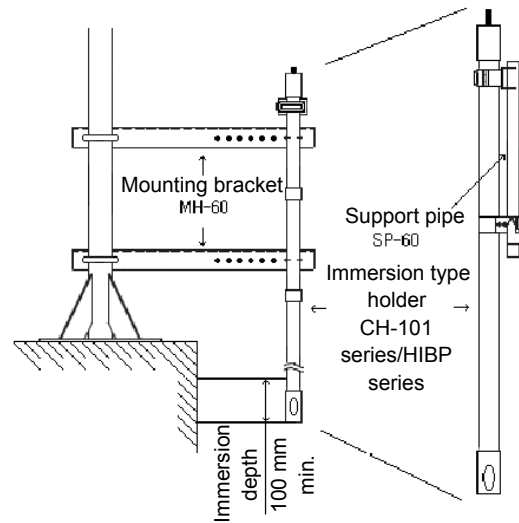
Immersion type holder + loose flange (FK-1 series)

- For the FK-1 series, JIS 10K 50A FF is the basic size. To install a special type of loose holder, previously check its size.
- To install an immersion holder on the FK-1 series, position it 200 mm minimum above the top of the hexagon cap nut on the loose holder.
- Install the immersion holder at such a level as cause its lower part of 100 mm minimum to be immersed in water.
- The mountable immersion type holder is limited to 1.5 m.



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

- When an immersion holder of 1.5 m minimum is used, it is recommended that a support pipe be used to secure the immersion holder.
- Before using the support pipe, check the length of the immersion type holder. [The length enabling the use of an immersion holder (holder length) and a support pipe is predetermined.]
- Use an immersion holder by securing it to a support pipe.
- To use the support pipe, secure it with the mounting bracket (MH-60).
- The mounting bracket MB-10 should be secured to the 50A pole.
- Install the immersion holder at such a level as cause its lower part of 100 mm minimum to be immersed in water.



Distribution holder

- For the CF-251 and CF-501 series flow-through holders, JIS 10K 25A FF is applicable for the basic sizes. To install a special type of flow-through holder, previously check its size.
- Make sure that the holder is installed upright.

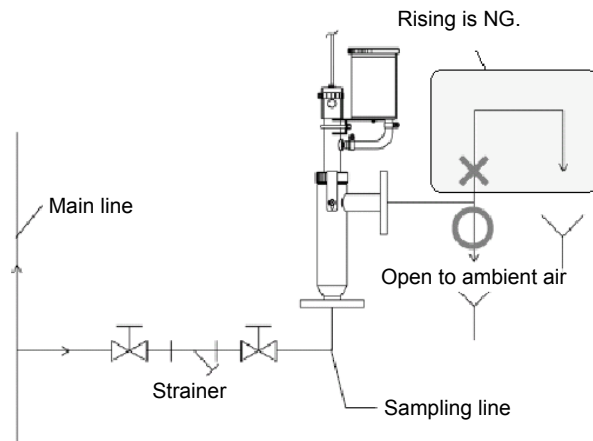
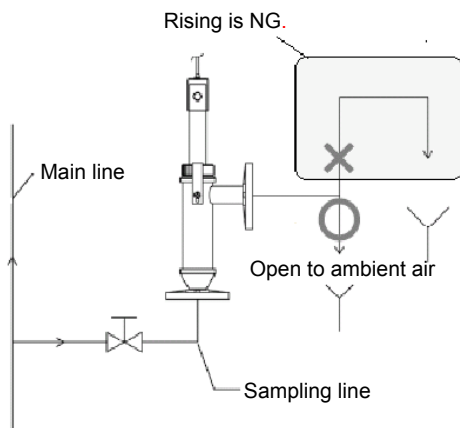
CF-251 series/CF-501

Provide a valve at the inlet of the flow-through holder.

- Minimize the piping at the outlet so that no back pressure applies. (The piping at the outlet is open to the atmosphere.)
- 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.

- Be sure to provide a pipe on the inflow side. If the flow rate of the solution under measurement is too fast, the reading may fluctuate with occurrence of cavitation or application of pressure to the sensor liquid junction due to the flow rate. 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.



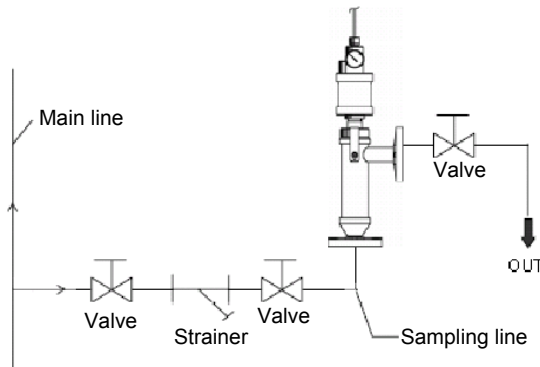
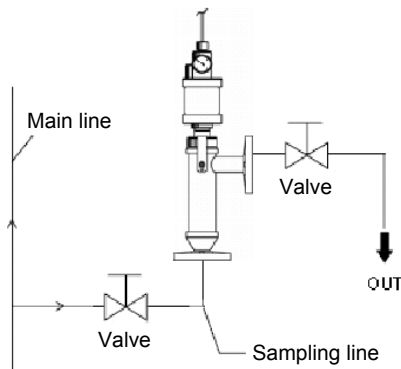
Distribution holder

- Make sure that the holder is installed upright.

CF-301 series/CF-401S series

- Provide a valve at the inlet and outlet of the flow-through 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 and install the HP-300 so that the solution under measurement flows in at the lower part of the flow-through holder and then laterally flows out.
- Be sure to provide a pipe on the inflow side. If the flow rate of the solution under measurement is too fast, the reading may fluctuate with occurrence of cavitation or application of pressure to the sensor liquid junction due to the flow rate. 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.

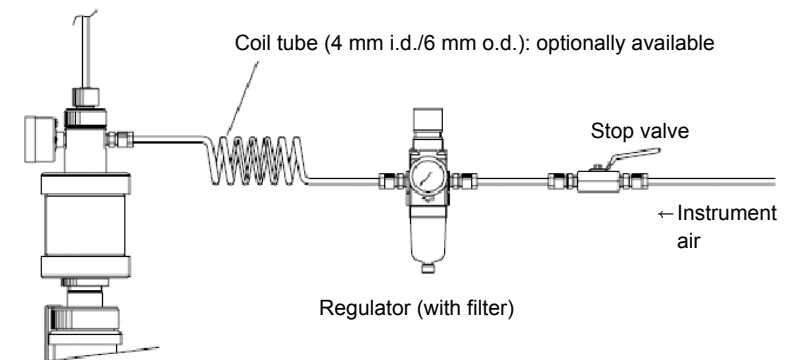
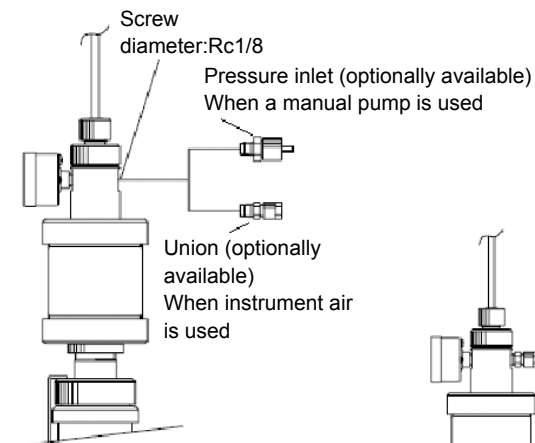


Pressurization

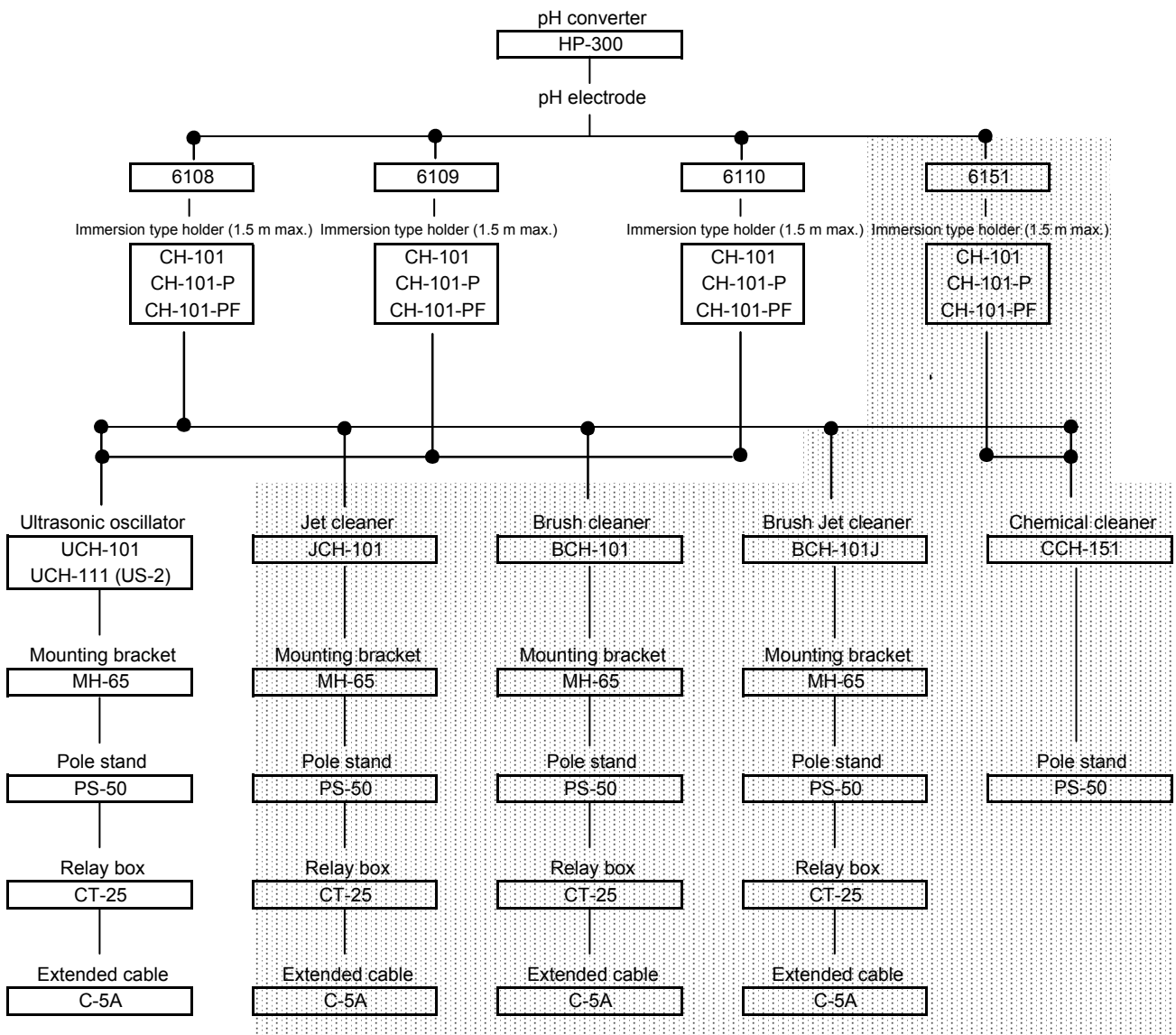
For pressurization with an inflator, use the pressure inlet.

- Maintain the pressure in the pressurized holder at 0.03 to 0.05 MPa.
- 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 at 0.03 to 0.05 MPa.
- 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.



■ Combination (immersion type ultrasonic cleaner)



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).

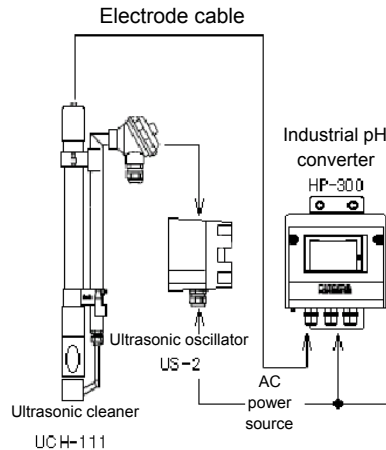
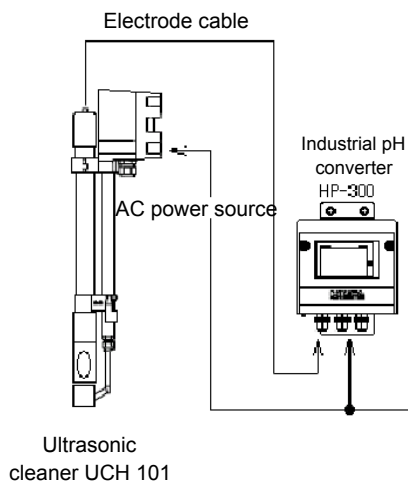
Objects

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	

○:Good ○:Acceptable ×:Not acceptable

System configuration



■ Specifications (UCH-101 and UCH-111)

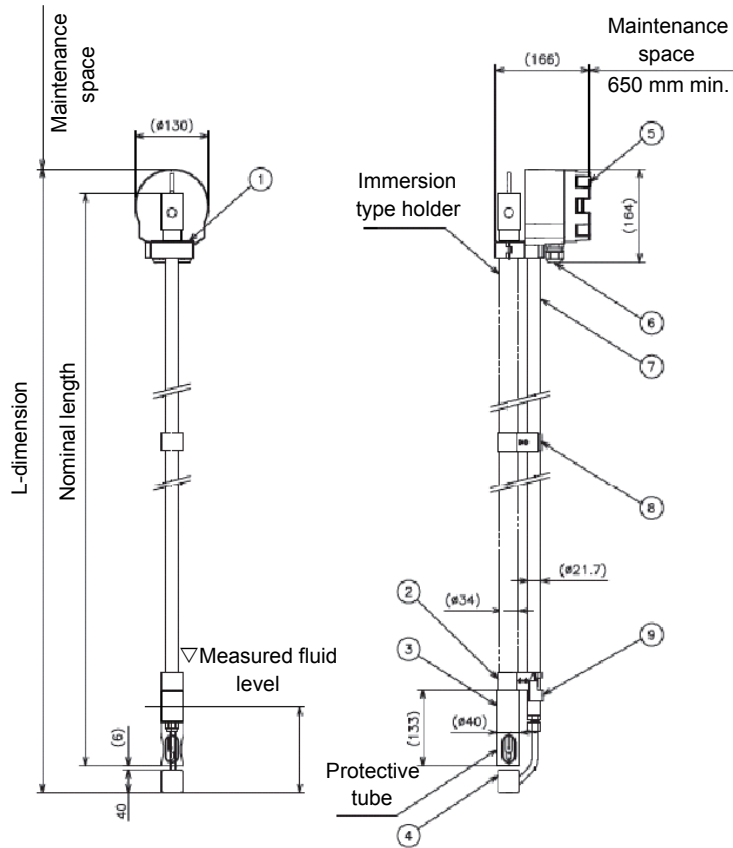
Product Name		Ultrasonic cleaner for immersion type (incorporating the ultrasonic oscillator into a single unit)
Model		UCH-101
Supply Voltage		100 to 240VAC 50/60Hz
Permissible Voltage Variation Range		90% to 110% of supply voltage
Power Consumption		10VA
Cleaning Method		Ultrasonic wave continuous 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)
Measured Liquid Flow Velocity		2 m/sec or less
Measuring liquid pressure		Atmospheric pressure
Materials of Liquid Junction Section		SUS316 (not including an electrode and materials for Immersion Holders)
Mass		Approx. 8.82lb (holder length of 1.0 m)
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 is not supplied with an electrode and a holder.

*1 A working temperature range varies with a combinational electrode and an Immersion Holder.
Moreover, a measured liquid in a frozen state cannot be measured.

Product Name		Ultrasonic cleaner for immersion type (with ultrasonic oscillator separately installed)
Model		UCH-111
Supply Voltage		100 to 240VAC 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
-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)
Measured Liquid Flow Velocity		2 m/sec or less
Measuring liquid pressure		Atmospheric pressure
Materials of Liquid Junction Section		SUS316 (not including an electrode and materials for Immersion Holders)
Mass	Oscillator	Approx. 4.41lb
	Vibrator holder	Approx. 5.51lb (holder length of 1.0 m)
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 is not supplied with an electrode and a holder.

*1 A working temperature range varies with a combinational electrode and an Immersion Holder.
Moreover, a measured liquid in a frozen state cannot be measured.

External dimensions (UCH-101)



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

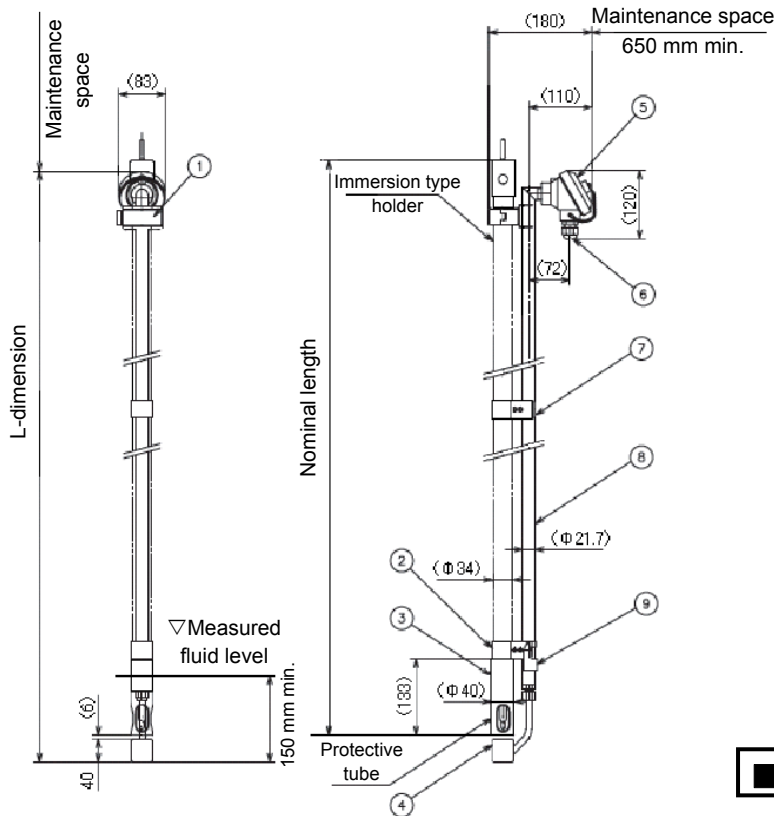
No	PARTS	NOTES
(1)	Electrode holder mounting bracket	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Ultrasonic vibrator	SUS316
(5)	Ultrasonic oscillator	AC4C
(6)	Piping slot	O.DΦ7to12cabel
(7)	Vibrator holder	SUS316
(8)	Support hook	SUS316
(9)	Stopper	SUS316

Nominal length (m)	L length (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 is required above the solenoid valve.

• No support hook is provided on a cleaner of 1.5 m maximum.

External dimensions (UCH-111)



External dimensions (US-2)

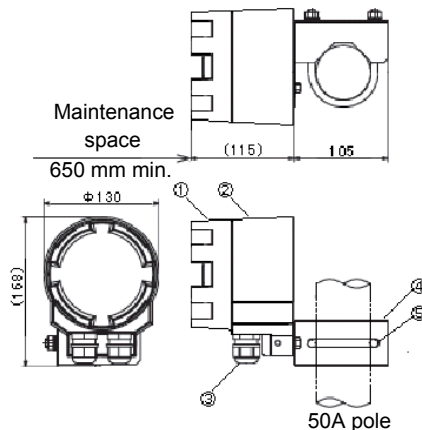
	PARTS	NOTES
(1)	Immersion holder	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Ultrasonic vibrator	SUS316
(5)	Relay terminal box	AI
(6)	Piping slot	O.DΦ7to12cabel
(7)	Vibrator holder	SUS316
(8)	Support hook	SUS316
(9)	Stopper	SUS316

• No support hook is provided on a cleaner of 1.5 m maximum.

The L length and tolerance of the UCH-111 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 is required above the solenoid valve.



No	PARTS	NOTES
(1)	Oscillator cover	AC4C
(2)	Oscillator case	AC4C
(3)	Wiring hole	O.DΦ7to12cabel
(4)	Mounti 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)

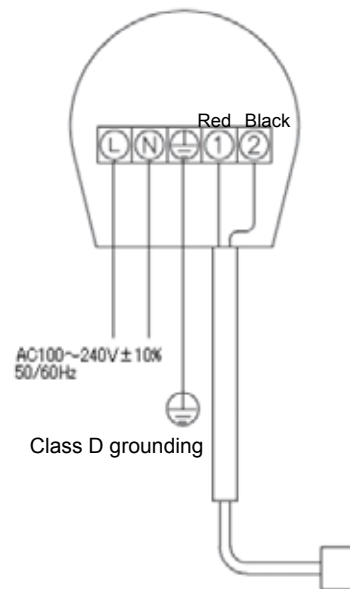
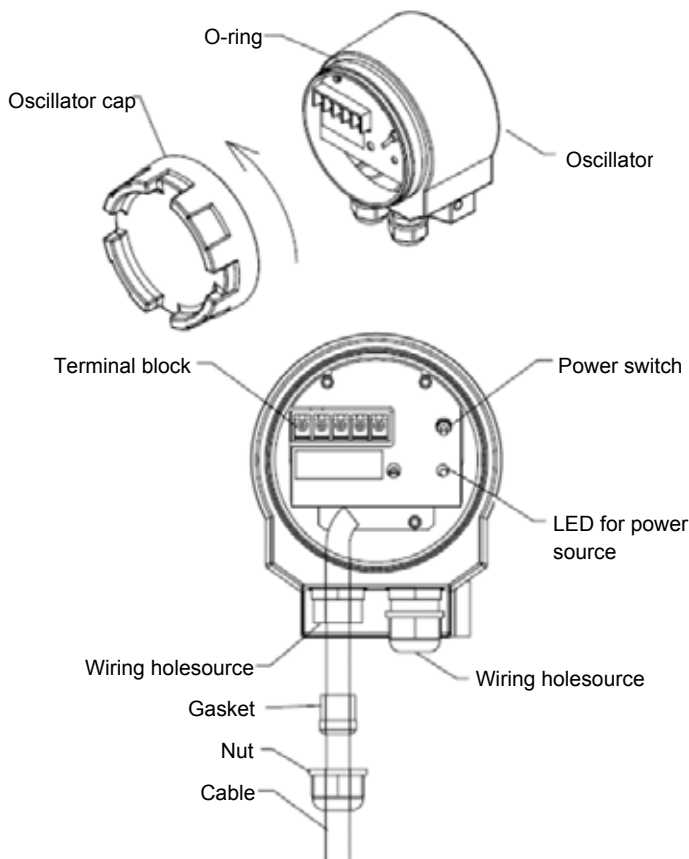
■ Installation (UCH-101) (connections)

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

Power Source

- The HP-300 has a power switch. Ensure that the power switch is OFF during work.
 - Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
 - Carefully check that the power supply voltage fluctuations fall within a range of $\pm 10\%$.
 - Be sure to ground the grounding terminal (class D grounding). The applicable diameter of the cable at the wiring slot ranges from 7 mm 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 power cable	7 to 12 mm dia.



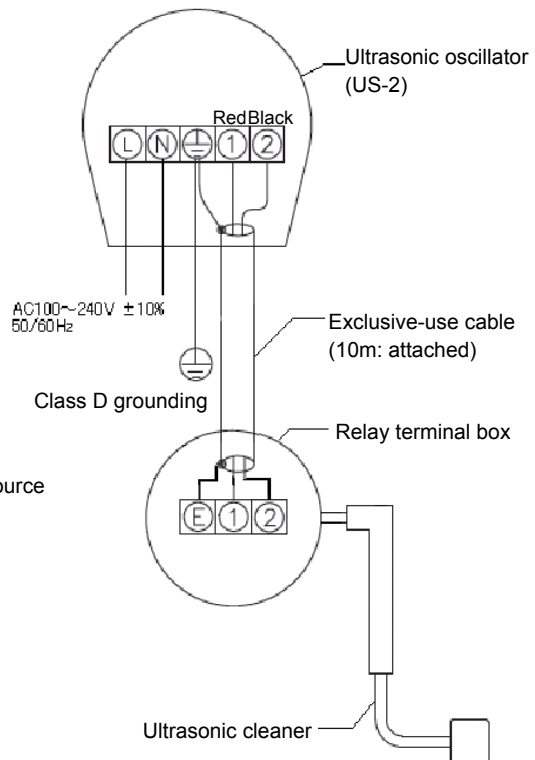
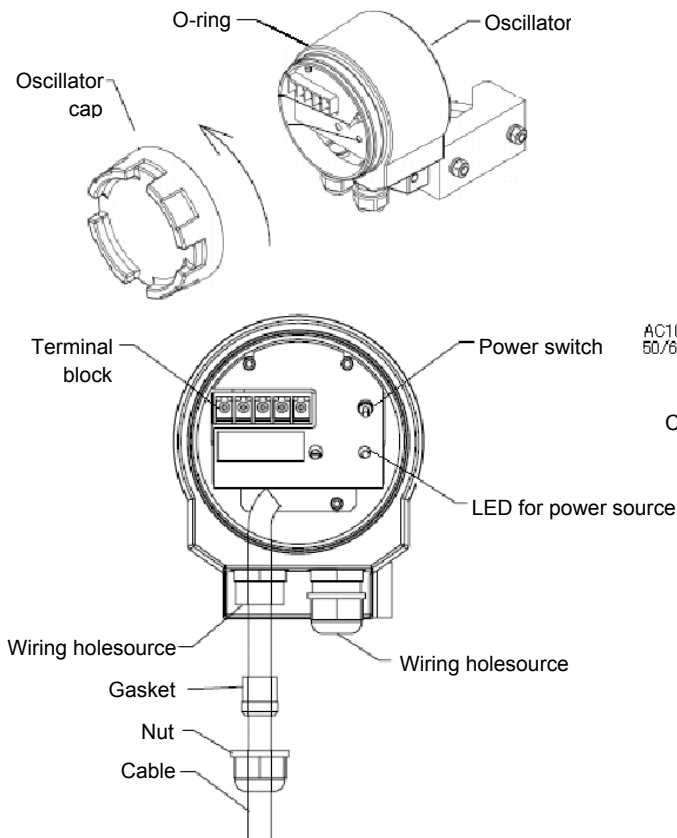
■ Installation (UCH-111) (connections)

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

Power Source

- The HP-300 has a power switch. Ensure that the power switch is OFF during work.
 - Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
 - Carefully check that the power supply voltage fluctuations fall within a range of $\pm 10\%$.
 - Be sure to ground the grounding terminal (class D grounding).
- The applicable diameter of the cable at the wiring slot ranges from 7 mm 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 power cable	7 to 12 mm dia.



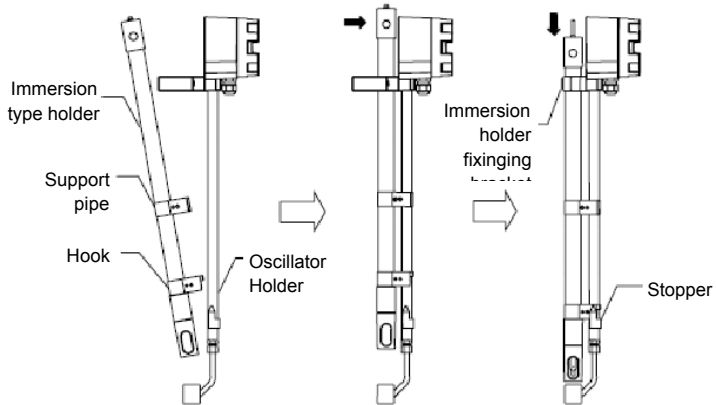
■ Installation (ultrasonic cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation

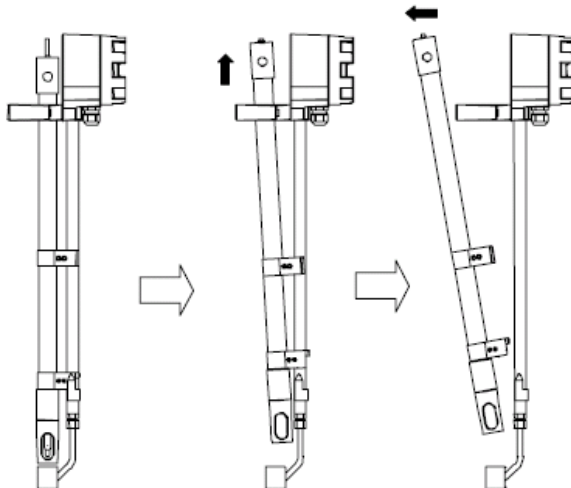
Attach the hook to the immersion holder.

- Slowly move down the hook along the vibrator holder.
- Once the hook is caught by the stopper on the oscillator holder, lock the immersion holder retainer.



Removal

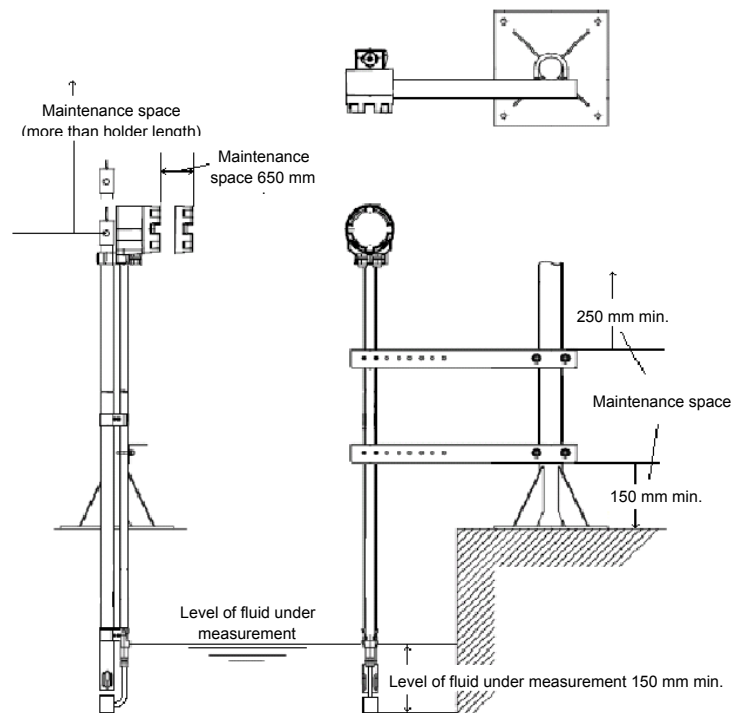
- Remove the immersion holder retainer.
- Pull up the immersion holder.
- Remove the hook and the support hook from the vibrator holder.



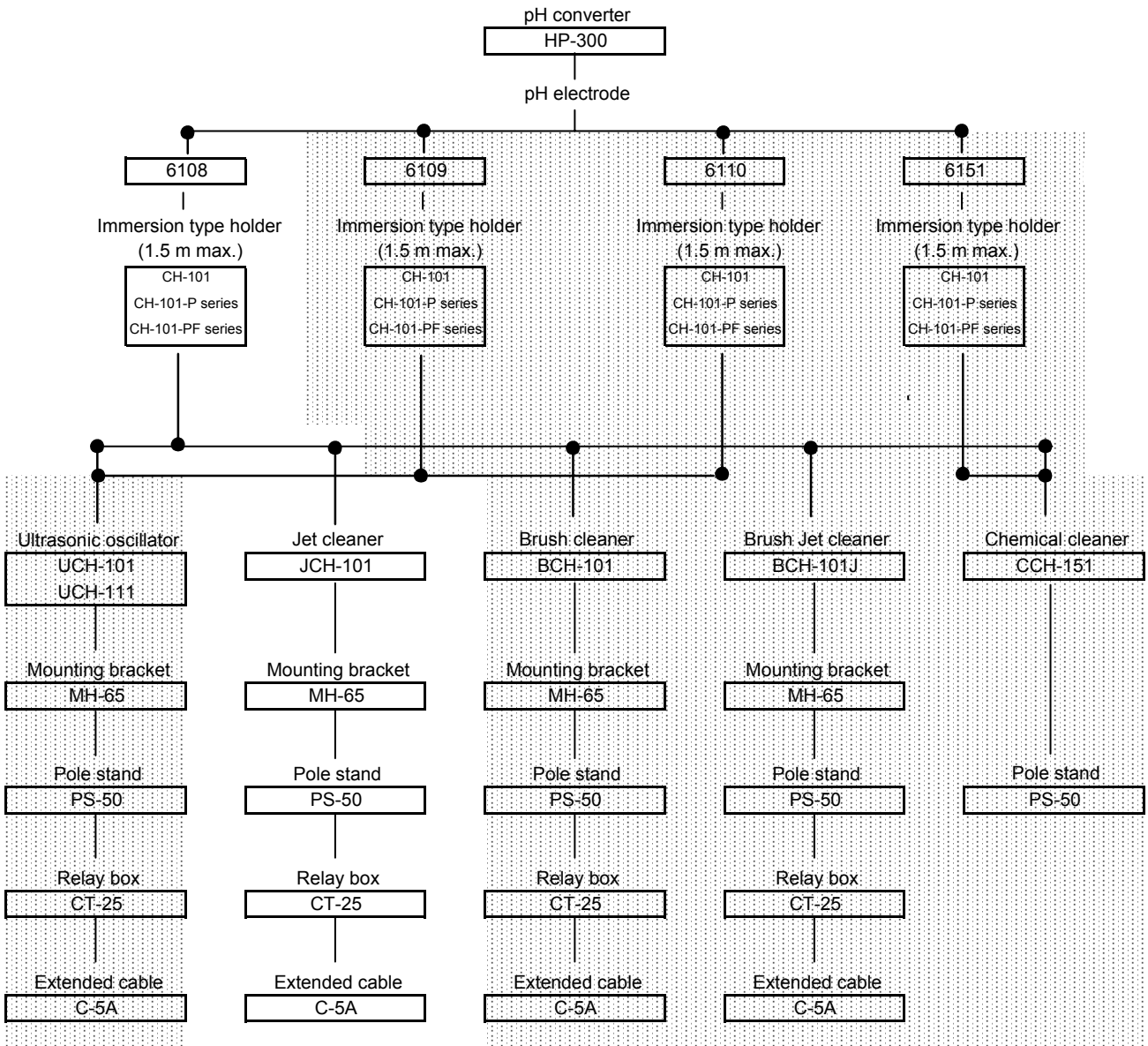
■ Installation

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 ° C or higher in the vicinity of a heat source.



Possible combination (immersion type jet cleaner)



H-1 series Immersion Jet Cleaner

JCH-101



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.

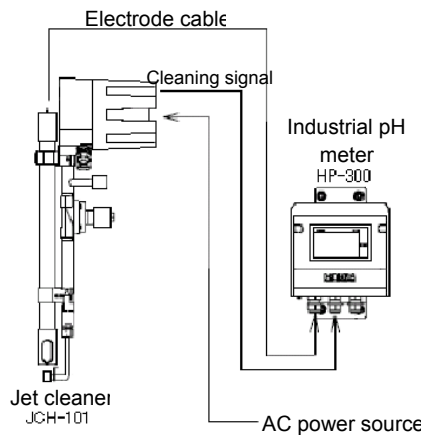
Objects

The 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 CaCO ₃ , etc.	

⊙:Good ○:Acceptable ×:Not acceptable

System configuration



Specifications (JCH-101)

Product Name		Immersion type jet cleaner (with built-in timer unit)
Model		JCH-101
Supply Voltage (*1)		100VAC 50/60Hz
Permissible Voltage Variatio		90% to 110% of supply voltage
Power Consumption		Max. 25VA
Signal output during cleaning	Contact Form	Relay contact SPDT(1c)
	Contact point capacity	250 V AC 3 A, 30 V DC 3 A (resistance load)
	Conditions	Short-circuited between NO-COM. Opened between NC-COM
Start of external cleaning Input (*2)	Contact Form	No-voltage contact
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.
	Conditions	Pulse input, closed time of 100 msec or more
Cleaning stop signal Input (*3)	Contact Form	No-voltage contact
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.
	Conditions	Continuous input, stopped at open
Timer	Washing frequency	0.1 to 3.0 hours
	Washing time	Between 0.5 and 10.0
	Signal output during cleaning	Between 0.2 and 5.0
	Delay time	
Cleaning Method		Intermittent water jet/air jet cleaning
Ambient temperature		0
-5°C to 50°C		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *4		5°C to 80°C (without dew condensation)
Measured Liquid Flow Velocity		2 m/sec or less
Measuring liquid pressure		Atmospheric pressure
Cleaning pressure	Water	0.05 MPa to 0.5MPa (consumption: approx. 4L/min)(*5)
	Air	0.05MPa to 0.2MPa(consumption: approx. 90L/min)
Bore Diameter Connected for Cleaning		Rc 1/2
Materials of Liquid Junction Section		SUS316, FKM (not including an electrode and materials for Immersion Holders)
Mass		Approx. 14.33lb (holder length of 1.0 m)
Timer case	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: When the input line to start external cleaning is used, remove the cleaning frequency timer (T1).

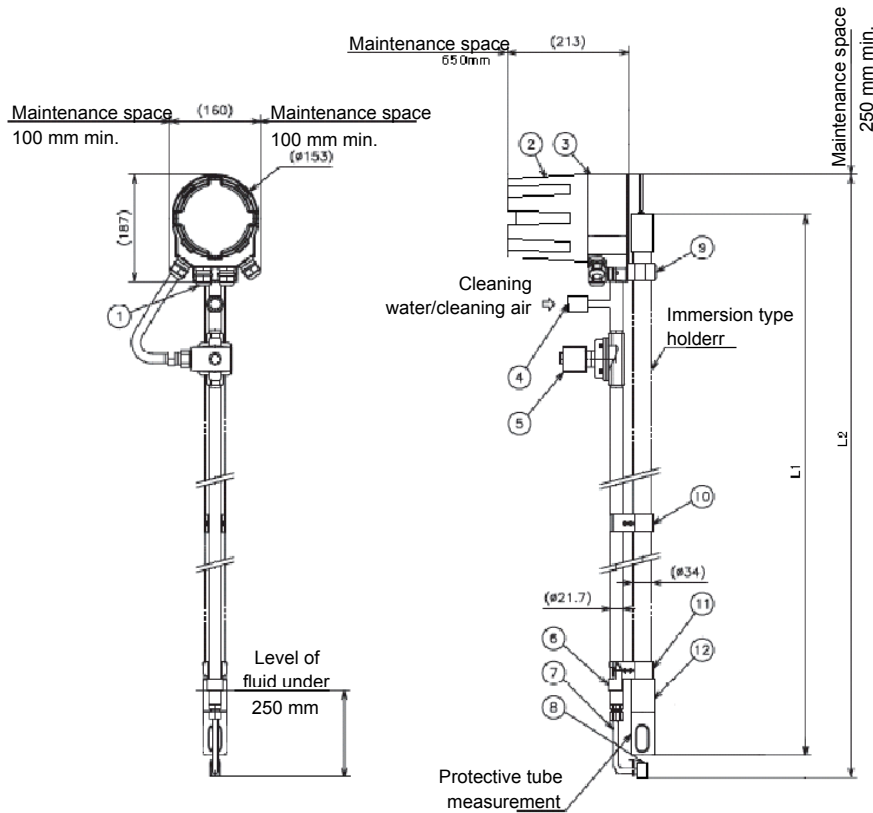
*3: The terminals were short-circuited at factory. To input the cleaning stop signal, remove the short-circuit.

*4: The operating temperature range differs depending on the combined electrode and immersion holder. Therefore, check the specified temperature for each model.

*5: 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 (JCH-101)



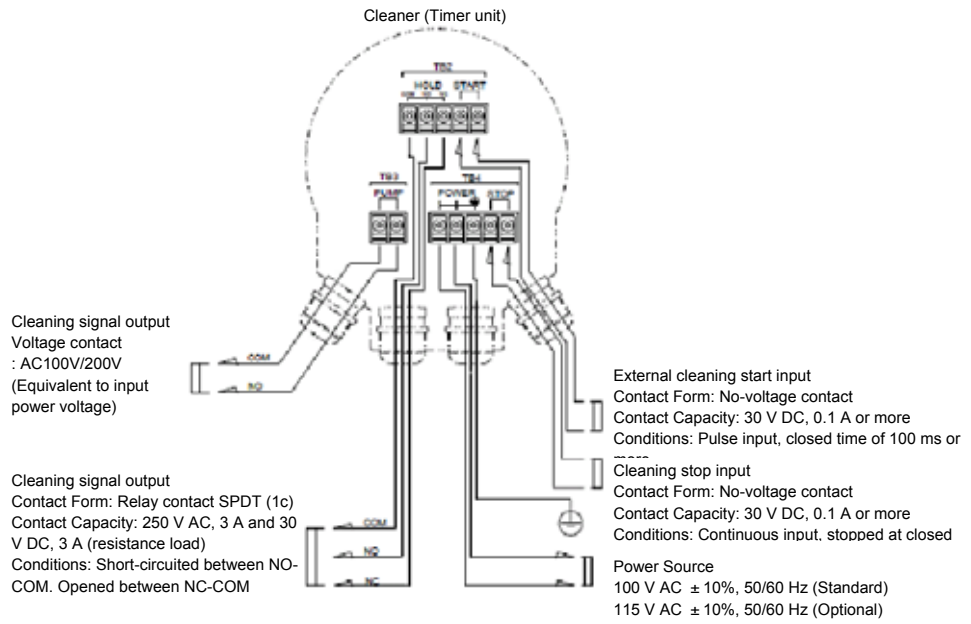
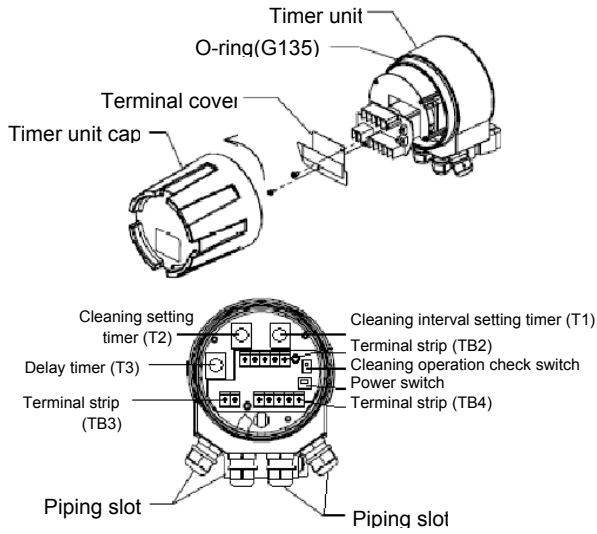
No	PARTS	NOTES
(1)	Piping slot	O.D $\Phi 7$ to $\Phi 12$ cable
(2)	Timer unit cover	AC4C
(3)	Timer unit	AC4C
(4)	Cleaning water/air inlet	Rc1/2
(5)	Solenoid valve	
(6)	Stopper	SUS316
(7)	Nozzle holder	SUS316
(8)	Nozzle	SUS316
(9)	Immersion holder fixing bracket	PVC
(10)	Support hook	SUS316
(11)	Hook	SUS316
(12)	Spacer	PP

L1 (m) (nominal length)	L2
1	1108 \pm 10
1.5	1608 \pm 10
2	2108 \pm 10
2.5	2608 \pm 10
3	3108 \pm 10

Unit: mm

• No support hook is provided on a cleaner of 1.5 m maximum.

Part names/terminals (JCH-101)



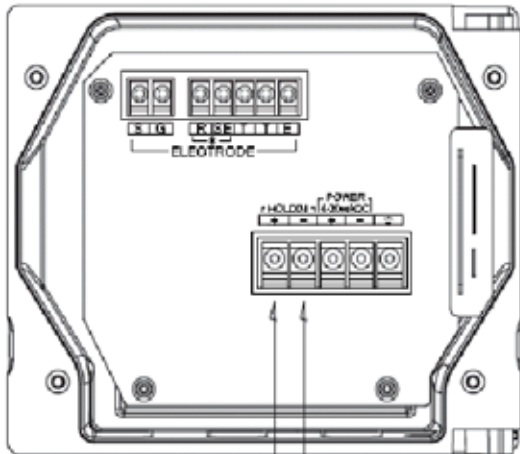
■Precautions for installation (JCH-101) (connections)

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

Connections

- Be sure to ground the grounding terminal (class D grounding).
- The applicable diameter of the cable at the wiring slot ranges from 7 mm to 12 mm.

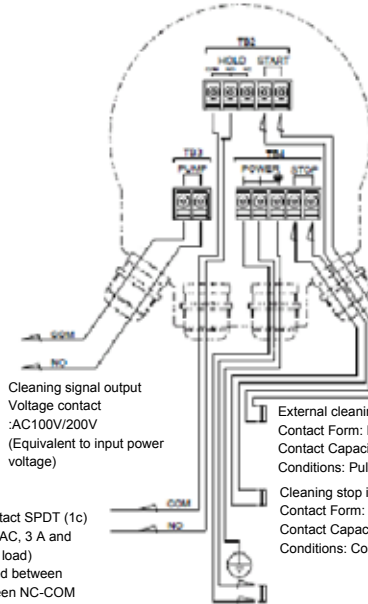
Applicable power cable 7 to 12 mm; 0.75 mm² min.



HOLD input terminal
ON resistance: Max. 40Ω
Open voltage: 1.2 VDC
Short-circuit current: Max. 21 mA

Cleaning signal output
Contact Form: Relay contact SPDT (1c)
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

Cleaner (Timer Unit)



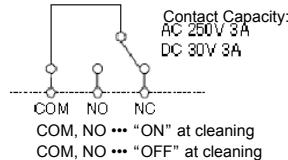
Cleaning signal output
Voltage contact
:AC100V/200V
(Equivalent to input power
voltage)

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

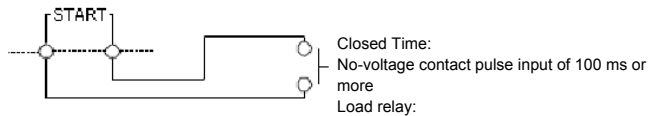
Wiring of HOLD (cleaning signal output (hold signal output))

- 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.



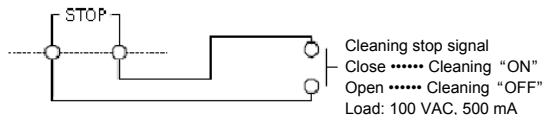
Wiring of START (external cleaning start input)

- 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.



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.

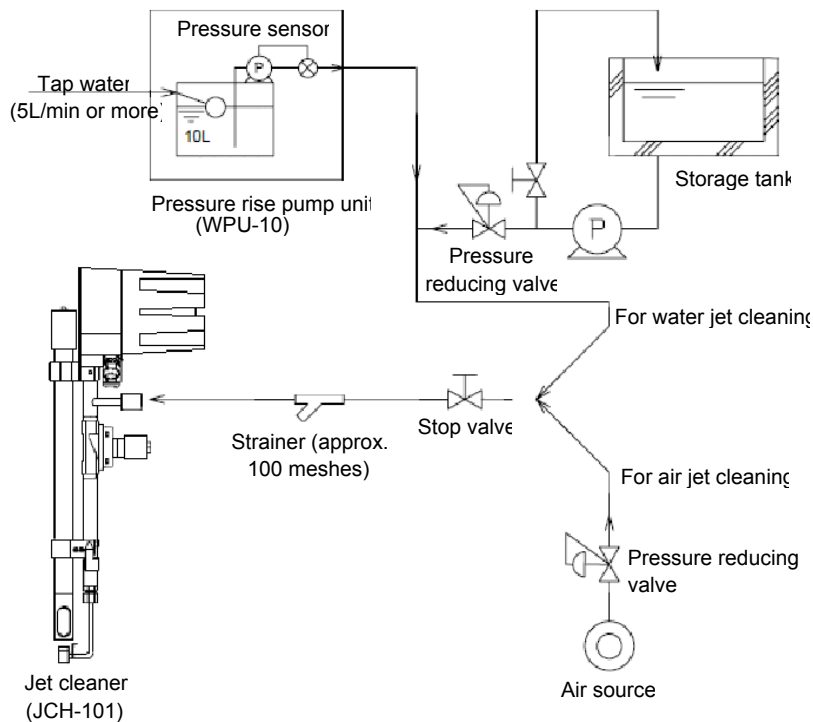


■ Installation (JCH-121A) (piping)

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 treatment water) pipe may be connected directly to a tap water main pipe. Moreover, a tap water pipe may be connected if the tap is isolated and supplied via a water tank located on a rooftop.



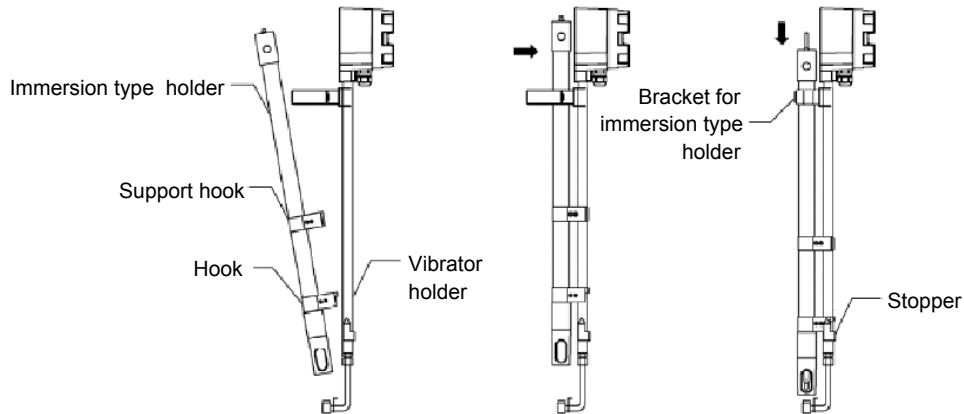
Installation (jet cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation

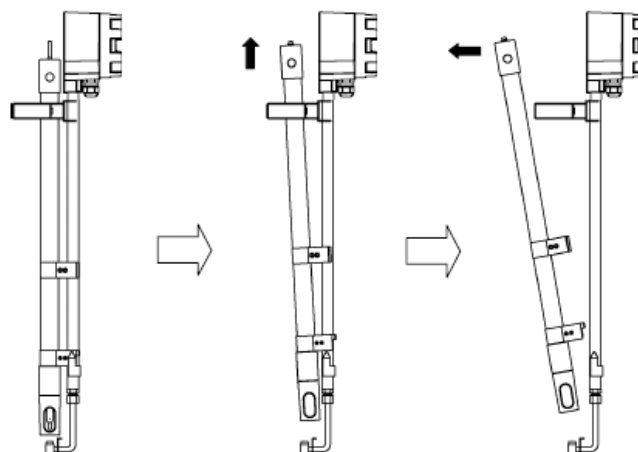
Attach the hook to the immersion holder.

- Slowly move down the hook along the nozzle holder.
- Once the hook is caught by the stopper on the nozzle holder, lock the immersion holder retainer.



Removal

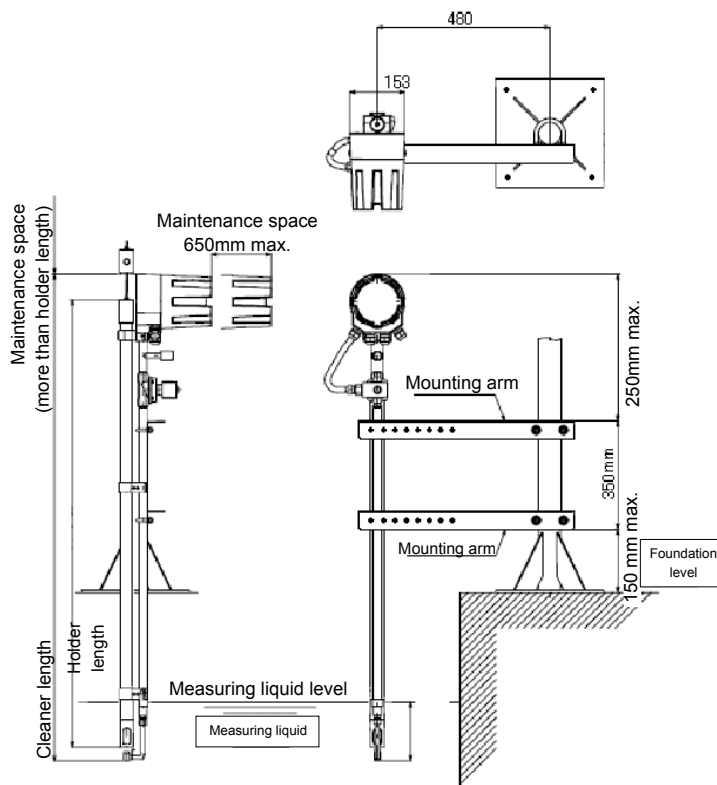
- Remove the immersion holder retainer.
- Pull up the immersion holder.
- Remove the hook and the support hook from the vibrator holder.



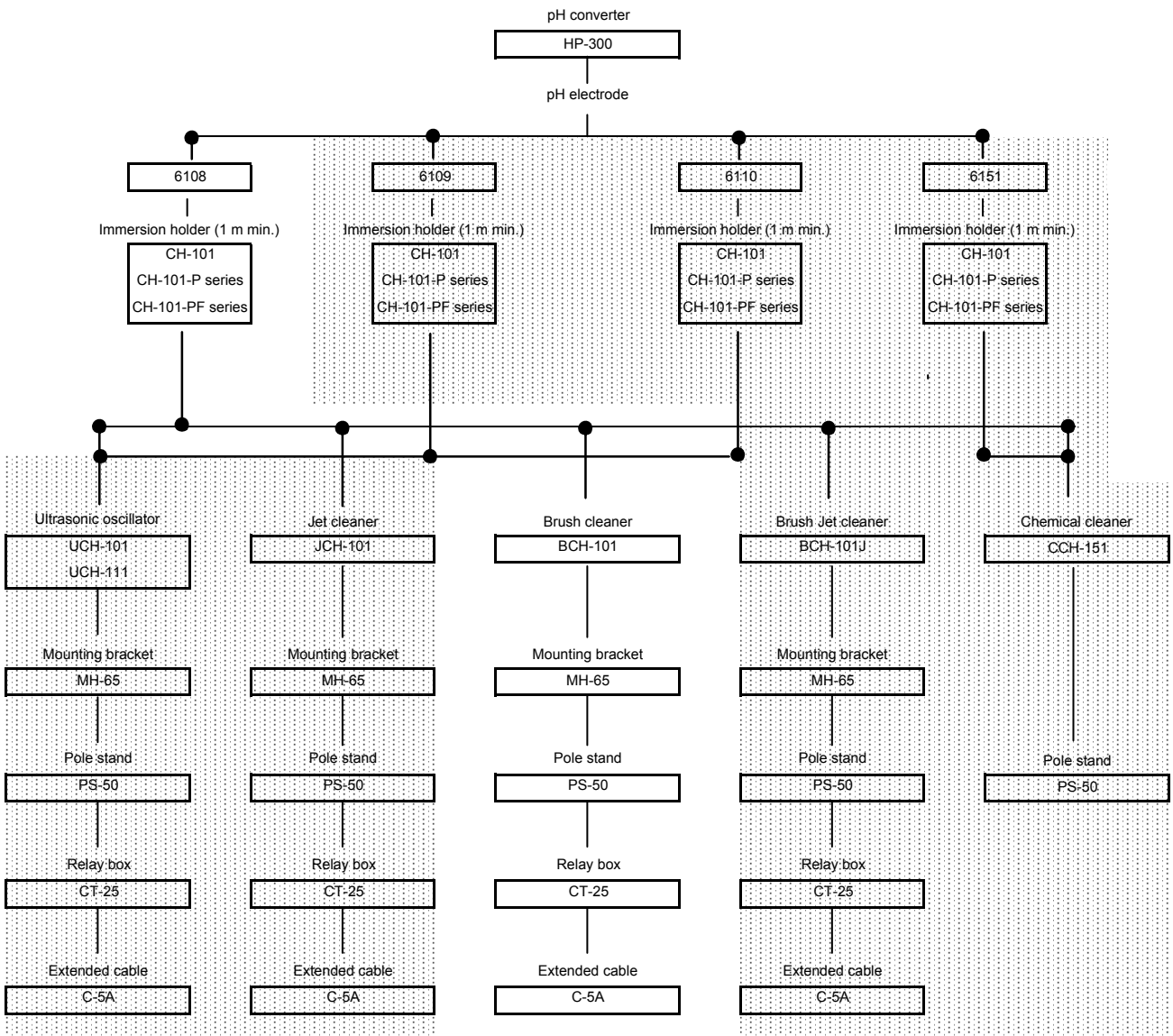
■ Installation

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 ° C or higher in the vicinity of a heat source.



Possible combinations (immersion type brush cleaner)



H-1 series Immersion Brush Cleaner

BCH-101



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.

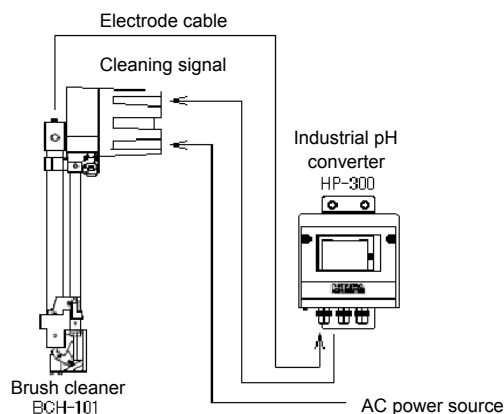
Objects

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 CaCO ₃ , etc.	×

○:Good ◐:Acceptable ×:Not acceptable

System configuration



<p>■ Specifications (BCH-101)</p>
--

Product Name		Immersion Type Brush Cleaner
Model		BCH-101
Supply Voltage (*1)		100VAC 50/60Hz
Permissible Voltage Variation		90% to 110% of supply voltage
Power Consumption		Max. 30VA
Cleaning signal output	Contact Form	Relay contact SPDT (1c)
	Contact point 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 (*2)	Contact Form	No-voltage contact
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.
	Conditions	Pulse input, closed time of 100 msec or more
Input of cleaning stop signal (*3)	Contact Form	No-voltage contact
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.
	Conditions	Stopped by turning OFF continuous input
Timer	Washing frequency	0.1 to 3.0 hours
	Washing time	Between 0.5 and 10.0
Cleaning Method		Intermittent cleaning with a swing brush
Ambient temperature		-5 to 50
-5°C to 50°C		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *4		5°C to 80°C (without dew condensation)
Measured Liquid Flow Velocity		2 m/sec or less
Measuring liquid pressure		Atmospheric pressure
Materials of Liquid Junction Section		SUS316, PP (not including an electrode and an Immersion
Mass		Approx. 15.43lb (holder length of 1.0 m)
Timer case	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.

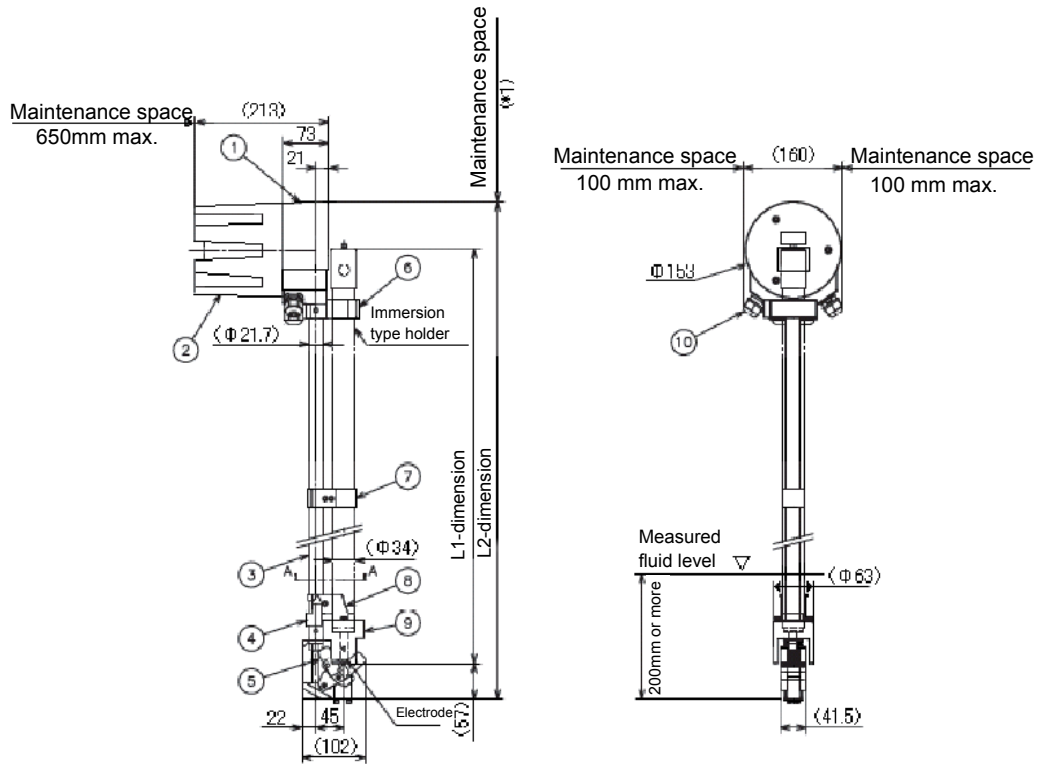
*1: A supply voltage of 200 V AC is optional. For any other voltages, please consult with HORIBA Advanced Techno.

*2: When the input line to start external cleaning is used, remove the cleaning frequency timer (T1).

*3: 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.

*4: A working temperature range varies with a combinational electrode and an Immersion Holder. Moreover, a measured liquid in a frozen state cannot be measured.

External dimensions (BCH-101)



No	PARTS	NOTES
(1)	Timer unit	AC4C
(2)	Timer unit 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)	Wiring hole	O.D $\phi 7$ to $\phi 12$ cable
(11)	Solenoid valve	

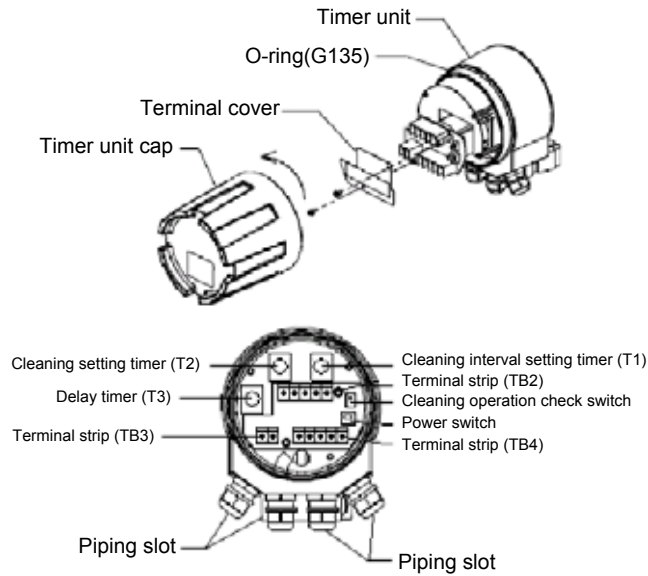
• No support hook is provided on a cleaner of 1.5 m maximum.

Nominal length (m)	L1 length	Maintenance space	L2 length
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

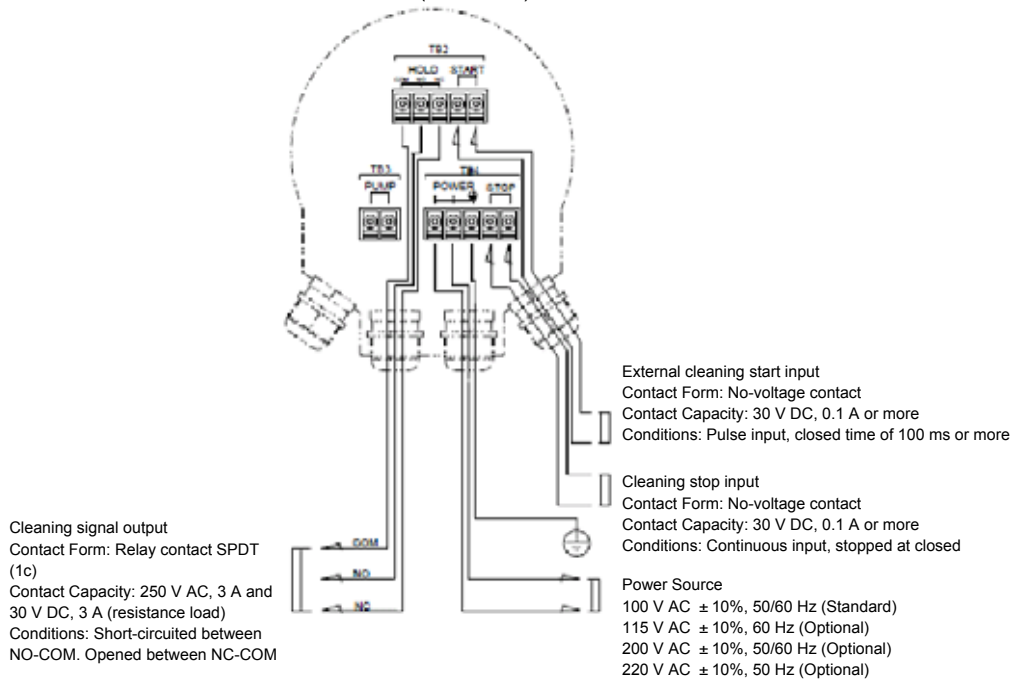
Unit: mm

(*1) The maintenance space is required above the timer unit.

Part names/terminals (BCH-101)



Cleaner (Timer Unit)



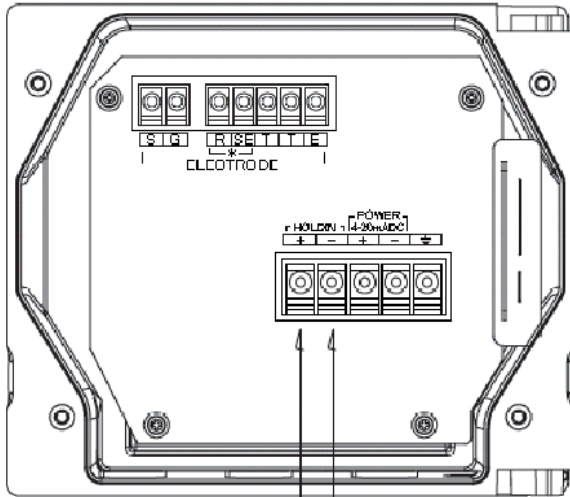
Installation (BCH-101)

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

Connections

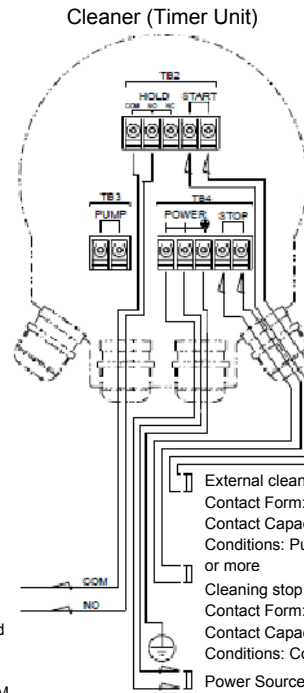
- Be sure to ground the grounding terminal (class D grounding).
- The applicable diameter of the cable at the wiring slot ranges from 7 mm to 12 mm.

Applicable power cable 7 to 12 mm; 0.75 mm² min.



HOLD input terminal
ON resistance: Max. 40Ω
Open voltage: 1.2 VDC
Short-circuit current: Max. 21 mA

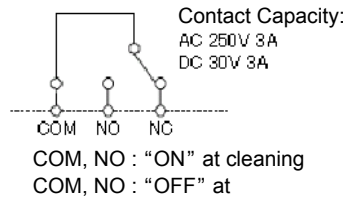
Cleaning signal output
Contact Form: Relay contact SPDT (1c)
Contact Capacity: 250 V AC, 3 A and 30 V DC, 3 A (resistance load)
Conditions: Short-circuited between NO-COM. Opened between NC-COM



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)

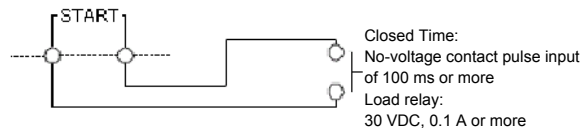
HOLD(Wiring of HOLD (cleaning signal output (hold signal output)

- 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



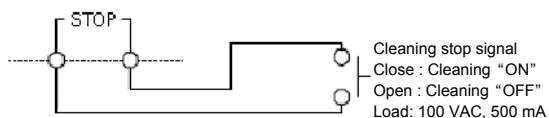
Wiring of START (external cleaning start input)

- 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.



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.

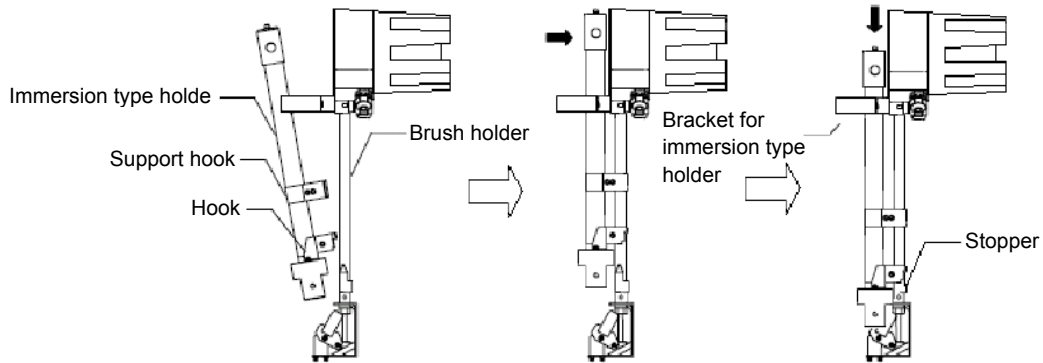


■ Installation (brush cleaner and holder)

Carry out installation and execution of work as illustrated below

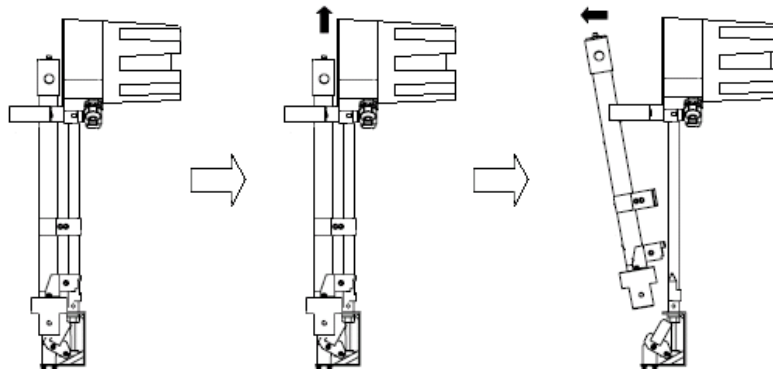
Installation

- Attach the hook and support hook provided on the immersion holder to the brush holder.
- Slowly move down the hook along the brush holder.
- Once the hook is caught by the stopper, close the immersion holder retainer.



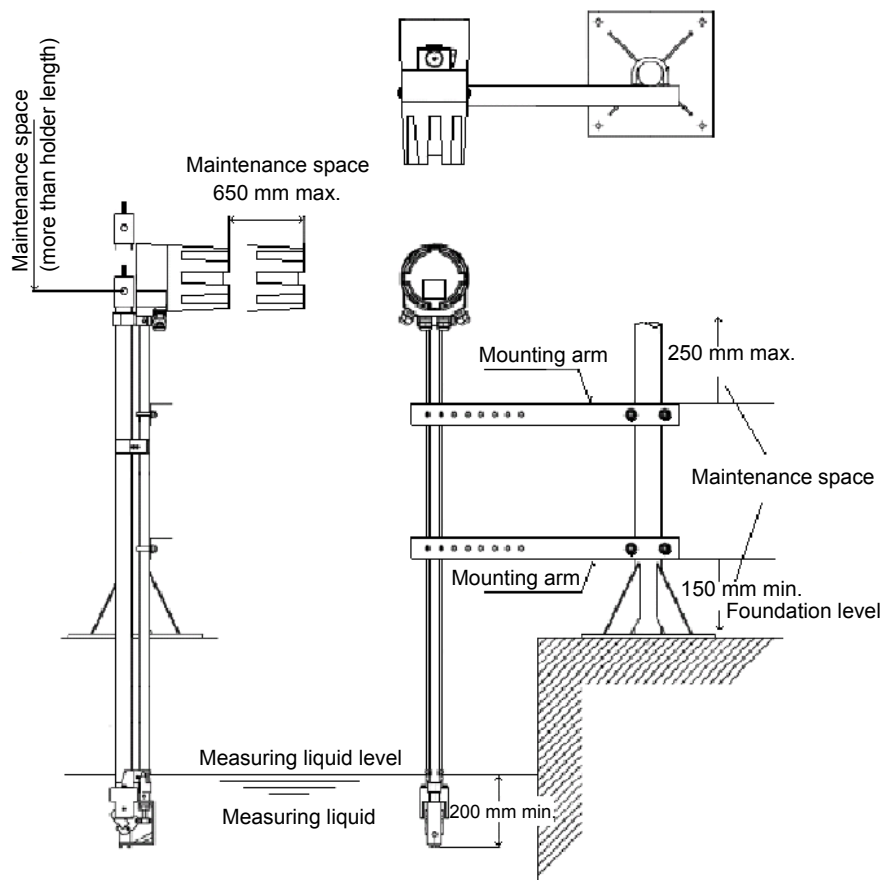
Removal

- Open the immersion holder retainer.
- Vertically pull up the immersion holder.
- Remove the hook and the support hook from the brush holder.

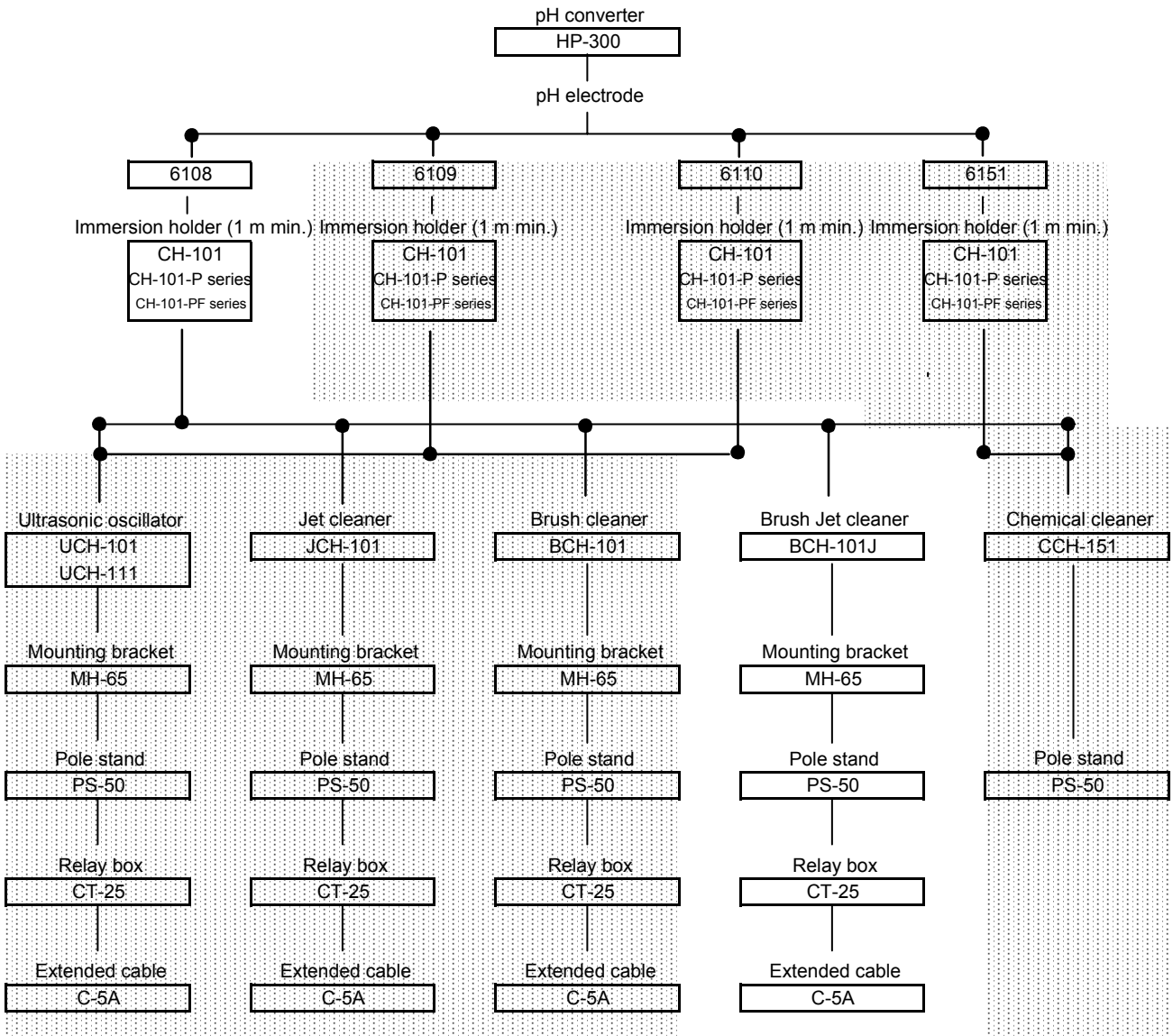


■ Installation

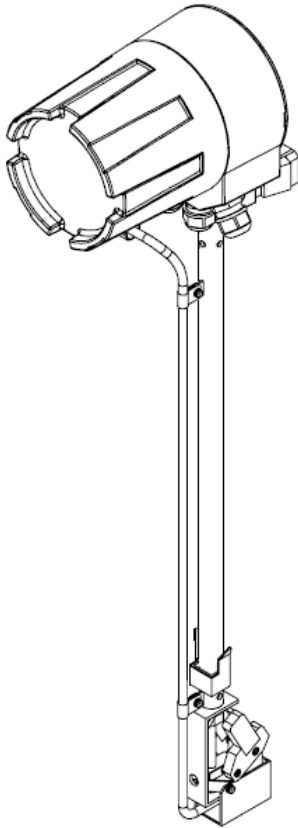
- Installation environment
- Install the Cleaner at a location where maintenance work can be easily performed.
 - Install the Cleaner at a height where an electrode is always immersed in measured liquid even if a measured liquid level changes.
 - Avoid installing the Cleaner at a location exposed to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



Possible combinations (immersion type brush jet cleaner)



H-1 series Immersion Brush Jet Cleaner BCH-101J



■ Overview

- This product intermittently cleans the glass film and liquid dropping part of the electrode by performing both brushing and flushing. 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.

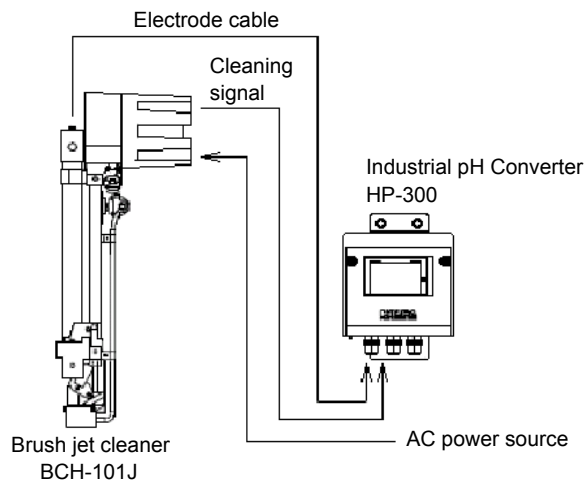
■ Objects

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

Properties 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



■ Specifications (BCH-101J)

Product Name		Immersion Type Brush Jet Cleaner
Model		BCH-101J
Supply Voltage (*1)		100VAC 50/60Hz
Permissible Voltage Variation Range		90% to 110% of supply voltage
Power Consumption		Max. 25VA
Cleaning signal output	Contact Form	Relay contact SPDT (1c)
	Contact point 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 (*2)	Contact Form	No-voltage contact
	Contact point capacity	Max. 30 mA (Voltage is the same of power voltage.)
	Conditions	Pulse input, closed time of 100 msec or more
Input of cleaning stop signal (*3)	Contact Form	No-voltage contact
	Contact point capacity	Max. 30 mA (Voltage is the same of power voltage.)
	Conditions	Stopped by turning OFF continuous input
Timer	Washing frequency	0.1 to 3.0 hours
	Washing time	Between 0.5 and 10.0
	Signal output during cleaning	Between 0.2 and 5.0
	Delay time	
Cleaning Method		Intermittent cleaning by swing brush and water jet
Ambient temperature		-5 to 50
Ambient humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid Temperature *4		5°C to 80°C (without dew condensation)
Measured Liquid Flow Velocity		2 m/sec or less
Measuring liquid pressure		Atmospheric pressure
Cleaner pressure		Pressure: 0.1 MPa to 0.5 Mpa
Cleaning water quality		Equivalent to tap water
Cleaning water consumption		Approx. 4L/min
Flange size for cleaning (*5)		Rc1/4
Materials of Liquid Junction Section		SUS316, PP (not including an electrode and an Immersion Holder)
Mass		Approx. 8.0 kg (holder length of 1.0 m)
Timer case	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: When the input line to start external cleaning is used. remove the cleaning frequency timer (T1).

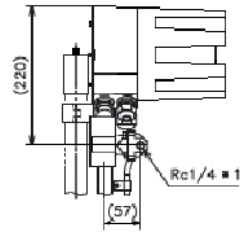
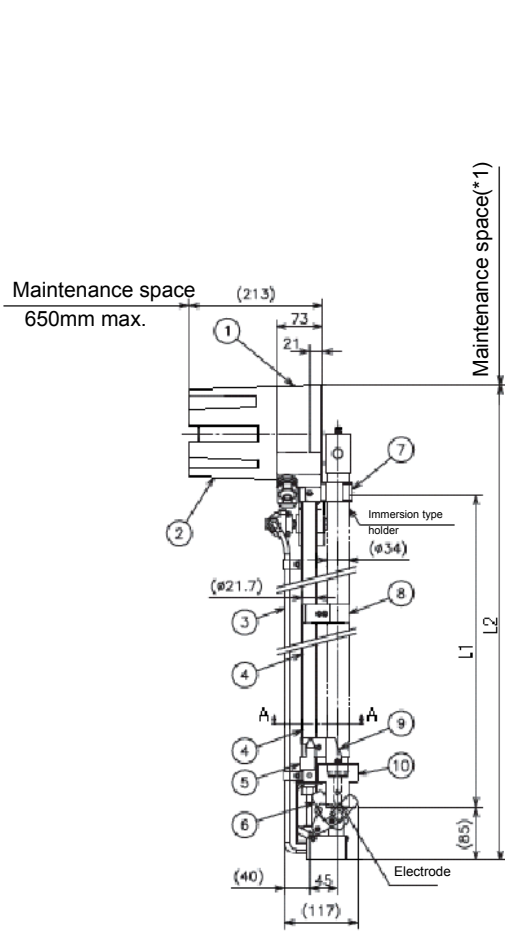
*3: Terminals have been short-circuited at the time of shipment of products. For a purpose of inputting a cleaning stop signal, remove a short-circuit line.

*4: A working temperature range varies with a combinational electrode and an Immersion Holder. Moreover, a measured liquid in a frozen state cannot be measured.

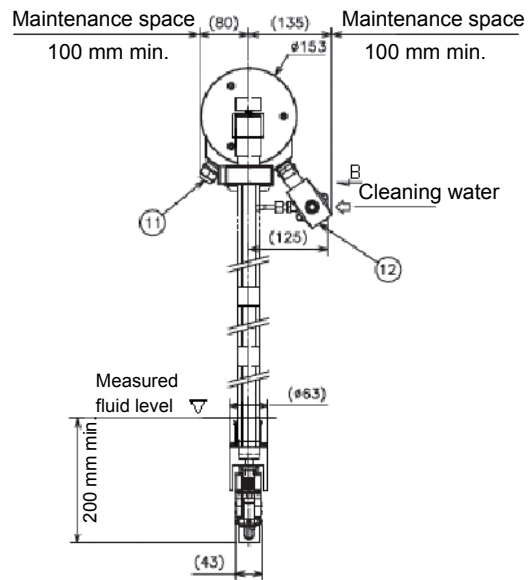
*5: If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaning water directly from a tap water pipe.

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-101J)



Viewed from B



No	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 fixing bracket	PVC
(8)	Support hook	SUS316
(9)	Hook	SUS316
(10)	Protective gear	PP
(11)	Wiring hole	O.D φ7toφ12cable
(12)	Solenoid valve	

No support hook is provided on a cleaner of 1.5 m maximum.

Nominal length (m)	L1 length	Maintenance space (*1)	L2 length
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

The L1 and L2 lengths and tolerance of the immersion type brush jet cleaner are shown in the following table: Unit: mm

The maintenance space is required above the solenoid valve.
The maintenance space is required above the ultrasonic oscillator.

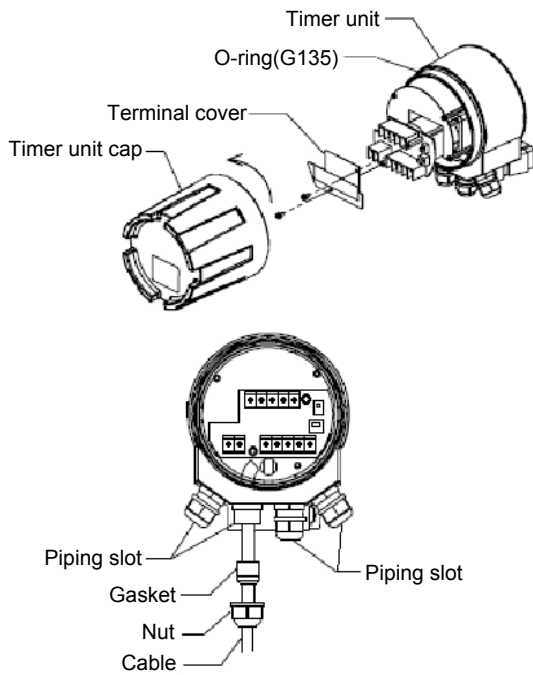
■ Installation (BCH-101J) (connections)

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

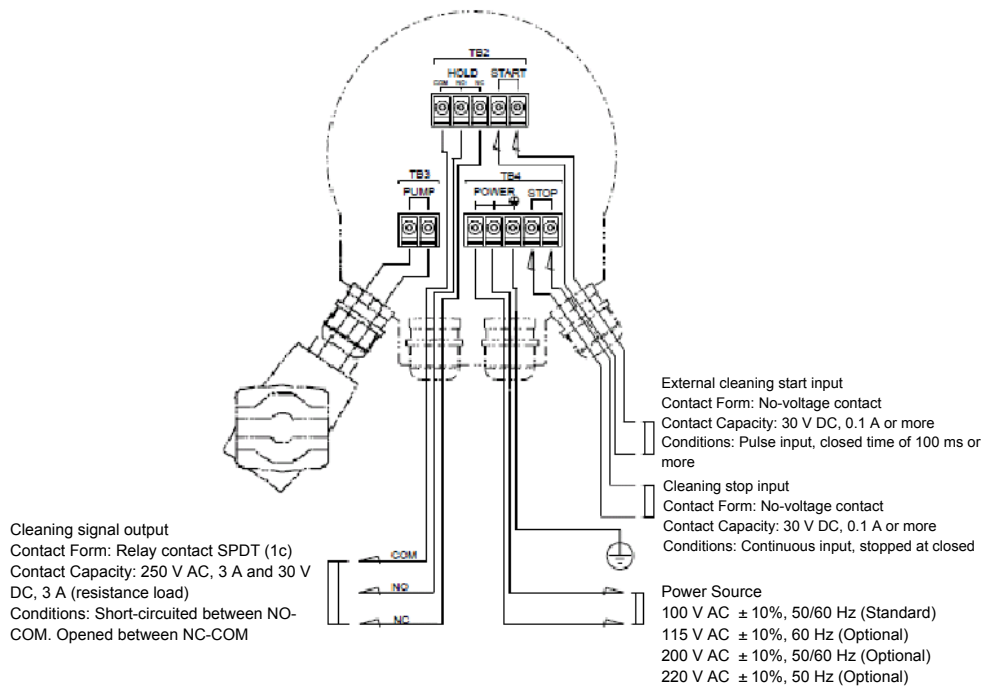
Connections

- 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. If the product is inadvertently dropped, the relay, timer, and 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.

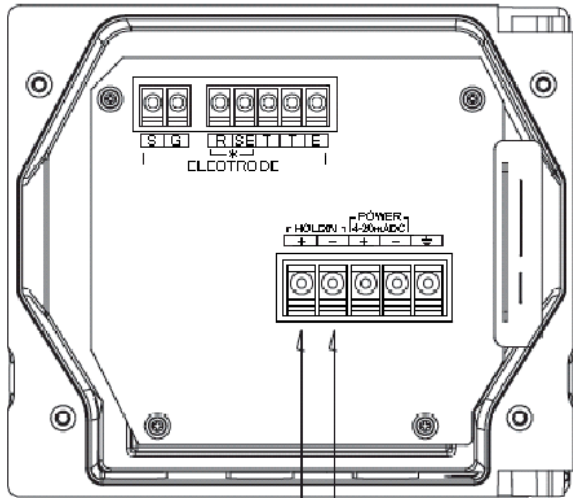
Applicable power cable 7 to 12 mm; 0.75 mm² min.



Cleaner (Timer Unit)

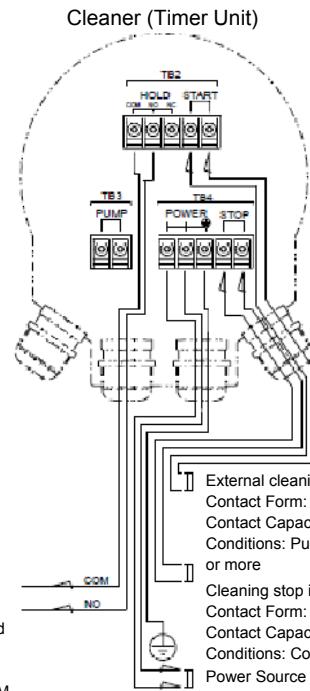


Installation (BCH-101J) (general connections)



HOLD input terminal
ON resistance: Max. 40Ω
Open voltage: 1.2 VDC
Short-circuit current: Max. 21 mA

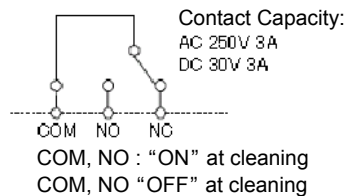
Cleaning signal output
Contact Form: Relay contact SPDT (1c)
Contact Capacity: 250 V AC, 3 A and 30 V DC, 3 A (resistance load)
Conditions: Short-circuited between NO-COM. Opened between NC-COM



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)

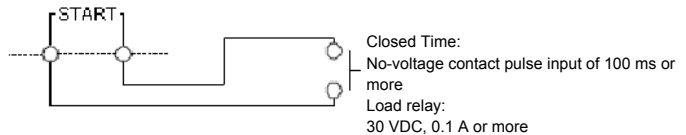
HOLD(Wiring of HOLD (cleaning signal output (hold signal output))

- 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.



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.



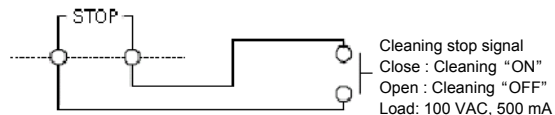
Wiring of STOP (cleaning stop signal input)

- 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.

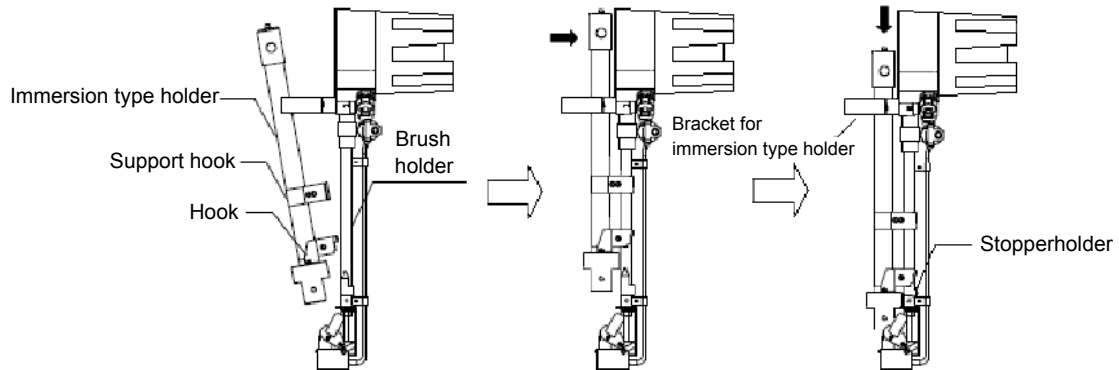


■ Installation (brush jet cleaner and holder)

Carry out installation and execution of work as illustrated below:

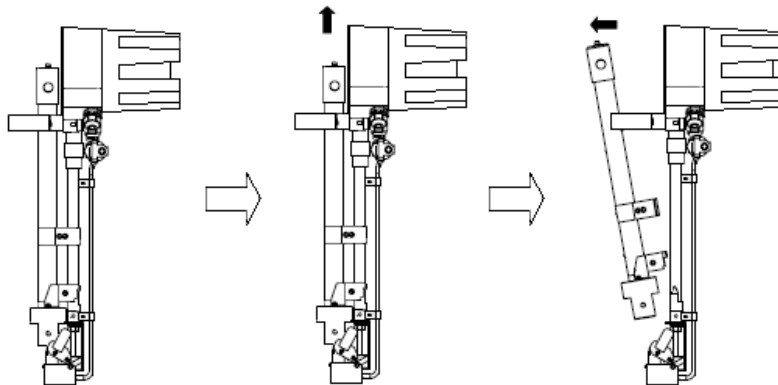
Installation

- Attach the hook and support hook provided on the immersion holder to the brush holder.
- Slowly move down the hook along the brush holder.
- Once the hook is caught by the stopper, close the immersion holder retainer.



Removal

- Open the immersion holder retainer.
- Vertically pull up the immersion holder.
- Remove the hook and the support hook from the brush holder.

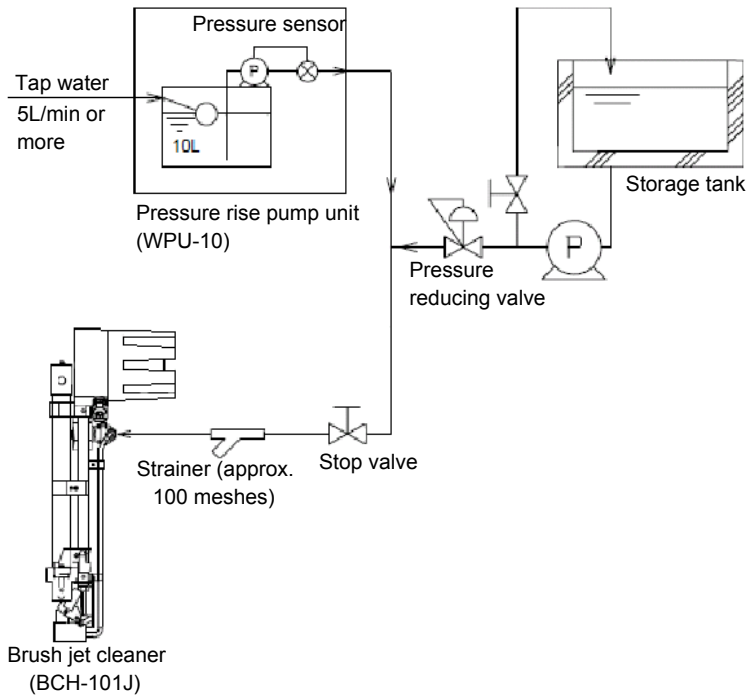


Installation (BCH-101J) (piping)

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

Piping

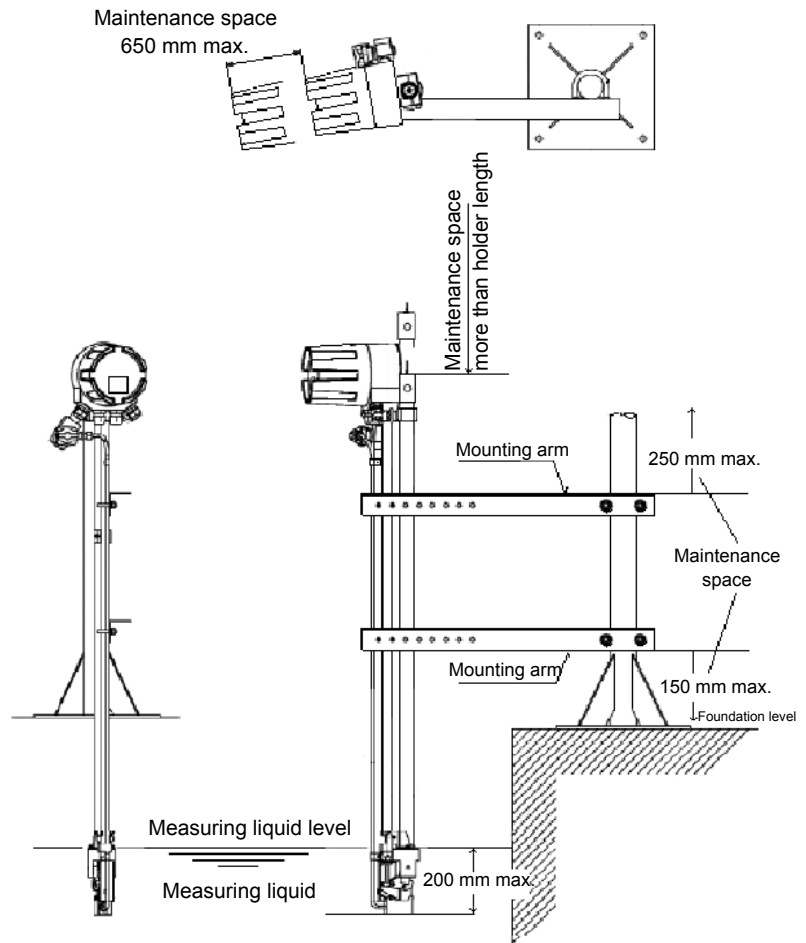
- Since the Cleaner may be detached for a maintenance purpose, use a flexible pipe that can allow enough room for its length.
- Before connecting a pipe to the Cleaner, be sure to pour water into the pipe to flush garbage inside the pipe.
- With the regulator, adjust the cleaning water to a specified 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 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 or higher in the vicinity of a heat source.



Distribution type ultrasonic cleaner for H-1 series

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).

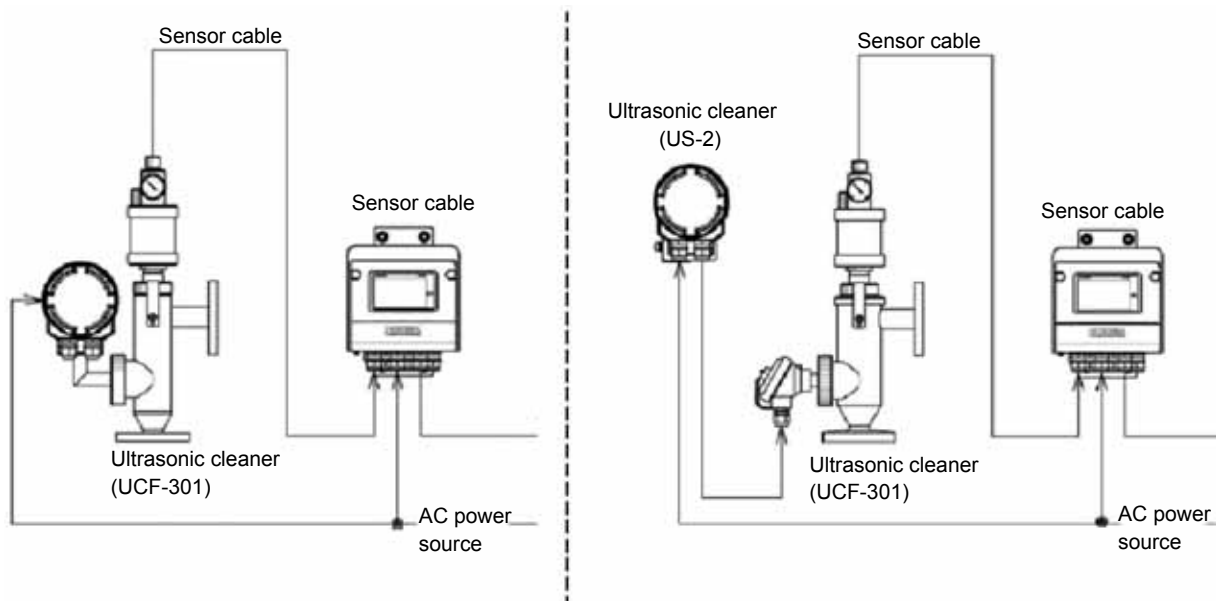
Objects

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

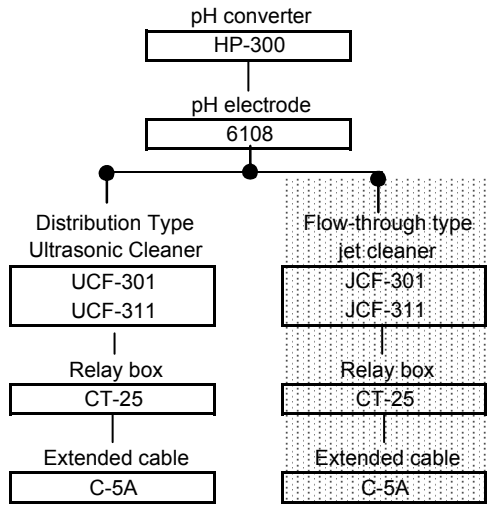
Properties Classification	Objects	
Slime	food, paper, pulp, algae	○
Microorganism	bacteria (activated sludge), slag	
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	×
Suspended Matters	earth and sands	
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent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

◎:Good ○:Acceptable ×:Not acceptable

System configuration



Possible combinations (flow-through type ultrasonic cleaner)



Specifications (UCF-301/UCF-311)

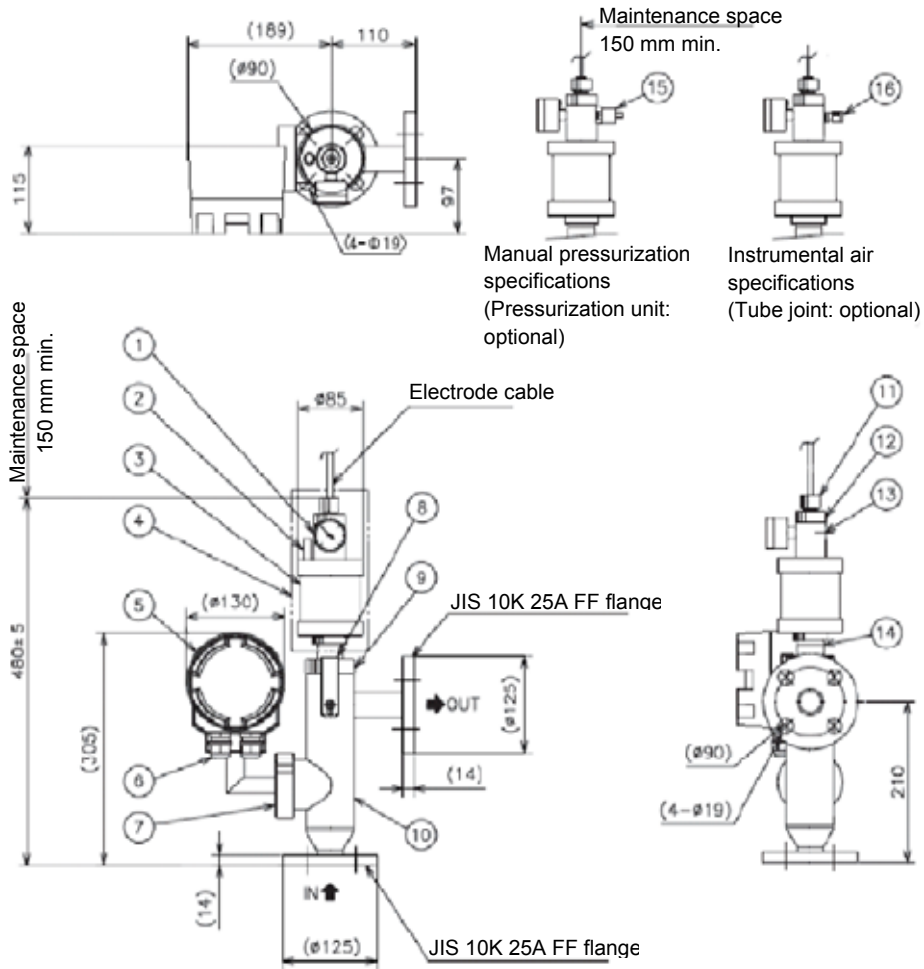
Product Name		Ultrasonic cleaner for flow-through type (ultrasonic oscillator incorporated type)	Ultrasonic cleaner for flow-through type (ultrasonic oscillator separated type)
Model		UCF-301	UCF-311
Ambient temperature		-5 to 50°C	
Ambient humidity		Relative humidity of 5% to 90% (without dew condensation)	
Measured liquid conditions	Temperature *1	5°C to 80°C (without dew condensation)	
	Flow rate	-5 to 40°C: 0.30 Mpa 40 to 60°C: 0.22 Mpa 60 to 80°C: 0.15 Mpa	
	Materials for Liquid Junction Section	0.3 to 10L/min	
SUS316, PP, FKM (not including an electrode materials)		Ambient Humidity	
Supply Voltage		100 to 240VAC 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 Size of Measured Liquid Connection		JIS 10K 25A FF flange	
Pressurizing Inlet for Holder's Internal Pressure (*3)		Rc1/8	
Mass		Approx. 15.43lb	Oscillator : Approx. 2.0 kg Cleaning unit
Special Note		<ul style="list-style-type: none"> • 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: A working temperature range varies with a combinational electrode and an Immersion Holder. Moreover, a measured liquid in a frozen state cannot be measured.

*2: If your sample has any property (e.g. alkalinity) of damaging FKM (fluoro-rubber), contact us.

*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.

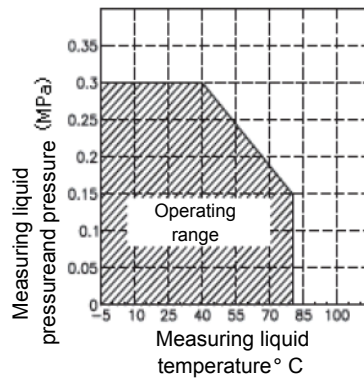
External dimensions (UCH-301)



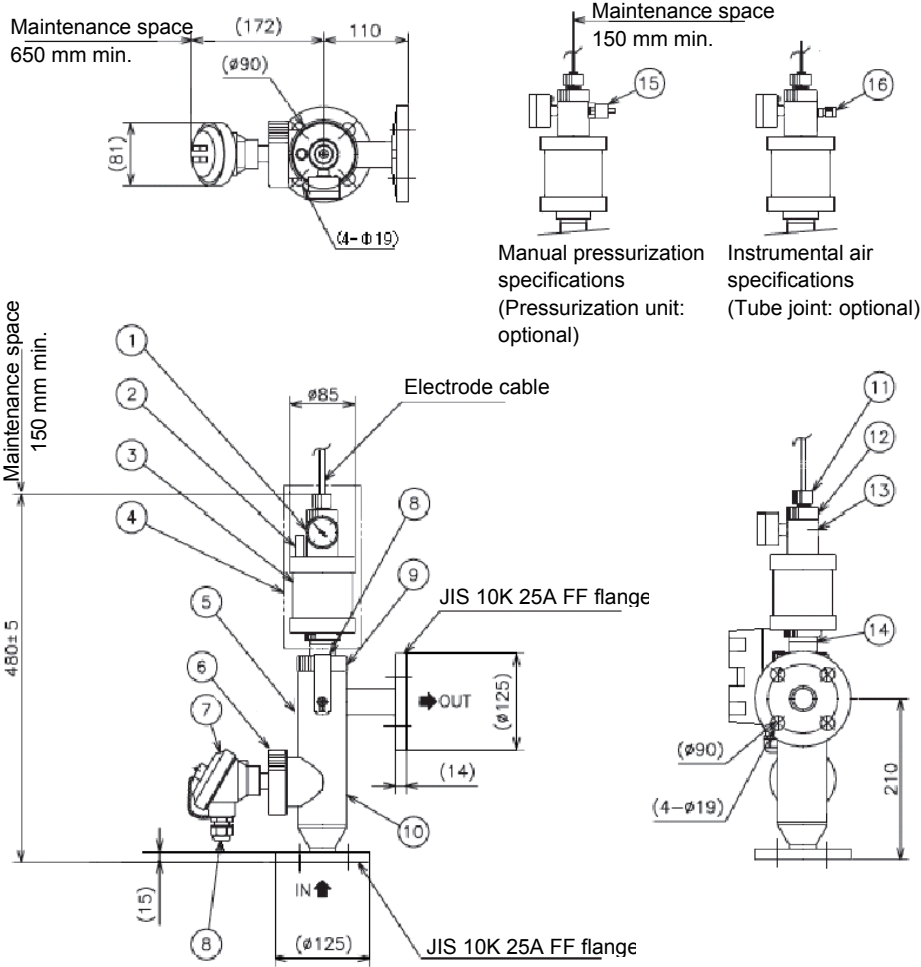
No	PARTS	NOTES
(1)	Pressure gauge	Pressure: 0 MPa to 0.5 Mpa
(2)	KCl inlet	PVC
(3)	KCl tank	PVC
(4)	Pressurization holder	
(5)	Ultrasonic oscillator	AC4C
(6)	Piping slot	O.DΦ7 to 12 cable
(7)	Vibration mounting nut	SUS304
(8)	Locking plate	SUS304
(9)	Vibration mounting nut	SUS304
(10)	Distribution holder	SUS316
(11)	Cable cap	PPO
(12)	Cable gasket	PPO
(13)	Pressurization interface screw	Rc1/8
(14)	Holder	PP
(15)	Pressurization union	C3604
(16)	Joint	For Φ6/Φ4 tube PVDF

← optionally available
← optionally available

Relation between temperature and pressure

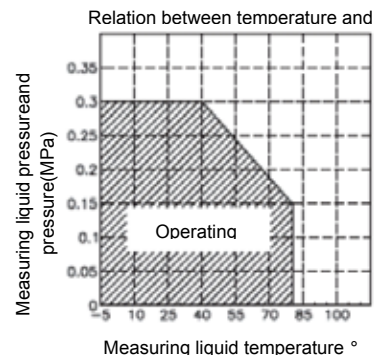


External dimensions (UCH-311)



No	PARTS	NOTES
(1)	Pressure gauge	Pressure: 0 MPa to 0.5 Mpa
(2)	KCl inlet	PVC
(3)	Kcl tank	PVC
(4)	Pressurization holder	
(5)	Distribution holder	PPO
(6)	Vibration mounting nut	PP
(7)	Relay box	Al
(8)	Wiring hole	O.D φ7 to φ12 cable
(9)	Vibration mounting nut	PP
(10)	Locking plate	SUS316
(11)	Cable cap	PPO
(12)	Cable gasket	PPO
(13)	Pressurization interface screw	Rc1/8
(14)	Holder	PPO
(15)	Pressurization union	C3604
(16)	Joint	For φ6/φ4 tube PVDF

← optionally available
← optionally available



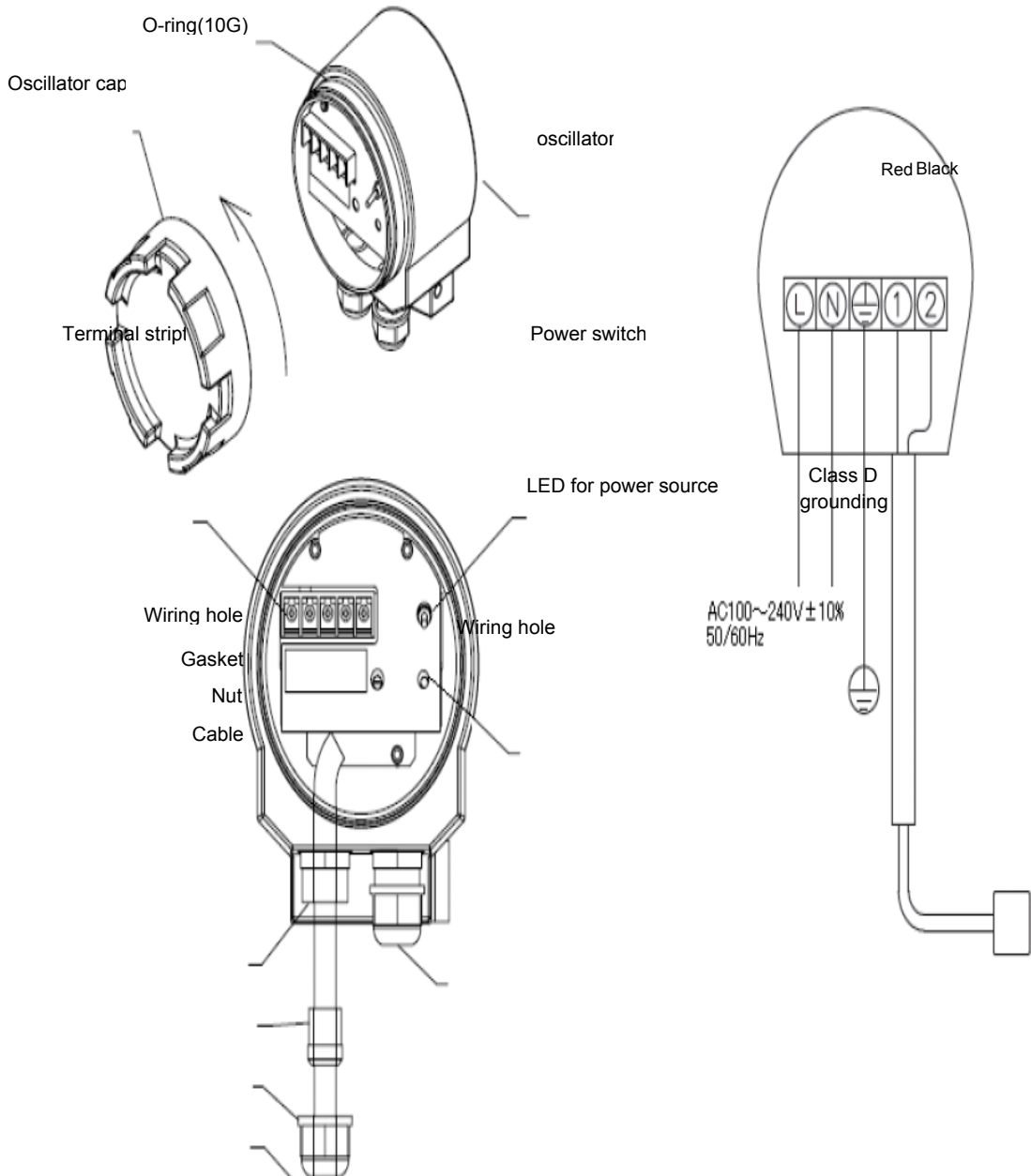
■ Installation (UCH-301)

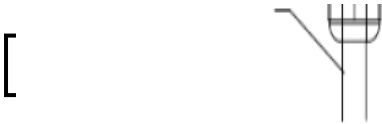
Carry out installation and execution of work while paying attention to the following points:

Power Source

- The HP-300 has a power switch. Ensure that the power switch is OFF during work.
- Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
- Carefully check that the power supply voltage fluctuations fall within a range of $\pm 10\%$. Be sure to ground the grounding terminal (class D grounding).
The applicable diameter of the cable at the wiring slot ranges from 7 mm 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 power cable	7 to 12 mm dia.



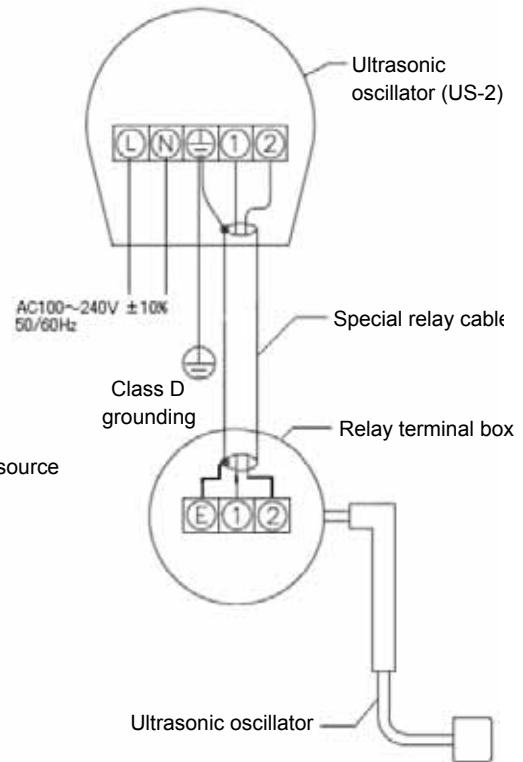
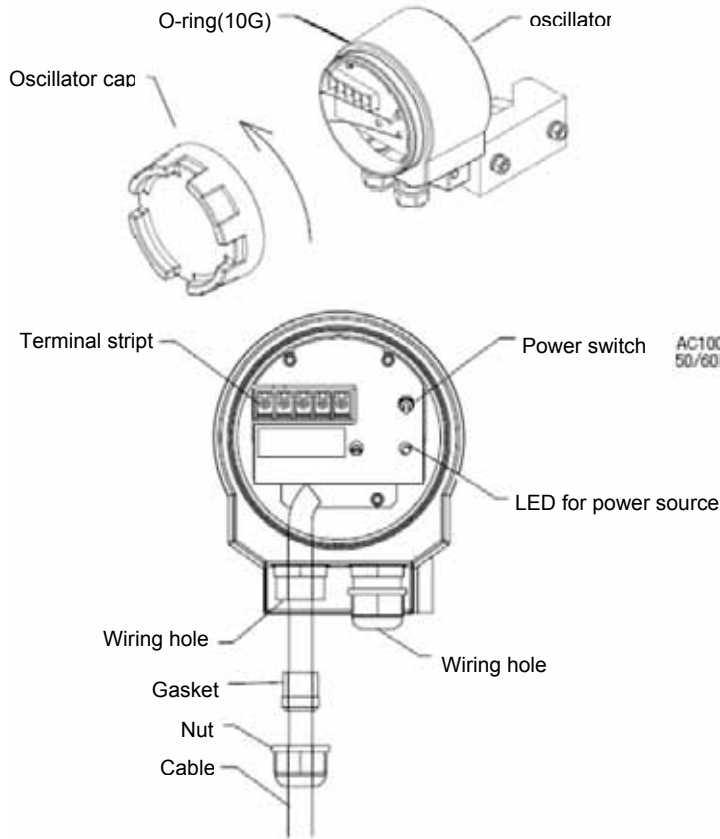


Carry out installation and execution of work while paying attention to the following points:

Power Source

- The HP-300 has a power switch. Ensure that the power switch is OFF during work.
- Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
- Carefully check that the power supply voltage fluctuations fall within a range of $\pm 10\%$. Be sure to ground the grounding terminal (class D grounding).
The applicable diameter of the cable at the wiring slot ranges from 7 mm 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 power cable	7 to 12 mm dia.



■ Precautions for installation (UCF-301/UCF-311)

Carry out installation while being careful about the following points:

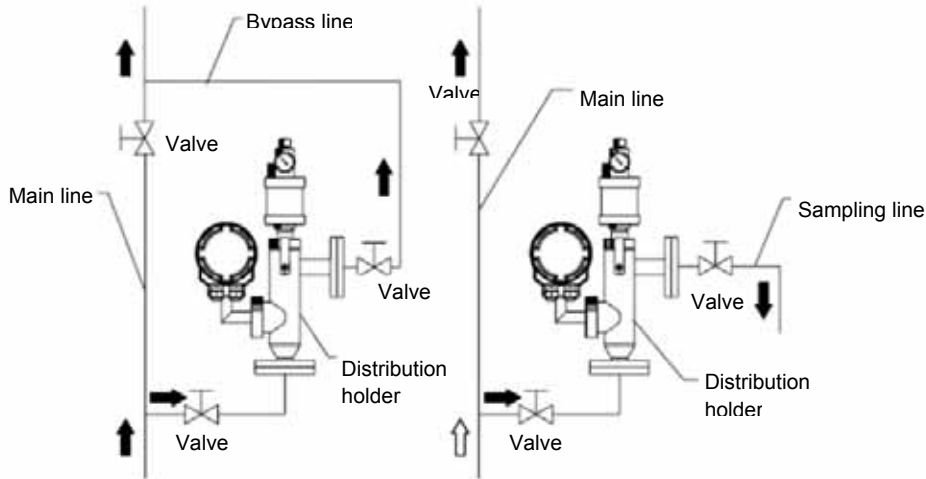
Installation environment

- 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

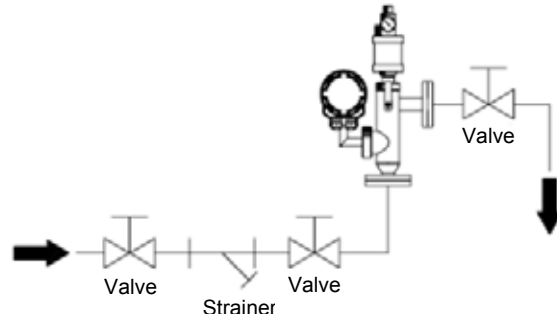
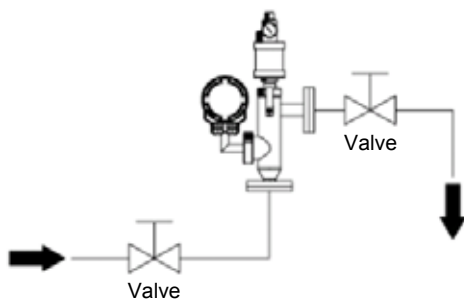
For installation of the Distribution Holder, provide a bypass line from the main line so that the measured liquid flows into the bottom side of the Distribution Holder and flows out of the lateral side of the Distribution Holder. Be sure to provide valves on the inflow and outflow sides respectively.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

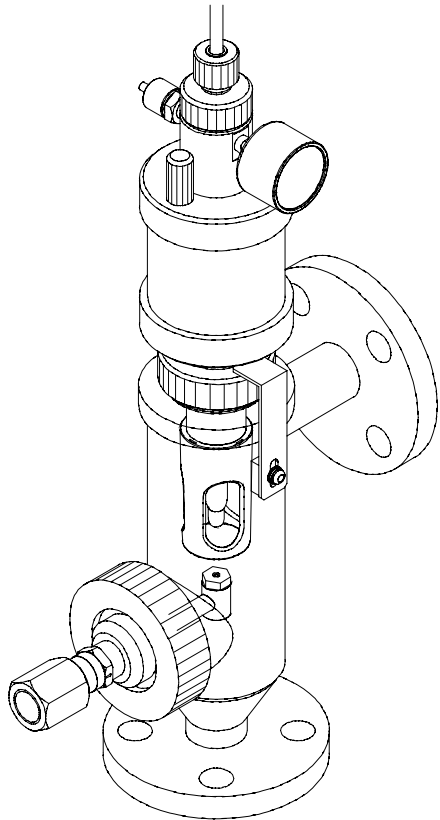
Fig. 1

Fig. 2



Distribution type jet cleaner for H-1

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.

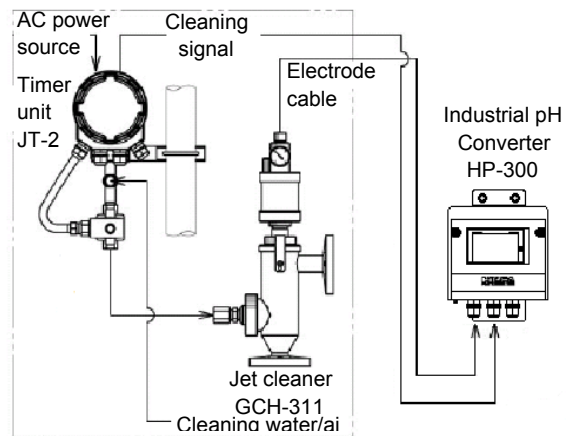
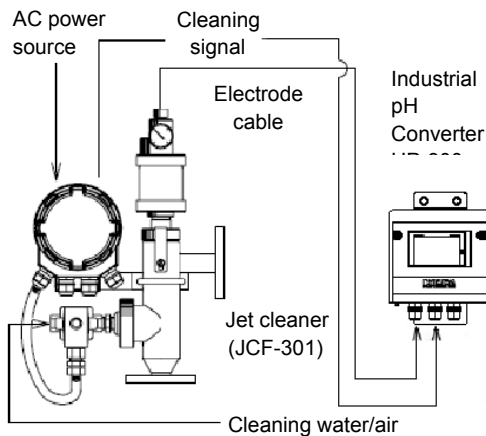
Objects

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

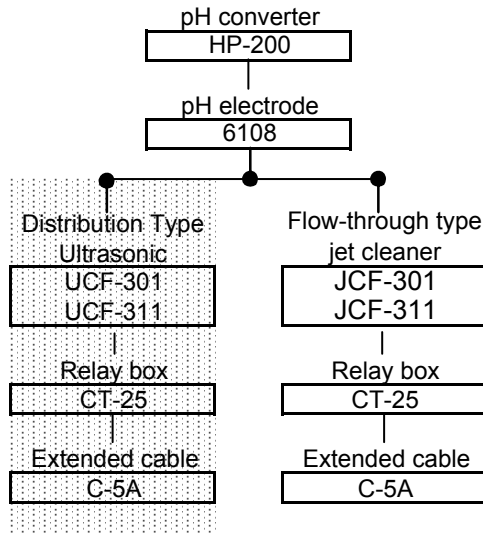
Properties Classification	Objects	
Slime	food, paper, pulp, algae	
Microorganism	bacteria (activated sludge), slag	
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment CaCO ₃ , etc.	○

◎ : Good ○ : Acceptable × : Not acceptable

System configuration



Combinations (Distribution Type Ultrasonic Cleaner)



Specifications 1 (JCF-301/311)

Product Name		Flow-through type jet cleaner (timer unit incorporated type)	Flow-through type jet cleaner (timer unit separated type)
Model		JCF-301	JCF-311
Ambient temperature		-5 to 50°C	
-5°C to 50°C		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		SUS316, PP, FKM (not including an electrode materials)	
Supply Voltage		100 VAC, 50/60 Hz	-
Permissible Voltage Variation Range		90% to 110% of supply voltage	-
Power Consumption		Max. 30VA	-
Cleaning signal output	Contact Form	Relay contact SPDT (1c)	-
	Contact point 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 (*3)	Contact Form	No-voltage contact	-
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.	-
	Conditions	Pulse input, closed time of 100 msec or more	-
Input of cleaning stop signal (*4)	Contact Form	No-voltage contact	-
	Contact point capacity	30 mA; the voltage is equivalent to the power supply voltage.	-
	Conditions	Stopped by turning OFF continuous input	-
Timer	Washing frequency	0.1 to 3.0 hours	-
	Washing time	Between 0.5 and 10.0	-
	Signal output during cleaning Delay time	Between 0.2 and 5.0	-

<p>■ Specifications 2 (JCF-301/311)</p>
--

Cleaning Method	Intermittent water jet/air jet cleaning	
Cleaning pressure (*5)	Water/air: 0.05 to 0.5 MPa Adjust a cleaning pressure to a measured liquid pressure + 0.05 MPa to 0.2 MPa.	
Bore Diameter Connected for Cleaning	Rc1/2	
Protection Class	IP54 (IEC 60529, JIS C0920) (category 2)	-
Materials	AC4C	-
Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)	-
Bore Size of Measured Liquid Connection	JIS 10K 25A FF flange	
Pressurizing Inlet for Holder's Internal Pressure (*6)	Rc1/8	
Mass	Approx. 20.94lb	Approx. 3.0 kg
Special Note	<ul style="list-style-type: none"> • 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: The operating temperature range differs depending on the combined electrode. Check the working temperature of an electrode.

*2: If your sample has any property (e.g. alkalinity) of damaging FKM (fluoro-rubber), contact us.

*3: When the input line to start external cleaning is not used, remove the cleaning frequency time (T1).

*4: The terminals were short-circuited at factory. To input the cleaning stop signal, remove the short-circuit line.

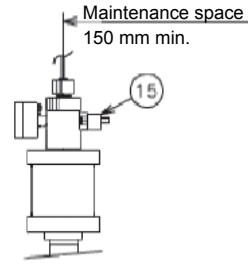
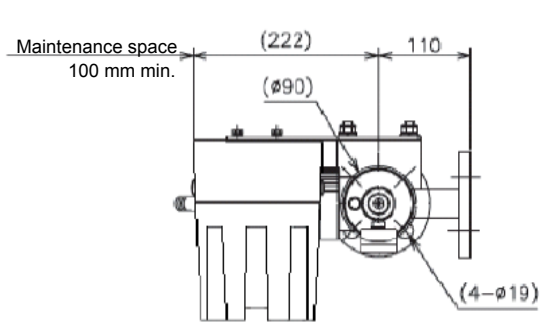
*5: If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaning water directly from a tap water pipe.

Separate a cleaning water pipe from a general tap water pipe by using a tap water pressurizing device, etc.

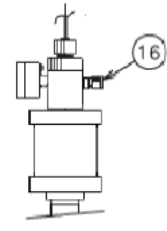
Moreover, if cleaning water may be frozen, provide heat insulated piping against warm and cold weather.

*6: 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.

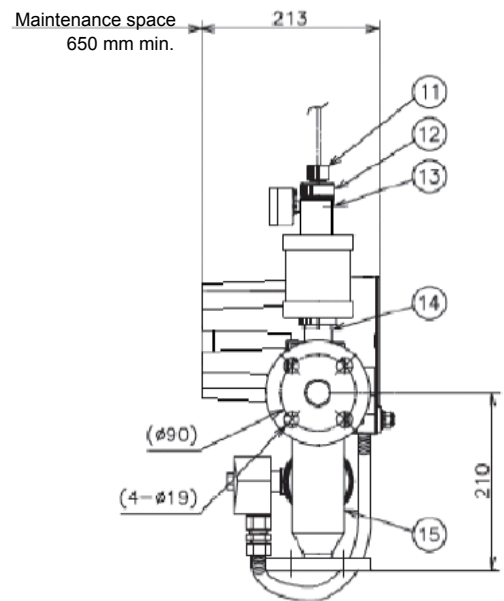
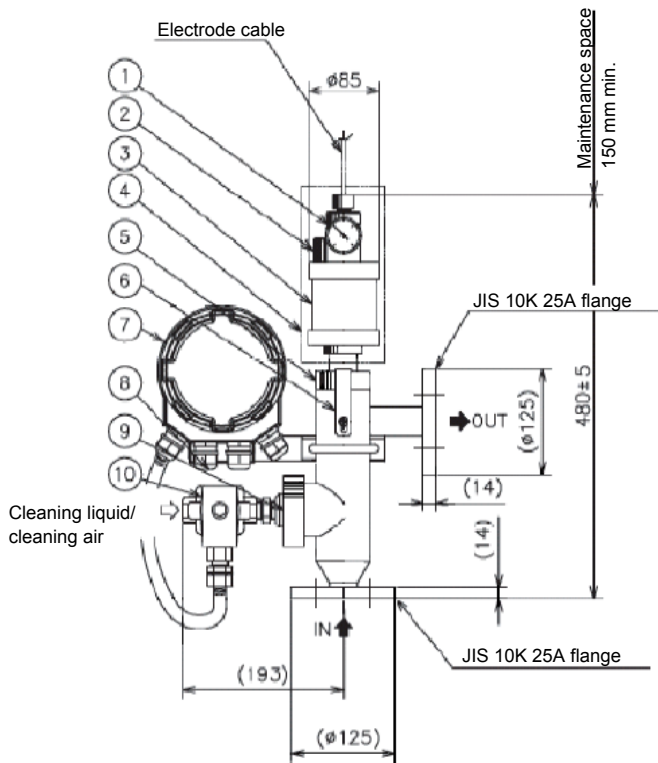
External dimensions (JCH-301)



Manual pressurization specifications
(Pressurization unit: optional)

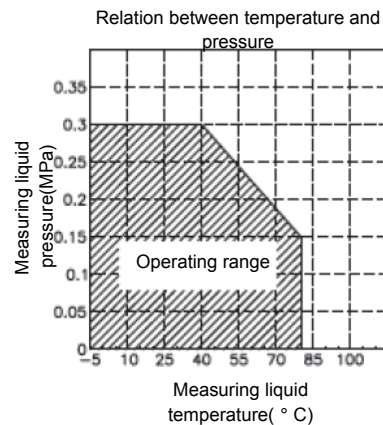


Instrumental air specifications
(Tube joint: optional)

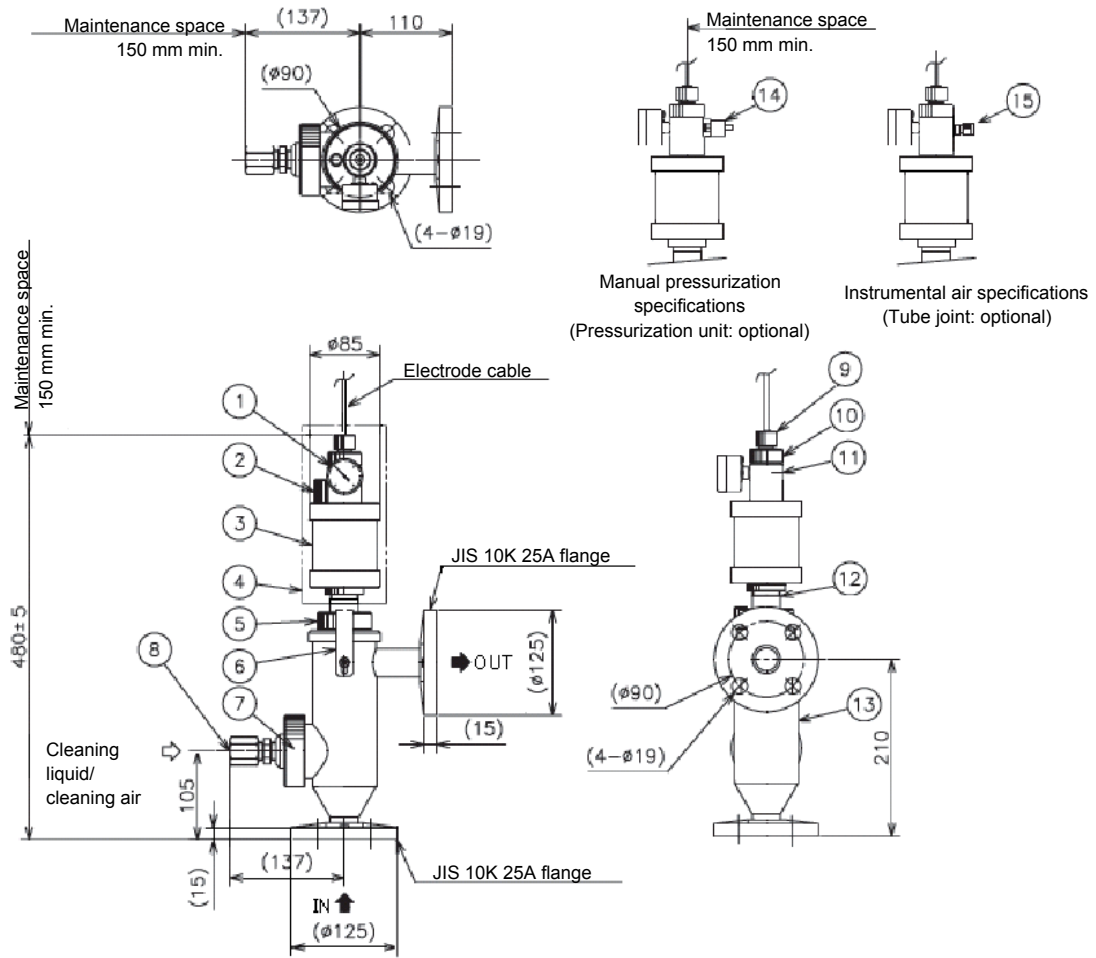


No	PARTS	NOTES
(1)	Pressure gauge	Pressure: 0 MPa to 0.5 Mpa
(2)	KCl inlet	PVC
(3)	KCl tank	PVC
(4)	Pressurization holder	
(5)	Vibration mounting nut	PP
(6)	Locking plate	SUS304
(7)	Timer unit	AC4C
(8)	Wiring hole	O.D Φ 7 to Φ 12 cable
(9)	Nozzle mounting nut	PP
(10)	Solenoid valve	Rc1/2
(11)	Cable cap	PPO
(12)	Cable gasket	PPO
(13)	Pressurization interface screw	Rc1/8
(14)	Holder	PP
(15)	Distribution holder	PP
(16)	Pressurization union	C3604
(17)	Joint	For ϕ 6/ ϕ 4 tube PVDF

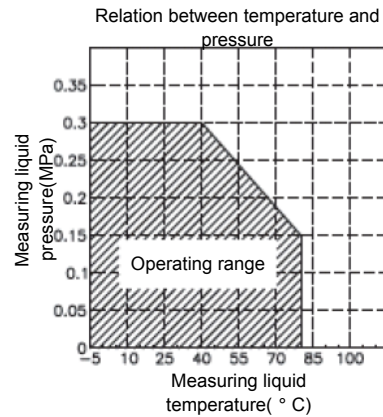
← optionally available
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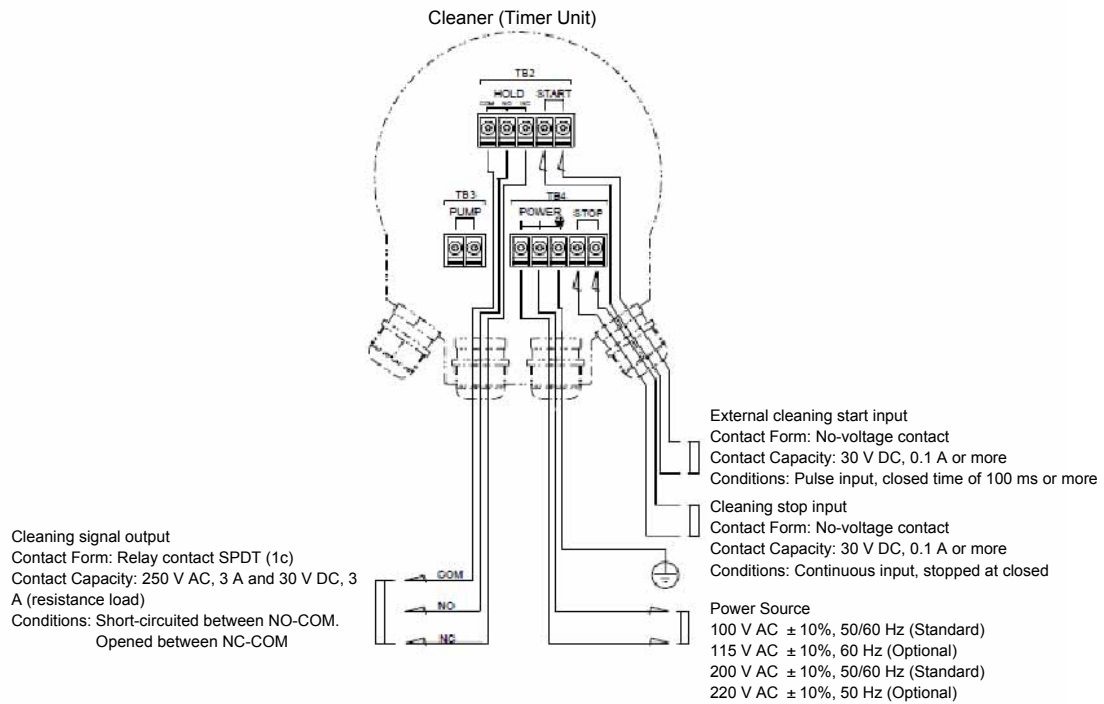
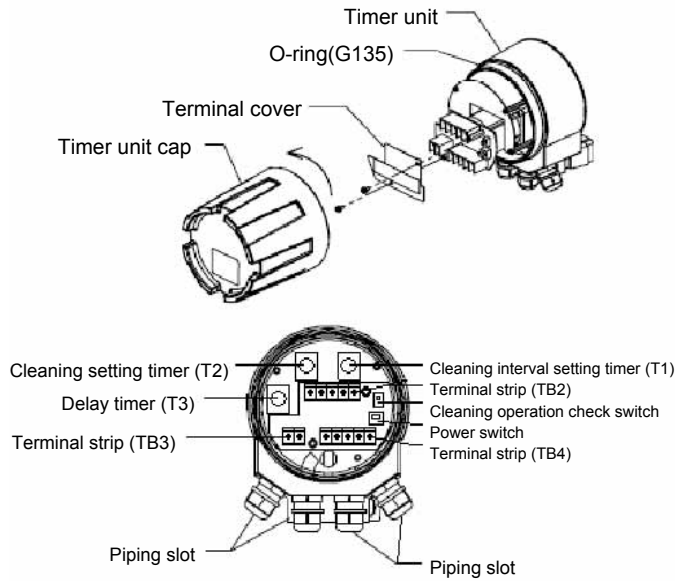
External dimensions (JCH-311)



No	PARTS	NOTES	
(1)	Pressure gauge	Pressure: 0 MPa to 0.5 Mpa	
(2)	KCl inlet	PVC	
(3)	KCl tank	PVC	
(4)	Pressurization holder		
(5)	Vibration mounting nut	PP	
(6)	Locking plate	SUS304	
(7)	Nozzle mounting nut	PP	
(8)	Cleaning water/air inlet	Rc1/2	
(9)	Cable cap	PPO	
(10)	Cable gasket	PPO	
(11)	Pressurization interface screw	Rc1/8	
(12)	Holder	PP	
(13)	Distribution holder	PP	
(14)	Pressurization union	C3604	← optionally available
(15)	Joint	For φ6/φ4 tube PVDF	← optionally available



Part names/terminals (JCF-301/JT-2 -- JCF-311)



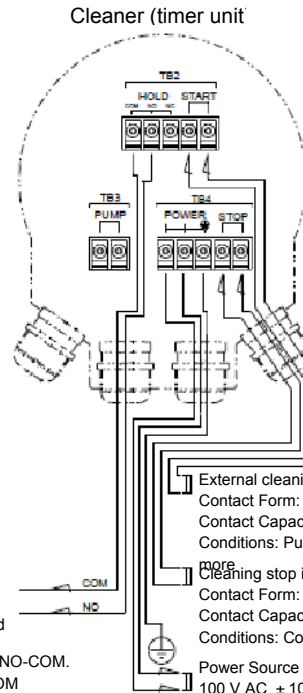
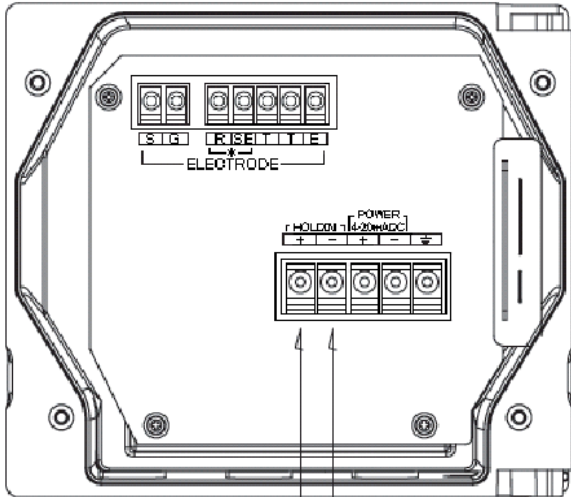
■ Precautions for installation (JCF-301/JT-2 -- JCF-311) (connections)

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

Connections

- Be sure to ground the grounding terminal (class D grounding).
The applicable diameter of the cable at the wiring slot ranges from 7 mm to 12 mm.

Applicable power cable	7 to 12 mm; 0.75 mm ² min.
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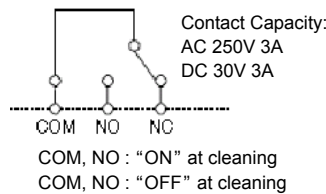


HOLD input terminal
ON resistance: Max. 40Ω
Open voltage: 1.2 VDC
Short-circuit current: Max. 21 mA
Cleaner (Timer Unit)
Cleaning signal output
Contact Form: Relay contact
Contact Capacity: 250 V AC, 3 A and 30 V DC, 3 A (resistance load)
Conditions: Short-circuited between NO-COM.
Opened between NC-COM

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)

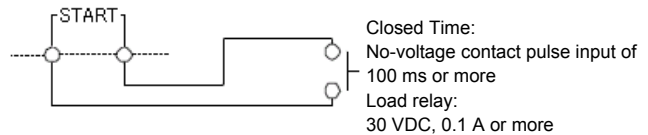
HOLD(Wiring of HOLD (cleaning signal output (hold signal output))

- 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.



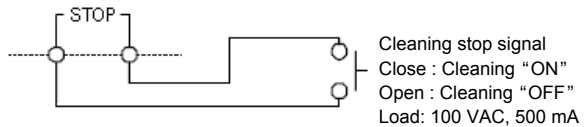
Wiring of START (external cleaning start input)

- 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.



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



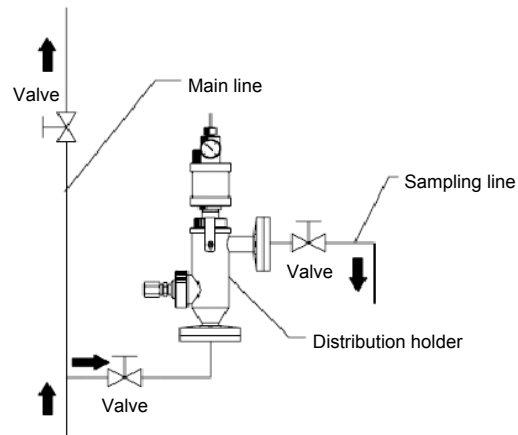
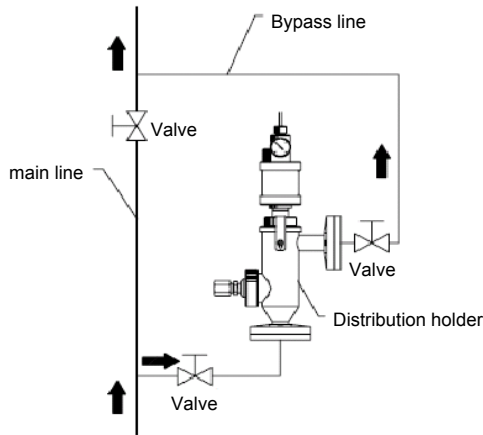
■ Precautions for installation (JCF-301/JCF-311) (piping)

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.

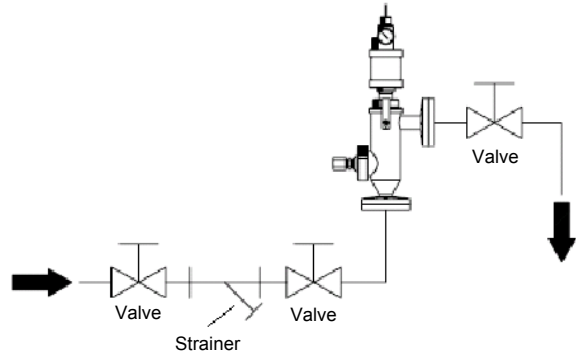
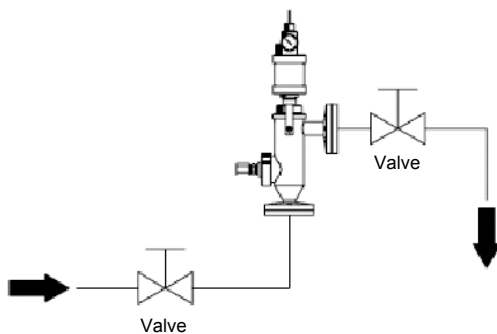
See Fig. 1.

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

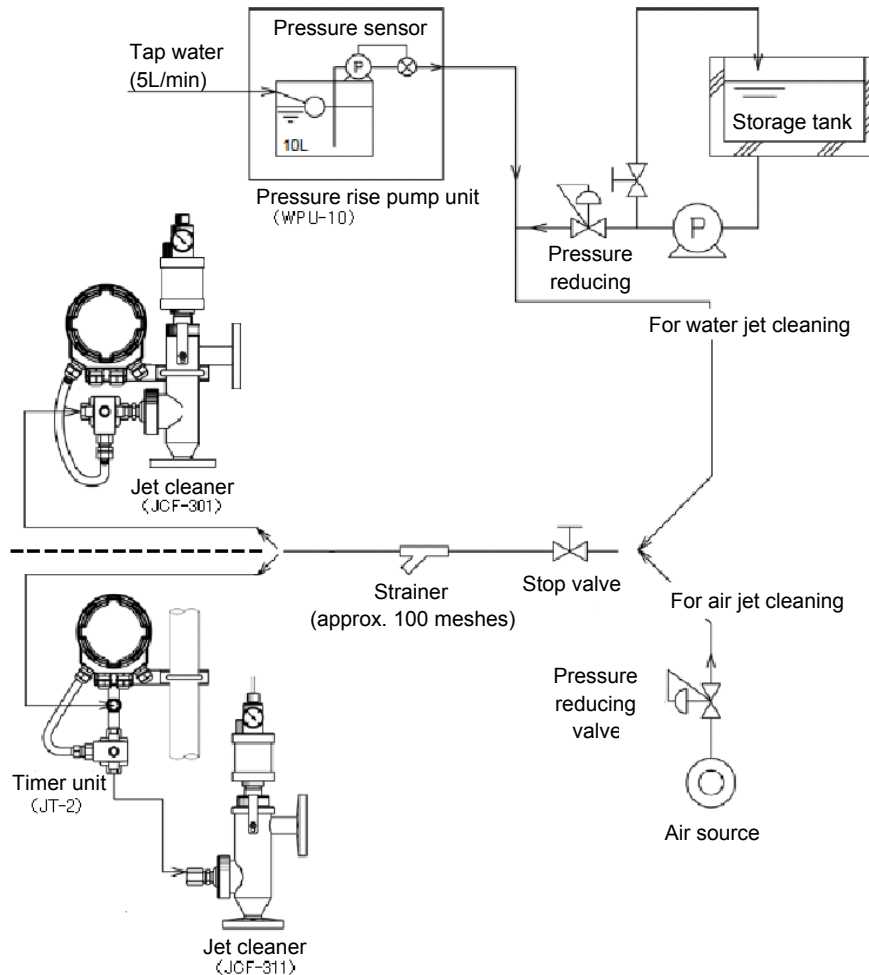


■ Precautions for installation (JCF-301/JCF-311) (piping)

Carry out installation while being careful about the following points:

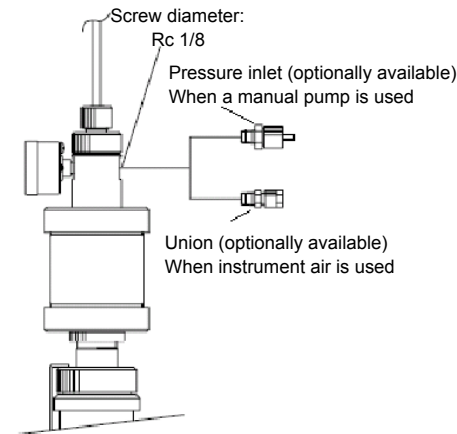
Piping

- 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 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.



Pressurized piping

- For pressurization with an inflator, use the pressure inlet.
- 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.



- For pressurization with instrument air, use a union.
- 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 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.

