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H-1 Series Simplified Fluoride Ion Concentration Meter

HC-200F

■ Overview

● The HC-200F detects free fluoride ions in the sample water.(Not all fluorine substances are detected.)

The measured value and various setting values are displayed on the LCD.When used with our cleaner, the HC-200F allows you to control the cleaner.
A variety of self-diagnostic capabilities is provided to allow you to detect a trouble with the pH electrode or the HC-200F.

■ Measurement target

Free fluoride ions in the sample ●

■ Measuring principle

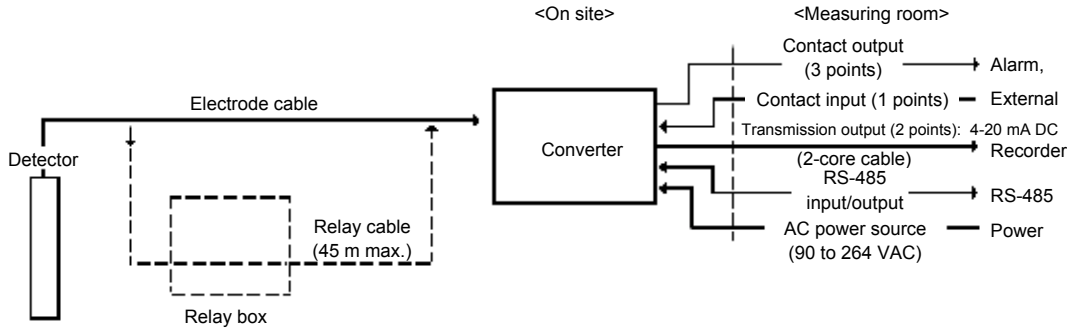
● Ion electrode method

■ Intended use

●Control of drainage from a semiconductor/FPD or glass factory.

■ System configuration diagram

Standard specification



* The relay box and the dedicated cable are used when the sensor lead of 10 m is insufficient.

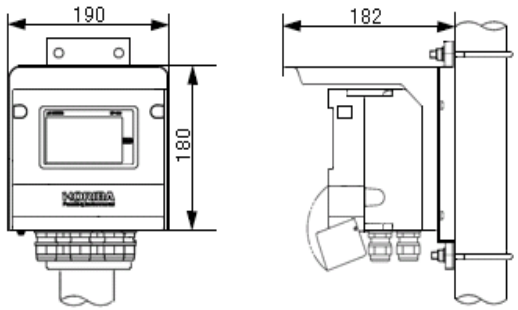
H-1 Series Simplified Fluoride Ion Concentration Meter

HC-200F Readout Converter

■ Features

●Outdoor installation type (drip-proof construction equivalent to IP65)
●Selectable simultaneous readout of temperature
●All settings that can be completed with front keys
●Improved maintenance capability (self-diagnostic capability)
●Transmission output range that can be set
●Memory backup
●Easy-to-read display (150% larger than former display)
●Higher operability of keys by using an emboss sheet

■ External Dimensions



Unit: mm

■ Converter/Sensor

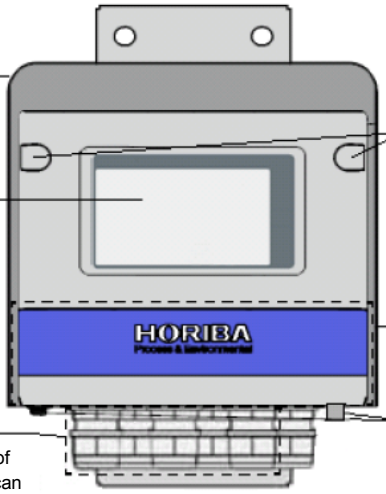
・Free fluoride ions (F^-) in the sample can be continuously measured.

・Any fluorine substance other than free fluoride ions (F^-) cannot be measured.

・The electrode potential has an almost linear relationship with the logarithm of fluoride ion concentration.
・The proper measurement condition is pH5 to pH8.Stable measurements can be made in the entire measurable range by adjusting the pH value to pH5 to pH8.

■ Configurations

● Front



Cover
This cover is used for outdoor installation.

Display part
The measured value and other information are displayed here.

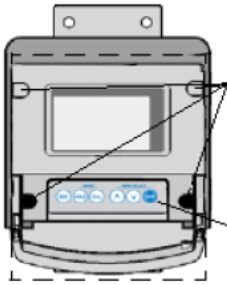
Conduit
Up to 6 electric wires of 7 to 12 mm diameter can be used.

Screw cap
When the two screw caps are removed, the front case screws appear.

Front cover
When the cover is opened, 6 operation keys appear.

Purge air inlet
Purge air is sent through this inlet to prevent internal corrosion. Normally no connection is required.

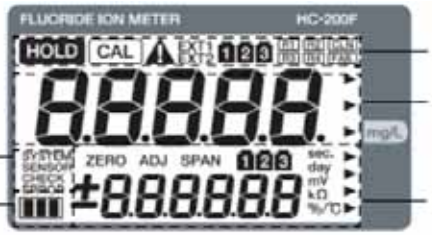
● With the front cover opened



Front case screw
When the four screws are removed, the front case can be opened.

Operation key section
6 operation keys are available.

● Display part



Status display

Measured value display

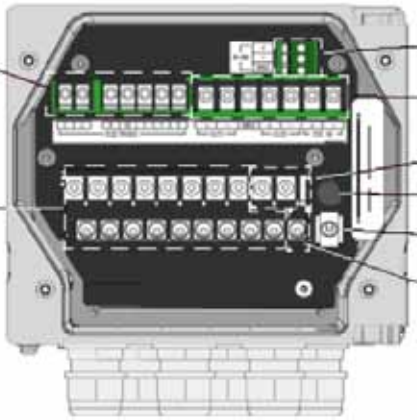
Status display

Indicator

Auxiliary display

● Operation key section

● Terminal block



Electrode connection terminal

Contact output terminal

RS-485 terminal

Transmission output terminal and contact input terminal

Power connection terminal

Fuse box

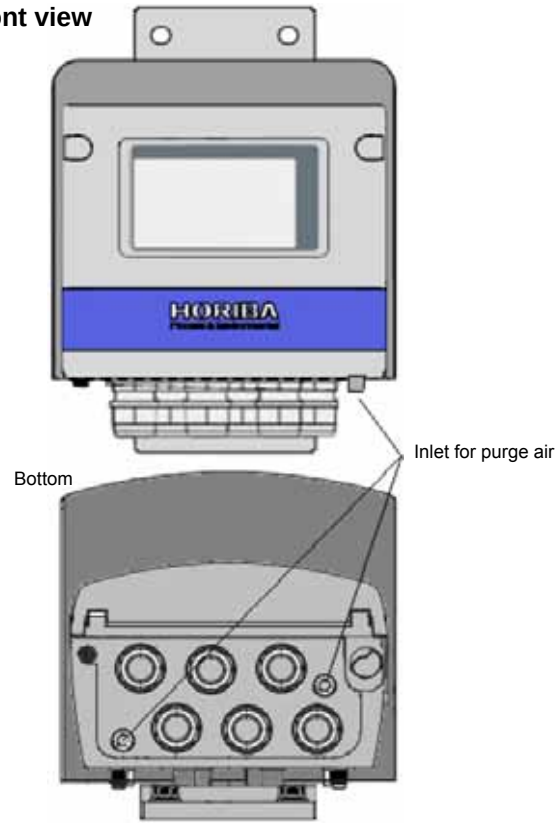
Power switch

Grounding terminal

■ Air purge

In order to prevent internal corrosion, a purge air inlet is provided.To use the HC-200F in a corrosive gas environment, constantly send instrumentation air to prevent corrosive gas from entering the unit.

Front view



■ Measuring the temperature

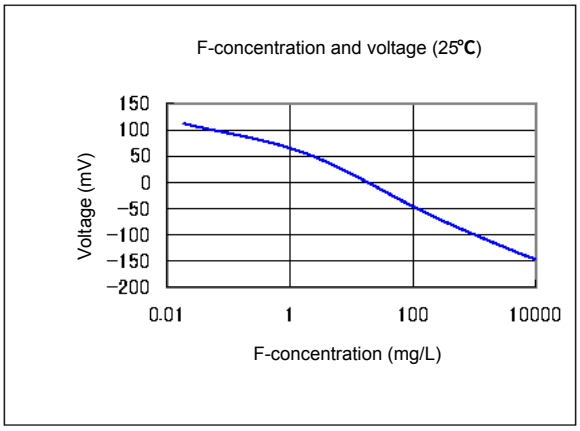
The RTD, an element to measure the temperature, uses a resistance-temperature detector which has resistance of 1000Ω at 0 ° C.
When a measurement is made by the ion electrode method, a reaction occurs with specific ions contained in the sample solution, generating electric potential. Electric potential is given by the following equation:
$E=E_0 + (2.303RT)/zF)\log a$

E0: Constant potential difference (including reference potential of comparison electrode)
R: Gas constant
T: Absolute temperature
z: Ionic valence
F: faraday constant
a: Activity of ion

2.303RT/zF in the above equation is a value equivalent to a change that occurs when ion activity 'a' increases tenfold. It is called potential gradient, which is 59.16 mV for monovalent ion or 29.58 mV for bivalent ion at 25 ° C.

In a sample with a relatively low ion concentration, the activity of ion may be regarded as equivalent to the concentration. If a calibration line is previously created using the relationship between the target ion concentration and electric potential, the ion

Since the temperature affects this measurement, high accuracy of temperature measurement is required. The temperature accuracy of ±0.3 ° C has been achieved. The temperature calibration mode is available to calibrate the temperature with a thermometer of higher accuracy.

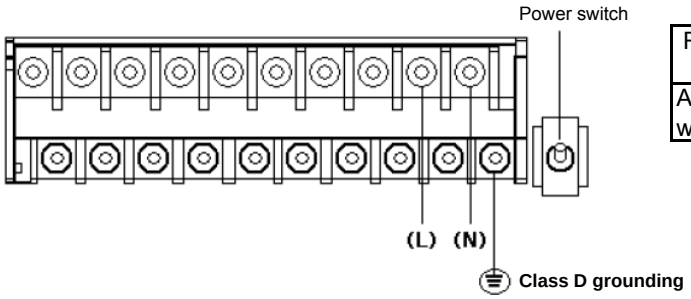


■ Power supply

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

Provide the power switch in a place near the HC-200F so that the power can be turned ON/OFF. If lightning might strike, install an arrester on the output side of the HC-200F and on the side of receiving instruments.

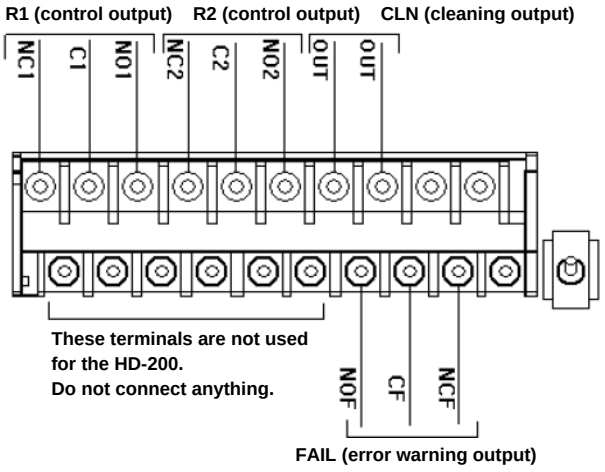
Be sure to ground the grounding terminal (class D grounding).
Separate this grounding from any other grounding for electric equipment such as a motor.



Rated voltage	Voltage: 100 to 240 VAC Frequency: 50/60 Hz
Applicable electric wire	0.75 to 5.5 mm2 (AWG18 to 10).

■ Contact output

Three contact outputs are provided as standard.
The HE-200C has various contact outputs such as USP determination, transmission output hold, and error alarm as well as upper and lower alarm contact outputs.
Major specifications
・The contact capacity is 250 VAC, 3 A maximum or 30 VDC, 3 A maximum for resistance load.
・The terminal screw for the contact output is of M4.
・The applicable electric wire is of 0.75 to 5.5 mm2 (AWG18 to 10).

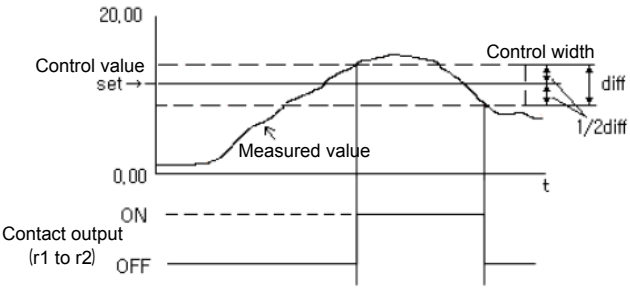


If noise is detected from the load, use a varistor or a noise killer.
Only the CLN output has voltage and the connected power supply voltage is output.Otherwise, the terminal provides no-voltage contact output.
For the FAIL output only, the positions of NO and NC are reversed.During the normal operation (without the FAIL signal), the CF-NOF contact is open and the CF-NCF contact short-circuited.When the power is OFF, the C-NOF contact is short-circuited.
The blank terminals are internally connect to each other. Do not connect anything.
To connect any load exceeding the contact capacity or any induction load (e.g., a motor or a pump), be sure to use a power relay exceeding the load rating.
When the HC-200F is OFF, the C-NC contact for R1 to R4 is short-circuited. Therefore, be careful about the connection of load.

Contact capacity	250 VAC, 3 A maximum or 30 VDC, 3 A maximum
Applicable electric wire	0.75 to 5.5 mm2 (AWG18~10)
Kinds of alarms	CtrL control output, alarm output Temperature alarm output, HOLD output FAIL output, Clu output

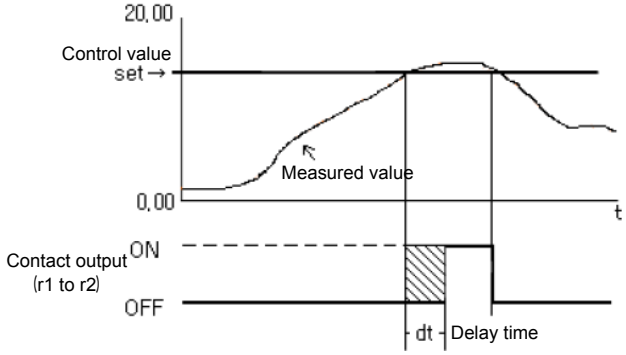
CtrL: Control output

When the measured value is larger than (control value + control width x 1/2), the output is turned ON.
When the measured value is smaller than (control value + control width x 1/2), the output is turned OFF.
These are the upper-limit actions. For the lower-limit actions, reverse them.)



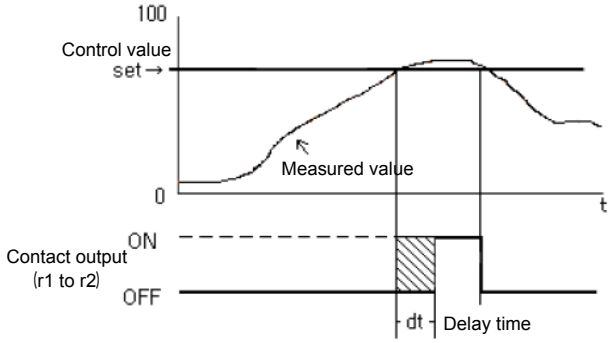
AL: Alarm output

When the measured value is larger than the setting value, the output will turn ON to issue an alarm after the delay time. When the measured value becomes lower than the setting, the output is immediately turned OFF and the alarm is canceled.
The output delay time may be set to 0 to 600 seconds.
These are the upper-limit actions. For the lower-limit actions, reverse them.)



t: Temperature alarm output

When the temperature value is higher than the setting, the output is turned ON to trigger the alarm after the delay time.When the temperature value becomes lower than the setting, the output is immediately turned OFF and the alarm is canceled.The output delay time may be set to 0 to 600 seconds.
These are the upper-limit actions. For the lower-limit actions, reverse them.)



HoLd: Output during hold mode

When the measured value is held, the output is turned ON after the delay time.When the HOLD mode is canceled, the output is immediately turned OFF.The output delay time may be set to 0 to 600 seconds.

FAIL: FAIL output

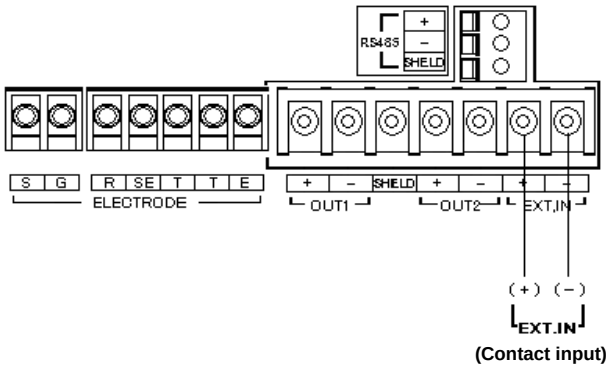
This output is provided when the over full-scale error or the system error occurs.The alarm is triggered when a failure occurs in the HC-200F.

CLn: Cleaning output

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

■ Contact input

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



(Contact input)

For the transmission output cable, use a shielded cable.
When lightning might strike, install an arrestor on the output side of the HC-200F and on the side of receiving instruments.

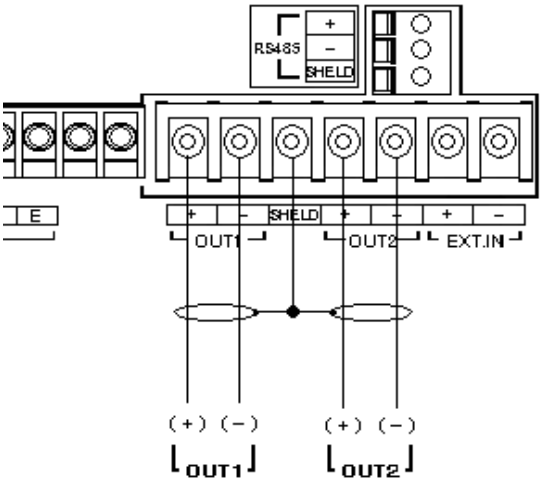
Contact input resistance	100 Ω maximum
Applicable electric wire	2mm2 (AWG14) MAX

■ Transmission output

The HC-200F is provided with two transmission outputs (4 to 20 mA DC).
Transmission output 1 outputs electric conductivity and transmission output 2 temperature.
When both outputs fall within the full-scale setting for measured values, the full-scale range for transmission output may be arbitrarily set.A burnout setting (transmission output: 3.8 or 21 mA) is also possible.When the transmission output is to be held with an external signal, you are given the option of selecting whether the output value is held with the directly previous value or the preset value.
Example: Arbitrary setting of transmission output
When the measurable full-scale setting for electric resistivity is 0 to 20 mg/L
The transmission output of 4 mA may be changed to 5 mg/L and that of 20 mA to 15 mg/L.
Example: Transmission output hold
When the held value is set to the directly previous value:
If any external signal is received when the measured value reads 10 mg/L, the transmission output maintains the output value of 10 mg/L.
Major specifications
The terminal screws for the contact input is of M3.5.
The applicable electric wire is of 2 mm2 (AWG14) maximum.

Maximum load resistance	900Ω
Applicable electric wire	2mm2 (AWG14) MAX

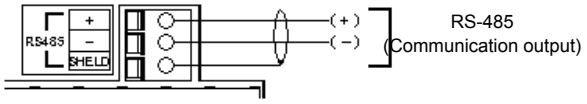
For the transmission output cable, use a shielded cable.
When lightning might strike, install an arrestor on the output side of the HC-200F and on the side of receiving instruments.
The negative terminal (OUT1) (-) and OUT2 (-) for the transmission output are internally connected and have



(Transmission output)

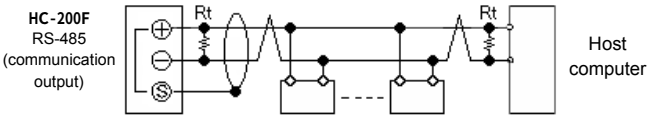
■ RS-485

The HC-200F has an RS-485 communication port.To use this terminal, connect wiring.
The applicable electric wire is of 0.14 to 2.5 mm2 (AWG26 to 14).
For the communication output cable, use a twisted shielded pair.
Up to 32 connections can be made including one for the host computer. Set the address.
The communication cable length is 500 m maximum.
Use a terminating resistor (Rt: 120Ω) for any device at which the RS-485 communication line is terminated.



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

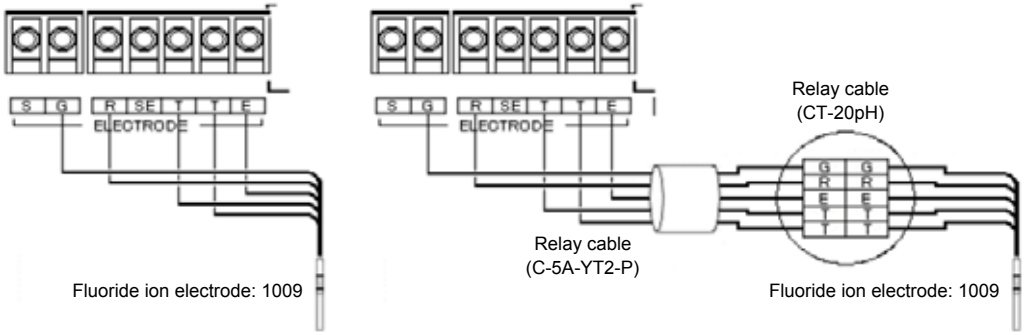
Example of external connection for communication



■ Electrode

The electrode cable for fluoride ions is highly insulated.In handling this cable, be careful about 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. Insulation decreases.The decreased insulation can cause instable readouts.Always maintain the electrode dry and clean.If the HC-200F becomes dirty, wipe it with alcohol or the like and then dry it.
Route the electrode cable and the relay cable by avoiding any place near inducing equipment such as a motor and keeping them away from the power cable for

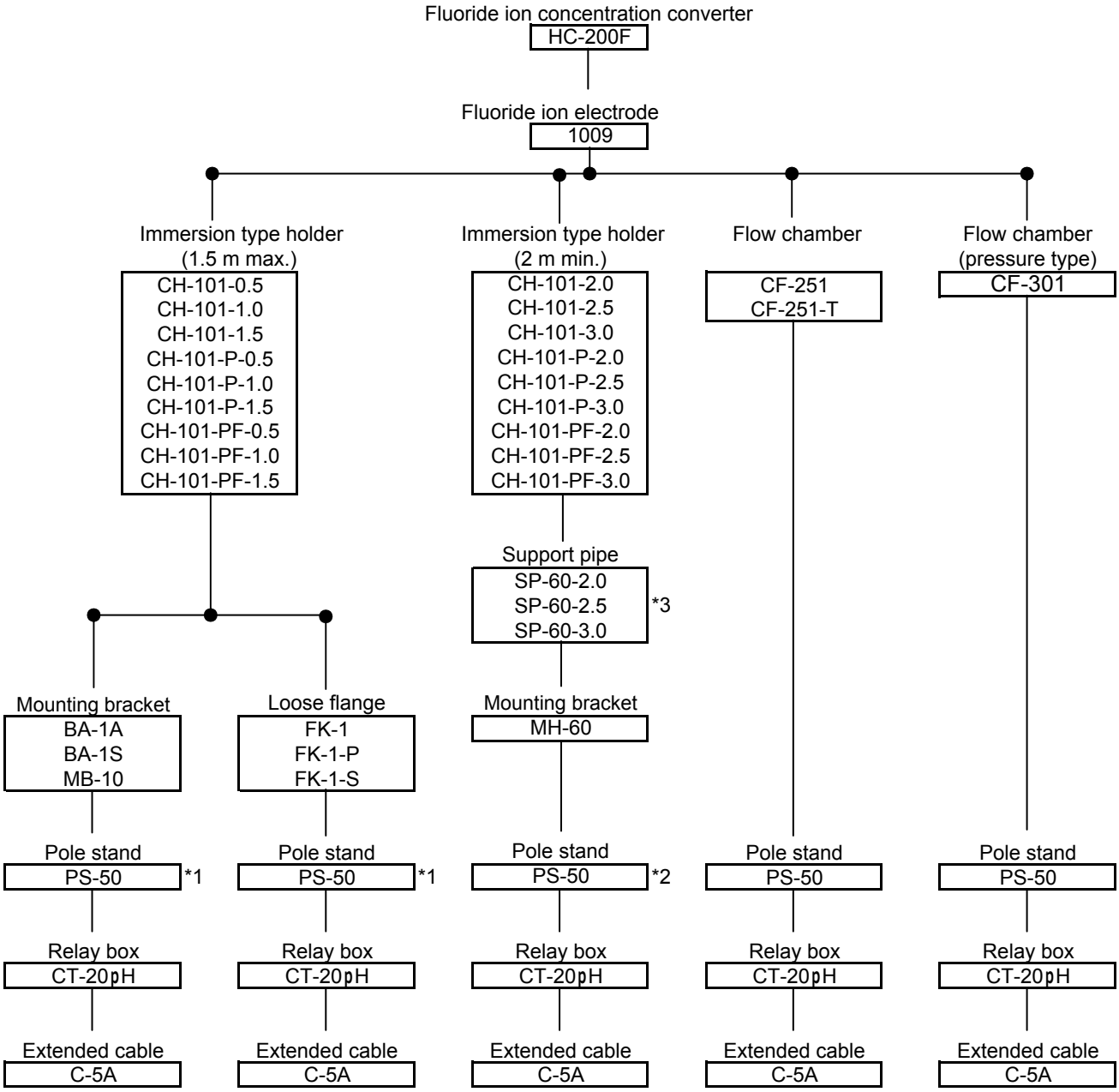
Fluoride ion electrode	G: Ion electrode terminal
	R: Reference electrode terminal
	T, T: Temperature compensation electrode
	E: Shielded terminal



■ Combinations

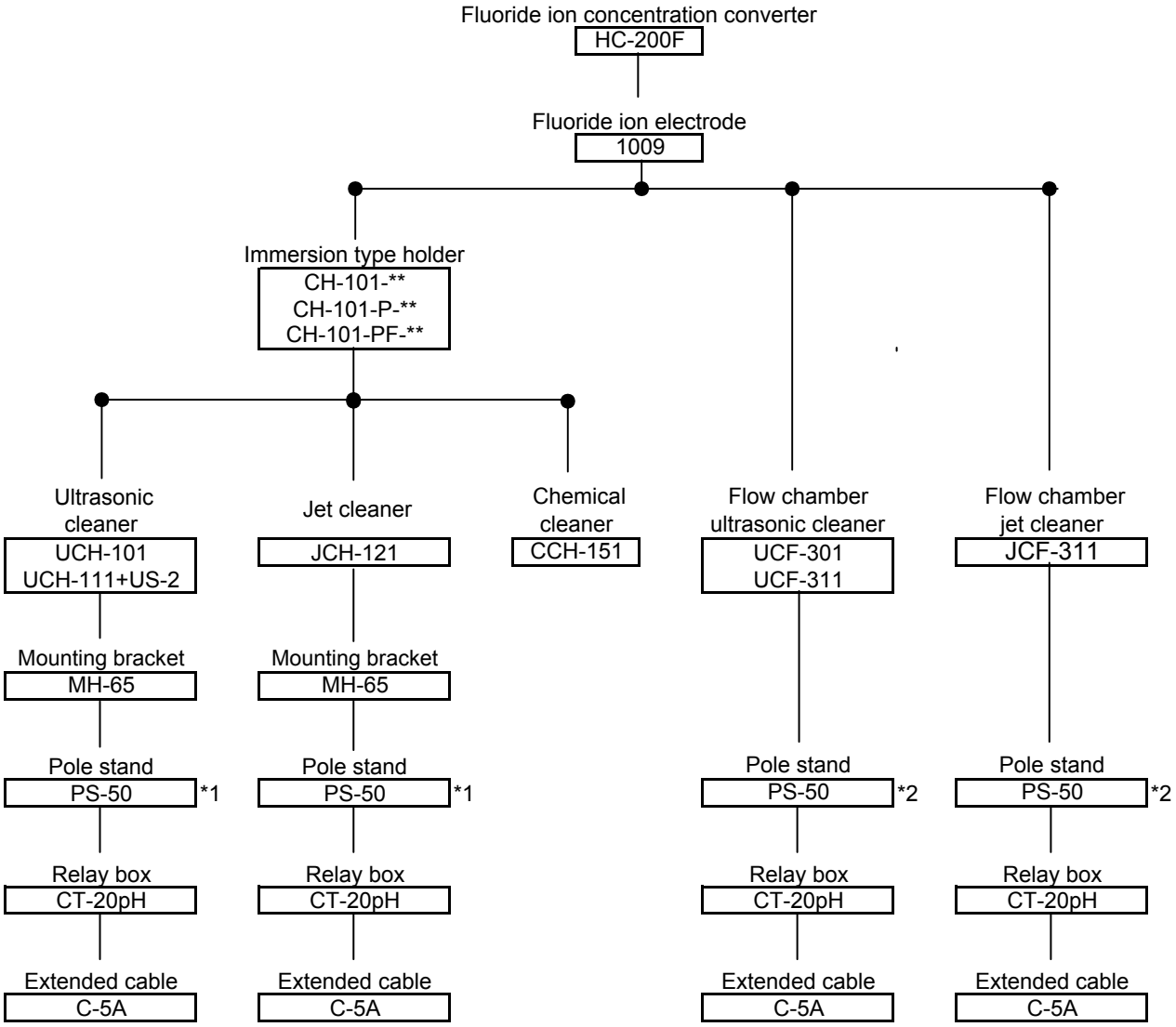
The following diagram shows the possible combinations of converters, electrodes, holders, and others.
For the detailed specifications, see the items of each product.

When the immersion type holder is used:



*1: This pole stand is used to attach the converter and the CT-20pH (relay box).
*2: This pole stand is used to attach the converter, the CT-20pH (relay box9, and the MH-60 (mounting bracket).
*3: For any combinations with the CH-101PF series, contact us.

When a cleaner is used



*1: This pole stand is used to attach the converter, the CT-20pH (relay box9, and the MH-65 (mounting bracket).
*2: This pole stand is used to attach the converter and the CT-20pH (relay box).

■ Specification 1

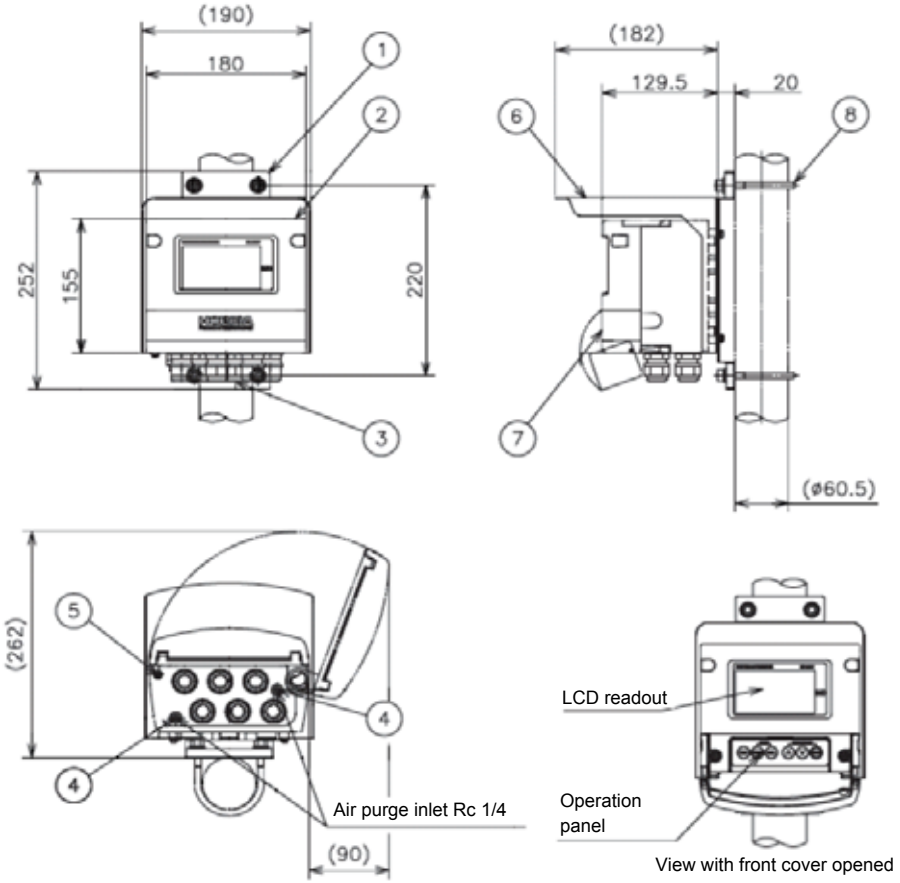
Product name	Simplified Fluoride Ion Concentration Converter for Industrial Use		
Model	HC-200F		
Combination sensor	Fluoride ion electrode (1009)		
Measurable range	Concentration		0 to 10000 mg/L (readout range: 0 to 11000 mg/L)
			Setting range 10000, 5000, 2000, 1000, 500, 200, 100, 50, 20.0, 10.0 mg/L
	Temperature		0°C to 100°C (readout range: -10°C to 110°C)
Display resolution	Concentration		0.1mg/L : 0.0-20.0mg/L 1mg/L : 0.0-200mg/L 10mg/L : 0.0-2000mg/L 100mg/L : 0.0-10000mg/L
	Temperature		0.1°C
Performance	Concentration	Repeatability	Within ±7% of full-scale value (with equivalent input)
		Linearity	Within ±10% of full-scale value (with equivalent input)
	Temperature	Repeatability	Within ±0.3°C (for equivalent input)
		Linearity	Within ±0.3°C (for equivalent input)
Transmission output	Number of output points		2 (the negative terminals for transmission outputs are internally connected to each other and have the same electric potential.
	Output type		4 to 20 mA DC, input/output insulation type
	Load resistance		900Ω max.
	Repeatability		Within ±0.02 mA (output only)
	Linearity		Within ±0.08 mA (output only)
	Output range	Output 1	Concentration : Selectable from fixed ranges or freely specifiable within the measurable range
		Output 2	Temperature: Freely specifiable within a range between -20℃ and 130℃
	Error output		With burn-out capability (3.8 or 21 mA)
	Hold capability		Select holding the previous value or an arbitrary value
Contact output	Number of output points		3
	Output type		No-voltage contact output
	Contact type		Relay contact, SPDT (1c)
	Contact capacity		250 V AC 3 A, 30 V DC 3 A (resistance load)
	Contact function	R1、R2	Selectable from upper limit alarm, lower limit alarm, ON/OFF control, transmission output hold, and washing output (closed when alarm is issued; normally open; open when power is turned
		FAIL	Error alarm (closed when normal; opened when an error occurs; opened when the power is turned OFF)
	Description of alarm function		-Setting range: Within setting range of fluoride ion concentration Delay time: 0 to 600 seconds
	Description of control function		-Setting range: Within setting range of fluoride ion concentration -Controllable width: 2 to 40 . of setting range
Washing output	Number of output points		1
	Output type		Voltage contact output (output of connected power supply voltage)
	Contact type		Relay contact, SPST (1a)
	Contact capacity		250 VAC 3 A; 30 VDC 3 A (resistance load)
	Contact function		Actuation of solenoid valve for washing
	Description of settings	Washing frequency	0.1 to 168.0 hours
		Washing time	2 to 600 seconds
		Hold time	2 to 600 seconds
	Timer accuracy		Within 2 minutes per month
	Description of washing		Function as internal timer Function as internal timer and function with external input The internal timer is enabled only when external input is used. Selects one function in washing start signal (internal washing sequence is started when the washing start signal is turned ON for 2 seconds or more).
Contact input Contact input {}	Number of input points Number of input points {}		1
	Contact type		Open collector, no-voltage a-contact
	Conditions		ON resistance: 100Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC
	Contact function		External input for holding transmission output
Communication function	Method		RS－485
	Signal type		Two-wire, input/output insulated type (not insulated from transmission output)

■ Specification 2

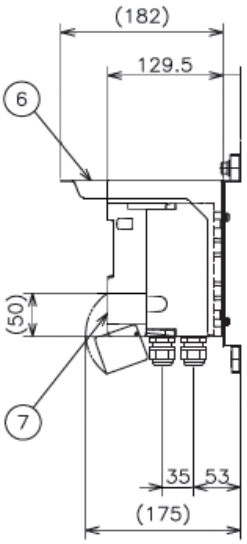
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ (0°C), positive thermosensing property resistor: 10 kΩ (25°C)	
	Temperature compensation range		0~100°C	
	Temperature calibration function		One-point calibration using comparison with reference thermometer	
Calibration	Calibration method		Arbitrary 1 or 2 points	
	Number of calibration points		Select 1-point or 2-point calibration.	
	Kinds of standard solutions		1 point: standard solution with concentration of 50-100% of the measurable limit	
	Additional functions		Automatic calibration failure detection (asymmetry potential, sensitivity, and stability) Calibration history (asymmetry potential, sensitivity, and number of days	
Self-diagnostics	Calibration errors		Asymmetry potential error, sensitivity error, response time error, and temperature calibration range error	
	Electrode diagnostic error		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 to 65°C			
Power source	Power supply voltage range		90 to 264VAC 50/60Hz	
	Power consumption		15VA (max)	
	Others		With built-in time lag fuse (250 V, 1 A)	
			With built-in power switch for maintenance	
Applicable standards	CE marking		EMC directive (2004/108/EC) EN61326-1: 2006	
			Low Voltage Directive (2006/95/EC) EN61010-1: 2001	
		EMC Immunity Industrial location	Electrostatic discharge	IEC61000-4-2
			Radiated radiofrequency electromagnetic field	IEC61000-4-3
			Electric fast transient/burst	IEC61000-4-4
			Surge	IEC61000-4-5 (*1)
			Conducted interference induced by radiofrequency	IEC61000-4-6
			Voltage dip, short-time power outage, and voltage fluctuation	IEC610000-4-11
		EMC Emission ClassA	Radiated disturbance	CISPR 11 CLASSA
			Noise terminal voltage	CISPR 11 CLASSA
		Low voltage	Contamination level 2	
	FCC Rules		Part 15 CLASS A	
Structure	Installation		Outdoor installation type	
	Installation method		50 A pole or wall mounting	
	International protection code		IP65	
	Case material		Aluminum alloy (coated with epoxy modified melamine resin)	
	Mounting bracket material		SUS304	
	Hood material		SUS304 (Coated with epoxy modified melamine resin)	
	Readout window material		Polycarbonate	
	Readout element		Reflection type monochrome LCD	
External	180 (W) x 155 (H) x 115 (D) (excluding the mounting bracket)			
Weight	Body: Approx. 3.5 kg; hood and mounting bracket: Approx. 1 kg			

*1: When the 2-sensor cable, transmission cable, or contact input cable is extended to more than 30 m, the surge test in the EMC directive for CE marking is not applied.
*2: An arrester (sparkover voltage: 400 V) is mounted for transmission output. However, use the most suitable surge absorbing element on the connection line in accordance with the ambient environment, the equipment installation situation, and the externally connected equipment.

■ External dimensions (HC-200F)



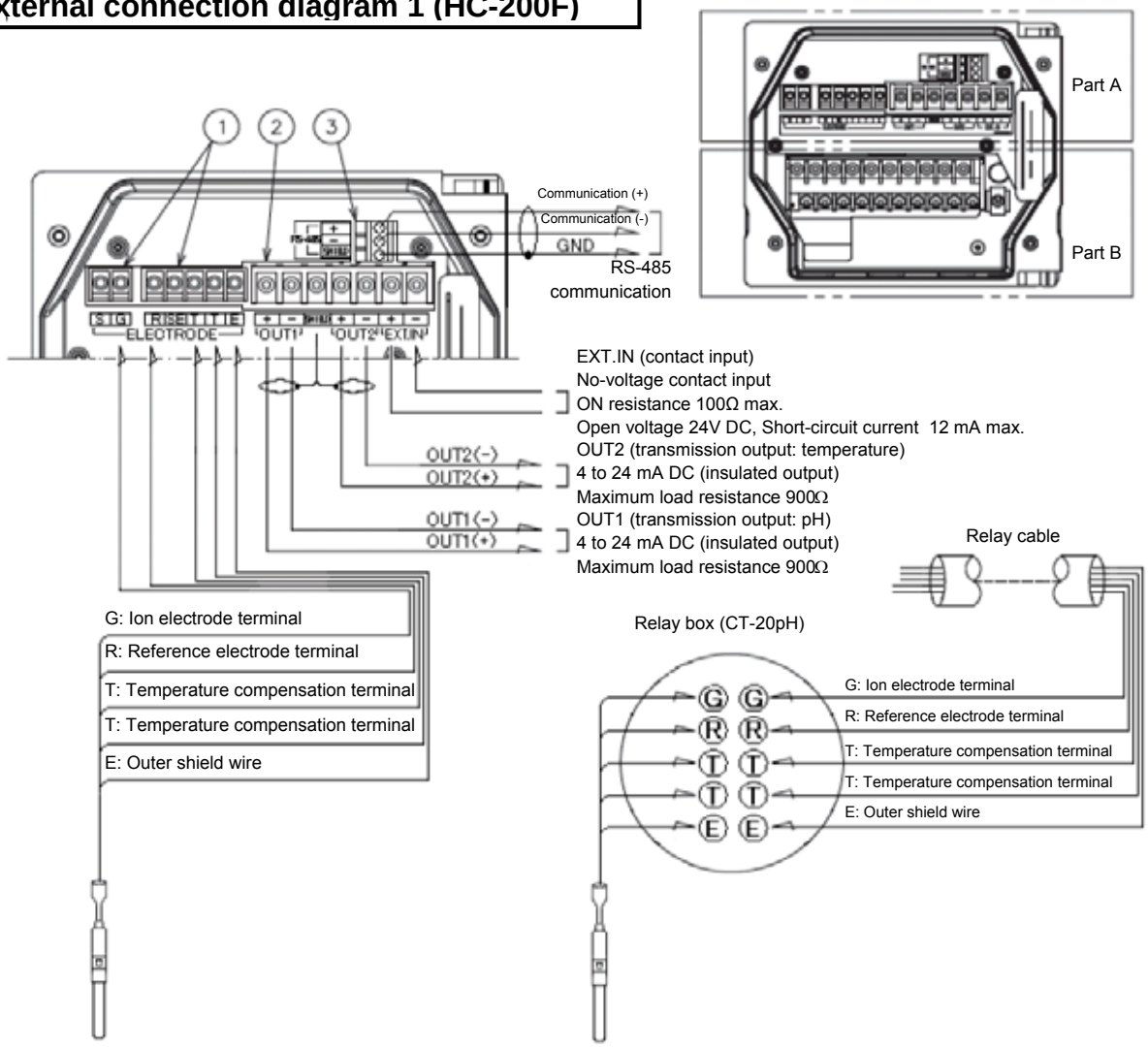
(wall-mounted)



	PARTS	NOTES
(1)	Mounting plate	SUS304
(2)	Case	ADC12
(3)	Conduit	O.DΦ7~Φ12cable
(4)	Plug	SUS304
(5)	Earth	SUS304 M4
(6)	Cover	SUS304
(7)	Front cover	ADC12
(8)	U-bolt	SUS304 50A M8

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

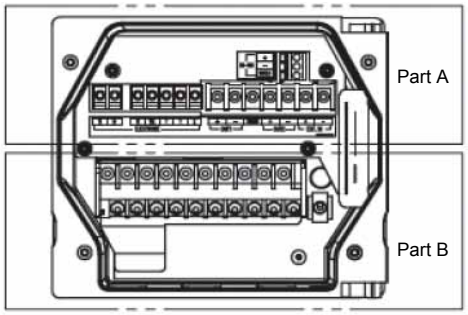
■ External connection diagram 1 (HC-200F)

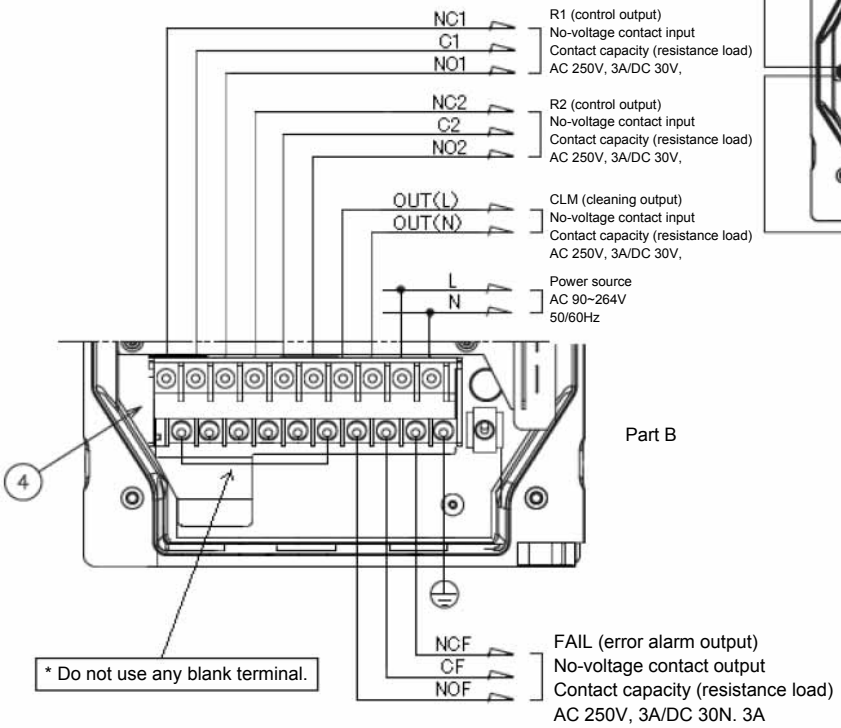


	Terminal screw	Applicable crimp-type terminal	Applicable electric wire	Screw tightening torque
①	M3	MAX6.5 MAX3.2 MAX6.2	1.25mm²/MAX (AWG16)	0.8N・m
②	M3.5	MAX6.2 MAX3.6 MAX7.2	2mm²/MAX (AWG14)	0.8～1.2N・m
③	M3		0.14～2.5mm² (AWG26～14)	0.5～0.6N・m

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.
: The negative terminals OUT1(-) and OUT2(1) are internally connected and have the same electric potential.

■ External connection diagram 2 (HC-200F)

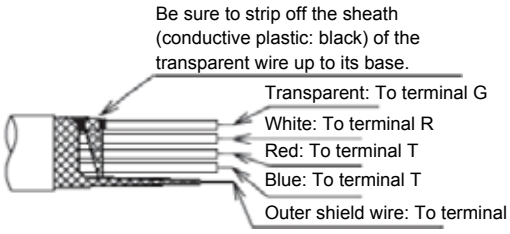




	Terminal screw	Applicable crimp-type terminal	Applicable electric wire	Screw tightening torque
④	M4	MAX8, MAX4.7, MAX8.5	5.5mm²/MAX (AWG10)	1.2~1.8N·m

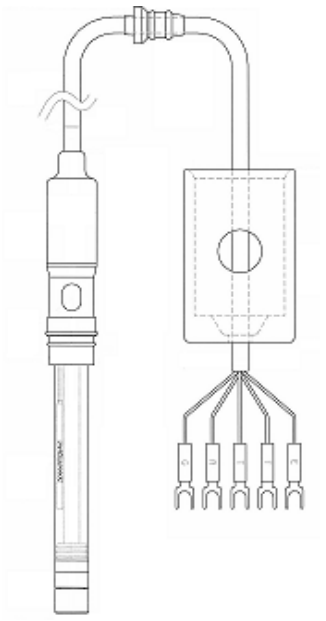
Note: The screws on the terminal block are designed as non-removable.
To connect a cable to a terminal, turn the screw until it is floated.
: The negative terminals OUT1(-) and OUT2(1) are internally connected and have the same electric potential.

Relay cable termination method



Note:Strip the covering (conductive plastic: black) of transparent wire up to the root.

■ Fluoride ion electrode



Model		1009
Measuring method		Ion electrode method (response membrane: contains lanthanum fluoride Eu 0.5%.
Measurable range		0.2-10000mg/L
Accuracy (including the	Linearity	**Within±30% of full-scale value**
	Repeatability	Within ±30% of full-scale value
Sample water conditions	pH range	pH4-8 at 0.2mg/L pH4-10 at 20mg/L pH4-12 at 2000mg/L
	Temperature range	0-40°C
	Electric conductivity	500 μS/cm min.
	Flow velocity range	1-20cm/s
Standard substance for calibration		Highest quality NaF or KF
Comparison electrode	Internal electrode	Ag/AgCl
	Internal solution	Kcl 3.3 mol/L supply type
		Zirconia ceramic junction
Temperature compensating element		Pt 1000Ω
Temperature compensation range		0-40°C
Dimensional outline drawing		12 mm dia. x 170 mm length excluding the cable and any protrusion
Weight		Approx. 200g

About measurements

・Free fluoride ions (F^-) in the sample can be continuously measured.

・Any fluorine substance other than free fluoride ions (F^-) cannot be measured.

・The electrode potential has an almost linear relationship with the logarithm of fluoride ion concentration.

・The proper measurement condition is pH5 to pH8.Stable measurements can be made in the entire measurable range by adjusting the pH value to pH5 to pH8.

The measurement is affected by OH-ions.

The use of the following equation is recommended to see whether the measurement is affected by OH^-ions.

(allowable limit value for coexistence)×(measured ion concentration) > (interfering ion concentration)

：Measurable

[allowable limit for interfering ion coexistence: OH^-=10 (index showing the effect of interfering ions)]

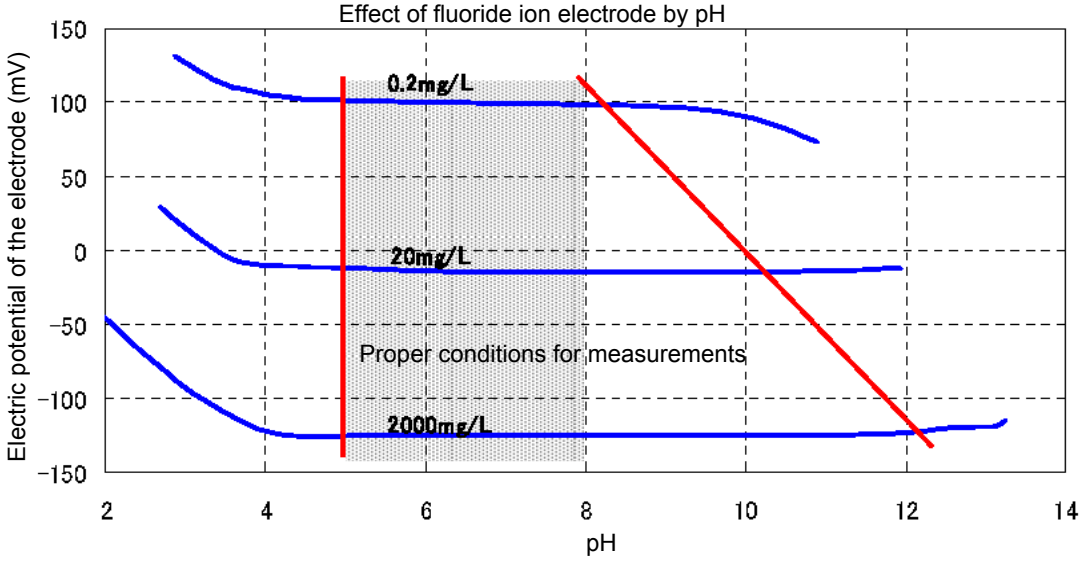
Example: (10) x 0.1 mol/L < 2 mol/L ... Not measurable

(10) x 0.1 mol/L > 0.5 mol/L ...Measurable

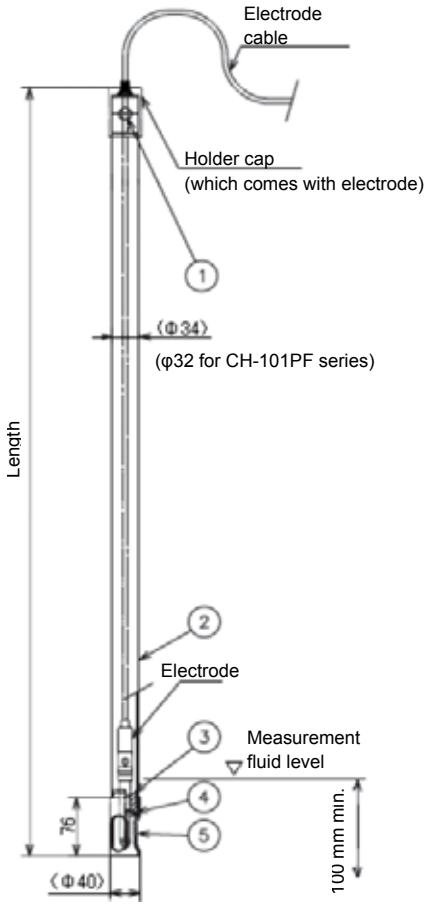
The above interfering ion reacts with the response membrane of the electrode and affects the electric potential of the electrode. This appears as an error.

Complexation affects the measured value.(Fe^{3+}, Al^{3+}, or the like) If multivalent metal ions (e.g. Fe^{3+} or Al^{3+}) coexist, they will form complexes (FeF_6^{3-} and AlF_6^{3-}) with fluoride ions.This may cause the free fluoride ion concentration to decrease, resulting in a lower measured value for concentration.

Effect of fluoride ion electrode by pH



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

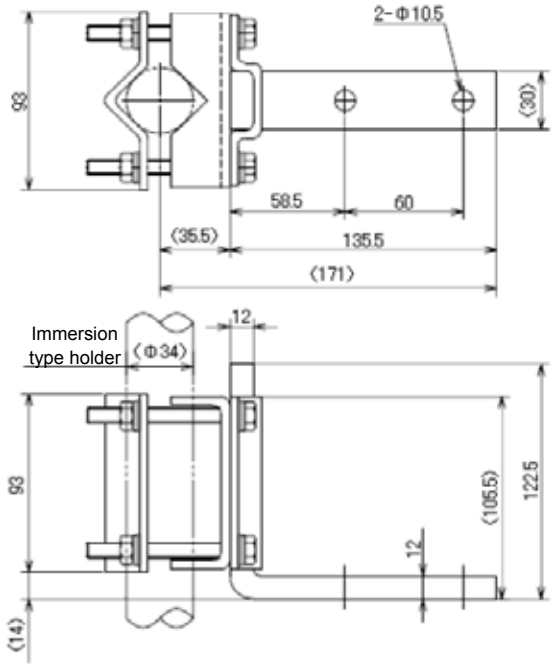


	PARTS	NOTES
(10	Internal fluid inlet	
(2)	Holder	PP(CH-101)
		PVC(CH-101-P)
		PVDF(CH-101-PF)
(3)	Electrode gasket	FKM
(4)	Washer	PP(CH-101, CH-101-P)
		PVDF(CH-101-PF)
(5)	Protective tube	PP(CH-101, CH-101-P)
		PVDF(CH-101-PF)

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

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

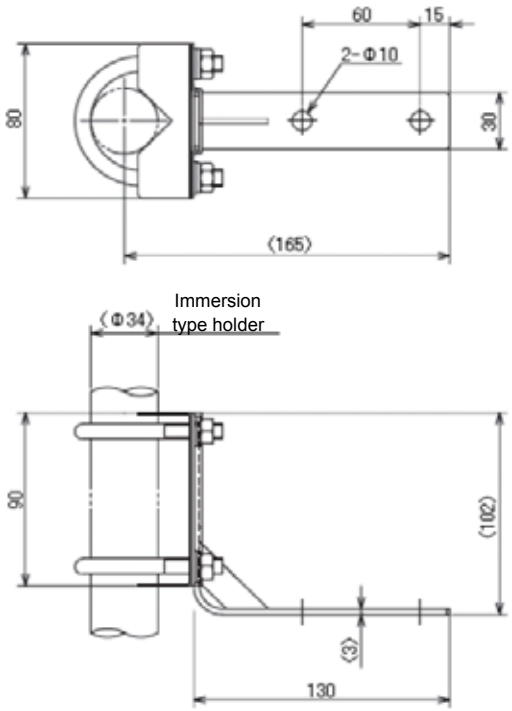
■ Mounting bracket (BA-1A): Specifications and external dimensions



Model	BA-1A
Material	ABS resin
Mounting	Anchoring

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

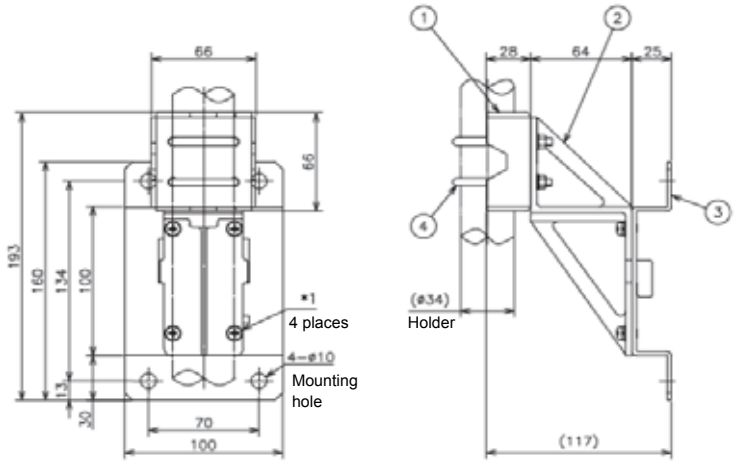
■ Mounting bracket (BA-1S): Specifications and external



Model	BA-1S
Material	SUS304
Mounting	Anchoring

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

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

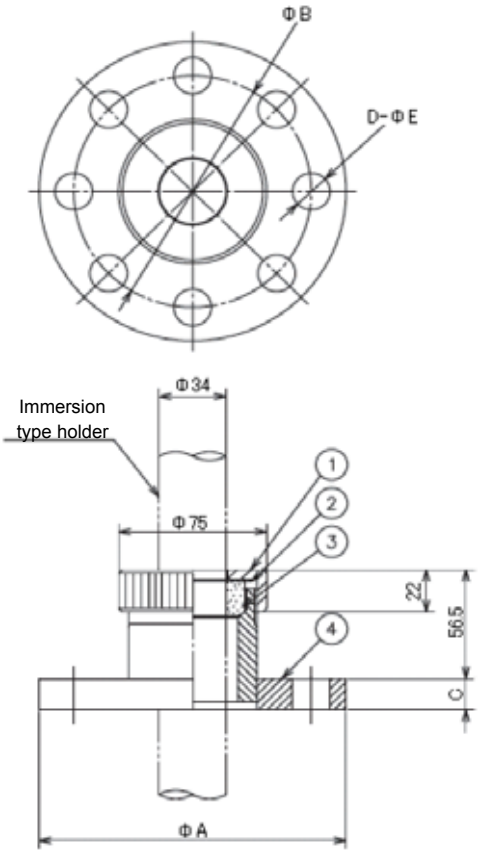


	PARTS	NOTES
(1)	Base 1	SUS304
(2)	Mounting plate	SCS13
(3)	Base 2	SUS304
(4)	U-bolt	SUS304

Mounting pipe: 50 A

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

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



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

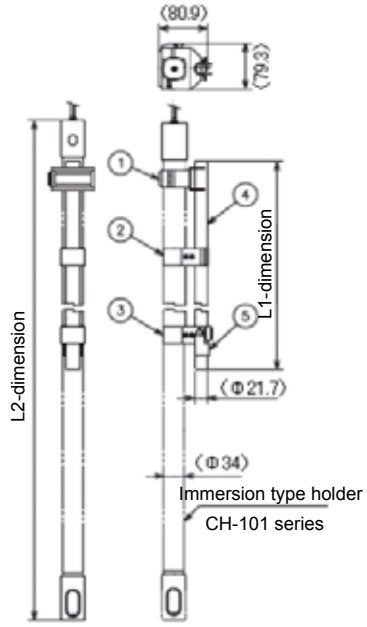
Applicable for immersion type resin-made holders of 1.5 m max.

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

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

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

■ Supporting bracket (SP-60): Specifications and external



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

When the flow rate is fast even if the holder length is shorter than 1.5 m,

A support pipe may be required.

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

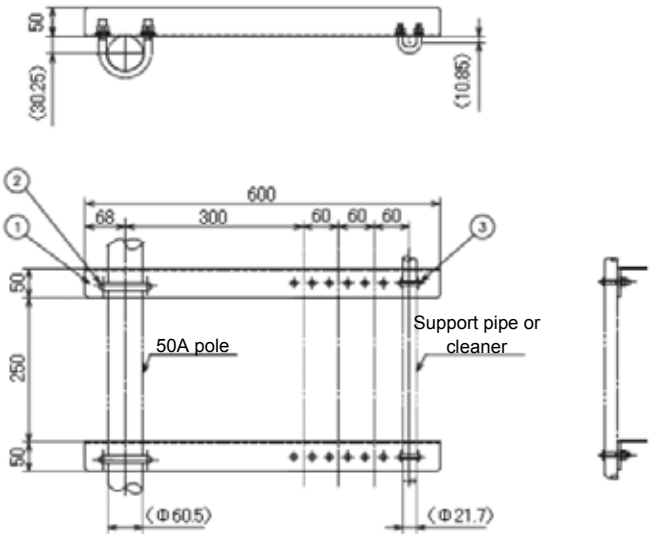
The intermediate hook is provided when the immersion type holder length is 2 m or more.

No combinations with the CH-101PF are available.

	Support pipe L1 length (mm)	Immersion type holder L2 length (mm)
For 1m	500±10	1000 ±10
For 1.5m	1000±10	1500 ±10
For 2m	1500±10	2000 ±10
For 2.5m	2000±10	2500 ±10
For 3m	2500±10	3000 ±10

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

■ Mounting bracket (MH-60): Specifications and external

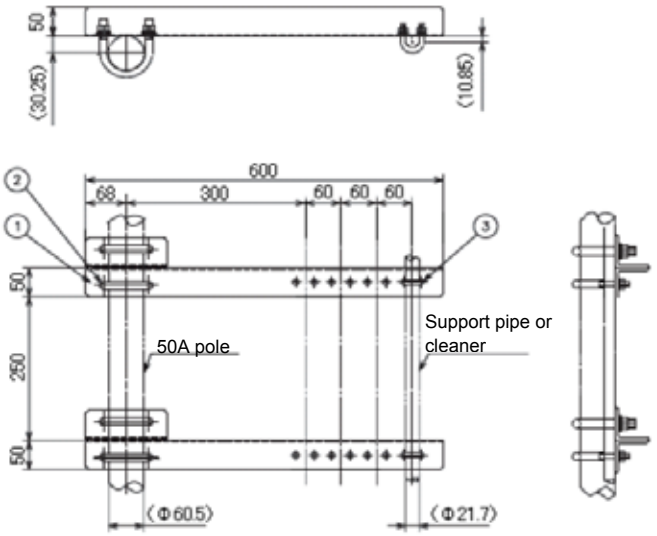


Model		MH-60
Material	Arm	SUS304
	U-bolt	SUS304
Mounting pipe		50A

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

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

■ Mounting bracket (MH-65): Specifications and external dimensions

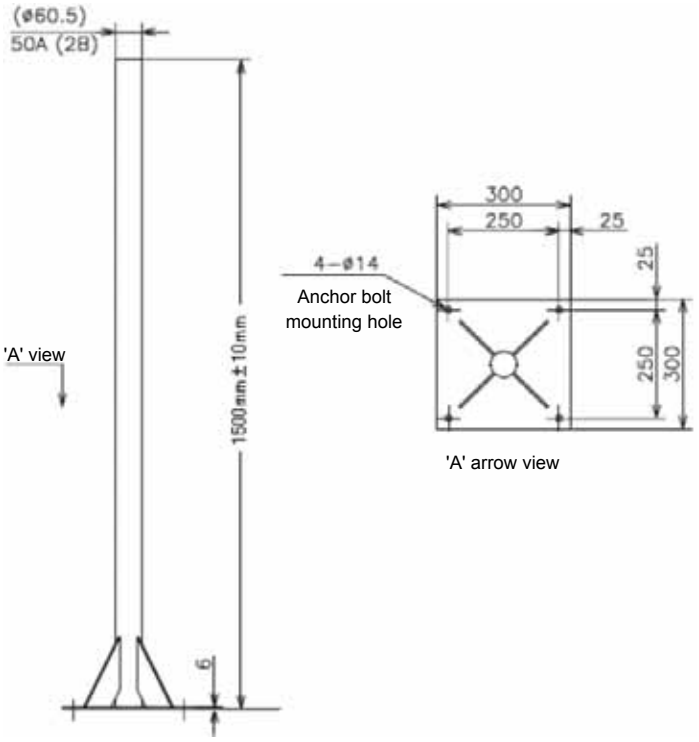


Model		MH-65
Material	Arm	SUS304
	U-bolt	SUS304
Mounting pipe		50A

To mount the cleaner on the pole stand, use the MH-65.

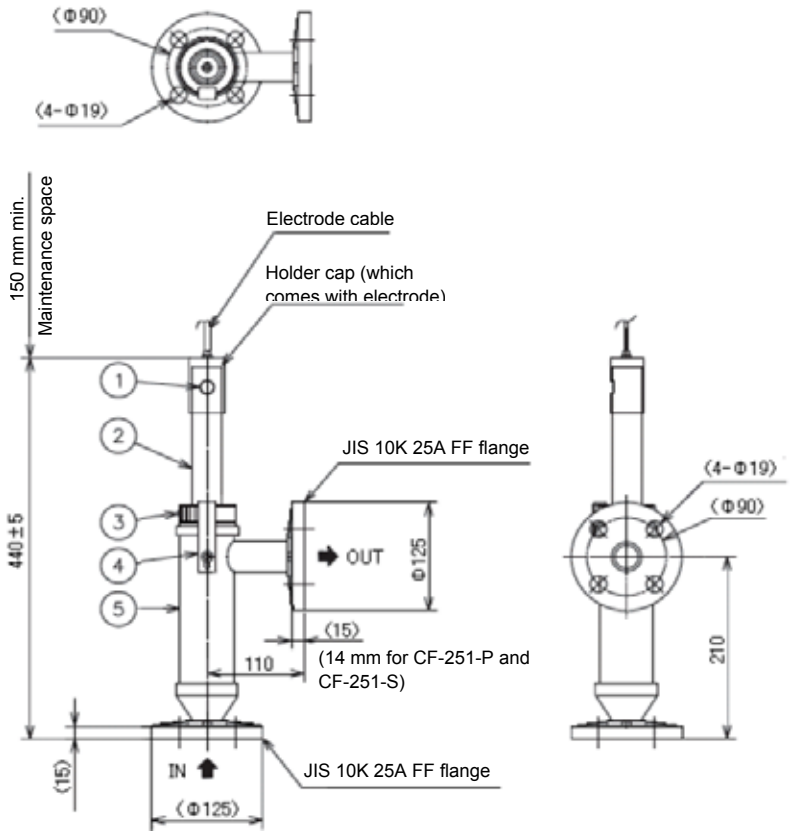
	PARTS	NOTES
(1)	Arm	SUS304
(2)	U-bolt	SUS304 stainless steel (for 50A)
(3)	U-bolt	SUS304 stainless steel (for 15A)

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



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

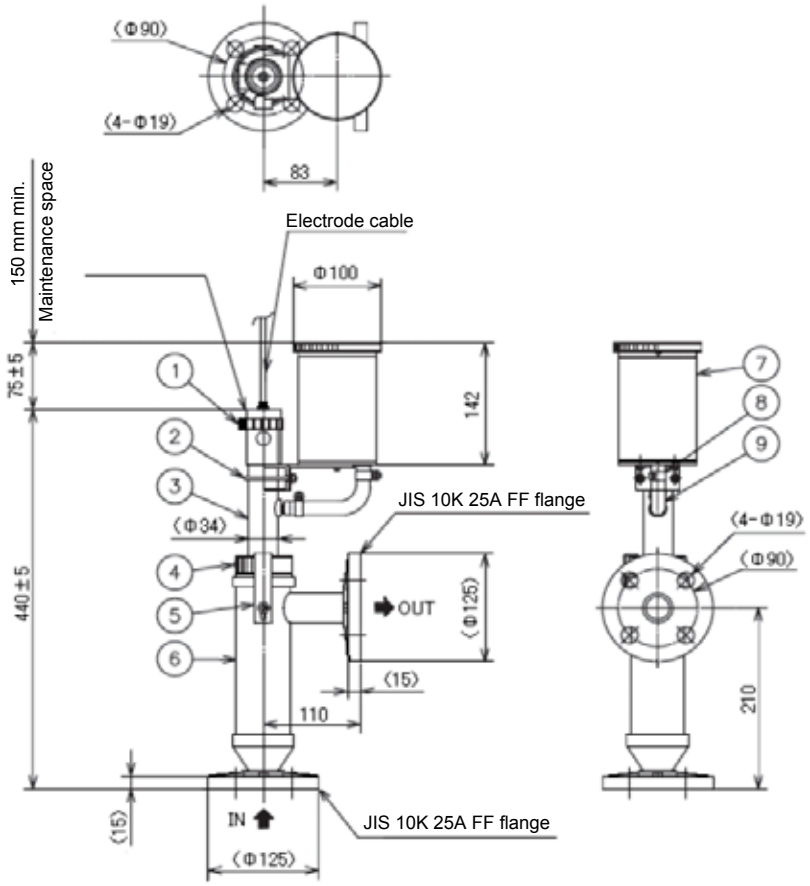
■ Flow chamber (CF-251 series): Specifications and external dimensions



Model		CF-251	CF-251P	CF-251S
Material of distribution holder		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temperature	-5 to 80°C	-5 to 50°C	-5 to 100°C
	For the actual operating temperature range, check the specifications of electrodes to be combined.			
	Pressure	Atmospheric pressure		
	Flow Rate	0.3 to 10L/min		
Wetted material	Packing	FKM	FKM	FKM
	Washer	PP	PP	PVDF
	Protective tut	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.			
Weight		Approx. 0.6kg	Approx. 0.9kg	Approx. 4.5kg

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

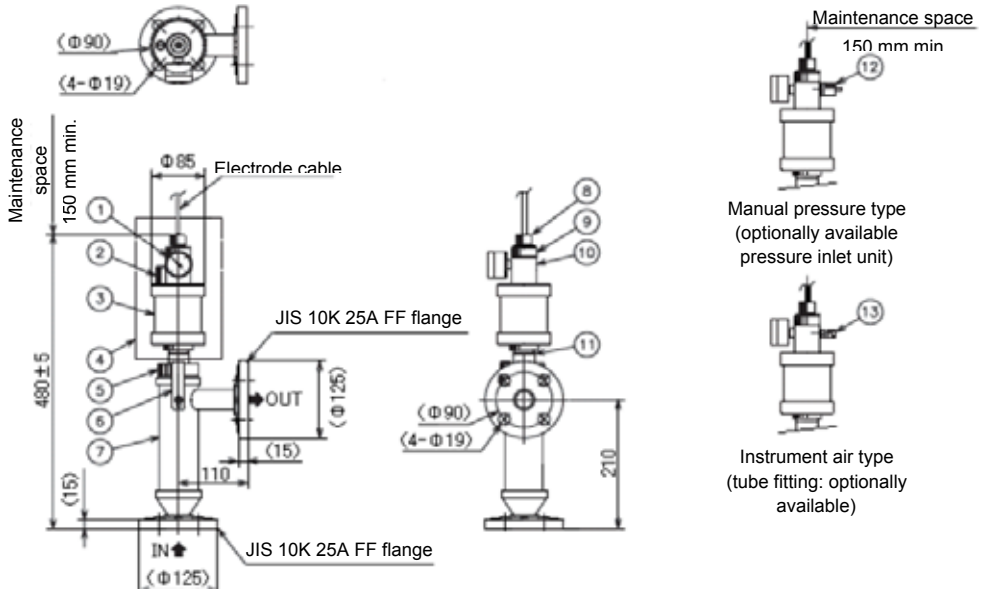
■ Flow chamber (CF-251-T series): Specifications and external dimensions



Model		CF-251-T	CF-251P-T	CF-251S-T
Holder material		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Temperature	-5 to 80°C	-5 to 50°C	-5 to 100°C
	Working temperature ranges vary with combinational electrodes. Check the working temperature of an			
	Pressure	Atmospheric pressure		
	Flow Rate	0.3 to 10L/miln		
Wetted material	Packing	FKM	FKM	FKM
	Washer	PP	PP	PVDF
	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.			
Weight		Approx. 1.3kg	Approx. 1.6kg	Approx. 5.2kg

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

■ Flow chamber (CF-301 series): Specifications and external dimensions



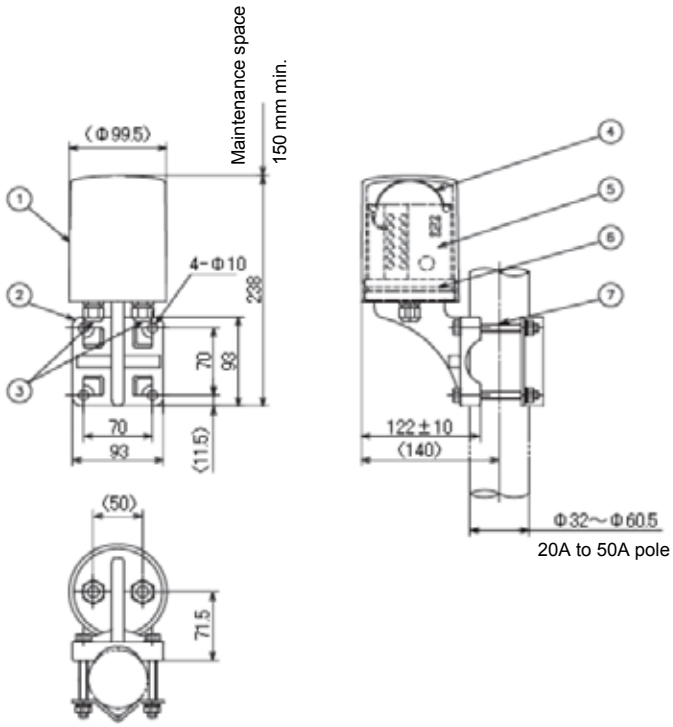
	PARTS	NOTES
(1)	Pressure gauge	0~0.5MPa
(2)	KCl inlet	PVC
(3)	KCl tank	PVC(CF-301/CF-301P)
		PP(CF-301S)
(4)	Pressure holder	
(5)	Tightening nut	PP(CF-301)
		PVC(CF-301P)
		SUS304(CF-301S)
(6)	Lock plate	SUS304

	PARTS	NOTES
(7)	Distribution holder	PP(CF-301)
		PVC(CF-301P)
		SUS316(CF-301S)
(8)	Cable cap	PPO
(9)	Holder cap	PPO
(10)	Pressure mating screw	Rc1/8
(11)	Holder	PP(CF-301)
		PVC(CF-301P)
		SUS316(CF-301S)
(12)	Pressurizing unit	C3604
(13)	Fitting	for Φ6/Φ4 tube PVDF

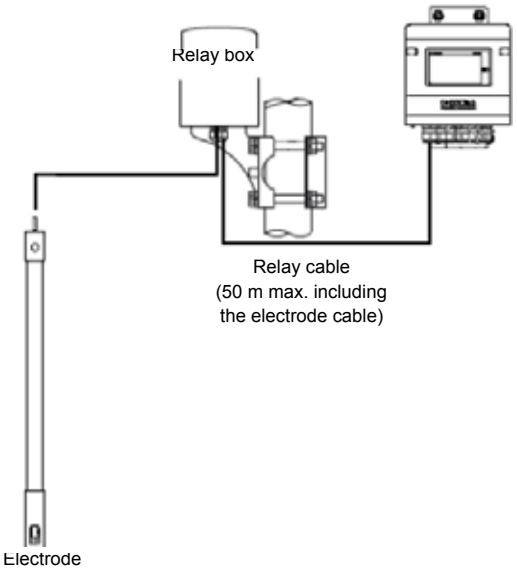
Model		CF-301	CF-301P	CF-301S
Material of distribution holde		PP	PVC	SUS316
Ambient Temperature		-5 to 60°C	-5 to 50°C	-5 to 60°C
Conditions for measurement solution	Wetted material	-5 to 80°C	-5 to 50°C	-5 to 100°C
		For the actual operating temperature range, check the specifications of the electrodes to be combined.		
	Pressure	-5 to 40°C:0.30MPa 40 to 60°C:0.22MPa 60 to 80°C:0.15MPa	-5 to 40°C:0.30MPa 40 to 50°C:0.15MPa	-5 to 40°C:0.30MPa 40 to 60°C:0.25MPa 60 to 80°C:0.20MPa 80 to 100°C:0.15MPa
	Flow Rate	0.3 to 10L/min		
Wetted material	Packing	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		Rc 1/8		
Weight		Approx. 1.2kg	Approx. 1.5kg	Approx. 5.1kg

*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.

■ Relay box (CT-20pH): Specifications and external dimensions

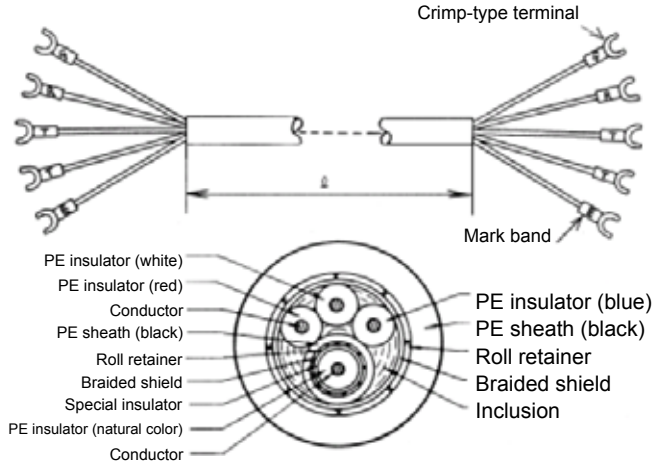


	PARTS	NOTES
(1)	Cover	ABS
(2)	Bracket	ABS
(3)	Conduit	
(4)	Spring	SUS304
(5)	Terminal board	ABS
(6)	O-ring	NBR
(7)	Bolt (provided)	SUS304 M8



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

■ Relay cable (C-5A): Specifications and external dimensions



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

・To extend the electrode cable by 5 m or longer, use this relay cable.
・For wiring, be sure to use the dedicated cable. Do not use the general cable or halfway splice the dedicated 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 HC-200F is of the standard specification.
For the HC-200F, the optionally available cleaner may be installed.
The installation of the HC-200F with the cleaner will be described in the section for the cleaner.

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

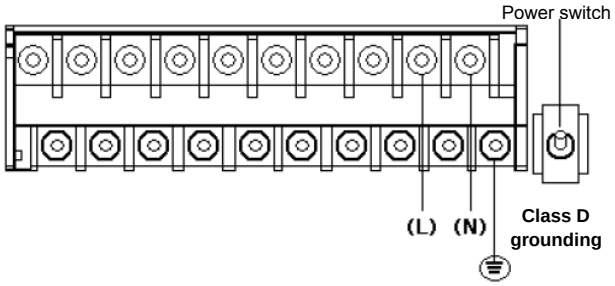
Power source

・The HC-200F has a power switch.
・Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
・Check that fluctuations of the power supply voltage fall within ±10%.

・Provide the power switch in a place near the HC-200F so that the power can be turned ON/OFF. If lightning might strike, install an arrester on the output side of the HC-200F and on the side of receiving instruments.

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

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



Contact output

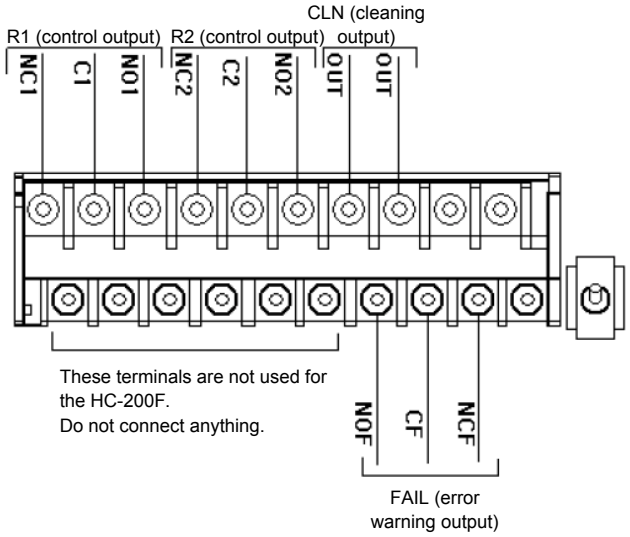
・If noise is detected from the load, use a varistor or a noise killer.

・Only the CLN output has voltage and the connected power supply voltage is output. Otherwise, the terminal provides no-voltage contact output.
・For the FAIL output only, the positions of NO and NC are reversed. During the normal operation (without the FAIL signal), the CF-NOF contact is open and the CF-NCF contact short-circuited. When the power is OFF, the C-NOF contact is short-circuited.

・The blank terminals are internally connect to each other. Do not connect anything.

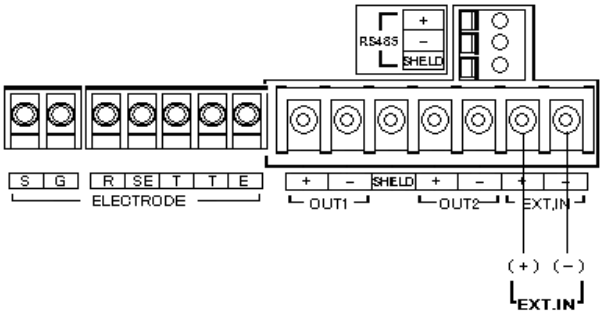
・To connect any load exceeding the contact capacity or any induction load (e.g., a motor or a pump), be sure to use a power relay exceeding the load rating.
・When the HC-200F is OFF, the C-NC contact for R1 to R4 is short-circuited. Therefore, be careful about the connection of load.

Contact capacity	250 VAC, 3 A maximum or 30 VDC, 3 A maximum
Terminal screw	M4
Applicable electric wire	0.75 to 5.5 mm2 (AWG18 to 10)



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

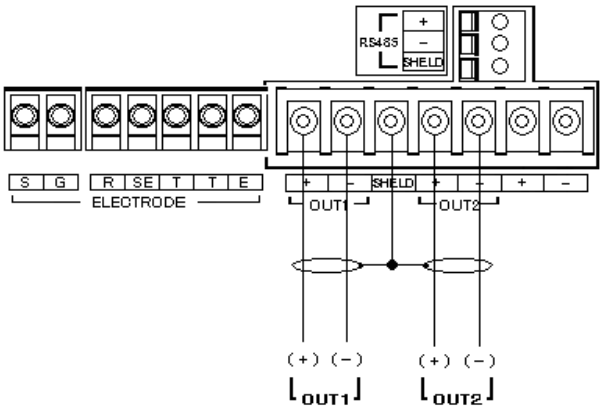
Contact input resistance	100 Ω maximum
Terminal screw	M3.5
Applicable electric wire	0.75 to 5.5 mm2 (AWG18 to 10)



(Contact input)

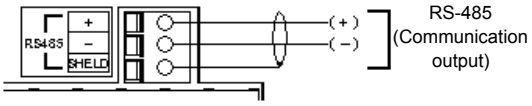
Transmission output
・For the transmission output cable, use a shielded cable.
・When lightning might strike, install an arrestor on the output side of the HC-200F and on the side of receiving instruments.
・The negative terminal (OUT1) (-) and OUT2 (-) for the transmission output are internally connected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

Maximum load resistance	900Ω
Terminal screw	M3.5
Applicable electric wire	2mm2 (AWG14) MAX



(Transmission output)

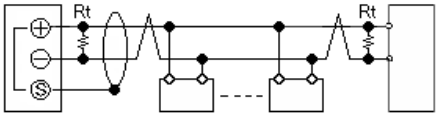
RS-485
・For the communication output cable, use a twisted shielded pair.
・The communication cable length is 500 m maximum.
・Use a terminating resistor (Rt: 120Ω) for any device at which the RS-485 communication line is terminated. Up to 32 connections can be made including one for the host computer.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



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

Example of external connection for communication

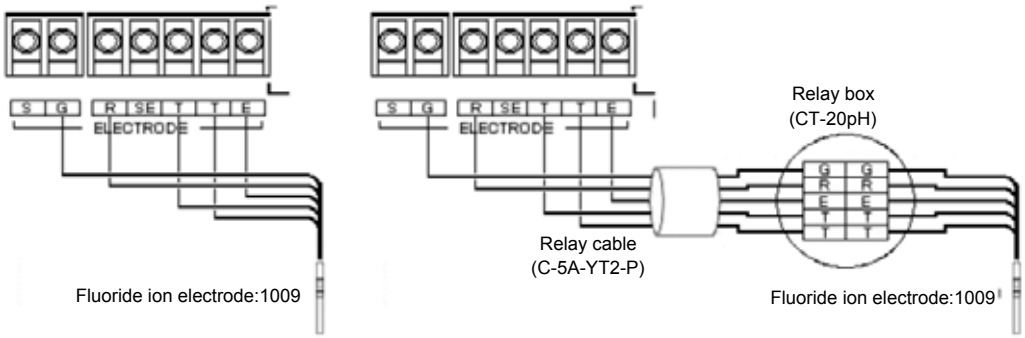
HC-200F
RS-485
(Communication output)



Host computer

Sensor cable
The sensor cable is highly insulated. Exercise care in handling the sensor cable.
・Do not wet the terminals and terminal block for cables with water or the like or contaminate them with your hand or oil. Insulation decreases. The decreased insulation can cause instable readouts. Always maintain the electrode dry and clean. 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.
・Keep the wiring of the sensor cable and the relay cable away from electromagnetic induction devices such as a motor and their power cables.

Fluoride ion electrode 1009	G: Ion electrode terminal
	R: Reference electrode terminal
	T, T: Temperature compensation electrode terminal
	E: Shielded terminal



Extension of electrode cable
・Be sure to use the dedicated relay cable and relay box.

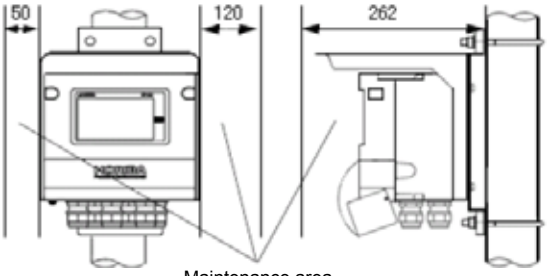
・・Relay cable exclusively for electrode cable (C-5A)
・・Dedicated relay box (CT-20pH)

・The maximum extension distance between the HC-200F and the electrode is 50 m.
・It is recommended that the dedicated relay cable be placed in a conduit in order to prevent static electricity from being generated by induction, vibration, or the like. In this case, pass the wiring near the instrument through a flexible tube (conduit).

■ Installation (mounting)

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

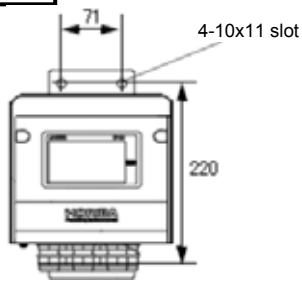
Body (for pole mounting)



Unit: mm

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

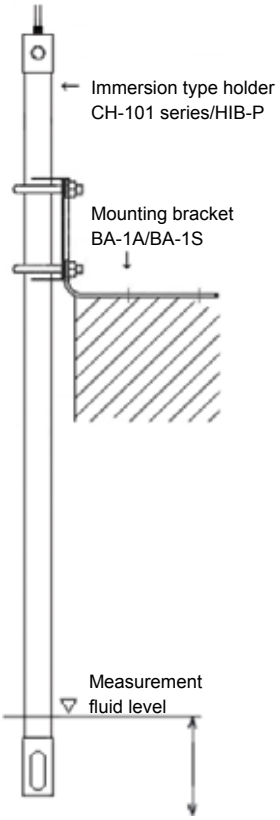
Body (to be wall-mounted)



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

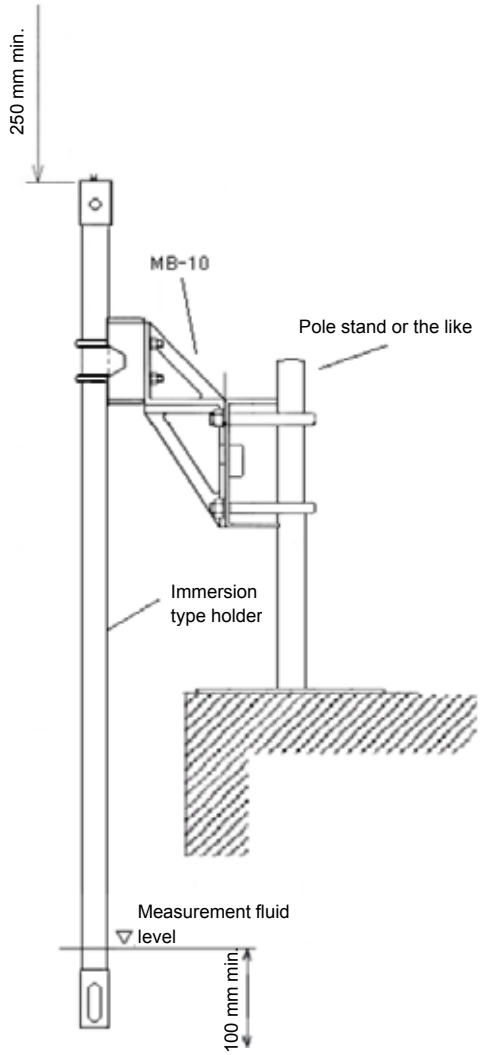
・The mounting bracket BA-1A or BA-1S should be secured with 2-Φ10 bolts.
・The immersion type holder should be mounted 250 mm minimum above the slab.
・In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.

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



Immersion type holder + mounting bracket (MB-10)

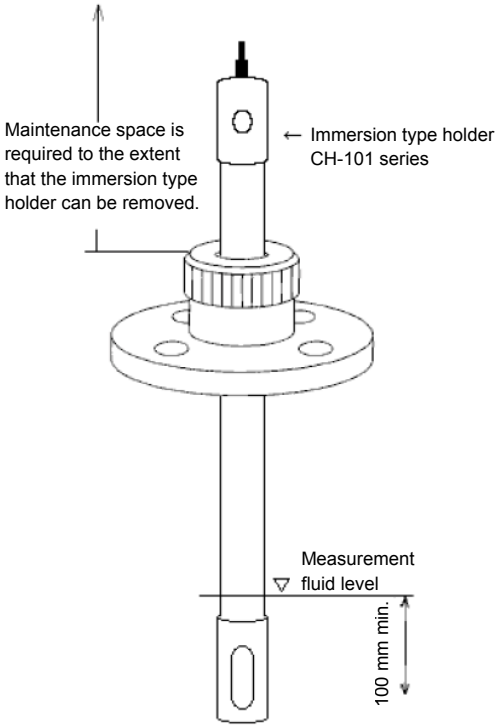
・The mounting bracket MB-10 should be secured to the 50A pole.
・In mounting the immersion type holder with the MB-10, position it about 250 mm above the U-bolt on the MB-10.
・In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.



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

・The FK-1 series uses JIS 10K 50A FF as its basic size. To install any loose flange of special specification, previously check its size.

・In mounting the immersion type holder with the FK-1 series, position it 200 mm minimum above the top of the hexagon cap nut on the loose flange.
・In mounting the immersion type holder, ensure that its lower part of 100 mm minimum is immersed in sample water.

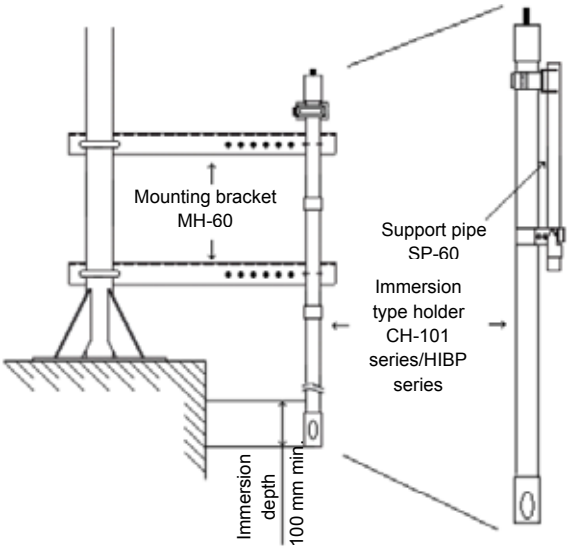


* For use with the CH-101PF, contact us.

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

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

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



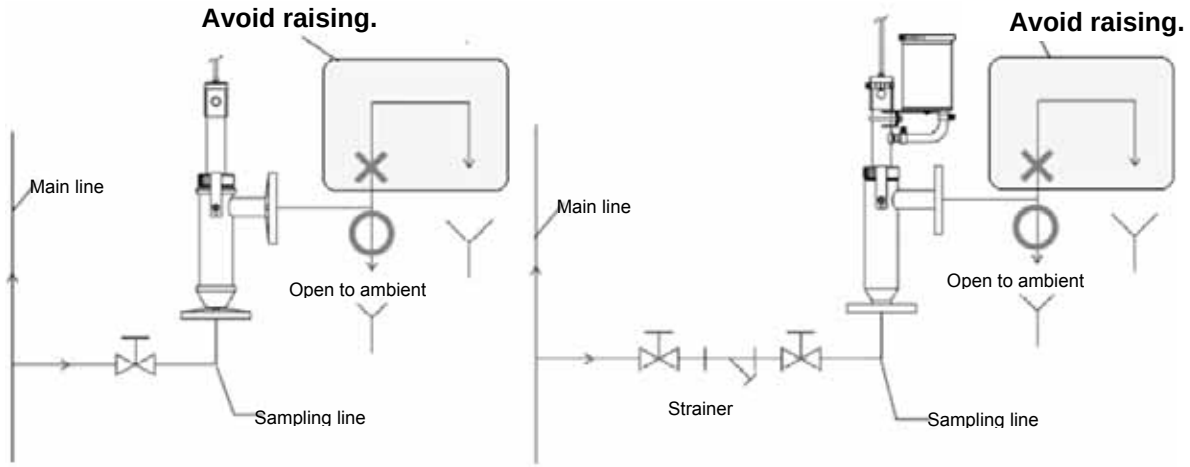
Flow chamber

・The CF-251 Series and CF-501 Series Flow-Through Holders use JIS 10K 25A FF as their basic size. To install a special type of flow chamber, previously check its size.

・Make sure that the holder is installed upright.

CF-251 series/CF-501 series
・Install a valve at the inlet of the flow chamber.
・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.
Back pressure will be applied to the inside of the flow chamber, causing reverse leakage of the solution under measurement into the electrode. This will prevent accurate measurements. Any electrode that caused reverse leakage cannot be used.

・Provide a bypass line from the main line so that the measured liquid flows into the bottom side of the flow chamber and flows out of the lateral side of the flow chamber.
・Be sure to provide a valve on the flow-in side. If the flow rate of the solution under measurement is too fast, the occurrence of capitation or the pressure applied by the flow velocity to the liquid junction of the pH electrode may cause the readout to fluctuate. If the flow rate is too low, the readout response may be delayed. Adjust the flow rate under the conditions for the solution under measurement.
・If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the flow chamber.



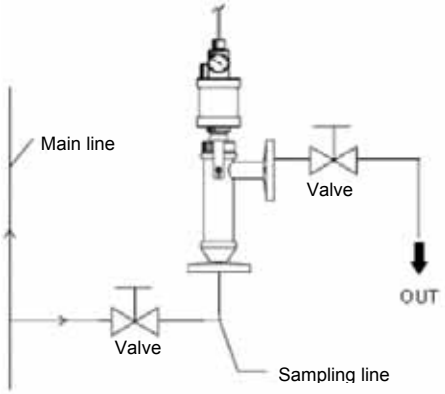
Flow chamber

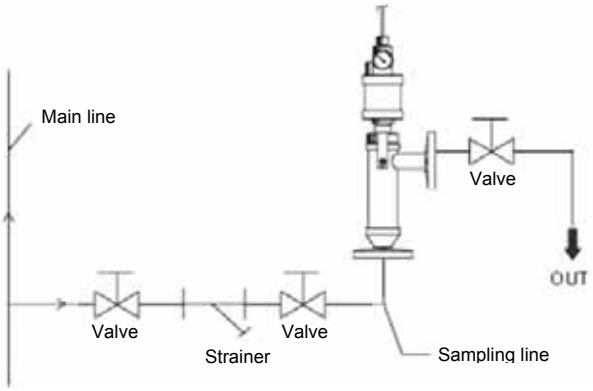
・CF-301 series flow chamber
If sample water has pressure, the type used by pressurizing the inside of the holder uses JIS 10K 25A FF as its basic size. To install a special type of flow chamber, previously check its size.

・Make sure that the holder is installed upright.

CF-301 series
・Install a valve both at the inlet and outlet of the flow chamber.
・Maintain the pressure in the pressurized holder at 0.03 to 0.05 MPa.
・To use instrument air, use a flexible hose considering maintenance easiness.

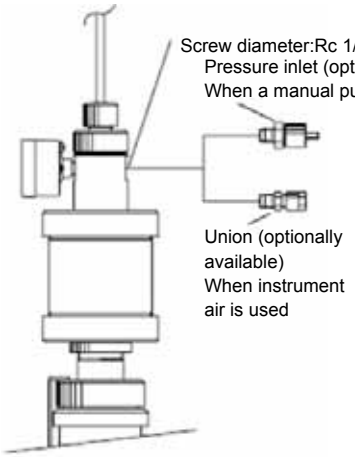
・Provide a bypass line from the main line so that the measured liquid flows into the bottom side of the flow chamber and flows out of the lateral side of the flow chamber.
・Be sure to provide a valve on the flow-in side. If the flow rate of the solution under measurement is too fast, the occurrence of capitation or the pressure applied by the flow velocity to the liquid junction of the pH electrode may cause the readout to fluctuate. If the flow rate is too low, the readout response may be delayed. Adjust the flow rate under the conditions for the solution under measurement.
・If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the flow chamber.



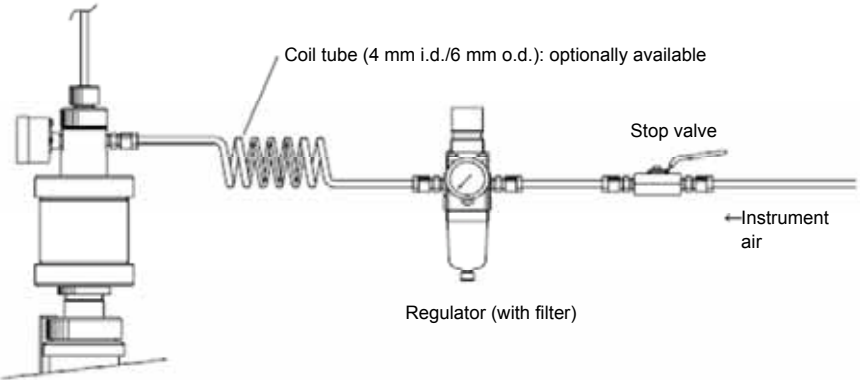


Pressurization

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



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



Immersion type ultrasonic cleaner for H-1 series

UCH-series

■ Overview

● The UCF-series is used with the fluoride ion electrode (1009) to remove foreign matter from the electrode or to prevent foreign matter from adhering to the electrode.
The electrode is irradiated with ultrasonic waves and this cavitation effect removes dirt adhering to the electrode.
In order to improve the cleaning effect, ultrasonic waves are intermittently oscillated (burst oscillation).

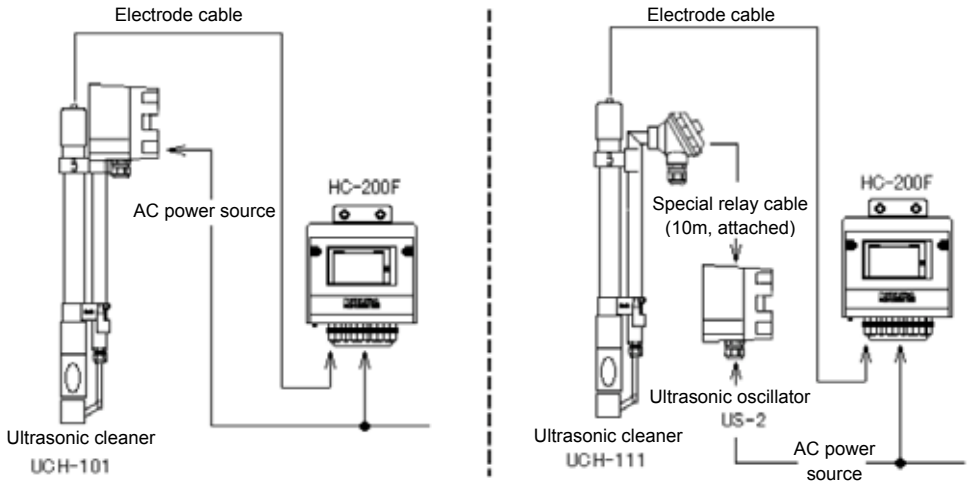
■ Objects

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

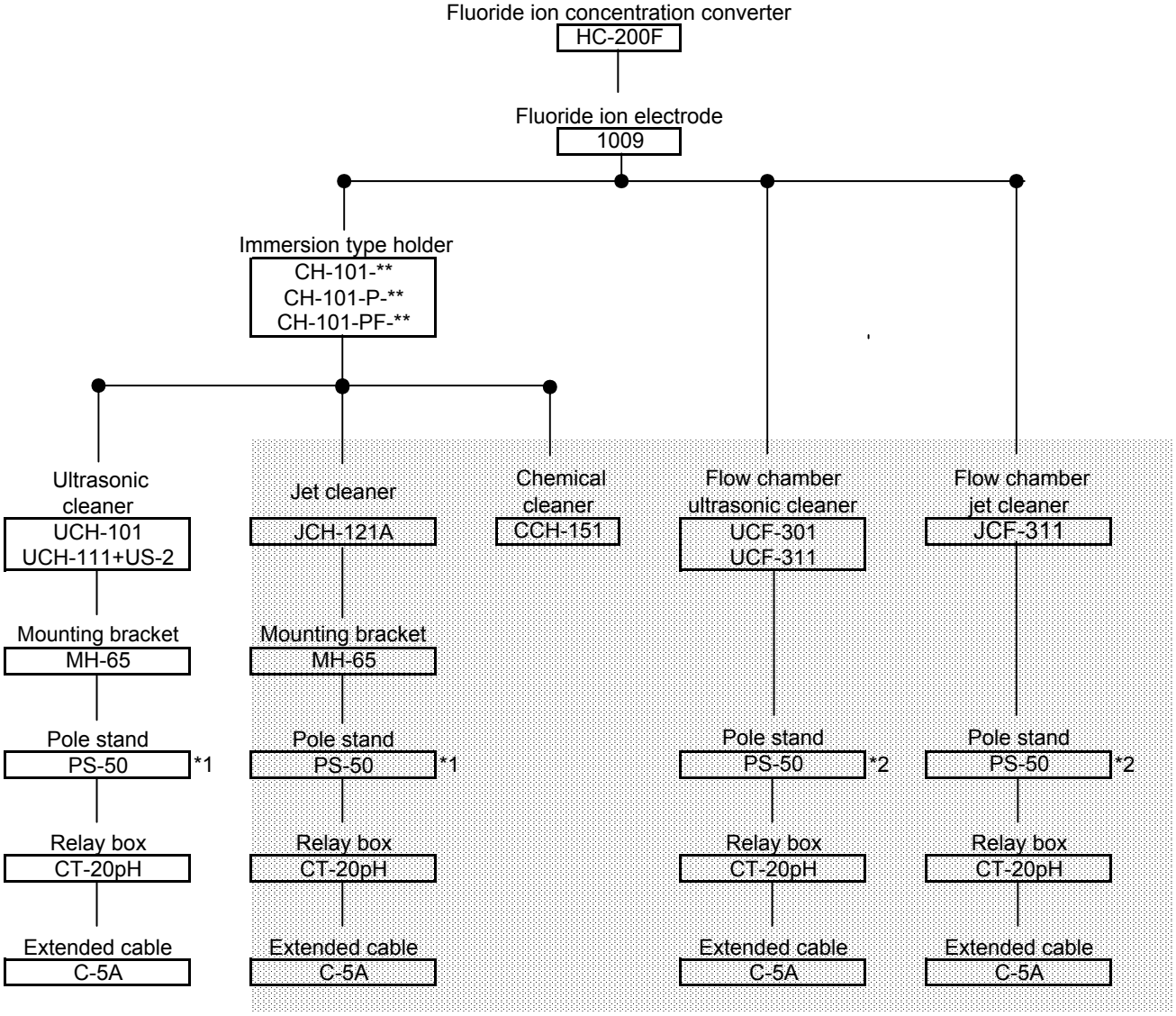
Properties Classification	Objects	
Slime	food, paper, pulp, algae	○
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	×
Suspended Matters	earth and sands	◎
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent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

⊙: Good ○: Acceptable ×: Not acceptable

■ System configuration



■ Combination (immersion type ultrasonic cleaner)



*1: This pole stand is used to attach the converter, the CT-20pH (relay box), and the MH-65 (mounting bracket).
*2: This pole stand is used to attach the converter and the CT-20pH (relay box).

■ Specifications (UCH-101 and UCH-111)

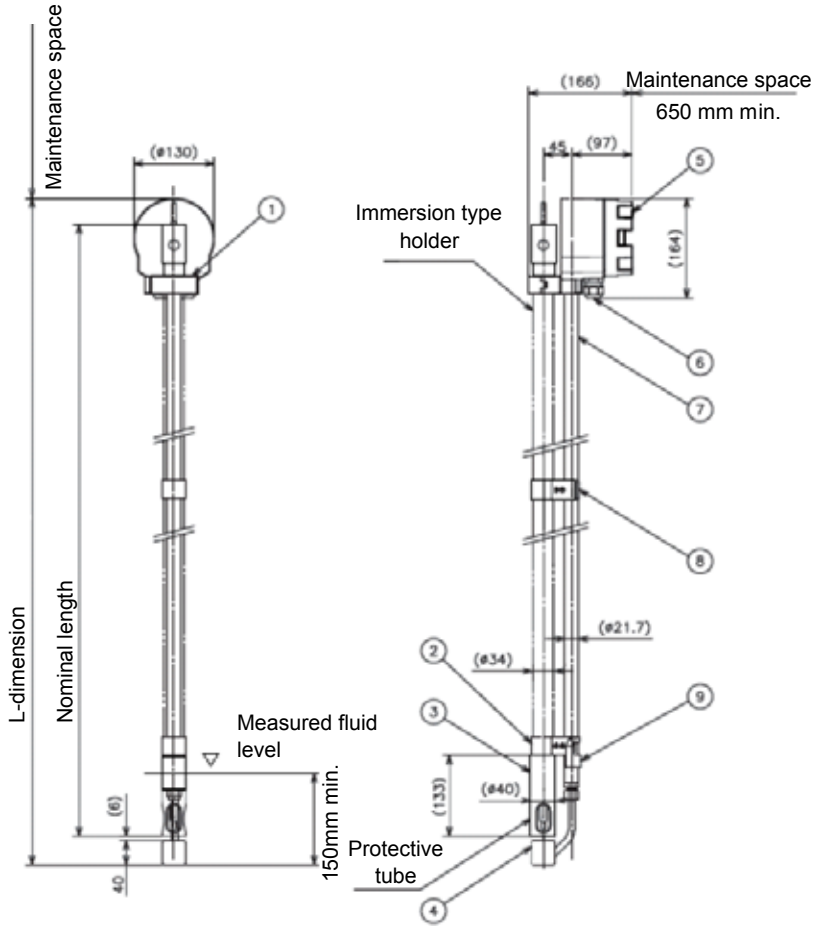
Product name		Immersion Type Ultrasonic Cleaner (ultrasonic oscillator-integrated)
Model		UCH-101
Supply Voltage		AC 100 to 240V　50/60Hz
Permissible Voltage Var		90% to 110% of supply voltage
Power consumption		10VA
Cleaning Method		Ultrasonic wave continuous irradiation system
Control System		Burst system by oscillation time control
Oscillation Frequency		Approx. 70kHz
Ambient Temperature		-5 to 50℃
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensatic
Measured Liquid (*1)		-5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec. max.
Pressure of fluid under measurement		Atmospheric pressure
Wetted material		SUS316 (not including an electrode and materials for Imn
Weight		Approx. 4.0kg (holder length of 1.0 m)
Oscillator Case	International	IP54 (IEC60529, JIS C0920) (Category 2)
	Material	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This Product does not come with electrodes and an Immersion Holder.

*1: The operating temperature range differs depending on the combined electrode and holder. Check the specification temperature for each product.

Product name		Immersion Type Ultrasonic Cleaner (ultrasonic oscillator-separately
Model		UCH-111
Supply Voltage		AC 100 to 240V　50/60Hz
Permissible Voltage Var		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. 70kHz
Ambient Temperature		-5 to 50℃
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensatic
Measured Liquid (*1)		-5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec. max.
Pressure of fluid under measurement		Atmospheric pressure
Wetted material		SUS316 (not including an electrode and materials for Imn
Weight	Oscillator	Approx. 2.0kg
	Oscillator Holder	Approx. 2.5kg (holder length of 1.0 m)
Oscillator Case	International	IP54 (IEC60529, JIS C0920) (Category 2)
	Material	AC4C
	Finish	Epoxy degenerated melamine resin painting (Munsell 10PB5/1)
Special Note		This Product does not come with electrodes and an Immersion Holder.

*1: The operating temperature range differs depending on the combined electrode and holder. Check the specification temperature for each product.

■ External dimensions (UCH-101)



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

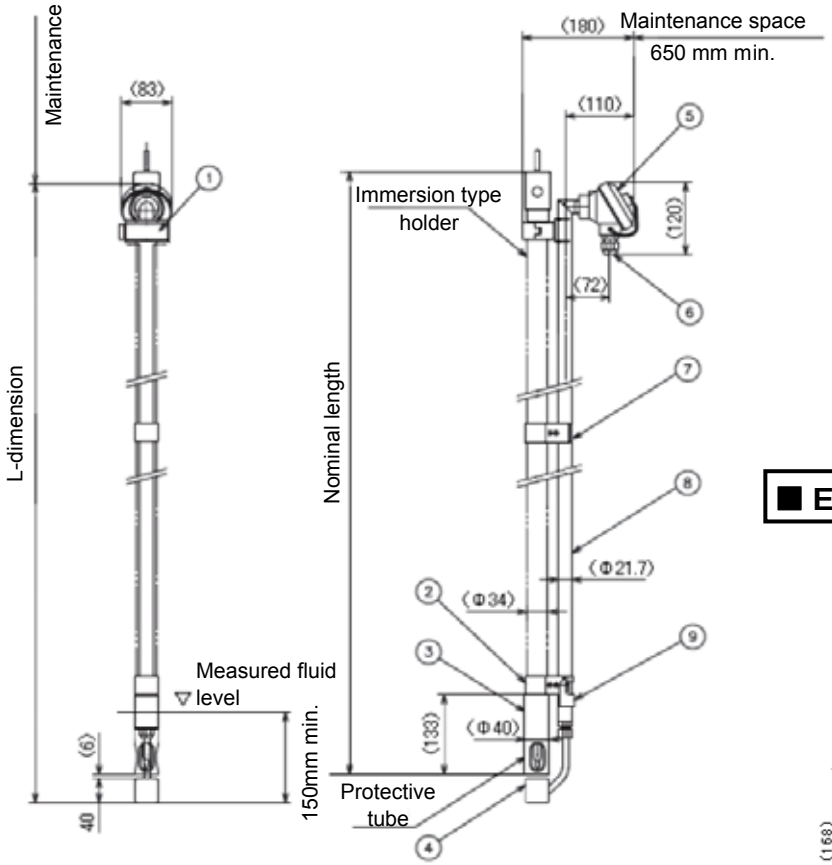
The support hook is not provided on any cleaner of 1.5 m or less.

Dimension L and tolerance of the UCH-101 Immersion Type Ultrasonic Cleaner are shown in the table below:

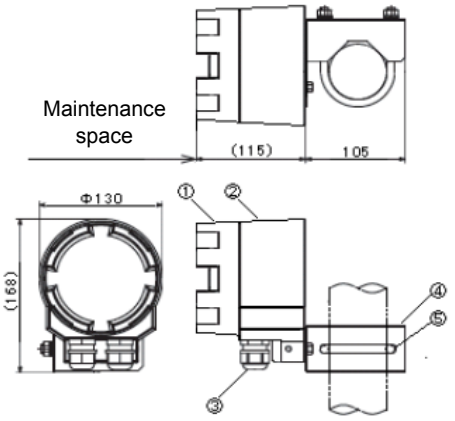
Nominal	L length	Maintenance
0.5	588±10	500 or more
1	1088±10	1000 or more
1.5	1588±10	1500 or more
2	2088±10	2000 or more
2.5	2588±10	2500 or more
3	3088±10	3000 or more

It is necessary to provide a maintenance space above the ultrasonic oscillator.

■ External dimensions (UCH-111)



■ External dimensions (US-2)



50A pole

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

・The support hook is not provided on any cleaner of 1.5 m or less.

No	PARTS	NOTES
(1)	Oscillator cover	AC4C
(2)	Oscillator Case	AC4C
(3)	Conduit	O.DΦ7to12cabel
(4)	Mount 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)

Dimension L and tolerance of the UCH-111 Immersion Type Ultrasonic Cleaner are shown in the table below:

Nominal	Length (mm)	Maintenance space
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

It is necessary to provide a maintenance space above the ultrasonic oscillator.

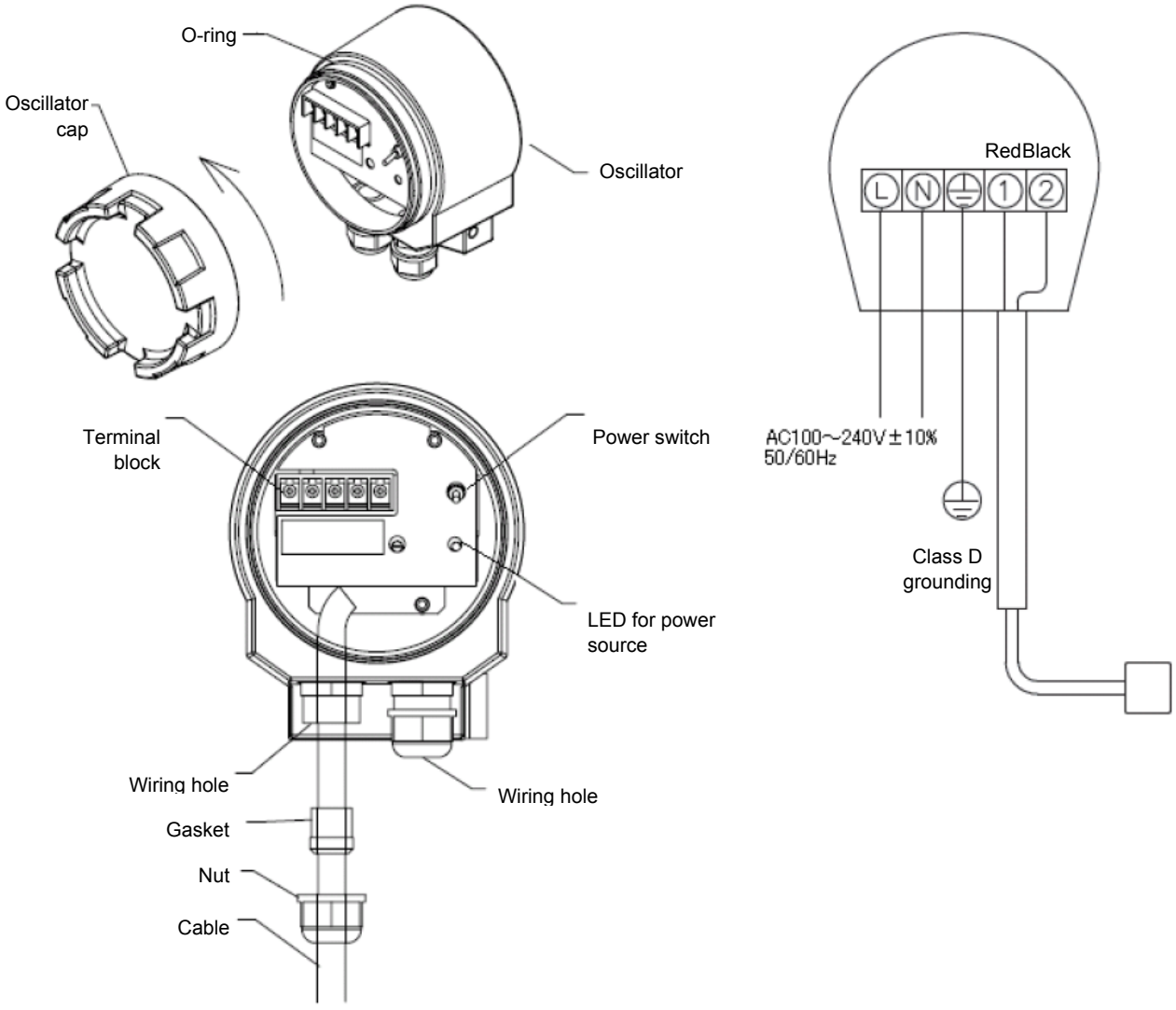
■ Installation (UCH-101)

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

Power source

・The HC-200F has a power switch. Turn OFF the power switch during work.
・Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
・Check that fluctuations of the power supply voltage fall within ±10%.
・Be sure to ground the grounding terminal (class D grounding).
・The applicable cable diameter for the wiring hole is 7 to 12 mm.
・After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.
・The ultrasonic vibrator is already connected to the corresponding terminal.

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



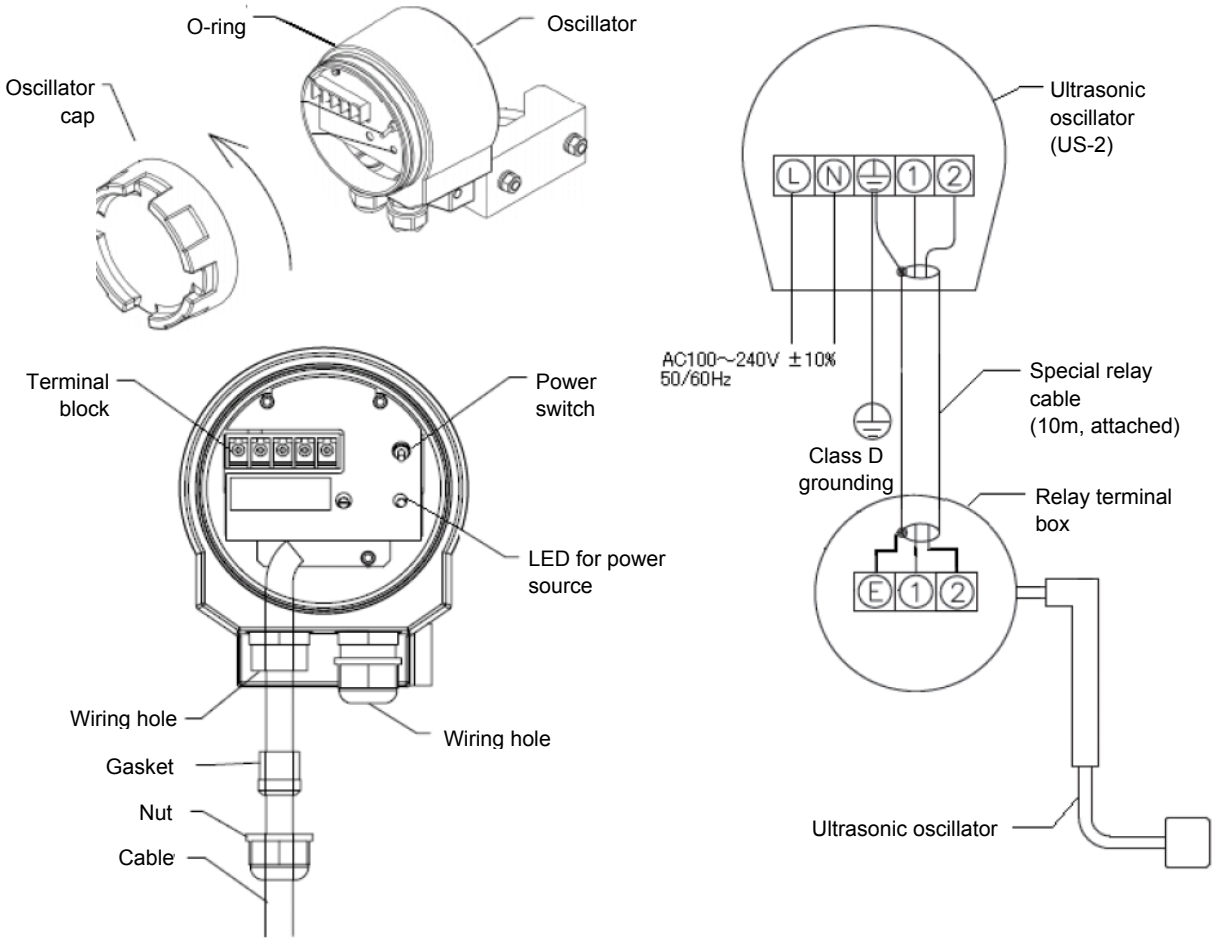
■ Installation (UCH-111)

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

Power source

・The HC-200F has a power switch. Turn OFF the power switch during work.
・Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
・Check that fluctuations of the power supply voltage fall within ±10%.
・Be sure to ground the grounding terminal (class D grounding).
・The applicable cable diameter for the wiring hole is 7 to 12 mm.
・After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.

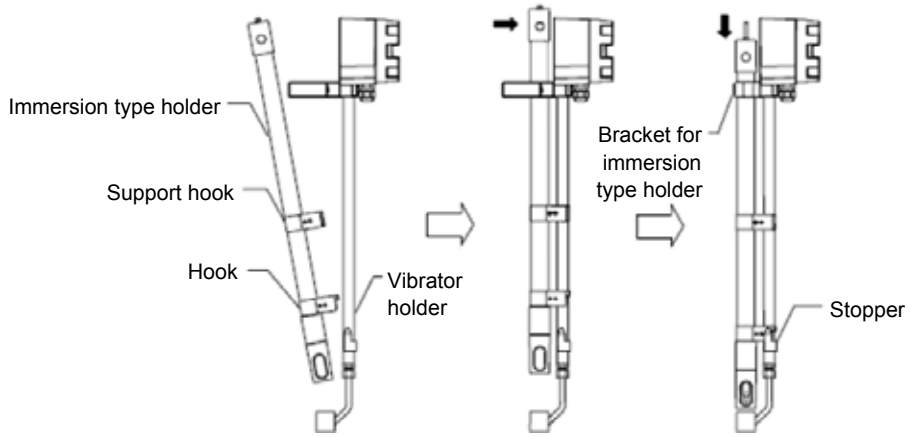
Power supplied	Voltage: 100 to 240 VAC
	Frequency: 50/60 Hz
Applicable electric wire	7 to 12 mm dia.



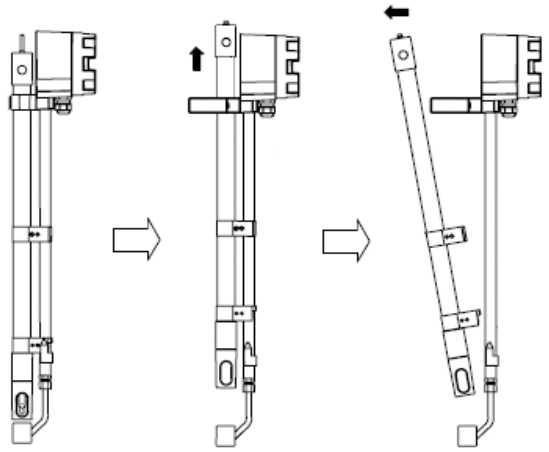
■ Installation (ultrasonic cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation
・Mount and lock the hook on the immersion type holder.
・Slowly lower the hook along the oscillator holder.
・After the hook has been caught by the stopper on the oscillator holder, lock the immersion type holder fitting.

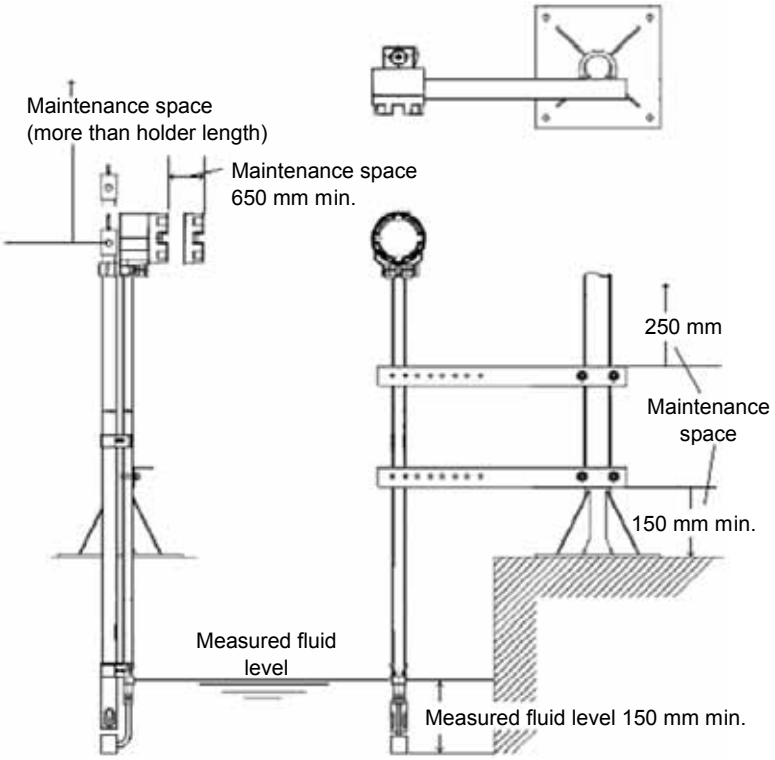


Removal
・Remove the immersion type holder fitting.
・Pull up the immersion type holder.
・Remove the hook and the support hook from the vibrator holder.



■ Installation

Installation environment
・Install the Cleaner at a location where maintenance work can be easily performed.
・Ensure that the installed electrode remains immersed even if the level of the liquid under measurement 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.



H-1 series Immersion Jet Cleaner

JCH-121A

■ Overview

● The UCF-series is used with the fluoride ion electrode (1009) to intermittently clean the electrode with cleaning water and air. Since this cleaner is not provided with a timer, use the timer on the converter to specify cleaning intervals and cleaning duration.

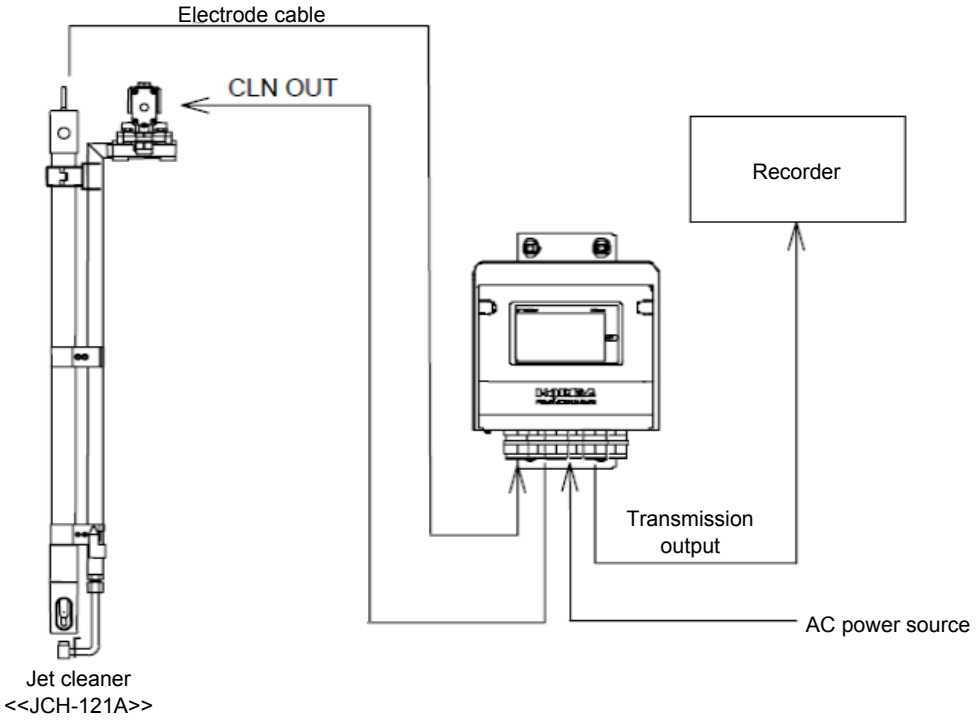
■ Objects

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

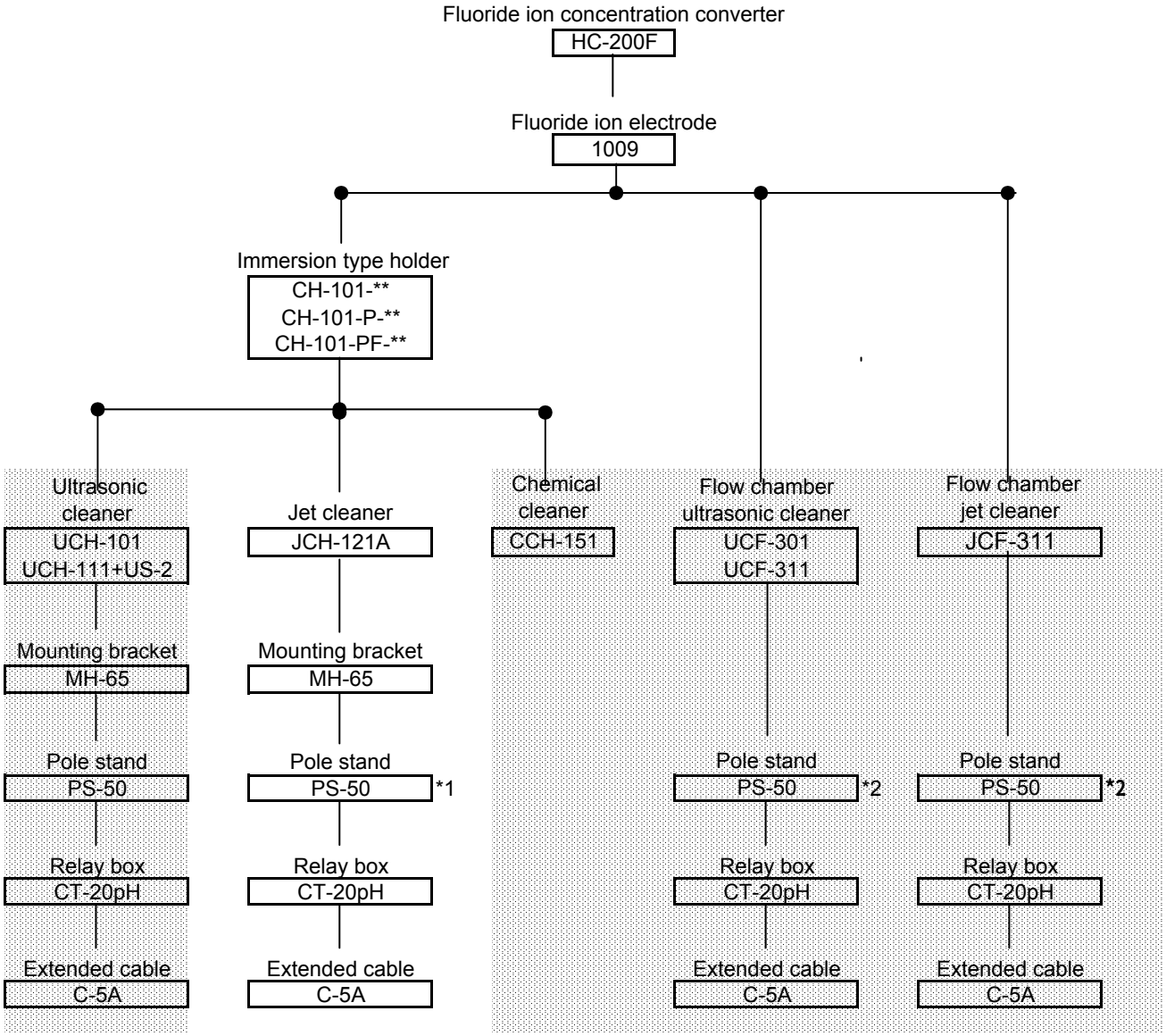
Properties	Objects	
Slime	food, paper, pulp, algae	◎
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment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

⊙:Good ○:Acceptable ×:Not acceptable

■ System configuration



■ Possible combination (immersion type jet cleaner)



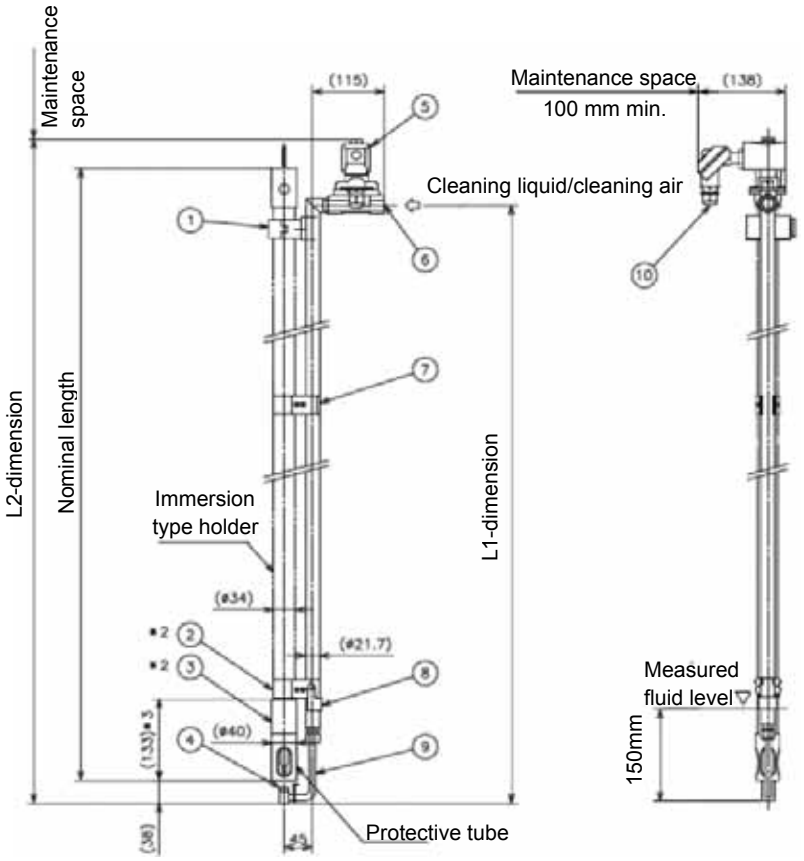
*1: This pole stand is used to attach the converter, the CT-20pH (relay box), and the MH-65 (mounting bracket).
*2: This pole stand is used to attach the converter and the CT-20pH (relay box).

■ Specifications (JCF-121)

Product name		Immersion Type Ultrasonic Cleaner
Model		JCH-121A
Supply Voltage (*1)		100VAC 50/60Hz
Permissible Voltage		90% to 110% of supply voltage
Power consumption		Max. 30VA
Cleaning Method		Intermittent water jet/air jet cleaning
Ambient Temperature		-5 to 50°C
Ambient Humidity		Relative humidity of 5% to 90% (without dew condensation)
Measured Liquid (*2)		-5°C to 80°C (without dew condensation)
Flow Velocity of Measured Liquid		2 m/sec. max.
Pressure of fluid under		Atmospheric pressure
Cleaning pressure	Water	0.05 MPs to 0.5MPs (consumption: approx. 4L/min)(*3)
	Air	0.05MPs to 0.2MPs(consumption: approx. 90L/min)
Connection hole diameter for c		Rc 1/2
Wetted material		SUS316, FKM (not including an electrode and
Weight		Approx. 3.5kg (holder length of 1.0 m)
International protection code		IP54 (IEC60529, JIS C0920) (Category 2)
Special Note		This Product does not come with electrodes and

*1: The power supply voltage of 200 VAC is available optionally. For any other power supply voltage, contact us.
*2: The operating temperature range differs depending on the combined electrode and holder. Check the specification temperature for each product.
*3: The water supply law prohibits supplying tap water directly from waterworks for use as cleaning water.
Use a tap water pressurization device to insulate your line from the general tap water pipe. If cleaning water might be frozen, If cleaning water might be frozen, install thermally insulated piping.

■ External dimensions (JCH-121A)



No	PARTS	NOTES
(1)	Bracket for immersion type holder	PVC
(2)	Hook	SUS316
(3)	Spacer	PP
(4)	Nozzle	SUS316
(5)	Solenoid valve	
(6)	Cleaning water/air inlet	Rc1/2
(7)	Support hook	SUS316
(8)	Stopper	SUS316
(9)	Nozzle holder	SUS316
(10)	Conduit	O.D Φ7toΦ12cable

・The support hook is not provided on any cleaner of 1.5 m or less.

Dimension L and tolerance of JCH-121 Immersion Type Jet Cleanerare shown in the table below:

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

Unit: mm

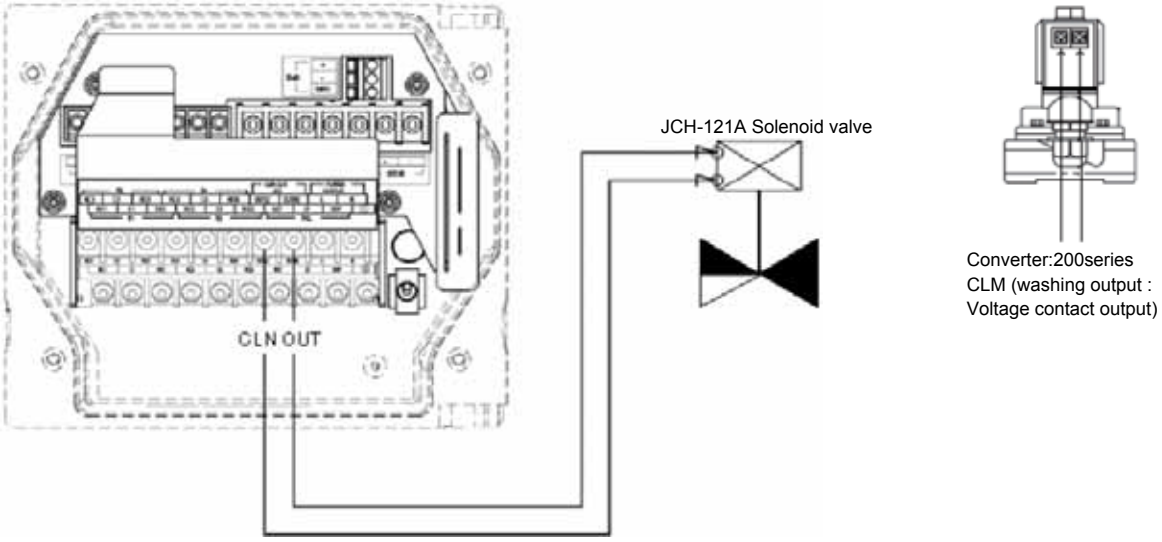
The maintenance space is required above the solenoid valve.

■ Installation (JCH-121A) (connections)

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

Connections
・Be sure to ground the grounding terminal (class D grounding).
・The applicable cable diameter for the wiring hole is 7 to 12 mm.
・The CLN OUT terminal on the converter outputs voltage in accordance with the specification.

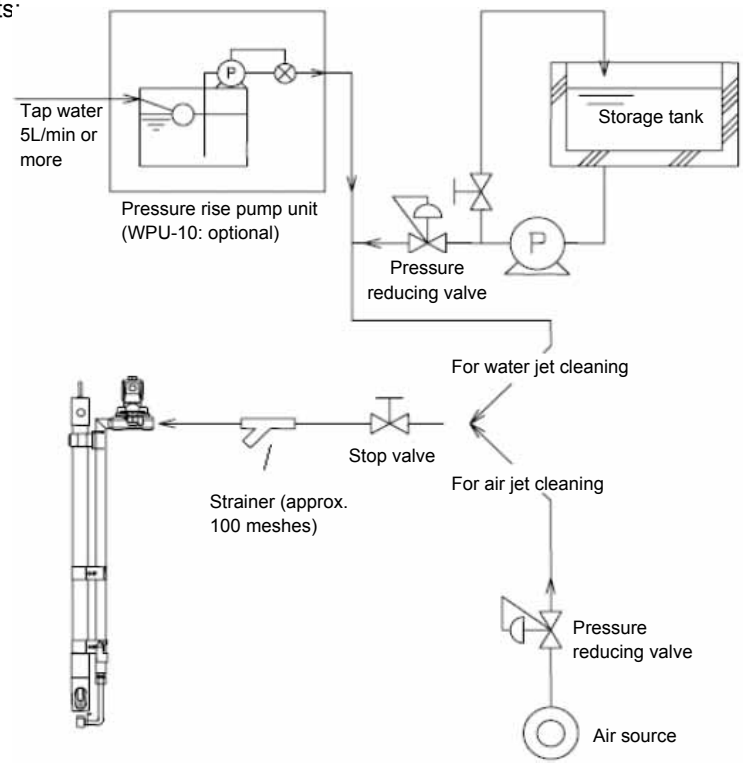
Applicable electric wire	Φ7 to Φ12 mm dia., 0.75 mm^2 min.



■ About installation (JCH-121A) - (piping)

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

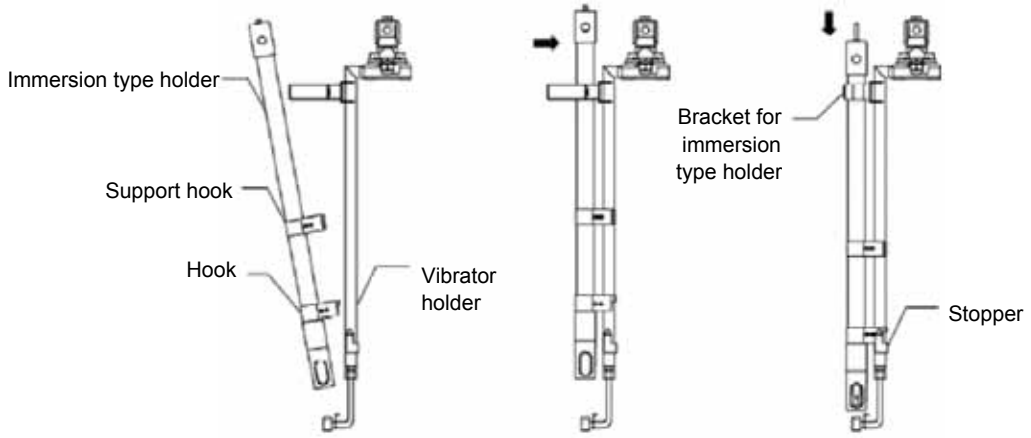
Piping
・Since the Cleaner may be detached for a maintenance purpose, use a flexible pipe that can allow enough room for its length.
・Before connecting a pipe to the Cleaner, be sure to pour water into the pipe to flush garbage inside the pipe.
・With the regulator, adjust the cleaning water to a specified pressure.
・The water supply law prohibits supplying tap water directly from waterworks for use as cleaning water. Use a method of temporarily receive tap water in a water tank or the like and then pressurize the tap water with a pump. However, tap water may be directly connected when your original industrial water (tertiary treatment water) is used. Even tap water may be connected if supplied through a rooftop tank and insulated.



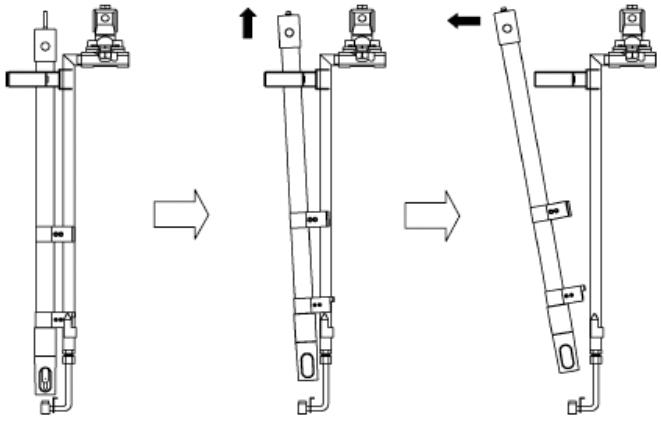
■ Installation (jet cleaner and holder)

Carry out installation and execution of work as illustrated below:

Installation
・Mount and lock the hook on the immersion type holder.
・Slowly move down the hook along the nozzle holder.
・After the hook has been caught by the stopper on the oscillator holder, lock the immersion type holder fitting.

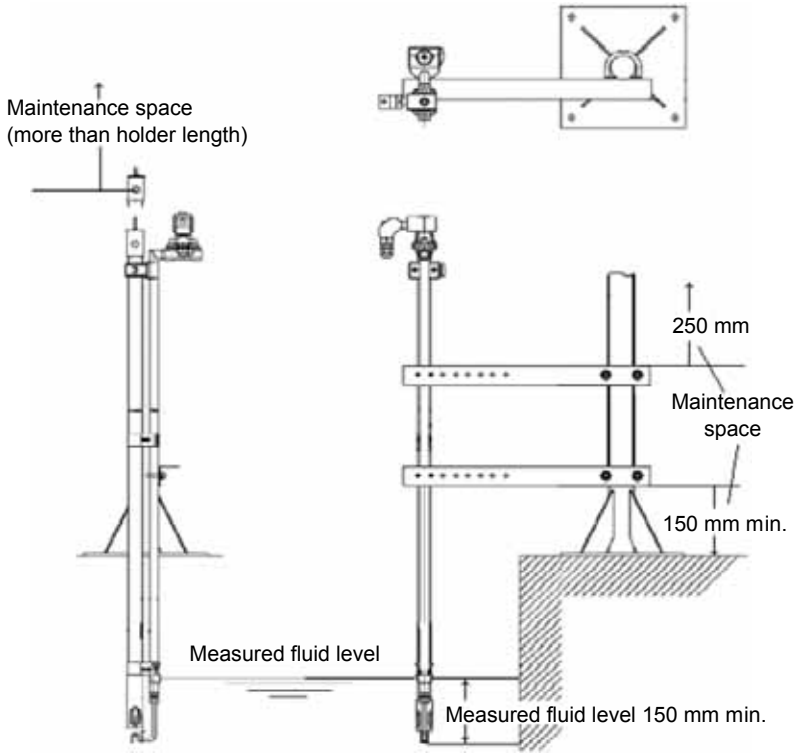


Removal
Remove the bracket for the immersion type holder.
Moves up the immersion type holder.
Remove the hook and the support hook from the vibrator holder.



■ Installation

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



Flow chamber ultrasonic cleaner for H-1 series

UCF-series

■ Overview

● The UCF-series is used with the fluoride ion electrode (1009) to remove foreign matter from the electrode or to prevent foreign matter 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).

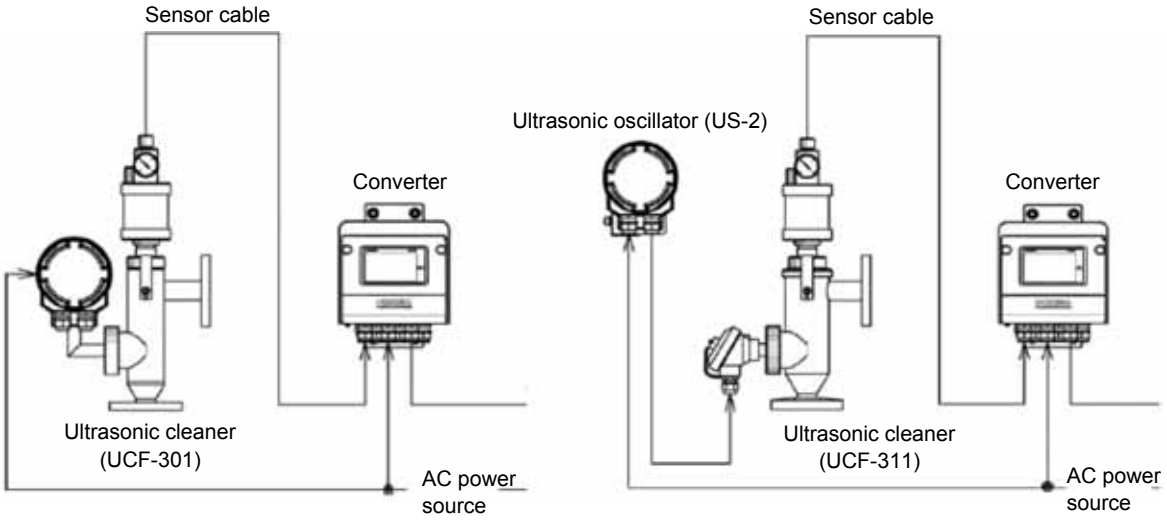
■ Objects

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

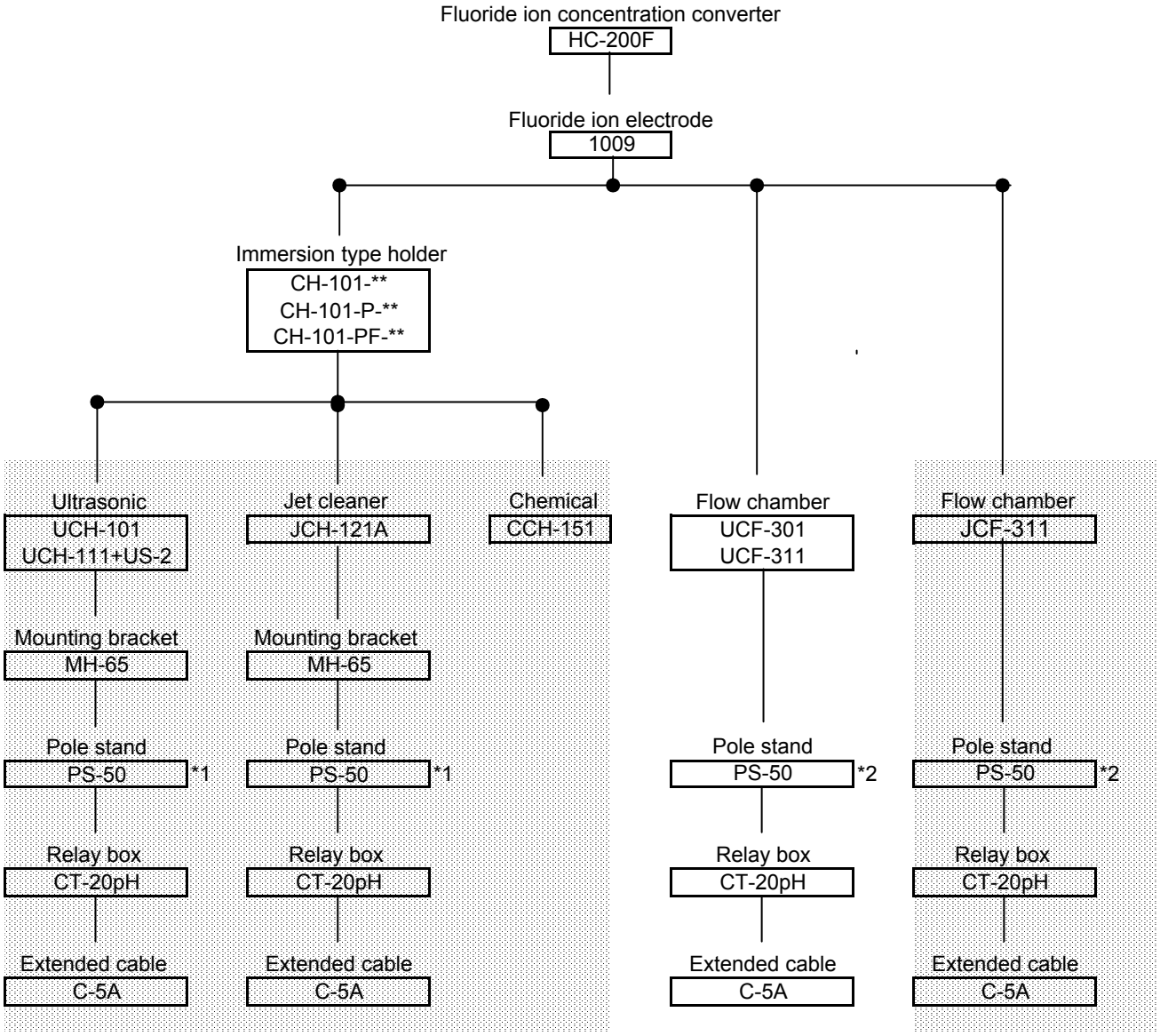
Properties	Objects	
Slime	food, paper, pulp, algae	○
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	×
Suspended Matters	earth and sands	◎
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment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

⊙:Good ○:Acceptable ×:Not acceptable

■ System configuration



■ Combinations (flow chamber ultrasonic cleaner)



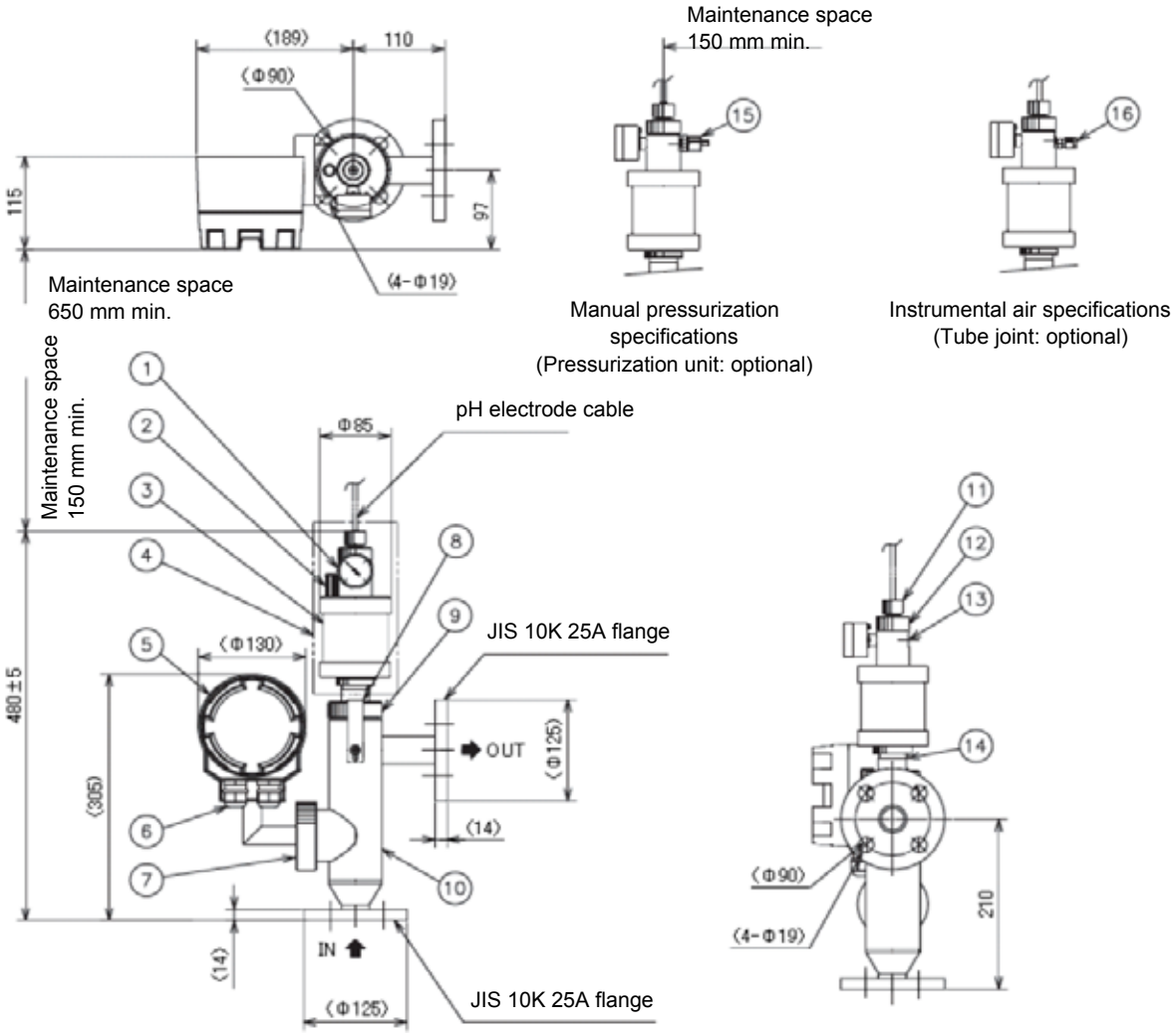
*1: This pole stand is used to attach the converter, the CT-20pH (relay box), and the MH-65 (mounting bracket).
*2: This pole stand is used to attach the converter and the CT-20pH (relay box).

■ Specifications (UCF-301/UCF-311)

Product name		Ultrasonic cleaner for flow chamber	Ultrasonic cleaner for flow chamber
Model		UCF-301	UCF-311
Ambient Temperature		-5 to 50°C	
Ambient Humidity		Relative humidity of 5% to 90% (without dew	
Conditions for measurement solution	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	
SUS316, PP, FKM (not		SUS316, PP, FKM (not including an electrode	
Supply Voltage		100-240VAC 50/60Hz	
Permissible Voltag		90% to 110% of supply voltage	
Power consumption		10VA	
Cleaning Method		Ultrasonic wave continuous irradiation syste	
Control System		Burst system by oscillation time control	
Oscillation Frequency		Approx. 70kHz	
Oscillator Case	International protection code	IP54 (IEC60529, JIS C0920) (Category 2)	
	Material	AC4C	
	Finish	Epoxy degenerated melamine resin painting	
Bore diameter connected for		JIS 10K 25A FF flange	
Pressurizing Inlet for Holder's		Rc1/8	
Weight		Approx. 7.0kg	Oscillator : Approx. 2.0 kg
Special Note		If periodical pressurization is manually performed, separately place a purchase order for optional parts: pressurizing inlet and hand pump. ・Holders are detached at the time of maintenance. So use a flexible pipe for instrument air. ・Provide a regulator with a mist cap and a filter to an instrument air line. ・This Product is supplied with holders, but electrodes are not supplied.	

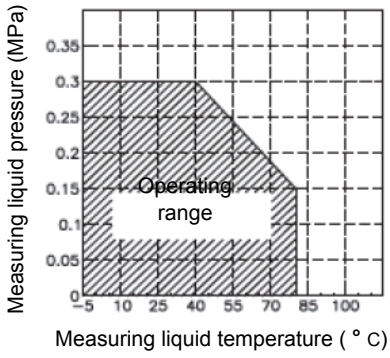
*1: The operating temperature range differs depending on the combined electrode and holder. Check the specification temperature for each product.
*2: If your sample has any property (e.g. alkalinity) of damaging FKM (fluoro-rubber), contact us.
*3 Maintain a pressure in the Pressurizing Holder at the level of 0.03 MPa to 0.05 MPa higher than a measured liquid pressure at all times.

■ External dimensions (UCF-301)

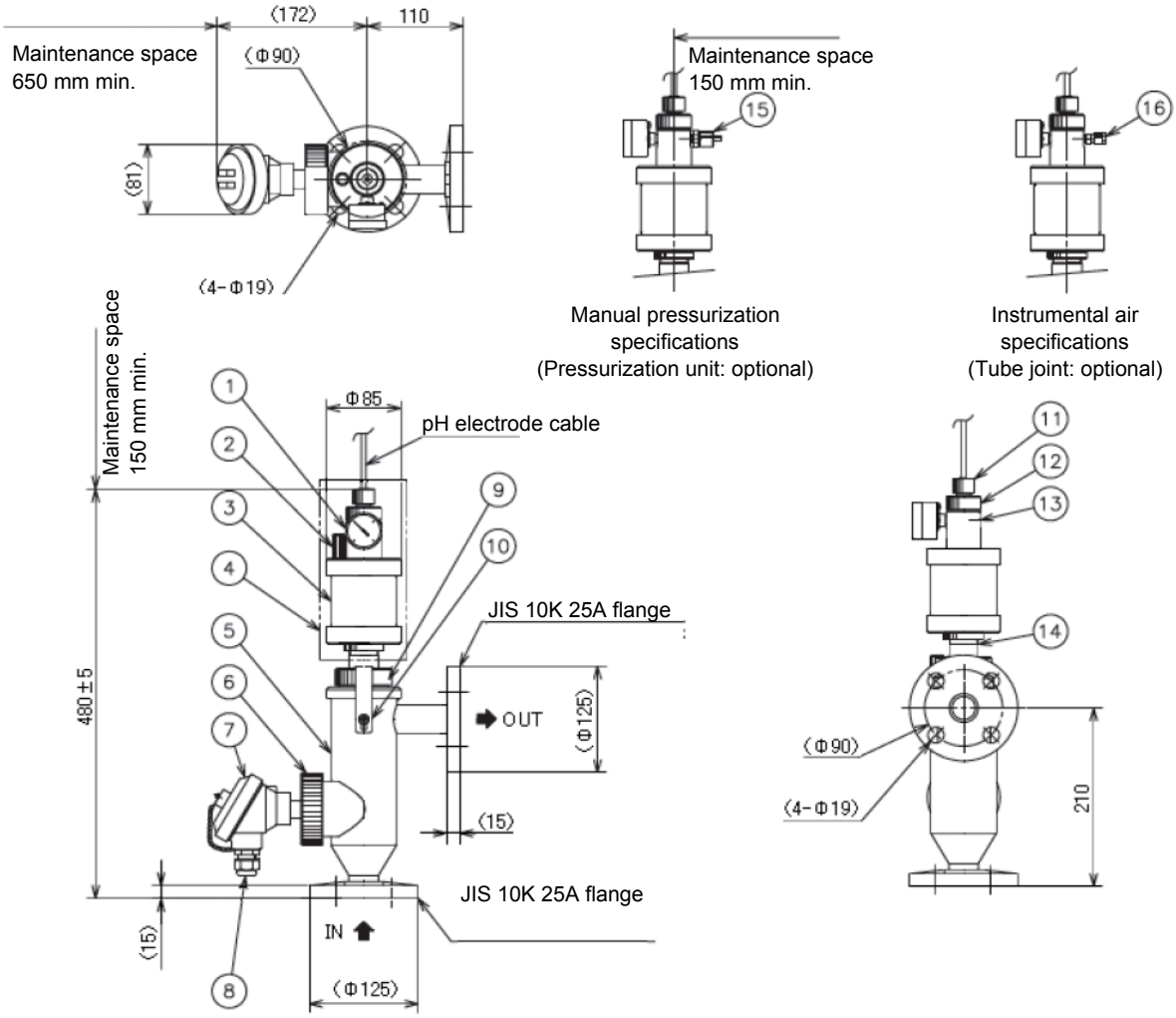


	PARTS	NOTES
(1)	Pressure gauge	0 MPa to 0.5 Mpa SUS304
(2)	KCl inlet	PVC
(3)	KCl tank	PVC
(4)	Pressure holder	
(5)	Ultrasonic oscillato	AC4C
(6)	Piping slot	O.DΦ7to12cabel
(7)	Vibration mounting nut	SUS304
(8)	Lock plate	SUS304
(9)	Tightening nut	SUS304
(10)	Distribution holder	SUS316
(11)	Cable cap	PPO
(12)	Holder cap	PPO
(13)	Pressure mating screw	Rc1/8
(14)	Holder	PP
(15)	Pressurizing unit	C3604 optionally available
(16)	Fitting	for tube PVDF of 6 mm optionally available

Relation between temperature and pressure

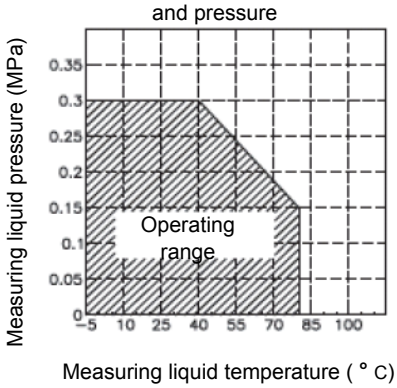


■ External dimensions (UCF-311)



	PARTS	NOTES
(1)	Pressure gauge	0 MPa to 0.5 Mpa SUS304
(2)	KCl inlet	PVC
(3)	KCl tank	PVC
(4)	Pressure holder	
(5)	Distribution holder	PPO
(6)	Vibration mounting nut	PP
(7)	Relay box	AI
(8)	Conduit	Cable with o.d. of 7 to 12 mm
(9)	Tightening nut	PP
(10)	Lock plate	SUS316
(11)	Cable cap	PPO
(12)	Holder cap	PPO
(13)	Pressure mating screw	Rc1/8
(14)	Holder	PPO
(15)	Pressurizing unit	C3604 optionally available
(16)	Fitting	for tube PVDF of 6 mm optionally available

Relation between temperature and pressure



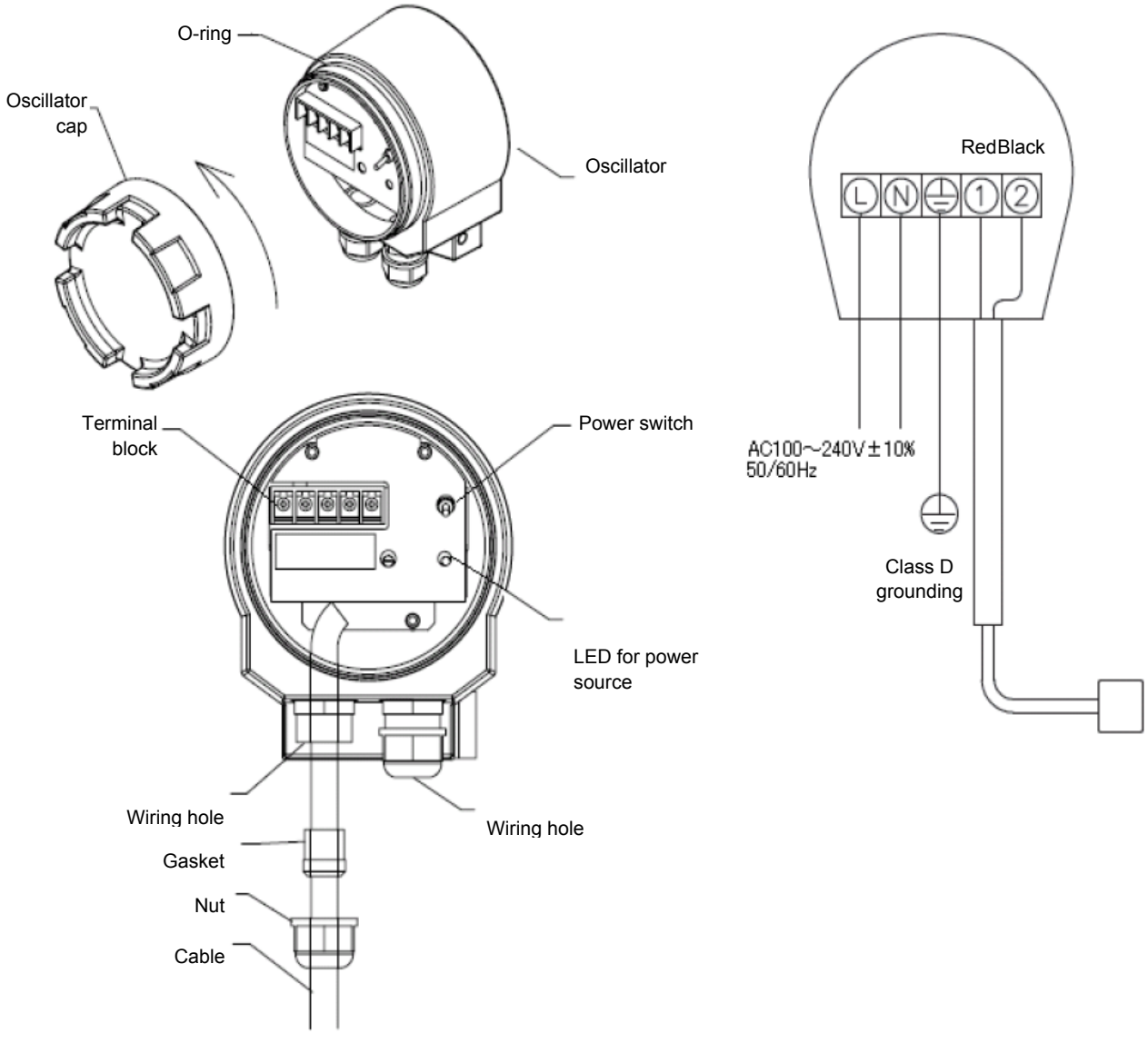
■ Installation (UCH-301) (connections)

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

Power source

・The HC-200F has a power switch. Turn OFF the power switch during work.
・Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
・Check that fluctuations of the power supply voltage fall within ±10%.
・Be sure to ground the grounding terminal (class D grounding).
The applicable cable diameter for the wiring hole is 7 to 12 mm.
・After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.
・The ultrasonic vibrator is already connected to the corresponding terminal.

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



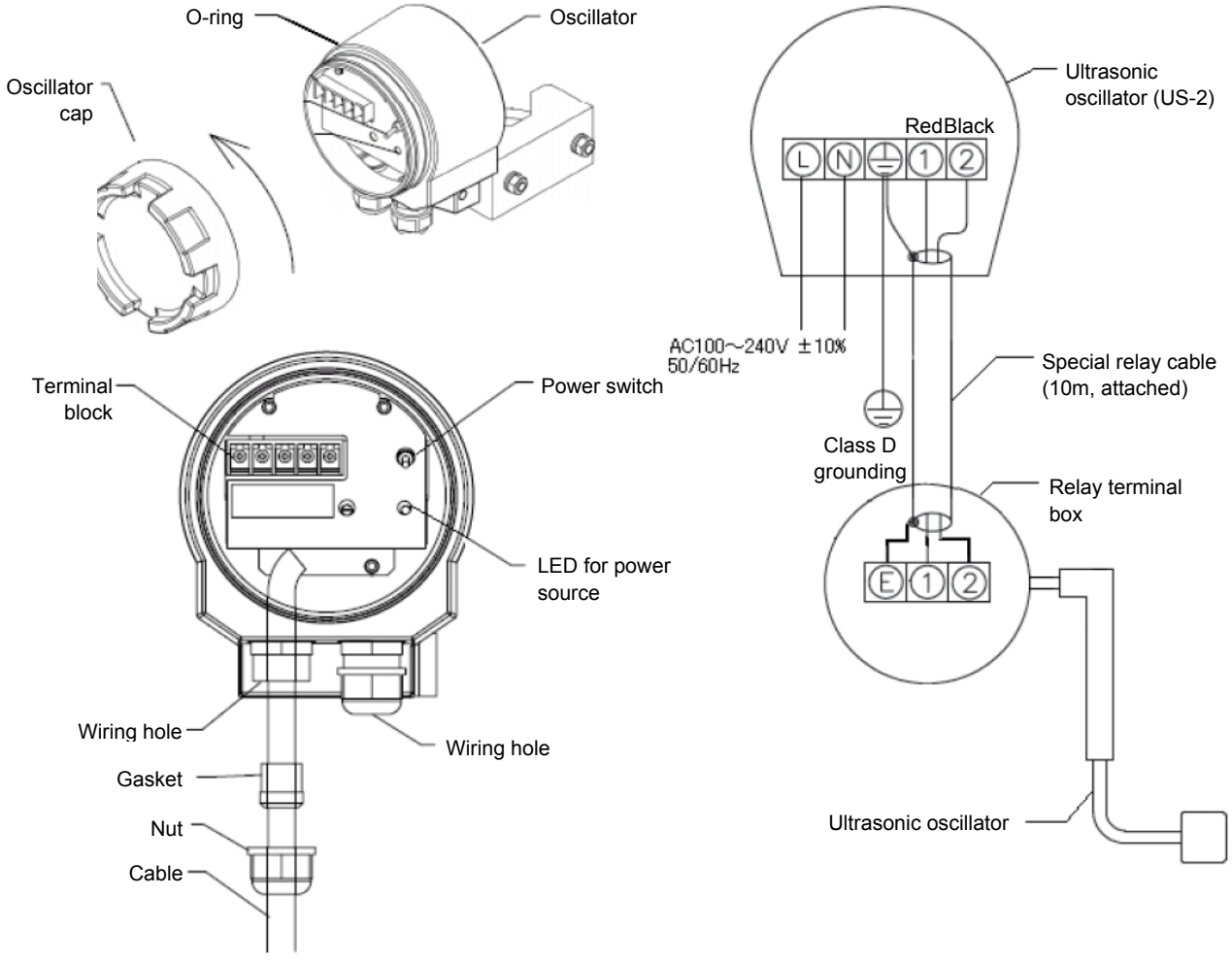
■ Installation (UCF-311) (connections)

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

Power source

・The HC-200F has a power switch. Turn OFF the power switch during work.
・Operation outside the rated range can cause a fault. Therefore, check the power supply voltage.
・Check that fluctuations of the power supply voltage fall within ±10%.
・Be sure to ground the grounding terminal (class D grounding).
The applicable cable diameter for the wiring hole is 7 to 12 mm.
・After the work has been finished, be sure to put the oscillator cap to prevent electric shocks during operation.

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



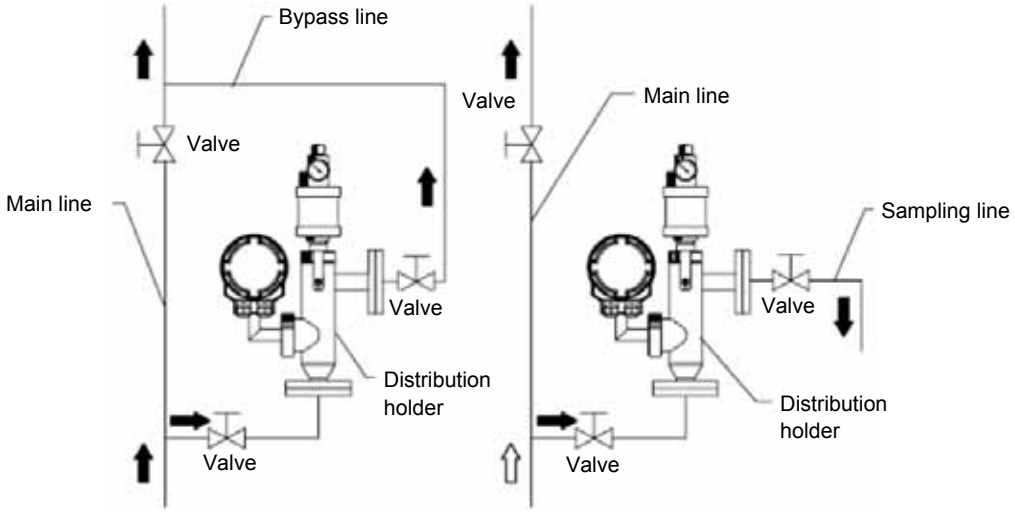
■ Installation (UCF-301)

Be sure to following the following instructions for setup.

Installation environment

・Install the flow chamber at a location where maintenance work can be easily performed.
・Allow a maintenance space of 15 cm above the pressure type holder. Allow for the electrode cable so that the UCF-301 can be removed.
・Avoid installing the flow chamber 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 flow chamber at a location exposed to corrosive liquid or gas.

・Avoid installing the flow chamber 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 use the pressure type holder on the main line. Be sure to provide a bypass line or a sampling line. (Maintenance cannot be performed unless the main line is stopped.)



Piping

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

If the flow rate of the solution under measurement is too fast, the occurrence of capitation or the pressure applied by the flow velocity to the liquid junction of the electrode may cause the readout to fluctuate. If the flow rate is too slow, the readout will be delayed. Therefore, adjust the flow rate in accordance with the conditions for the solution under measurement.
If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the flow chamber. See Fig. 2.

Fig. 1

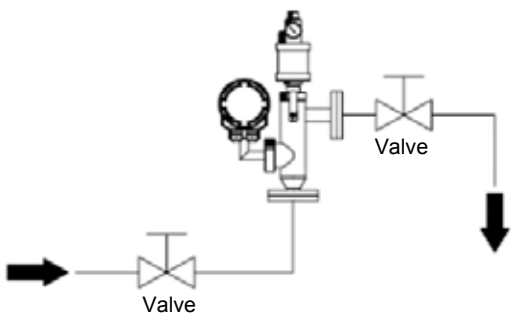
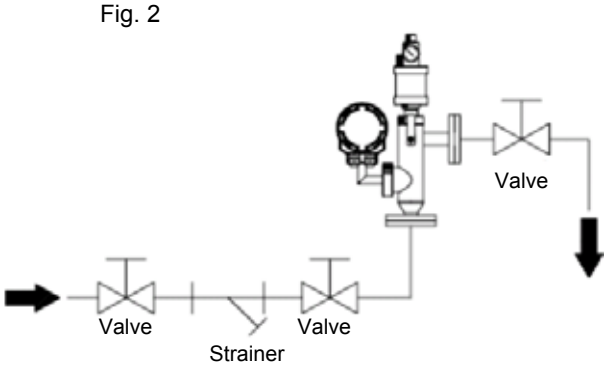
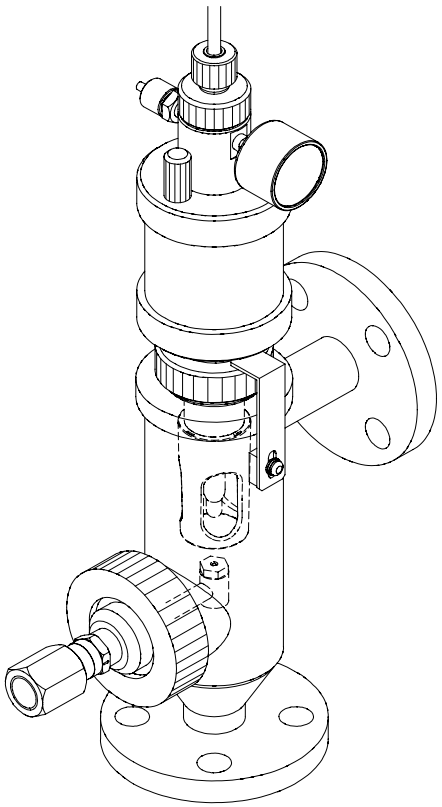


Fig. 2



Flow chamber jet cleaner for H-1 series

JCF-311



■ Overview

● The UCF-series is used with the fluoride ion electrode (1009) to remove foreign matter from the electrode or to prevent foreign matter from adhering to the 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 use of the timer unit allows you to specify cleaning intervals and cleaning duration.
This Jet Cleaner is comparatively effective against the following objects.
However, its effect differs with various conditions and is not guaranteed.

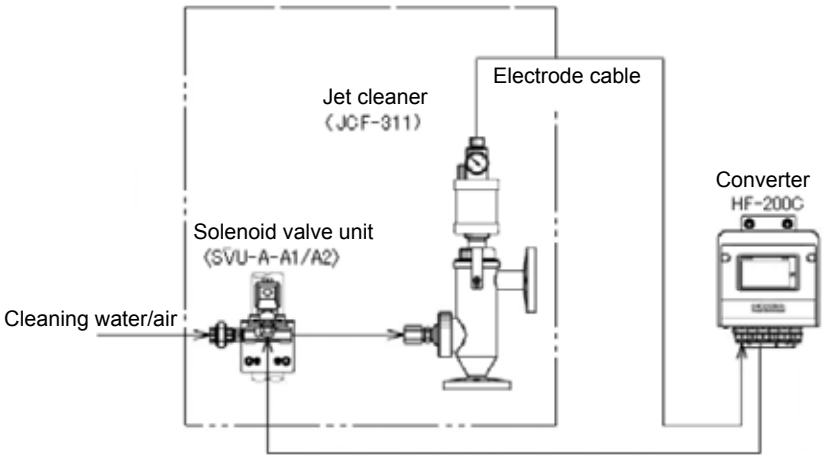
■ Objects

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

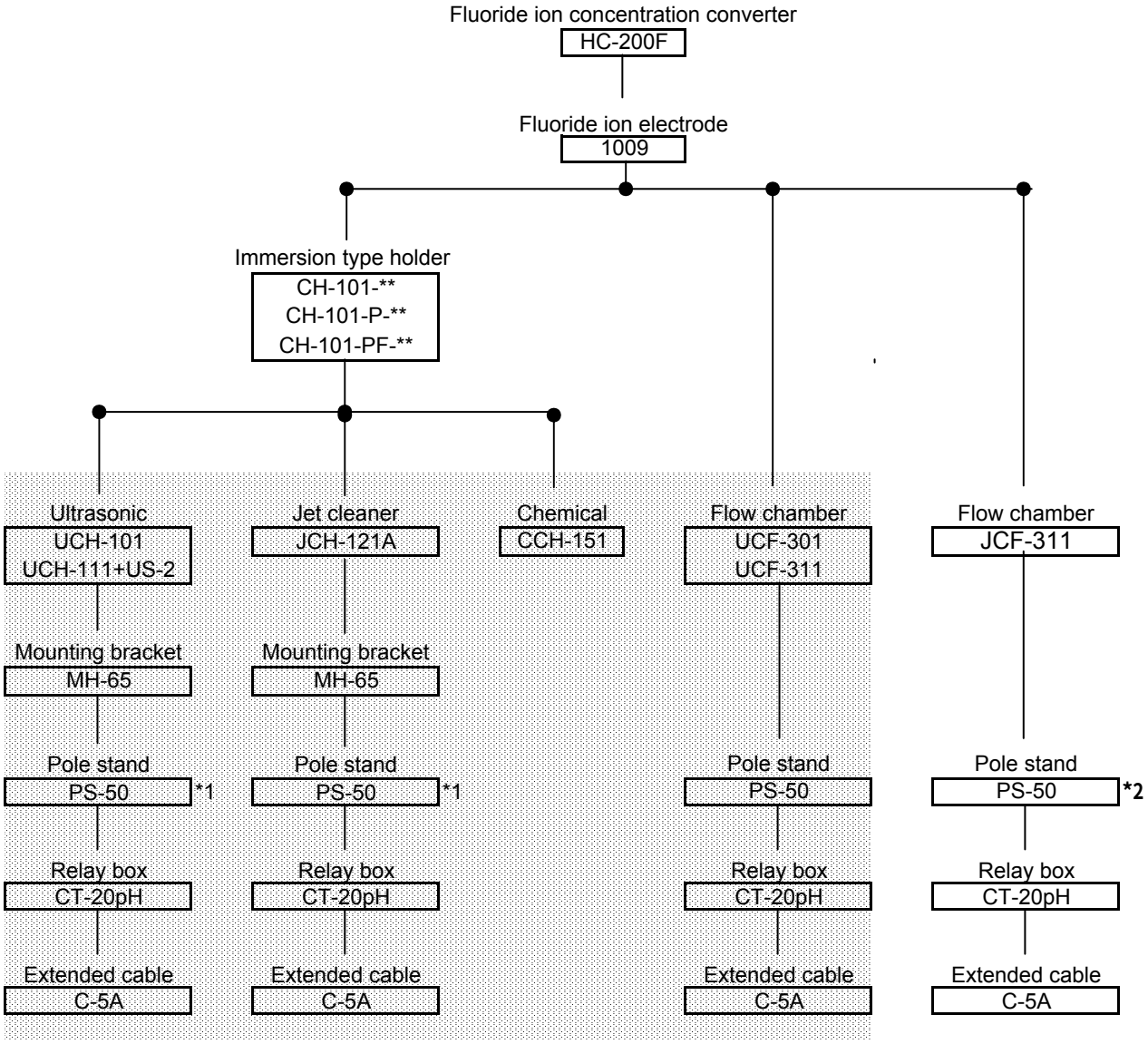
Properties	Objects	
Slime	food, paper, pulp, algae	◎
Microorganism	bacteria (activated sludge), slag	◎
Oily	tar, heavy oil	×
	light oil	○
	fatty acid, amine	○
Suspended Matters	earth and sands	○
	metallic minute powder	○
	clay, calcareous	○
Scale	coagulated deposit and neutralized effluent treatment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

⊙: Good ○ : Acceptable ×:Not acceptable

■ System configuration



■ Combinations (Flow Chamber Ultrasonic Cleaner)



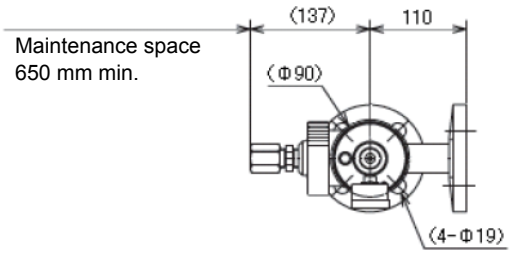
*1: This pole stand is used to attach the converter, the CT-20pH (relay box), and the MH-65 (mounting bracket).
*2: This pole stand is used to attach the converter and the CT-20pH (relay box).

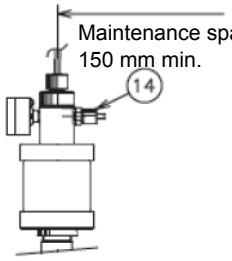
■ Specifications (JCF-311)

Product name		Flow-through type jet cleaner (timer unit separated type)
Model		JCF-311
Ambient Temperature		-5 to 50°C
Ambient Humidity		Relative humidity of 5% to 90%
Conditions for measurement solution	Temperatur	-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	0.3~10L/min
SUS316, PP, FKM (not		SUS316, PP, FKM (not including an electrode
Cleaning pressure		Water/air: 0.05 MPa to 0.5 MPa (*3) Adjust a cleaning pressure to a measured liquid pressure + 0.05 MPa to 0.2 MPa.
Connection hole diameter for		Rc1/2
Bore diameter connected for		JIS 10K 25A FF flange
Pressurizing Inlet for Holder's		Rc1/8
Weight		Approx. 3.0kg
Special Note		If periodical pressurization is manually performed, separately place a purchase order for optional parts: pressurizing inlet and hand pump. Holders are detached at the time of maintenance. So use a flexible pipe for instrument air. Provide a regulator with a mist cap and a filter to an instrument air line. This Product is supplied with holders, but electrodes are not supplied.

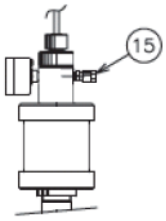
*1: The operating temperature range differs depending on the combined electrode. Check the specification temperature of the electrode.
Moreover, a measured liquid in a frozen state cannot be measured.
*2 For the sample properties that affect FKM (fluorine rubber) (strong alkali, etc.), please consult with HORIBA Advanced Techno.
*3 If tap water is used as cleaning water, it is prohibited under the Water Supply Law to supply cleaning water directly from a tap water pipe.
Moreover, if cleaning water may be frozen, provide heat insulated piping against warm and cold weather.
*4 Maintain a pressure in the Pressurizing Holder at the level of 0.03 MPa to 0.05 MPa higher than a measured liquid pressure at all times.

■ External dimensions (JCF-311)

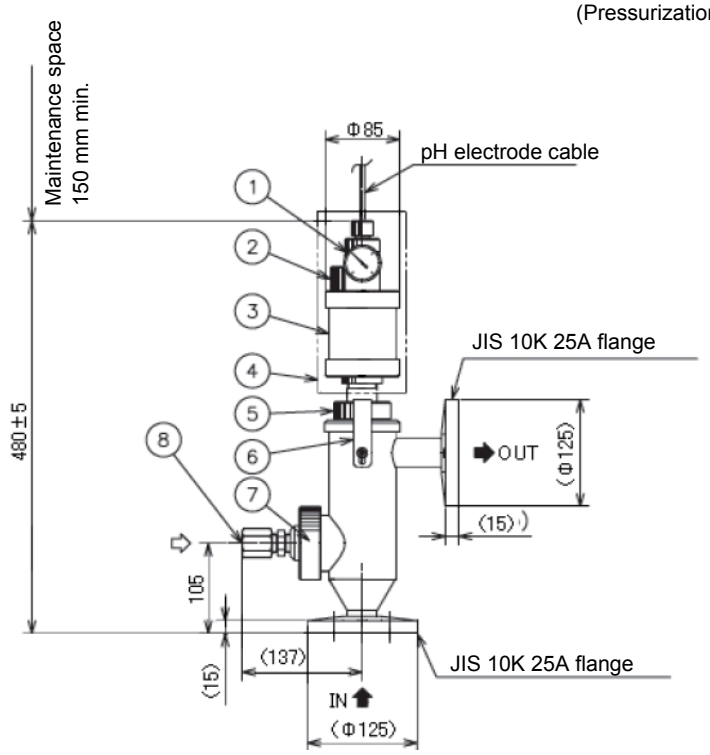


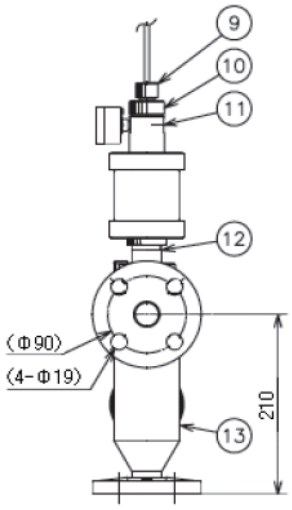


Manual pressurization specifications
(Pressurization unit: optional)



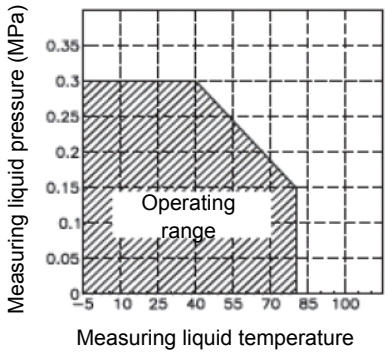
Instrumental air specifications
(Tube joint: optional)





	PARTS	NOTES
(1)	Pressure gauge	0 MPa to 0.5 Mpa SUS304
(2)	KCl inlet	PVC
(3)	KCl tank	PVC
(4)	Pressure holder	
(5)	Tightening nut	PP
(6)	Lock plate	SUS304
(7)	Nozzle mounting nut	PP
(8)	Cleaning water/air inlet	Rc1/2
(9)	Cable cap	PPO
(10)	Holder cap	PPO
(11)	Pressure mating screw	Rc1/8
(12)	Holder	PP
(13)	Distribution holder	PP
(14)	Pressurizing unit	C3604 optionally available
(15)	Fitting	for tube PVDF of 6 mm o.d./4 mm i.d. optionally available

Relation between temperature and pressure



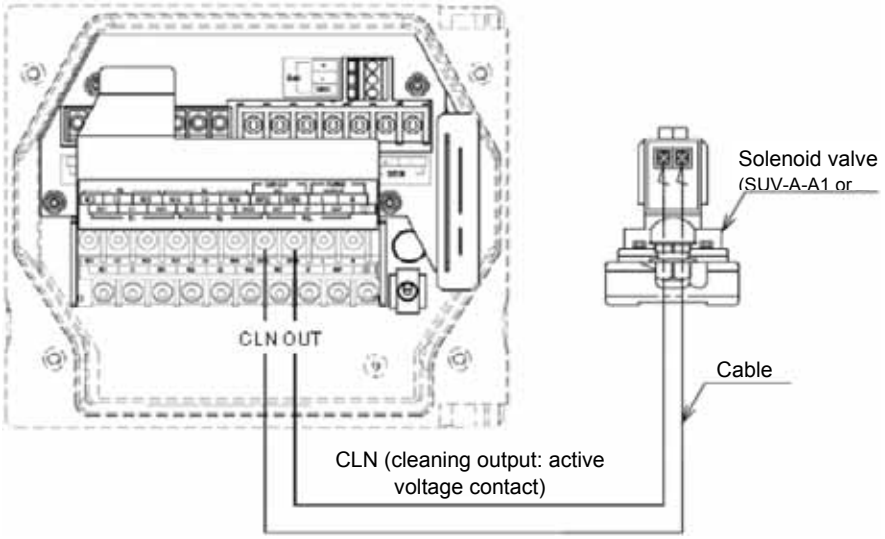
■ Installation (JCF-311) (connections)

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

Connections

・Be sure to ground the grounding terminal (class D grounding).
・The applicable cable diameter for the wiring hole is 7 to 12 mm.
・The connected power supply voltage is output from the CLN OUT terminal on the converter.

Applicable electric wire	Φ7 to Φ12 mm dia., 0.75 mm2 min.



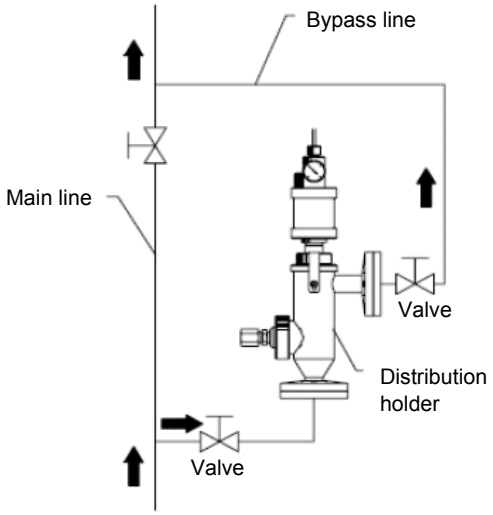
■ Installation (JCF-311) (piping)

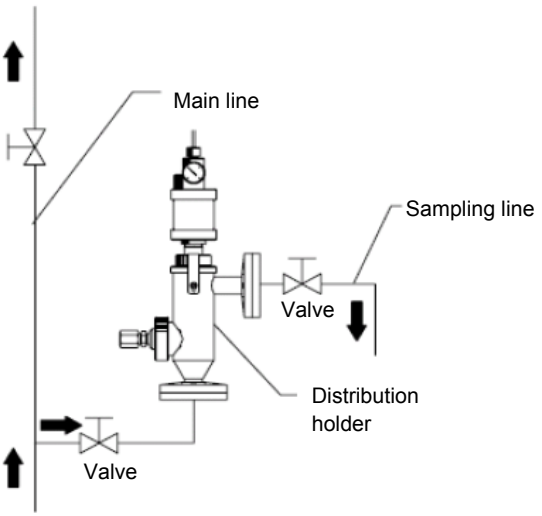
Carry out the installation of execution of work while paying attention to the following points:

Installation environment

・Install the flow chamber at a location where maintenance work can be easily performed.
・Allow a maintenance space of 15 cm above the pressure type holder. Allow for the electrode cable so that the UCF-301 can be removed.
・Avoid installing the flow chamber 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 flow chamber at a location exposed to corrosive liquid or gas.

・Avoid installing the flow chamber 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 use the pressure type holder on the main line. Be sure to provide a bypass line or a sampling line. (Maintenance cannot be performed unless the main line is stopped.)





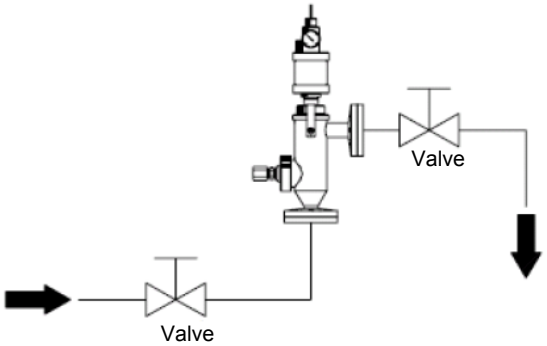
Piping

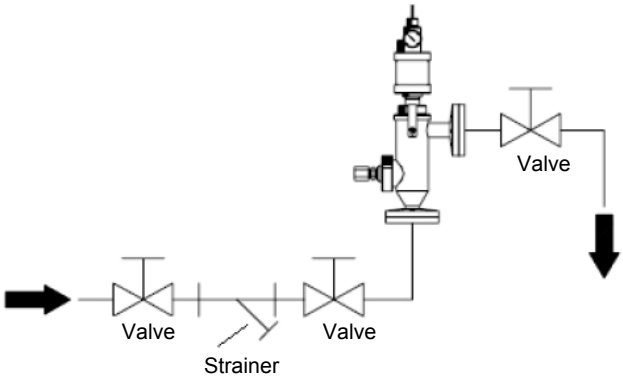
For installation of the flow chamber, provide a bypass line from the main line so that the measured liquid flows into the bottom side of the flow chamber and flows out of the lateral side of the flow chamber.
Be sure to provide valves on the inflow and outflow sides respectively.
See Fig. 1.

If the flow rate of the solution under measurement is too fast, the occurrence of capitation or the pressure applied by the flow velocity to the liquid junction of the electrode may cause the readout to fluctuate. If the flow rate is too slow, the readout will be delayed. Therefore, adjust the flow rate in accordance with the conditions for the solution under measurement.

Fig. 1

Fig. 2



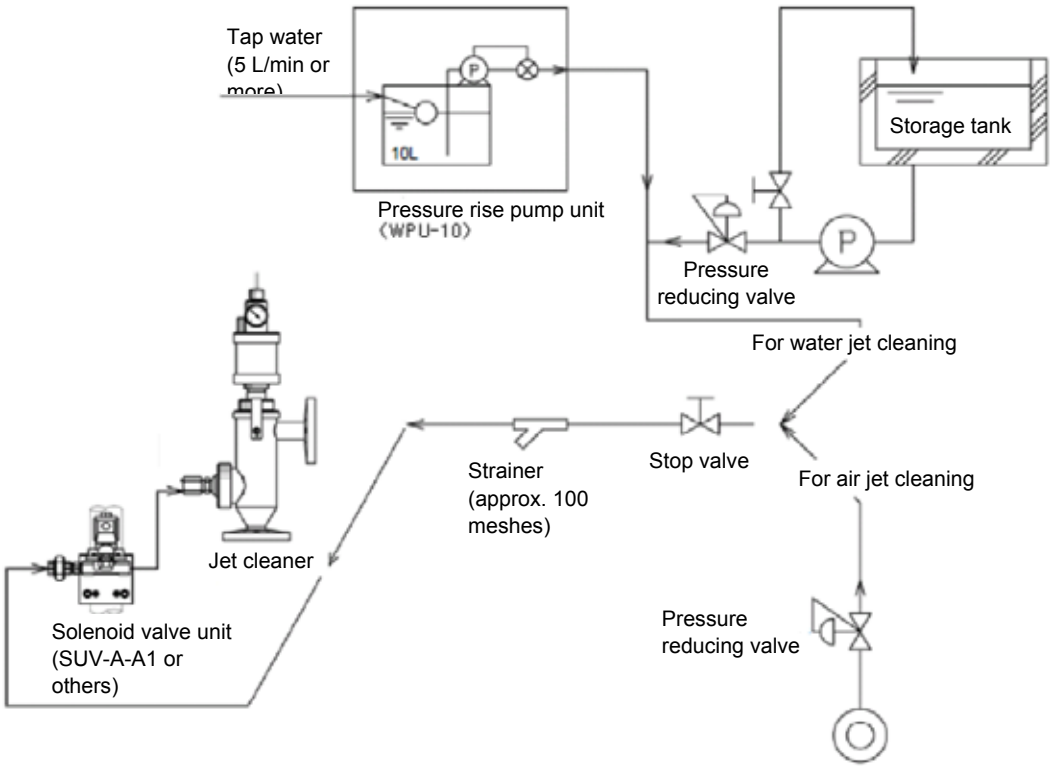


■Installation (JCF-311) (piping)

Be sure to following the following instructions for setup.

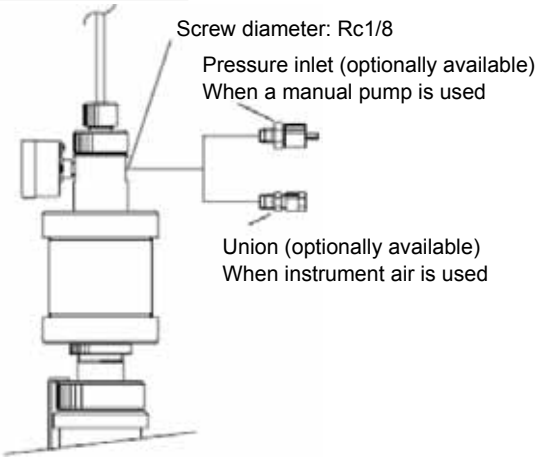
Piping

・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.
・The water supply law prohibits supplying tap water directly from waterworks for use as cleaning water. Use a method of temporarily receive tap water in a water tank or the like and then pressurize he tap water with a pump.
However, tap water may be directly connected when your original industrial water (tertiary treatment water) is used. Even tap water may be connected if supplied through a rooftop tank and insulated.



Pressurized piping

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



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