

H-1series MLSS meter
HU-200SS



Over view

This instrument consists of the HU-200SS converter and the SS-90 immersion type detector. A wide range of suspended solids - 0-20000 mg/L - are measured with excellent reproduction using the near-infrared transmitting method. Calibration curves for three standard suspended solid agents - MLSS, clay (inorganic sludge) and Kaolin can be selected. Select MLSS for activated sludge processing tanks, clay for sedimentation processing of construction sludge and Kaolin for white sludge to obtain concentrations closer to the analysis value. The censor head (end) of the SS-90 detector is made from an impurity-resistant PFA resin. The light source and detector are attached to the two corners of the censor head so that they face each other, and the concentration is converted from the attenuation of the transmitted light occurring in the approximately 7 mm gap. The amount of light from the light source is monitored using a reference photo detector, and the ratio of this to the transmitted light signal is calculated to correct fluctuations in light intensity. The near-infrared LED light sources flash at approximately 10 Hz and the signal difference between the lit and unlit state is extracted to cancel out influences from light in the surrounding area. Continuous sensitivity correction is not required, as the transmitting method has a steady span sensitivity. Usually, only zero calibration is performed periodically. Self-diagnosis capabilities are used to continuously diagnose the status of the instrument and output any errors.

Measur ement Tar get

MLSS inside an activated sludge tan

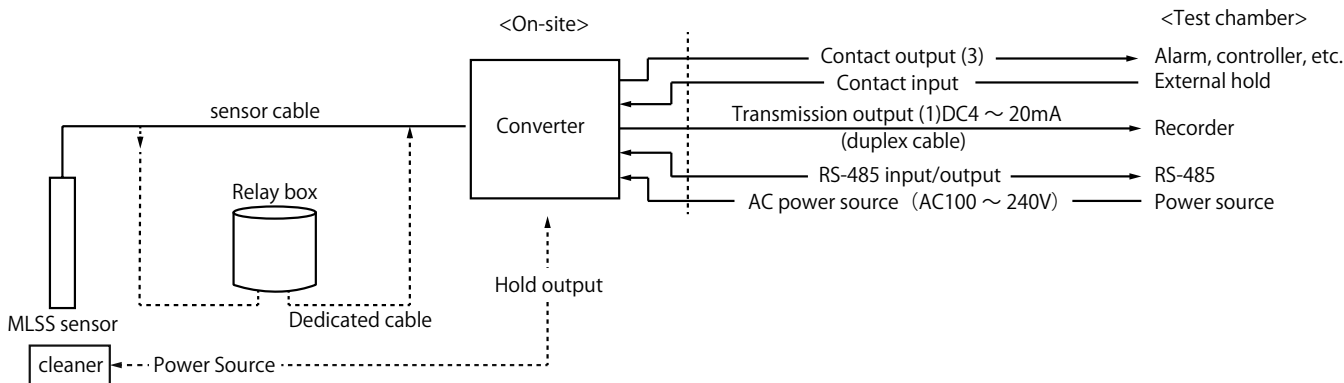
Measur ing Pr inciple

Transmitted light method

Use

Control and monitoring of drain water processin

System Configur ation



HU-200SS MLSS meter(Overview-1)

Features

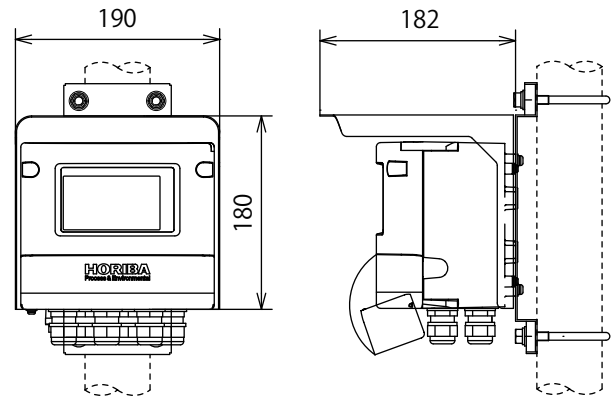
Converter

- Rugged aluminum die cast
- Outdoor installation type (drip-proof structure equivalent to IP65)
- Easily viewable display(150% larger than conventional models)
- All operations can be performed from front screen keys
- Self-diagnosis function and full range of other functions
- Free range settings for transmission output
- Calibration history memory
- The unique data calling of the detector allows measurement without instrumental error

Detector

- Near-infrared transmitting method with steady sensitivity
- Impurity-resistant PFA sensor head
- Contains three types of calibration curve
- Long-life LED light sources and canceling of surrounding light by flashing

External Dimensions



Part Configuration

- Cover
Cover (roof) for outdoor installation.

- Screw caps
Remove the 2 screw caps to expose the front case screws.

- Display
Displays information such as measured values.

- Front cover
Open the cover to expose the 6 operation keys.

- Purge air inlet
The purge air inlet prevents corrosion inside the instrument. Usually does not need to be connected.

- Conduit
Up to 6 wires with a diameter of 7-12mm can be used.

- Measured value display

- Status display

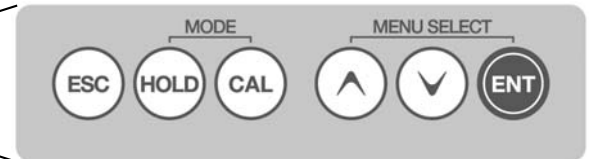
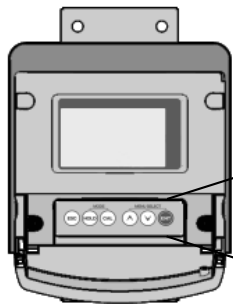


- Indicator

- Auxiliary display

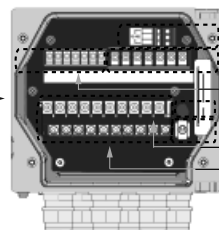
- Status display

(When front cover is open)



- Operation key section
6 operation keys.

(Terminal block)



- RS-485 terminal
- Transmission output terminal/Contact input terminal
- Detector cable connection terminal
- Fuse box
- Power switch
- Power connection terminal
- Contact output terminal

HU-200SS MLSS meter(Overview-2)

Power Source

- This instrument has a power switch. The power source is a free power source with a rated voltage of AC100-240 V.

Contact Output

- Three contact outputs are included as a standard featur.
- The contact capacity is a maximum resistance value load of AC250V and 3A or DC30V and 3 A.

Transmission Output

- One transmission output (DC 4-20mA) is included.
- Maximum load resistance 900Ω.

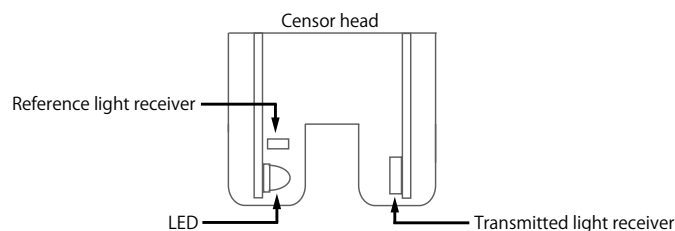
Measuring Principle

The measuring principle of this instrument is the attenuation of transmitted light caused by solids in a sample. Light absorption is calculated from transmittance and then converted to concentration using a relational expression of light absorption and concentration. Near-infrared LEDs are used for the light sources and silicon photocells are used for the transmitted light receiver and reference light receiver. The light sources flash at 10Hz to cancel out influences from light in the surrounding area.

First, the light signal intensities are converted to a direct current by synchronous detection. With T expressing the transmitted light signal intensity and R expressing the reference light signal intensity, T/R is calculated to correct changes in the amount of light in the light source. The T/R value during zero calibration is recorded as T_0/R_0 , and $T/R \div T_0/R_0$ is calculated to find the transmittance (T) of the sample. As the transmittance attenuates exponentially in relation to the concentration, a logarithm of the transmittance is calculated for conversion to light absorption.

$A = -\log T$ A: light absorption, T:transmittance

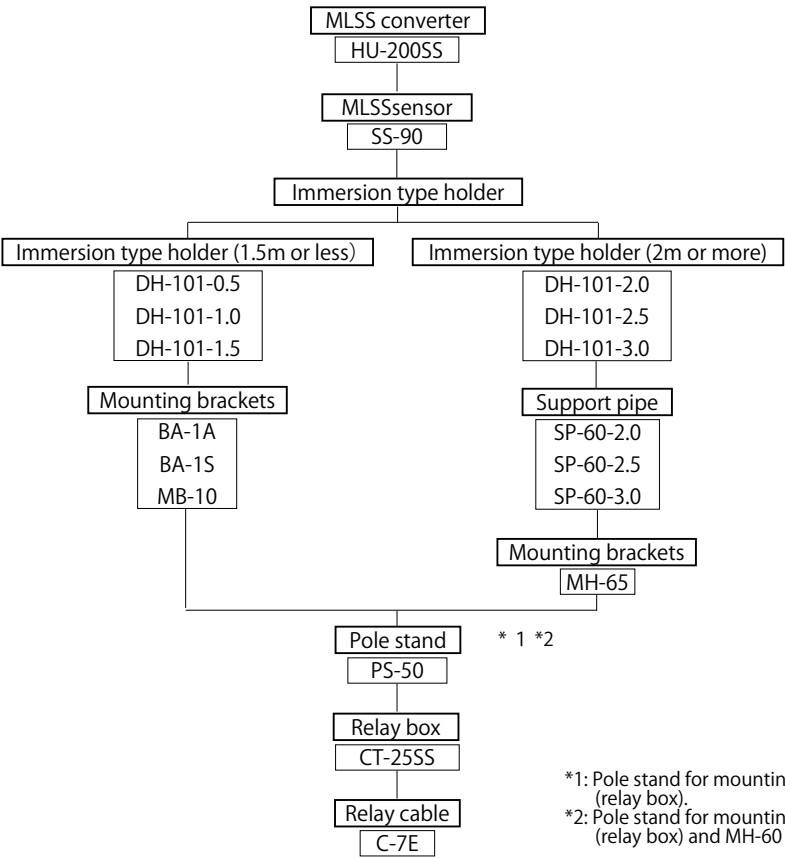
As light absorption is not fully proportionate to concentration when using light attenuation caused by scattering of matter such as MLSS, the relationship between light absorption and concentration is expressed in an equation to measure the concentration of the sample. The relational expression of MLSS concentration and light absorption was obtained through sampling by HORIBA, but the sensitivity may vary considerably depending on the type of activated sludge. Span calibration can be used to match this value to analysis values. When measuring matter other than activated sludge, a relationship between gray inorganic sludge and clay or between white sludge and Kaolin can be recorded. Select the option that best correlates with the analysis value.



HU-200SS MLSS meter(Combinations-1)

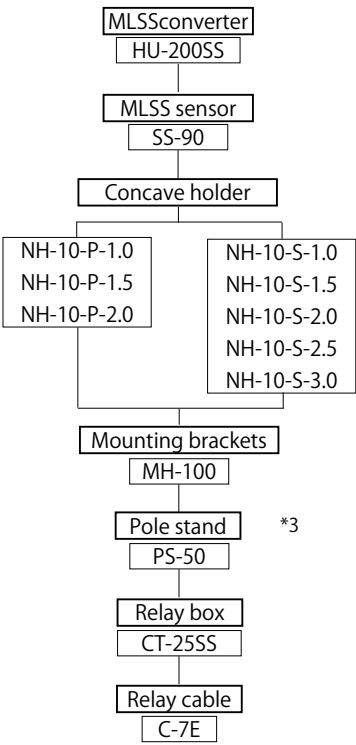
Below are combinations suitable for the specifications of products such as the converter, sensor and holder. Refer to the section on each product for detailed specifications.

Combinations-1- (If using an Immersion type holder)



*1: Pole stand for mounting the converter and CT-25SS (relay box).
*2: Pole stand for mounting the converter, CT-25SS (relay box) and MH-60 (mounting brackets)

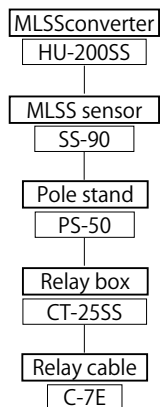
Combinations-2- (If using an concave holder)



*3: Pole stand for mounting the converter, CT-25SS (relay box) and MH-100 (mounting brackets)

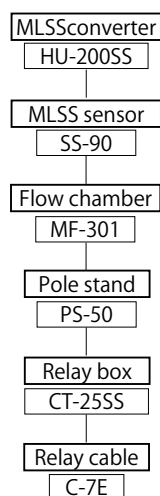
HU-200SS MLSS meter(Combinations-2)

Combinations-3- (If using by immersio)



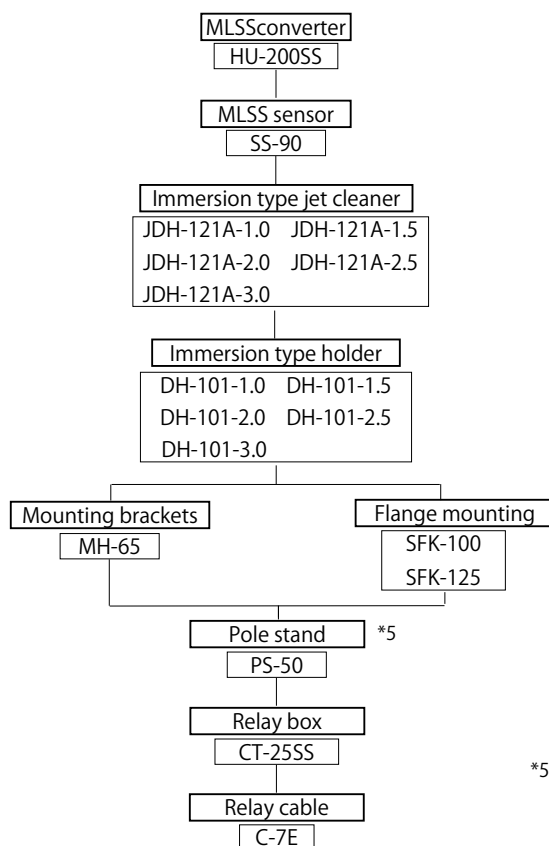
*1: Pole stand for mounting the converter and CT-25SS (relay box).

Combinations-4- (If using a Flow chamber)



*1: Pole stand for mounting the converter and CT-25SS (relay box).

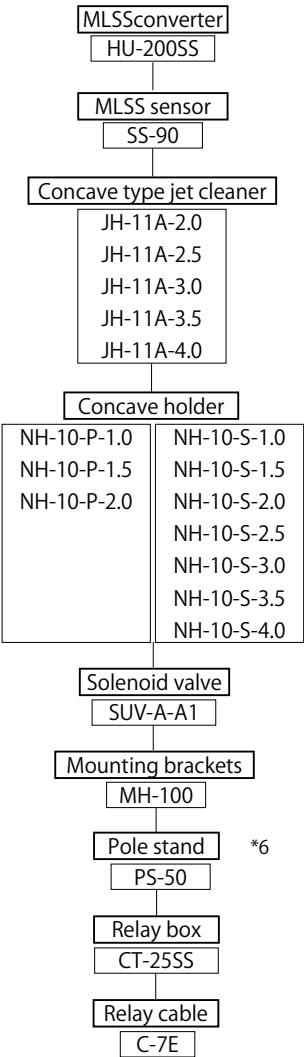
Combinations-5- (If using a Immersion type jet cleaner)



*5: Pole stand for mounting the converter, CT-25SS (relay box) and MH-65(mounting brackets)

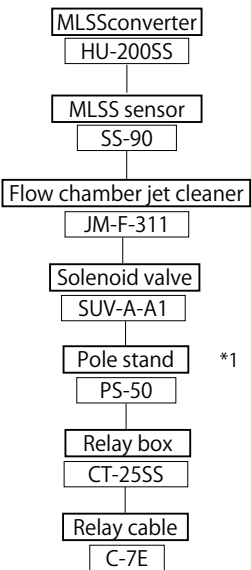
HU-200SS MLSS meter(Combinations-3)

Combinations-6- (If using an concave holder jet cleaner)



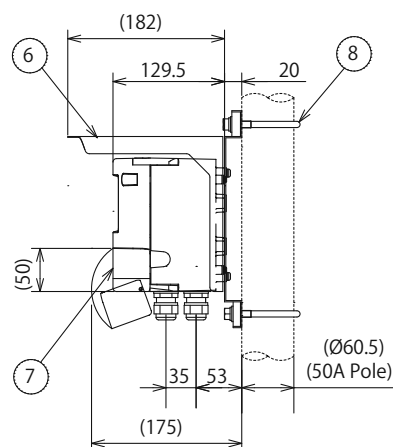
*6: Pole stand for mounting the converter, CT-25SS (relay box) and MH-100 (mounting brackets)

Combinations-7- (If using an Flow chamber jet cleaner)

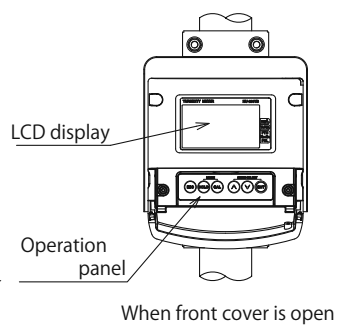
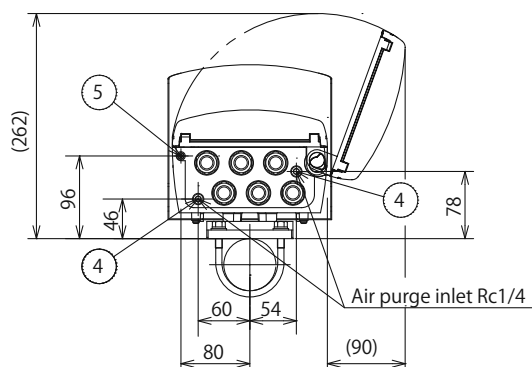


*1: Pole stand for mounting the converter and CT-25SS (relay box).

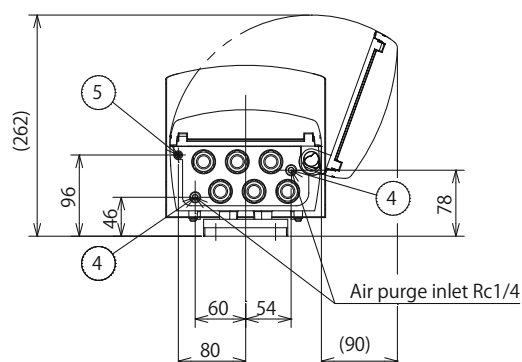
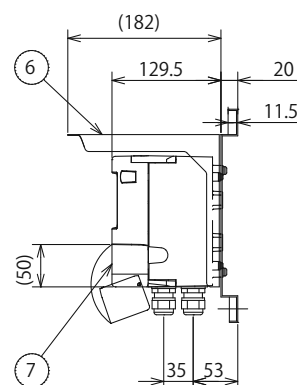
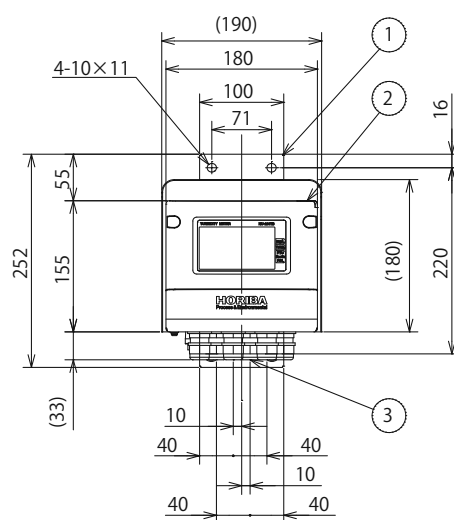
- Pole mount type -



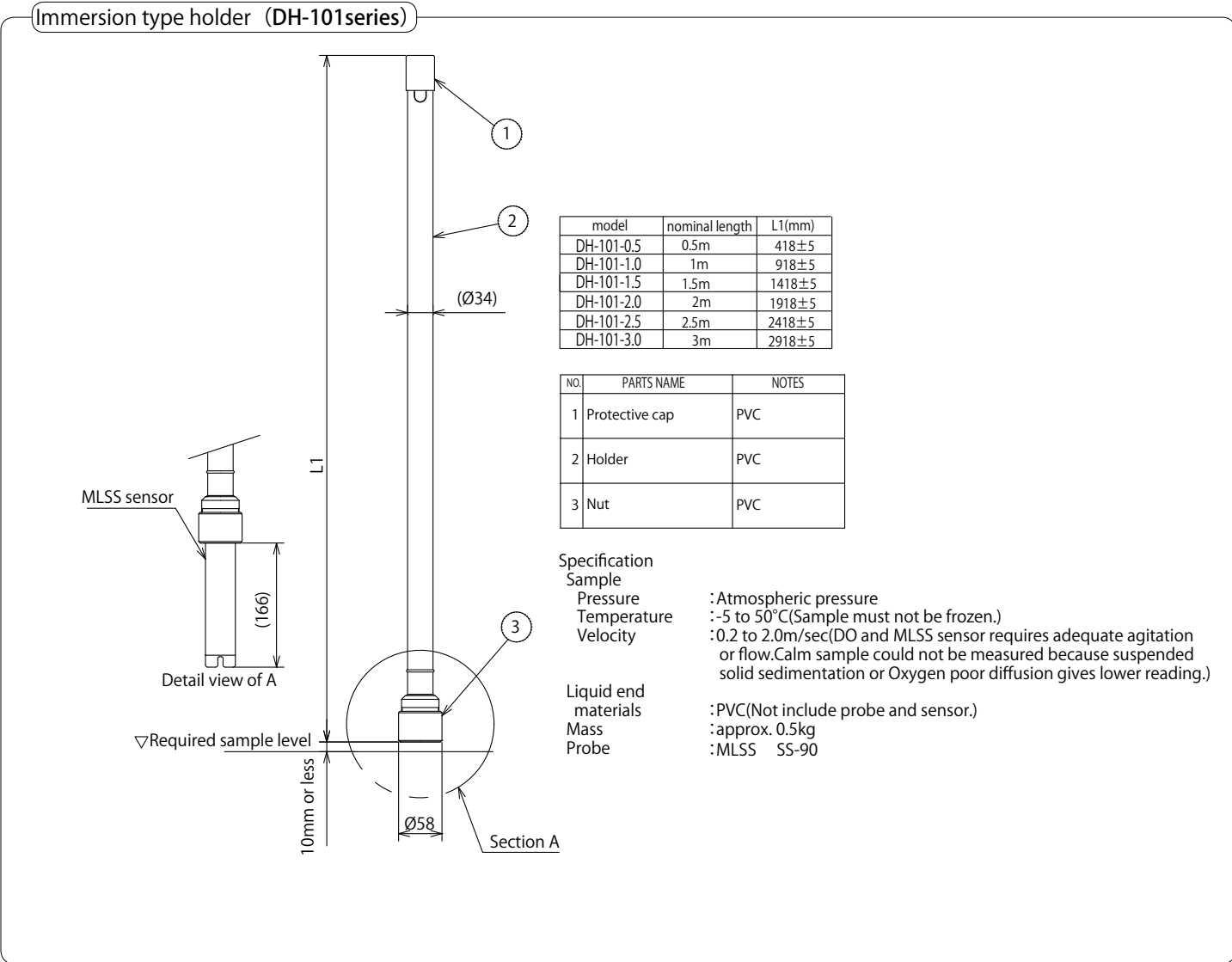
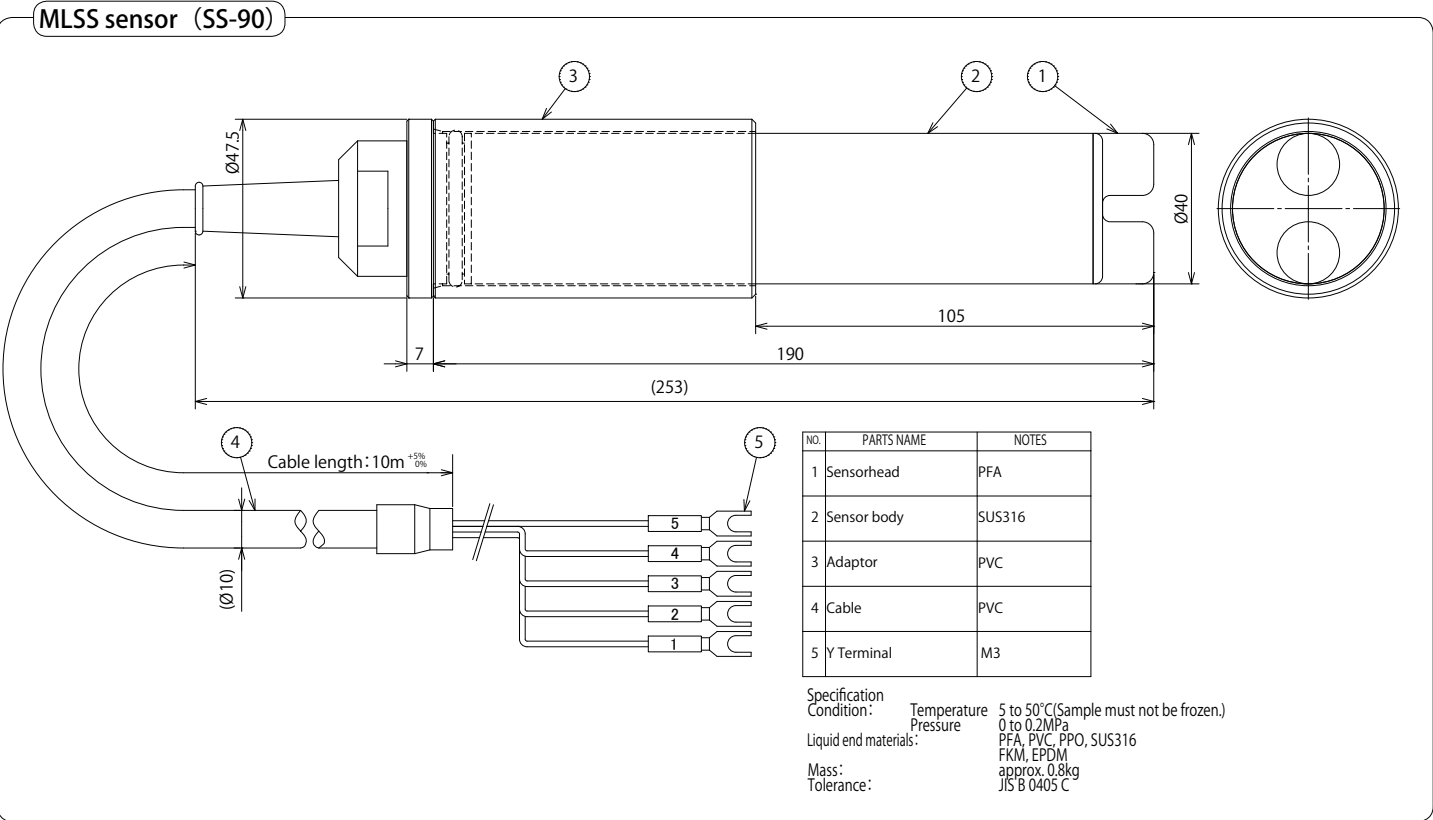
NO.	PARTS NAME	NOTES
1	Bracket	SUS304
2	Case	ADC12
3	Cable gland	Screw size G1/2 O.D Ø7~Ø12Cable
4	Plug	SUS304
5	Earth terminal	SUS304 M4
6	Cover	SUS304
7	Front cover	ADC12
8	U-Bolt	SUS304 50A M8



- Wall mounting type -

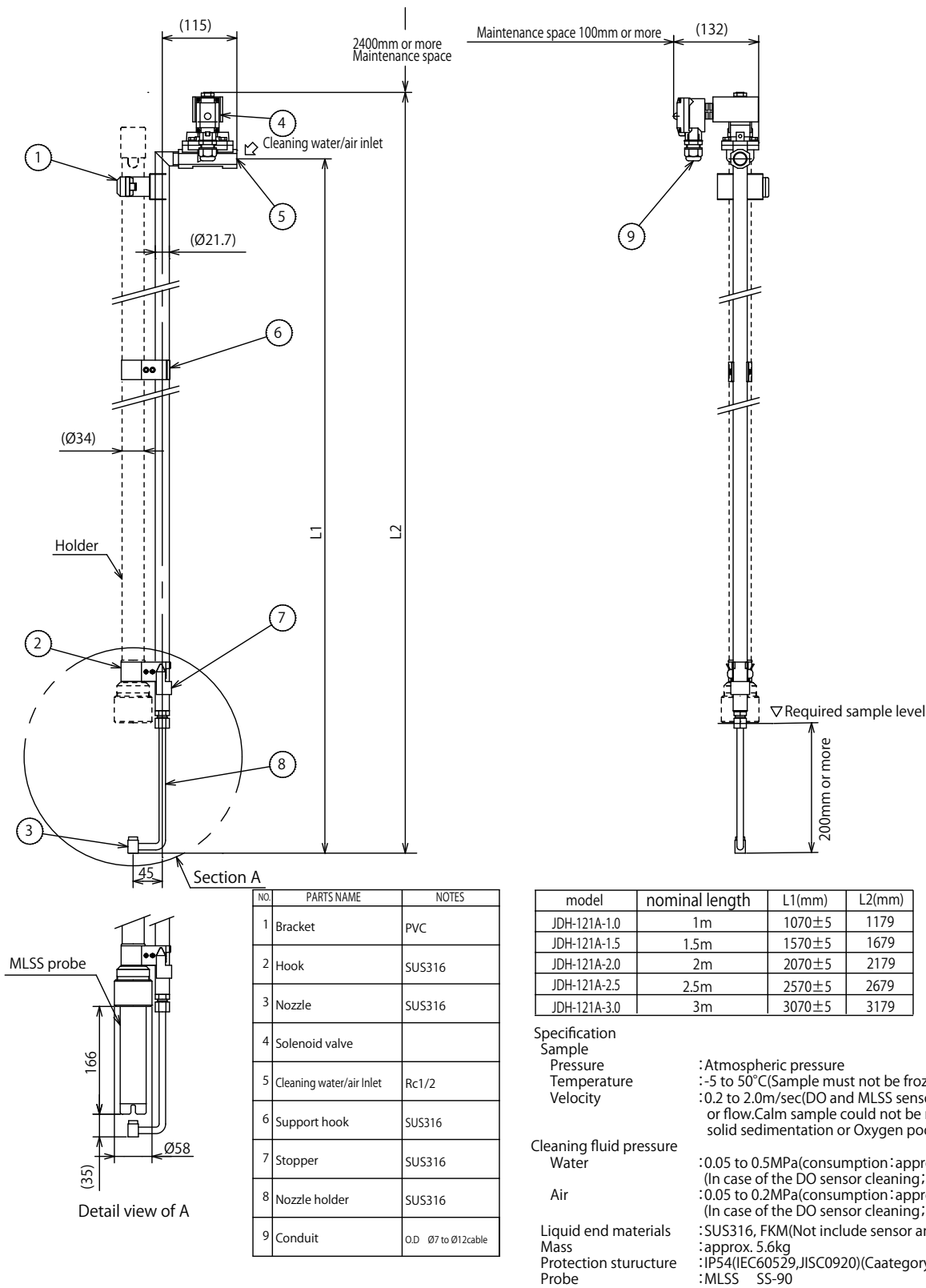


HU-200SS MLSS meter(External dimensions-2)



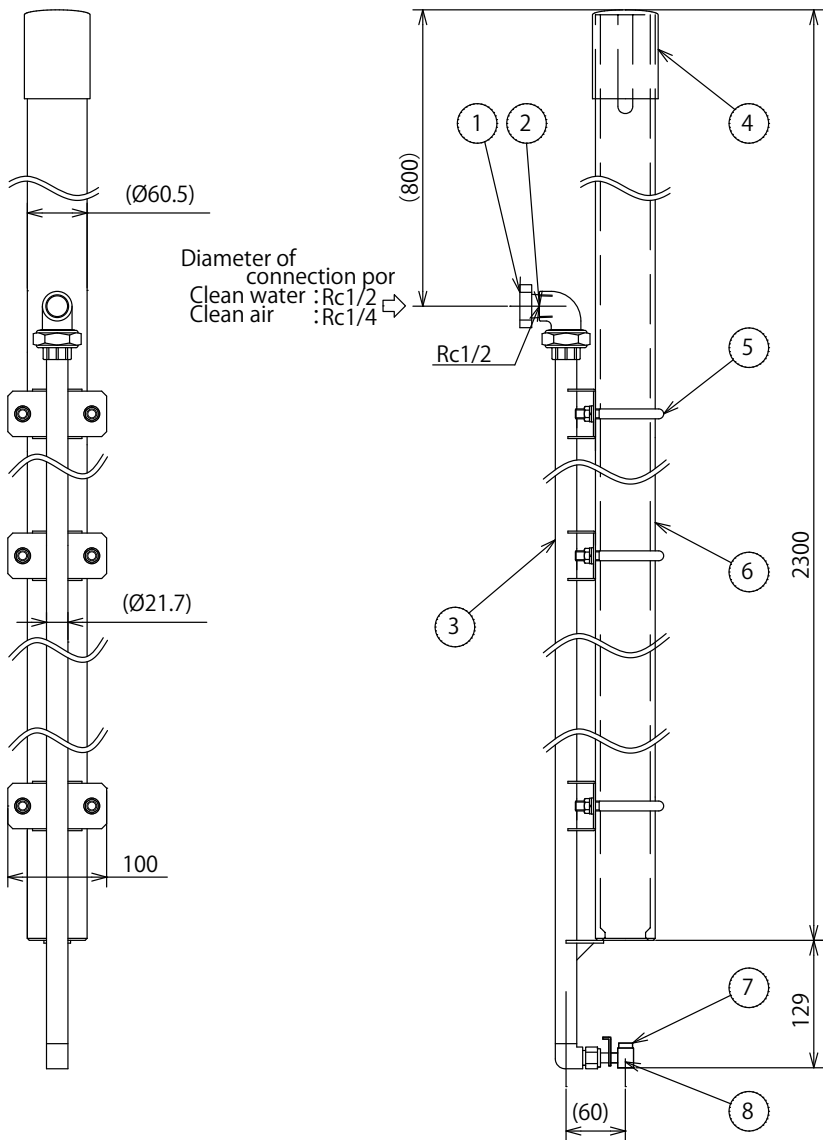
HU-200SS MLSS meter(External dimensions-4)

Immersion type jet cleaner (JDH-121Aseries)



HU-200SS MLSS meter(External dimensions-5)

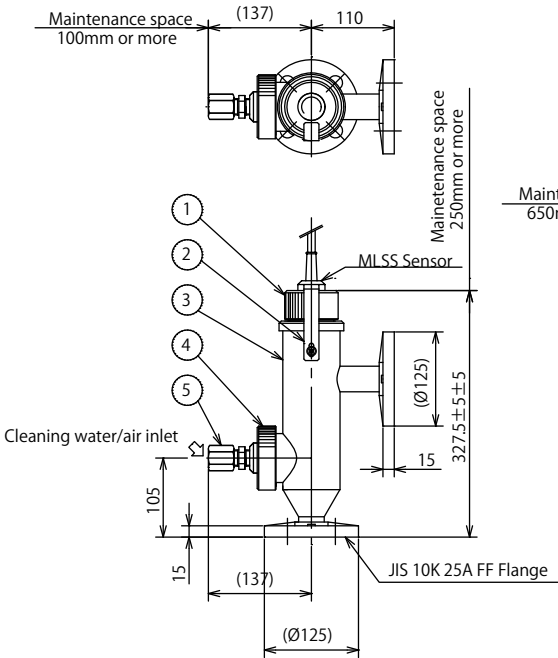
Concave type jet cleaner (JH-11A)



NO.	PARTS NAME	NOTES
1	bushing	R1/2xRc1/4 SUS304
2	clean water inlet	SUS304
3	nozzle holder pipe	SUS316
4	cap	PVC
5	U-bolt	SUS316
6	guide pipe	SUS316
7	nozzle	SUS316
8	nozzle holder	SUS316

model	nominal length	L1(mm)
JH-11A-2.0	2m	1800
JH-11A-2.5	2.5m	
JH-11A-3.0	3m	2800
JH-11A-3.5	3.5m	
JH-11A-4.0	4m	3800

Flow holder cleaner (JM-F-311)



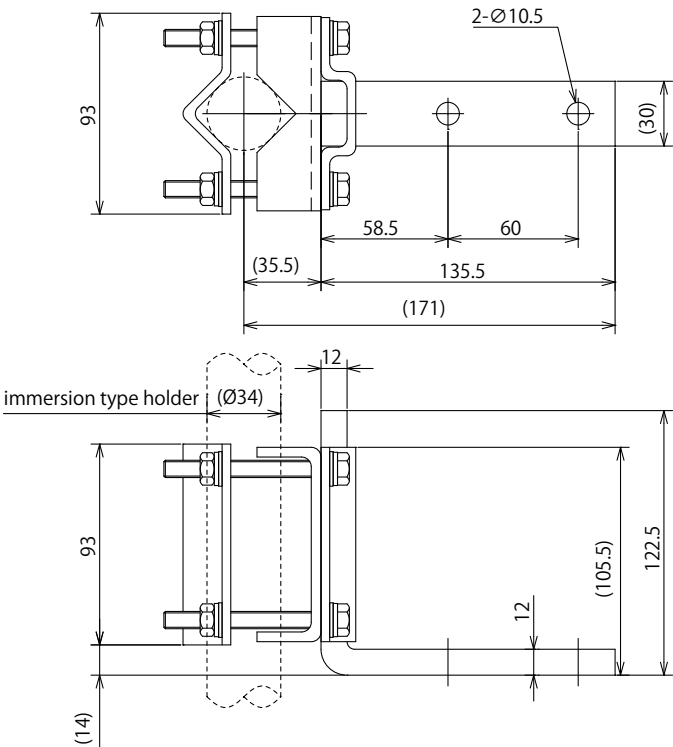
NO.	PARTS NAME	NOTES
1	Holder fixing nut	PVC
2	Locking plate	SUS304
3	Holder	PVC
4	Cleaner mounting nut	PVC
5	Cleaning water/air inlet	Rc1/2

Specification
Sample
Pressure : 0 to 0.2MPa
Sample temperature : 5 to 50°C (Sample must not be frozen.)
※The temperature range might be limited by sensor, refer to the sensor specification.
Flow rate : 0.3 to 10L/min
Cleaning fluid pressure : 0.05 to 0.5MPa
(Set the cleaning pressure between 0.05 and 0.2MPa higher than sample pressure.)
Liquid end materials : PVC, EPDM, SUS316 (Not include sensor.)
Mass : approx. 1.6kg
Sensor : MLSS SS-90

Accessory1
(Mounting brackets • Support pipe ect.)

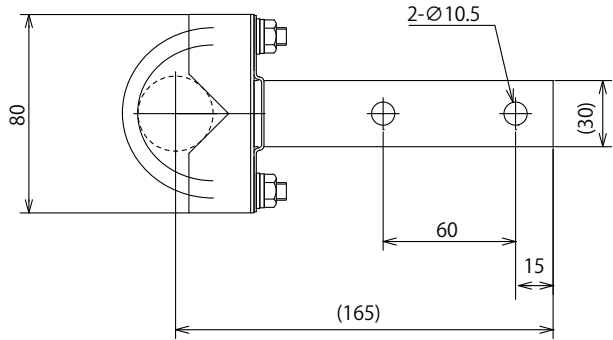
Mounting brackets

Mounting brackets (BA-1A)

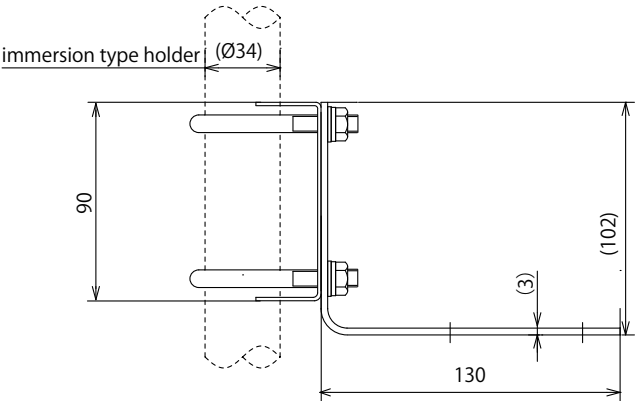


model	BA-1A	
material	ABS resin	
Installation	anchor installation	
Combinations	immersion type holde	CH-101 • CH-101-P • CH-101-PF (Can be used for the DH-101 immersion type holder that extends up to 1.5m.)

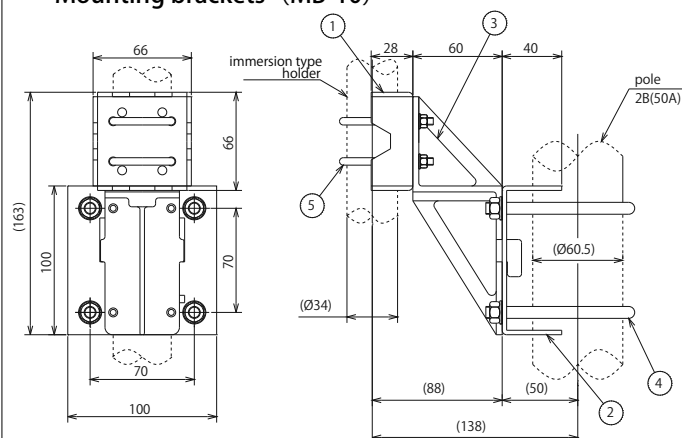
Mounting brackets (BA-1S)



model	BA-1S	
material	SUS304	
Installation	anchor installation	
Combinations	immersion type holde	CH-101 • CH-101-P • CH-101-PF (Can be used for the DH-101 immersion type holder that extends up to 1.5m.)



Mounting brackets (MB-10)



NO.	PARTS NAME	NOTES
1	Base1	SUS304
2	Base2	SUS304
3	Bracket	SUS13
4	U-bolt	SUS304
5	U-bolt	SUS304

model	MB-10
material	SUS304、SCS13
Installation	pole
Combinations	immersion type holde
	CH-101・CH-101-P・CH-101-PF HIBP・HIBS (Can be used for the DH-101 immersion type holder that extends up to 1.5m.)

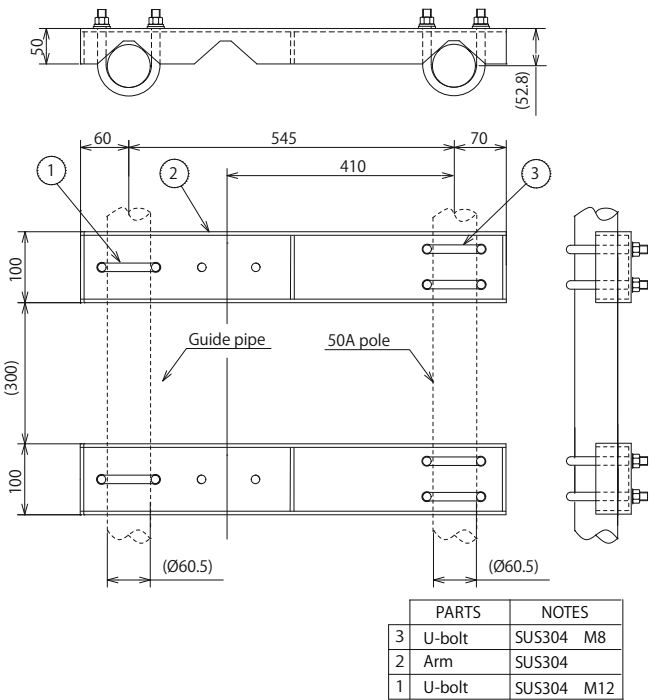
NO.	PARTS NAME	NOTES
1	arm	SUS304
2	U-bolt	SUS304 50A
3	U-bolt	SUS304 15A

model		MH-65
material		SUS304
installation		pole (Use when securing a support pipe (SP-60 Series) to the pole stand)
Combinations	immersion type holde	CH-101 • CH-101-P • CH-101-PF HIBP • HIBS
	cleaner	UCH-101 • UCH-111

Accessory3
(Mounting brackets • Support pipe ect.)

Mounting brackets

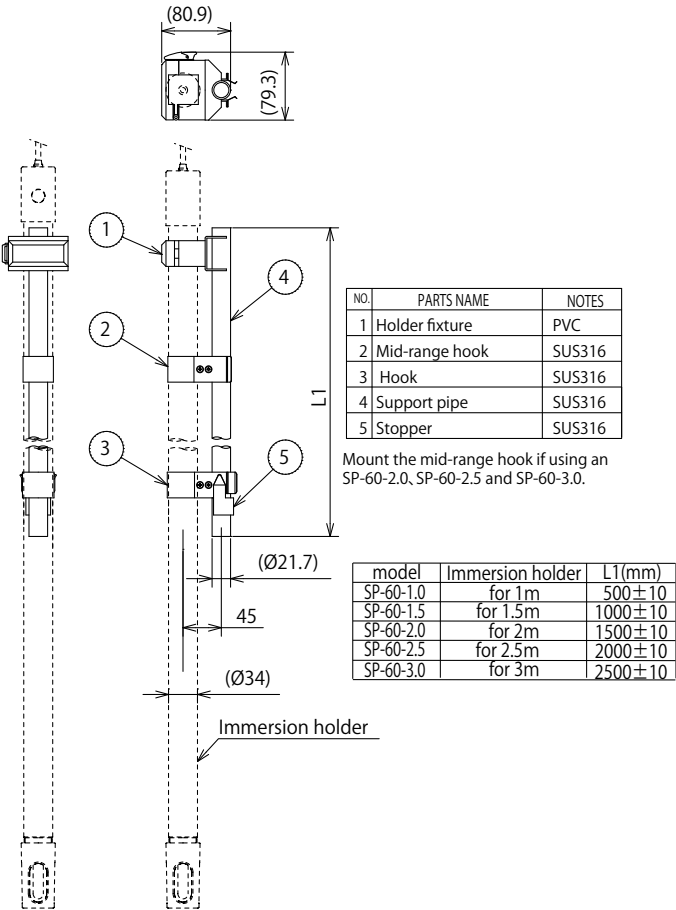
Mounting brackets (MH-100)



model	MH-100	
material	SUS304	
Installation	Use when securing a concave holder (NH-10 Series) to the pole stand. A distance of 545mm or 410mm between the concave holder and pole stand can be selected by changing the mounting position of the U-bolt	
Combinations	Concave holder	NH-10P • HN-10S

Support pipe

Support pipe (SP-60)



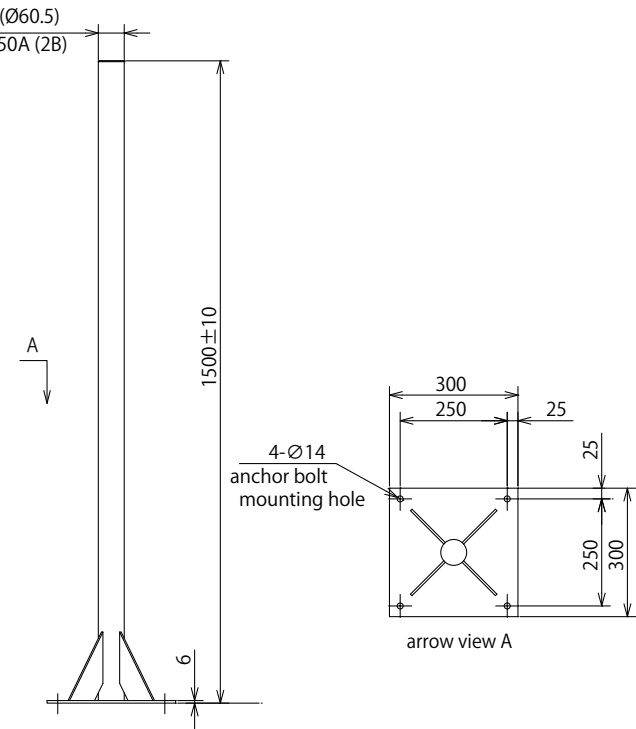
model	SP-60	
material	SUS304、PVC	
compatible holder lengths (m)	1.0 • 1.5 • 2.0 • 2.5 • 3.0	
Combinations	Immersion holder	CH-101 • CH-101P • CH-101PF HIBP
	Mounting brackets	MH-65

Accessory4
(Mounting brackets • Support pipe ect.)

Pole stand

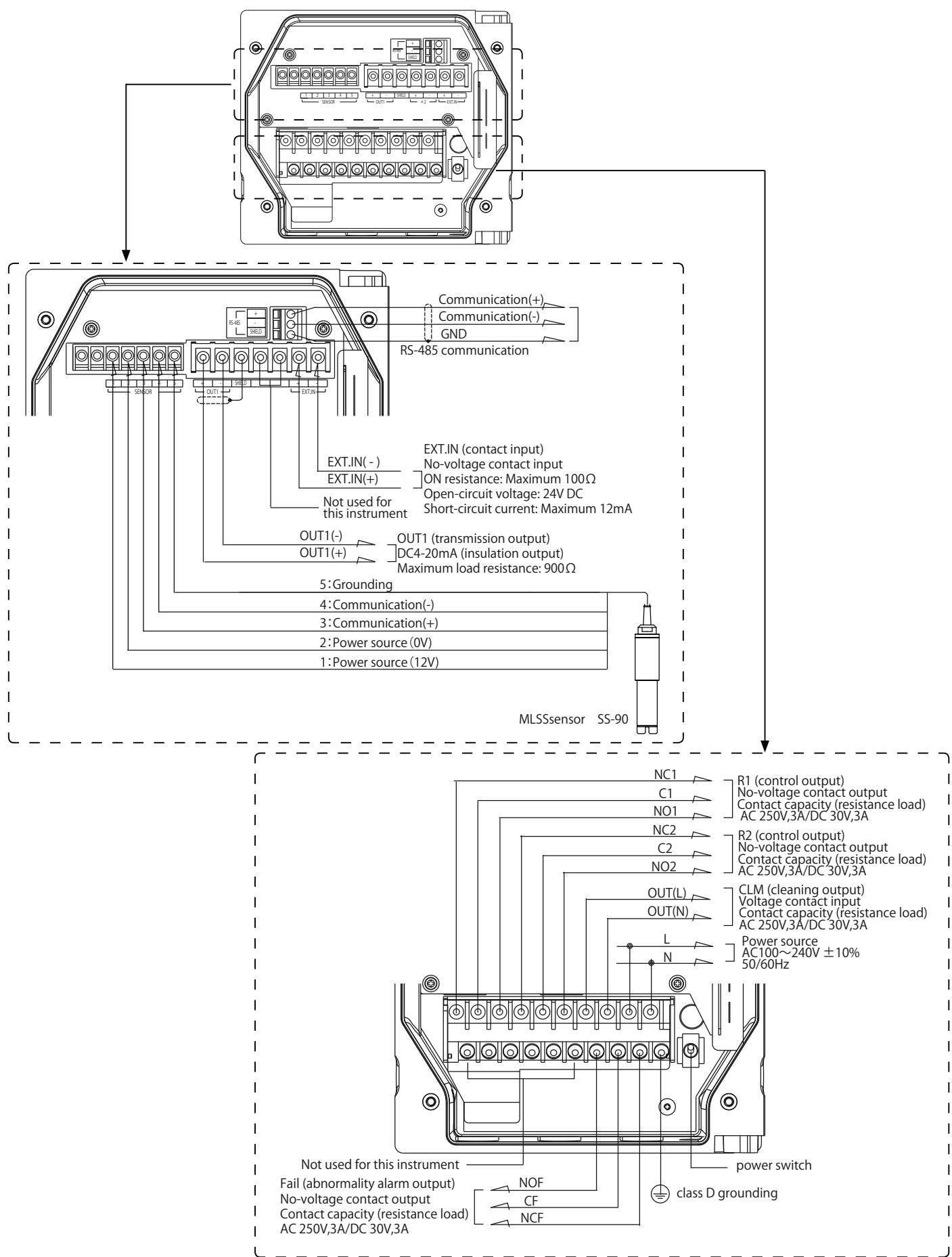
Pole stand (PS-50-SUS-300)

model	PS-50-SUS-300
material	SUS304



HU-200SS MLSS meter (External Connection Diagram)

Converter + MLSSsensor



HU-200SS MLSS meter(Specifications-1)

ConverterSpecifications-1-

Product name	Industrial-use MLSS meter	
Converter type	HU-200SS MLSS converter for industrial use	
Detector type	SS-90 MLSS detector for industrial use	
Measurable range	Activated sludge(MLSS)	0-20000 mg/L (MLSS)
	Kaolin	0-10000 mg/L (white inorganic powder)
	Clay(inorganic mud)	0-20000 mg/L (gray inorganic mud)
Transmission output setting range	Activated sludge(MLSS)	Arbitrary setting within the range from 0-1000 mg/L to 0-20000 mg/L
	Kaolin	Arbitrary setting within the range from 0-1000 mg/L to 0-10000 mg/L
	Clay(inorganic mud)	Arbitrary setting within the range from 0-1000 mg/L to 0-20000 mg/L
Display resolution	1 mg/L (0-10000mg/L) 10 mg/L (10000-22000mg/L)	
Performance	Repeatability	Within a reading value $\pm 3\%$ or ± 10 mg/L, whichever is larger. (sensor connecting sludge measured value)
Transmission output	Number of output points	1
	Output type	DC 4 to 20 mA, input/output insulation type
	Load resistance	900 Ω maximum
	Linearity	Within ± 0.08 mA (for output only)
	Repeatability	Within ± 0.02 mA (for output only)
	Error output	With the burnout capability (3.8 mA or 21 mA)
	Hold capability	Either the last value hold or the arbitrary value hold is to be selected.
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 VDC, 3 A (resistance load)
	Contact capability	R1, R2 Selectable from upper limit alarm, lower limit alarm, transmission output Hold, and cleaning output. (opened at alarm operation, closed usually, closed at power-off)
		FAIL Error warning (normally closed; open when an error occurs; open when the power is turned OFF)
	Description of alarm	Setting range: Turbidity, within measuring rangeDelay time: 0 s to 600 s
Cleaning input	Number of input points	1
	Output type	Active voltage contact output (connected supply voltage output)
	Contact type	Relay contact, SPST (1a)
	Contact capacity	250 V AC, 3A, 30 V DC, 3 A (resistance load)
	Contact capability	Solenoid valve drive for cleaning
	Setting	Cleaning frequency 0.1 - 168.0 h
		Cleaning time 2 - 600 s
		Hold time 2 - 600 s
	Timer accuracy	Within 2 min per month
	Description of cleaning operation	Operation of the internal timer Operation of the internal timer and external contact input The internal timer is enabled only at the time of external contact input. One of the cleaning trigger operations is selected (the internal cleaning sequence starts when external contact input is ON for at least 2 s).
Contact input	Number of input points	1
	Contact type	No-voltage a contact for open collector
	Condition	ON resistance: 100 Ω maximum Open-circuit voltage: 24 V DC Short-circuit current: 12 mA DC maximum
	Contact capability	Can be selected from cleaning directives and transmission hold.
Communication capability	Type	RS-485
	Signal type	Two-wire input/output insulation type (not insulated from transmission output)
Calibration	Calibration method	Zero calibration : With clean water Span calibration: Concentration conversion method using coefficient input Working curve selection: (selection of activated sludge and inorganic mud)
	There is a feature that allows you to match an instrument indicated value to a hand analyzed value of sludge (by the Mass method).	
Self-check	Sensor check error	Sensor error
	Converter error	CPU abnormality, ADC abnormality, memory abnormality
Operating temperature range	-20°C to 55°C (without freezing)	
Operating humidity range	Relative humidity: 5% to 90% (without due condensation)	
Storage temperature	-25°C to 65°C	
Power source	Power supply voltage range	90 V to 264 V AC, 50/60 Hz
	Power consumption	35 VA (max.) when an automatic cleaner is connected.
	Others	With the built-in time lag fuse (250 V,1 A)
	A power switch for maintenance is incorporated.	

HU-200SS MLSS meter(Specifications-2)

ConverterSpecifications-2-

Applicable standards	CE marking		EMC Directives (2004/108/EC) EN61326-1:2006	
			Low Voltage Directives (2006/95/EC) EN61010 -1:2001	
	EMC	Immunity Industrial location	Electrostatic discharge	IEC61000-4-2
			Electromagnetic radiation radio frequency field	IEC61000-4-3
			Electric fast transient/burst	IEC61000-4-4
			Serge	IEC61000-4-5 (*1)
			Conduction obstruction induced by radio frequency	IEC61000-4-6
			Voltage dip, short time blackout, voltage variation	IEC61000-4-11
		Emission Class A	Radiation obstruction	CISPR 11 CLASS A
			Noise terminal voltage	CISPR 11 CLASS A
	low voltage		Pollution degree 2	
	FCC rules		Part15 CLASS A	
Structure	Installation		Outdoor installation type	
	Installation method		50 A pole-mounted or wall-mounted	
	Protection class		IP65	
	Material of case		Aluminum alloy (coated with epoxy modified melamine resin)	
	Material of mounting brackets		SUS304	
	Material of hood		SUS304 (epoxy glue degeneration melamine resin painting)	
	Material of display window		Polycarbonate	
	Display element		Reflective monochrome LCD	
External dimensions	180 (W) x 155 (H) x 115 (D) mm (excluding brackets)			
Mass	Mainframe: approx. 3.5 ka, hood, bracket: approx. 1 ka			

*1 The surge test specified in the EMC Directive for CE Marking shall not apply to the case when a sensor cable, transmission cable, or contact input cable is extended for 30 m or longer.

*2 An arrester (electric discharge voltage: 400 V) is provided for transmission output, contact input, and communications. However, incorporate and use an optimal surge absorption element on the connected line according to the ambient environment, equipment installation situations, and externally connected equipment, etc.

Specifications (Sensor)

Product name	MLSS sensor for industrial use
Model	SS-90
Measuring principle	Light transmission method
Light source	Infrared LED, 880 nm, approx. 10 Hz, AC blinking
Detector	(transmitted light/reference light)
Cell length	Approx. 7 mm
Data transfer	RS-485 (communication with converter)
Self-check	Water immersion detection
Operating temperature range	5° C to 45° C (without freezing)
Storage temperature	25° C to 65° C
Measured liquid pressure	0 MPa to 0.2MPa
Material of wetted part	PPO ,SUS316 ,PFA ,FKM ,EPDM ,PVC
Cable length	10 m (standard), maximum extension: 50 m (overall length: 60 m)
Power source	12 VDC supplied from the HU-200SS converter
External dimensions	48 mm in diameter x 250 mm in length (excluding the cable)
Mass	Approx. 0.8 Kg (excluding the cable)

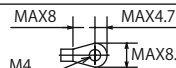
HU-200SS MLSS meter(Specifications-3)

Power Source

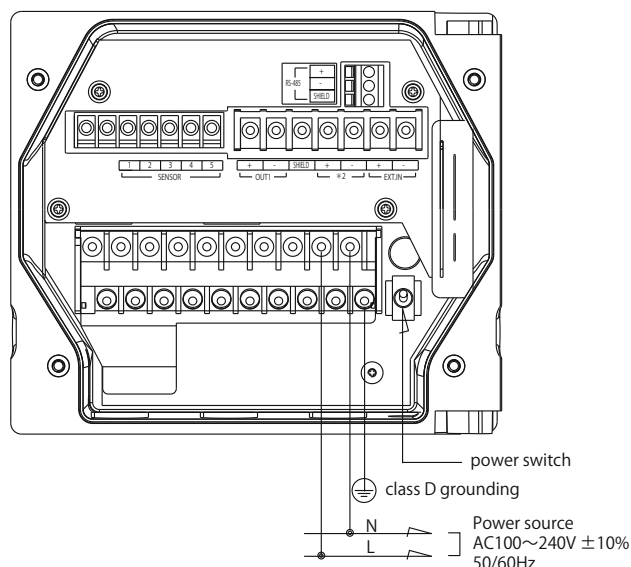
- The power source is a free power source with a rated voltage of AC100-240 V.
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction.
- Also, check that the range of fluctuations in supply voltage does not exceed $\pm 10\%$.
- This instrument has a power switch

Main Specifications

- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm² (AWG18-10).

Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

- Install the power switch near the instrument and ensure that the power source can be turned on and off.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- For safety reasons, be sure to ground the earth terminal (class D grounding).
- Ground separately from electrical equipment such as the motor.



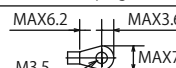
Main Specifications	
Power Source	AC100~240V 50/60Hz
Power consumption	35VA(Max)
Terminal screws	M4
Wire size	0.75~5.5mm ² (AWG18~10)

Transmission Output

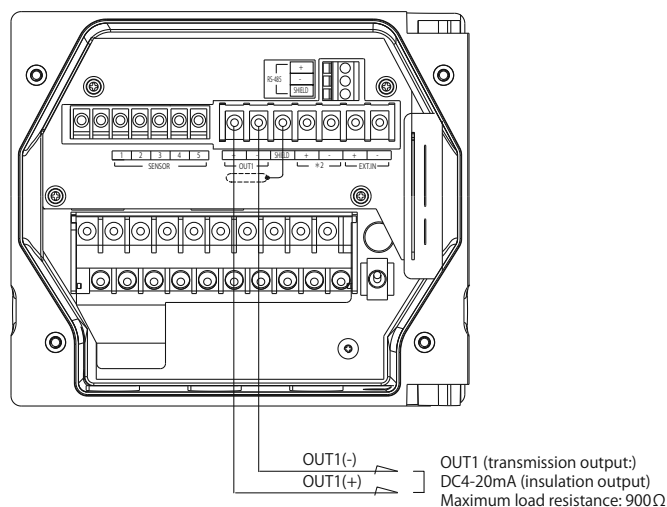
- One transmission output (DC 4-20mA) is included.
- If desired, a full-scale transmission output range can be set, as long as it is within the full scale setting range of the measured values.
- Also, set a burnout (transmission output: 3.8mA or 21mA).It is possible to set whether to temporarily hold the output value at the last value or a preset value when holding the transmission output during an external signal.

Main Specifications

- The transmission output terminal screws are M3.5 screws.
- The wire size is 2mm² (AWG14) max.

Crimping	Wire size	Torque
	2mm ² /MAX (AWG14)	0.8~1.2 N·m

- Use a twist pair shielded cable.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- Make sure that the maximum resistance of the contact input is 100 Ω or less.



Main Specifications	
Transmission Output	DC 4 ~ 20mA
Maximum load resistance	900 Ω
Terminal screws	M3.5
Wire size	2mm ² (AWG14)

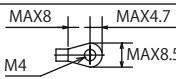
HU-200SS MLSS meter(Specifications-4)

Contact Output

- Three contact outputs are included as a standard feature.
- The instrument includes contact outputs such as upper and lower limit alarms, error warnings and transmission output holds.

Main Specifications

- The contact capacity is a maximum resistance value load of AC250V and 3A or DC30V and 3A.
- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm2 (AWG18-10).

Crimping	Wire size	Torque
	5.5mm 2/MAX (AWG10)	1.2~1.8 N·m

- Use a varistor or noise killer if noise occurs in the load.
- The NO and NC arrangement is reversed only in the case of fail output. For normal (non-fail) output, the CF-NOF contact is open and the CF-NCF contact is shorted. The C-NOF contact is shorted when the power is off.
- If connecting a load higher than the contact capacity or an inductive load (such as a motor or pump), be sure to connect the load through a power relay with a rating higher than that of the load.
- Take care when connecting a load, as the C-NC contact of R1-R2 is shorted when the power source of this instrument is off.

Main Specifications	
Contact capacity	Maximum of AC250V and 3A or DC30V and 3 A.
Alarm types	<ul style="list-style-type: none">• Concentration alarm output• Hold output• Fail output, CLu output
Terminal screws	M4
Wire size	0.75~5.5mm ² (AWG18~10)

AL: Alarm output

This is output (turned on) and an alarm is activated after a delay period when the measured value is higher than the set value. The output immediately stops (is turned off) and the alarm is canceled when the measured value falls below the set value. The output delay time can be configured (0-600 seconds). (The above refers to upper limit operation. The reverse occurs in lower limit operation.)

HoLd: Holding output

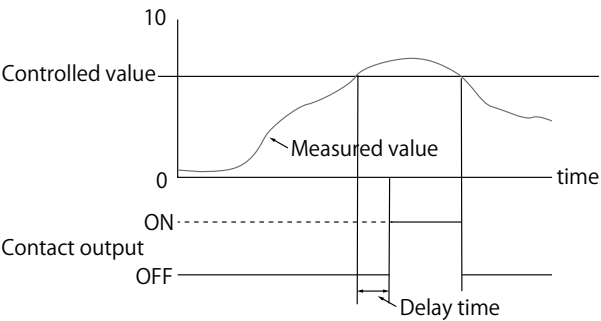
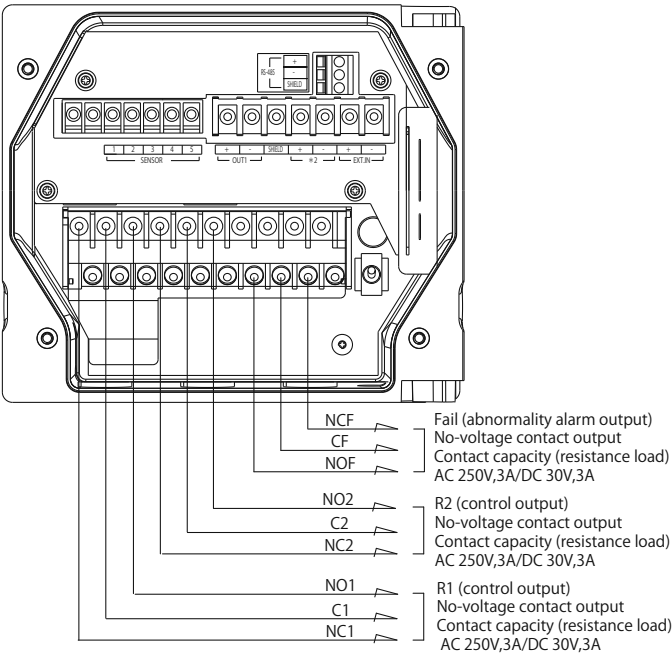
This is output (turned on) after a delay period when the measured value is held. The output immediately stops (is turned off) when the hold is released. The output delay time can be configured (0-600 seconds).

CLn: Cleaning output

A five-second contact signal is output (turned on) when the cleaner is in operation and when it stops.

FAIL: Fail output

Output when over full scale or in the event of a system error. Activated in cases such as an error in the instrument.



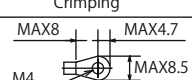
HU-200SS MLSS meter(Specifications-5)

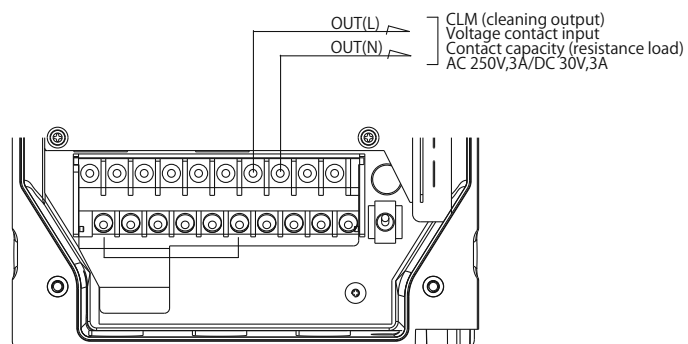
Cleaning output

- A cleaning output is included as a standard feature.
- Cleaning output terminal The cleaning output is a voltage output with the same electrical potential as the power source. (It is not a no-voltage contact.)

Main Specifications

- The contact capacity is a maximum resistance value load of AC250V and 3A or DC30V and 3A.
- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm² (AWG18-10).

Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m



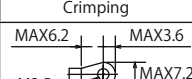
Main Specifications	
Contact capacity	Maximum of AC250V and 3A or DC30V and 3 A.
contact output types	for solenoid valve
Terminal screws	M4
Wire size	0.75~5.5mm ² (AWG18~10)

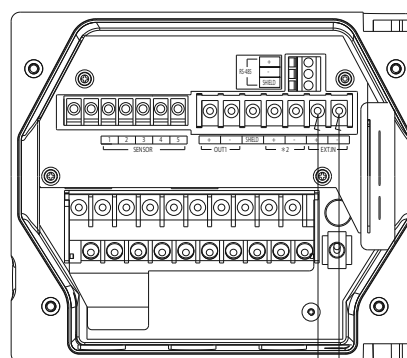
Contact Input

A contact input is included as a standard feature. The cleaner can be operated by an external signal.

Main Specifications

- The contact input terminal screws are M3.5 screws.
- The wire size is 0.14-2.5mm (AWG 26-AWG 14).

Crimping	Wire size	Torque
	2mm ² /MAX (AWG14)	0.8~1.2 N·m



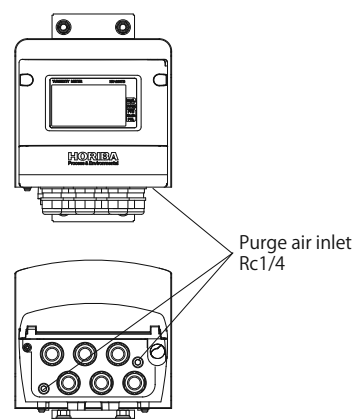
- Use a twist pair shielded cable. Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- Make sure that the maximum resistance of the contact input is 100 Ω or less.

EXT.IN (contact input)
No-voltage contact input
ON resistance: Maximum 100Ω
Open-circuit voltage: 24V DC
Short-circuit current: Maximum 12mA

Main Specifications	
Contact input resistance	100 Ω or less
Terminal screws	M3.5
Wire size	0.14~2.5mm ² (AWG26~14)

Air Purge


- There is a purge air inlet to prevent internal corrosion. If using in an environment with corrosive gas, instrumentation air is constantly passed through the instrument, preventing the corrosive gas from entering the instrument.



HU-200SS MLSS meter(Specifications-6)

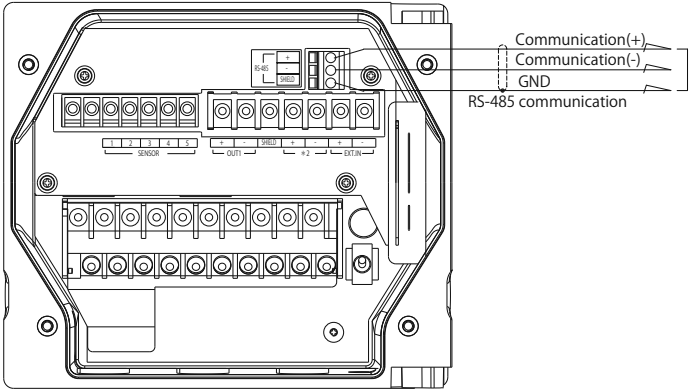
RS-485

- This instrument includes the RS-485 communication terminal.Connect the wiring before using.
- The wire size is 0.14-2.5mm (AWG 26-14).</885>
- Use a twist pair shielded cable for the communication output cable.
- Up to 32 terminals can be connected including the host computer.Set an address.
- The maximum cable length of the communication cable is 500 m.
- Provide termination resistance (Rt: 120 Ω) for instrument that is the terminus of the RS-485 communication line.

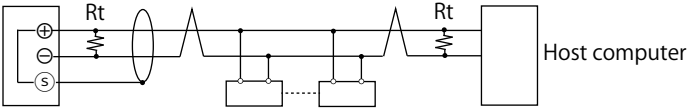
Crimping	Wire size	Torque
	0.14~2.5mm ² (AWG26~14)	0.5~0.6 N·m

Example of external communication connection

This instrument: RS-485
(communication output)



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




Sensor

A contact input is included as a standard feature.The cleaner can be operated by an external signal.

Main Specifications

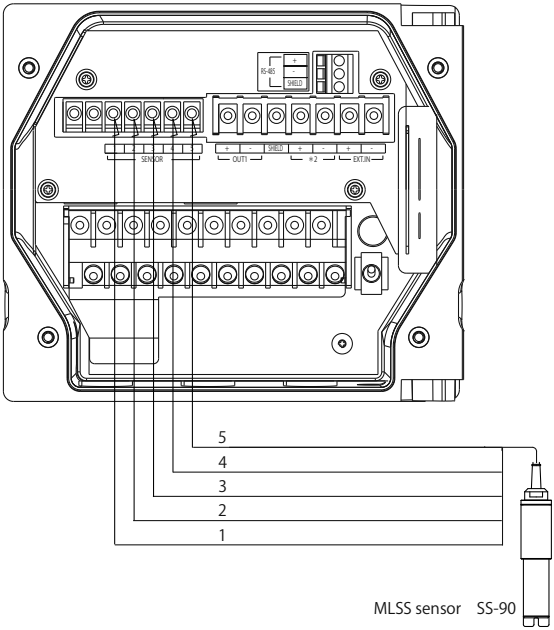
- The contact input terminal screws are M3 screws.
- The wire size is 1.25mm² (AWG16).

Crimping	Wire size	Torque
	1.25mm ² /MAX (AWG16)	0.8N·n

- Do not allow the cable terminal and terminal block to come into contact with liquids such as water or soil them with finger marks or oil from hands. This decreases insulation. A decrease in insulation causes indication to become unstable. Be sure to keep dry and clean. If soiled, wipe with alcohol etc. and dry well.
- Make sure that the wiring is long enough to lift the detector, as this is required during maintenance.
- Do not wire the detector cable near equipment that supplies induction to parts such as the motor or the power cable of this equipment

Specifications

Measuring principle	Light transmission method
Light source	Infrared LED, 880 nm, approx. 10 Hz, AC blinking
Detector	(transmitted light/reference light)
Cell length	Approx. 7 mm
Data transfer	RS-485 (communication with converter)
Self-check	Water immersion detection
Operating temperature range	5° C to 45° C (without freezing)
Storage temperature	25° C to 65° C
Measured liquid pressure	0 MPa to 0.2MPa
Material of wetted part	PPO ,SUS316 ,PFA ,FKM ,EPDM ,PVC
Cable length	10 m (standard), maximum extension: 50 m (overall length: 60 m)
Power source	12 VDC supplied from the HU-200SS converter
External dimensions	48 mm in diameter x 250 mm in length (excluding the cable)
Mass	Approx. 0.8 Kg (excluding the cable)



Sensor	1 : Power terminal (+12V)
	2 : Power terminal (0V)
	3 : Communication terminal (+)
	4 : Communication terminal (-)
	5 : Grounding

HU-200SS MLSS meter(Installation-1)

Installation environment

To ensure the stable use of the HU-200SS SS-90 condition, install the HU-200SS SS-90 in a location that meets the following requirements.

Instrument mainframe

- The location should be well ventilated to prevent build-up of moisture.
- The ambient temperature should be between -20°C and 55°C .
- The HU-200SS SS-90 should not be exposed to direct sunlight.
- The HU-200SS SS-90 should not be exposed to direct high radiation heat.
- The relative humidity should be 90% or lower.
- The HU-200SS SS-90 should not be exposed to splashed water or chemical agent.
- The mechanical vibration in the location should be minimal.
- The location should have adequate space to allow maintenance and wire connecting work.
- The location should be free from dust and corrosive gas.
- The location should be minimally affected by an electromagnetic fields.
- The altitude should be no more than 2000 m.
- The range of fluctuations in supply voltage should be within 100 V to 240 V AC $\pm 10\%$.

Detector

- The location should have adequate space to allow for checking and maintenance of the detector.
- Spilled water should not adversely affect the location.
- Utilities should be made available for zero water.
- Measured liquids should be those that will not damage the portion of the detector that comes into contact with the liquid.
- The solution being measured should be free from air bubbles.
- Measured liquid should be adequately agitated to be uniform.
- If measured liquid is aerated, air bubbles do not directly come in contact with the detector.

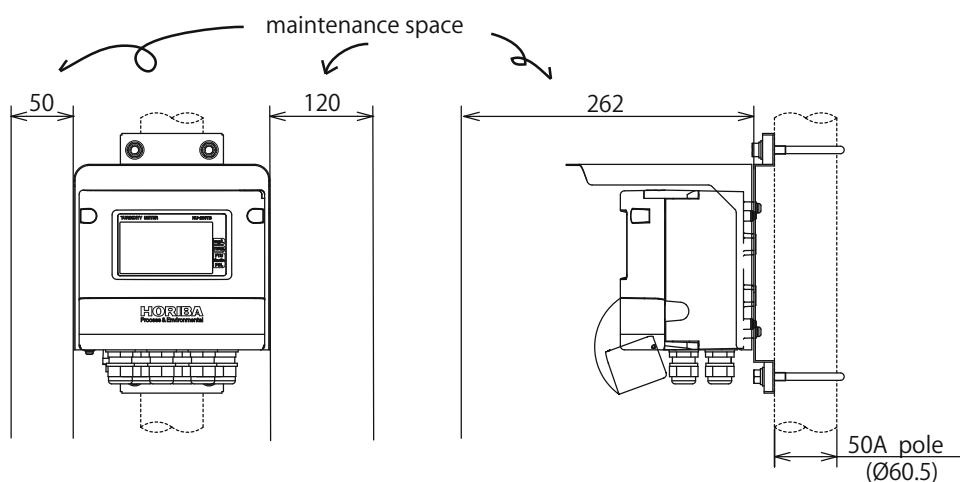
Converter

The following installation (mounting) uses the standard specifications.

- The main unit can be mounted to a pole or a wall.

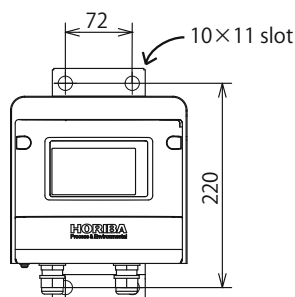
-mounted to a pole-

Consider maintenance space when installing.



-mounted to a pole or a wall-

Consider maintenance space when installing.



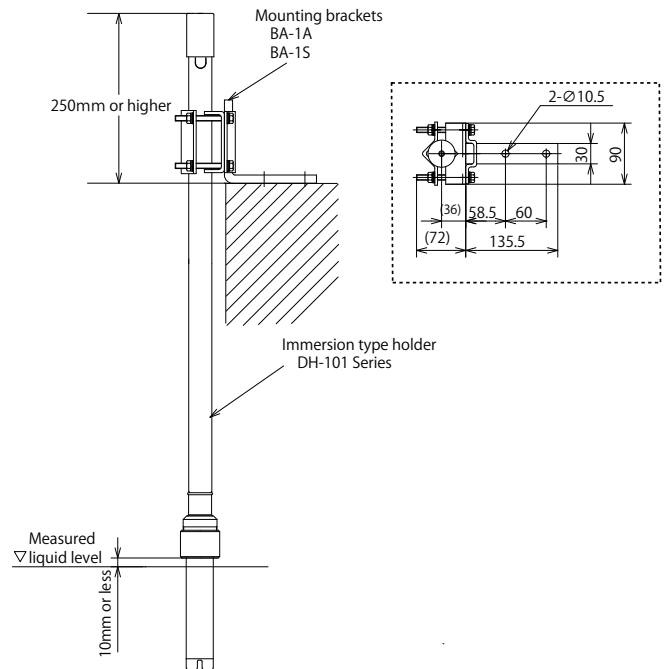
HU-200SS MLSS meter(Installation-2)

設 置

以下は浸漬ホルダなどの設置に関して（取付方法）を記載します。

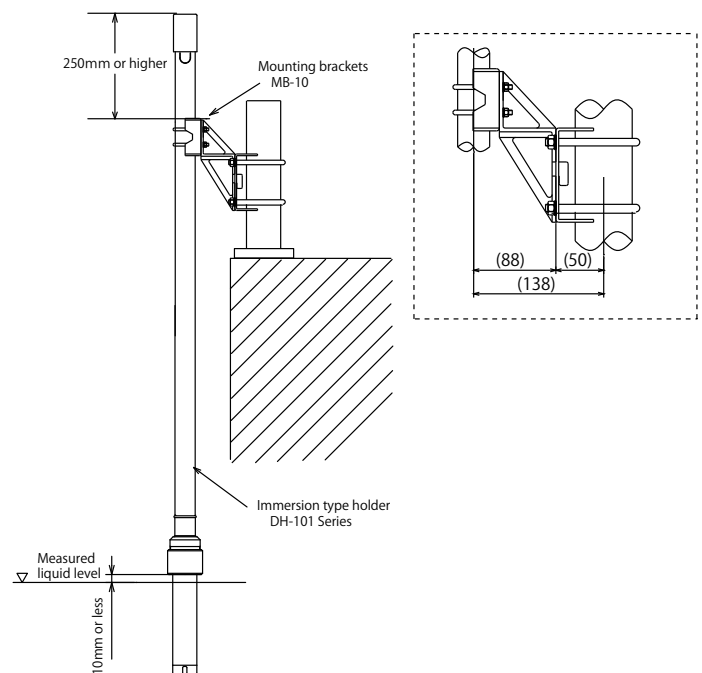
immersion type holde+Mounting brackets1

- Secure BA-1A or BA-1S mounting brackets with two $\Phi 10$ bolts.
- If installing an immersion type holder, install with 250mm or more on the slab.
- If installing an immersion type holder, install it so that 10mm or more of the bottom of the immersion holder will be submerged in the sample water.
- A (resin) immersion type holder up to 1.5m can be installed



immersion type holde+Mounting brackets2

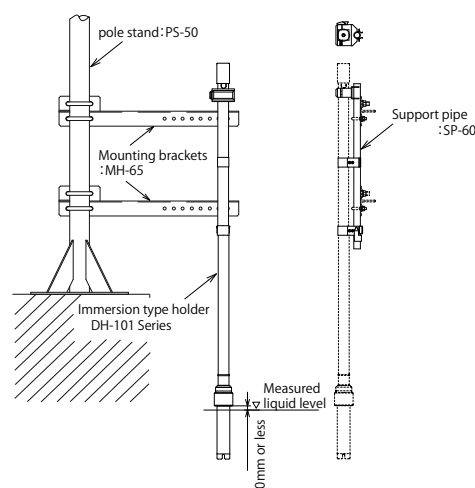
- Secure the MB-10 mounting brackets to the 50A pole.
- If installing an immersion type holder to the MB-10, install the immersion type holder of the MB-10 with approximately the upper 250mm of the U-bolt.
- If installing an immersion type holder, install it so that 10mm or more of the bottom of the immersion holder will be submerged in the sample water.



HU-200SS MLSS meter(Installation-3)

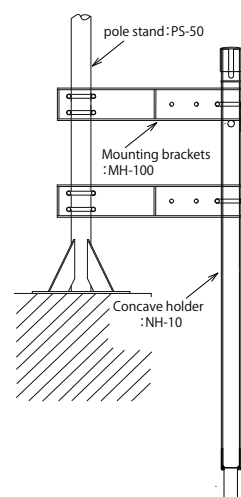
immersion type holde+Mounting brackets3

- If using an immersion type holder over 1.5m, it is recommended that a support pipe is used to secure the immersion holder.
- Check the length of the immersion type holder before using/installing a support pipe. (Specific support pipe lengths must be used for specific immersion type holders (holder lengths).)
- Secure the immersion type holder to the support pipe.
- Secure the support pipe to the mounting brackets (MH-60).
- Secure the MB-60 mounting brackets to the 50A pole.
- If installing an immersion type holder, install it so that 10mm or more of the bottom of the immersion type holder will be submerged in the sample water.



Concave holder + Mounting brackets

- If using a concave holder, securing with the MH-100 mounting brackets is recommended.
- Secure the MB-100 mounting brackets to the 50A pole stand



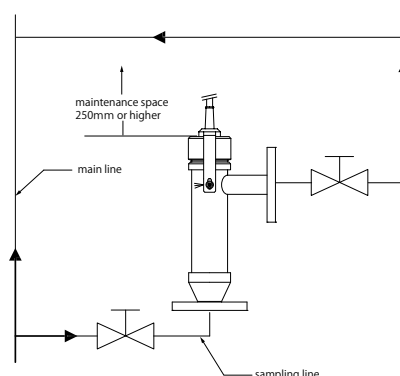
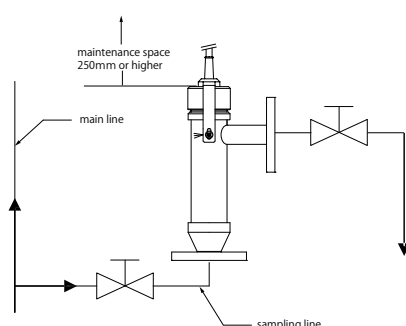
Flow holder

- Be sure to following the following instructions for setup.
- Install the Flow Holder at a location where maintenance work can be easily penormed.
- Leave a maintenance space of 25 cm or more at the top of the Flow Holder. Give room to an electrode cable to detach it for maintenance, etc.
- Avoid installing the Flow Holder at a location exposed to violent vibrations or heavy dust.
- Avoid installing the Flow Holder at al location where corrosive liquid is splashed, or in an atmosphere of corrosive gas.
- Avoid installing the Flow Holder at al location where a surface temperature and an ambient temperature are 50 °C or higher in the vicinity of a heat source.
- Do not connect the Flow holder to the main line. Be sure to provide a bypass line or a sampling line to connect it to the Flow Holder. (Maintenance work cannot be penormed whthout closing the main line.)

For installation of the Flow Holder, provide a bypass line from the main line or a sampling line so that the measured liquid flows into the bottm side of the Flow Holder and flow out of the lateral side of the Flow Holder.

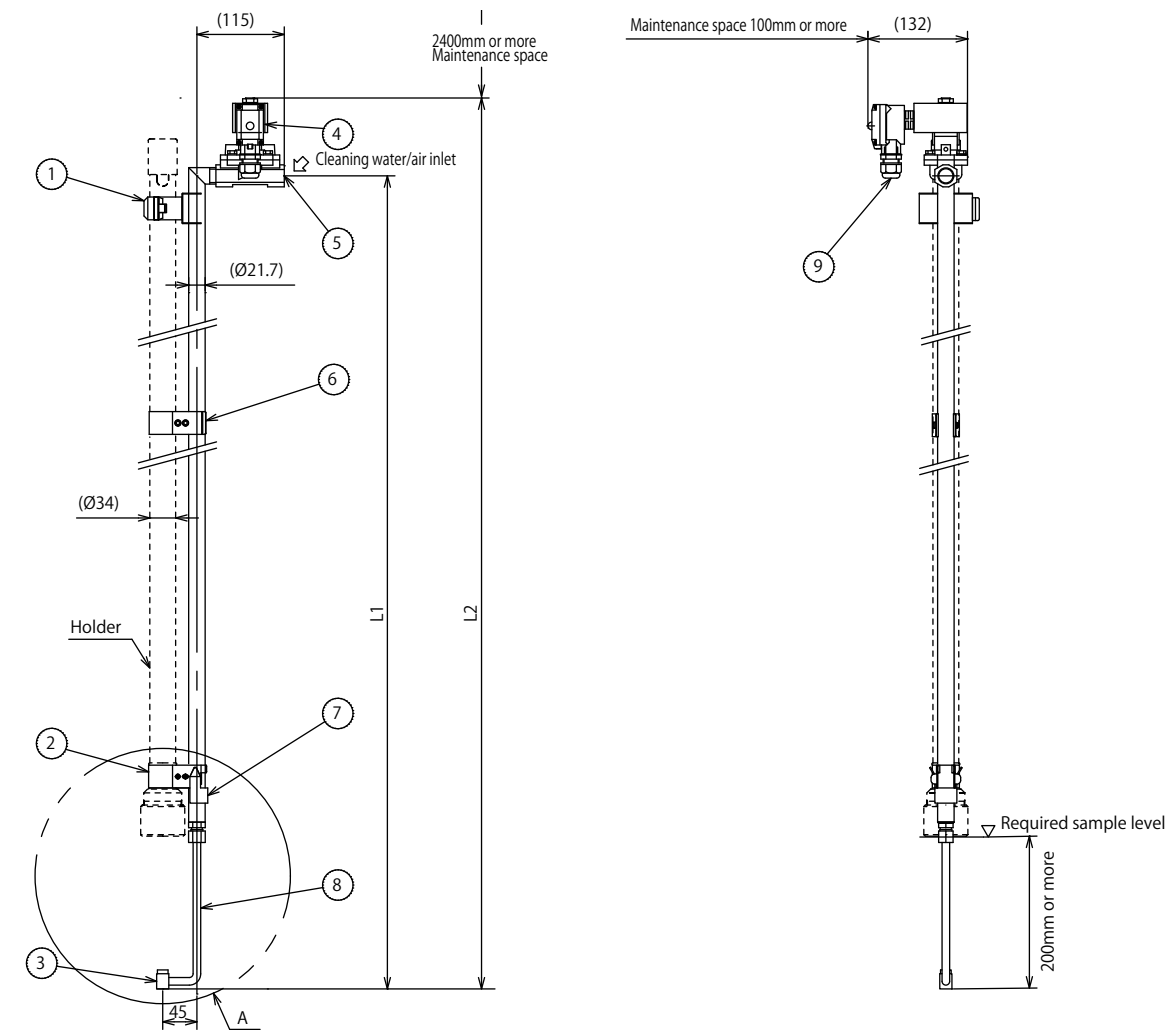
Be sure to provide valves on the inflow and outflow sides respectively. If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluculation of indicated values because the Sensor liquid junction section is pressurized by flow velocity. If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid.

If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Flow Holder.



HU-200SS Cleaner(Installation-4.1)

Immersion Type Jet Cleaner (JDH-121A) External Dimensions



NO.	PARTS NAME	NOTES
1	Bracket	PVC
2	Hook	SUS316
3	Nozzle	SUS316
4	Solenoid valve	
5	Cleaning water/air Inlet	Rc1/2
6	Support hook	SUS316
7	Stopper	SUS316
8	Nozzle holder	SUS316
9	Conduit	OD Ø7 to Ø12 cable

model	Immersion holder	L1(mm)	L2(mm)
JDH-121A-1.0	1m	1070±5	1179
JDH-121A-1.5	1.5m	1570±5	1679
JDH-121A-2.0	2m	2070±5	2179
JDH-121A-2.5	2.5m	2570±5	2679
JDH-121A-3.0	3m	3070±5	3179

Specification
Sample
Pressure : Atmospheric pressure
Temperature : -5 to 50°C (Sample must not be frozen.)
Velocity : 0.2 to 2.0m/sec (DO and MLSS sensor requires adequate agitation or flow. Calm sample could not be measured because suspended solid sedimentation or Oxygen poor diffusion gives lower reading.)

Cleaning fluid pressure
Water : 0.05 to 0.5MPa (consumption : approx. 4L/min)※1
(In case of the DO sensor cleaning : 0.05 to 0.2MPa)
Air : 0.05 to 0.2MPa (consumption : approx. 90L/min)
(In case of the DO sensor cleaning : 0.03 to 0.05MPa)

Liquid end materials
Mass : approx. 5.6kg
Protection structure : IP54 (IEC60529, JISC0920) (Category 2)
Probe : MLSS SS-90

HU-200SS Cleaner(Installation-4.2)

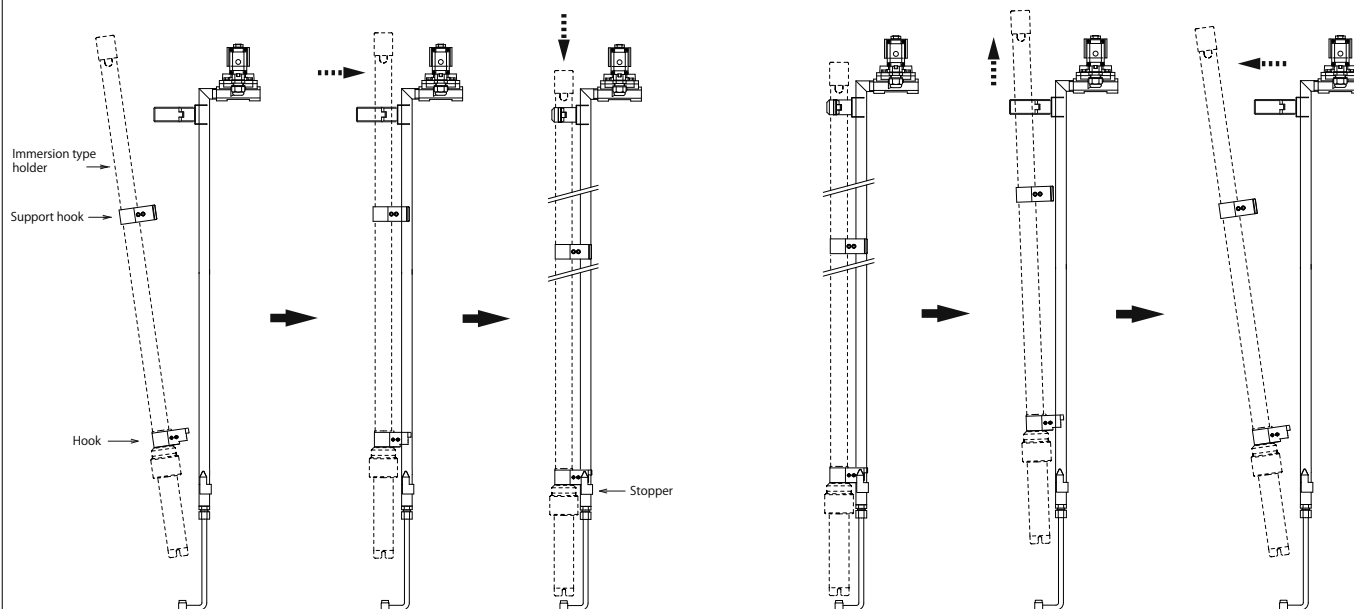
Immersion Type JetCleaner (JDH-121A) desorption

Mounting

- Mount and secure the hook to the immersion type holder.
- Align the hook with the oscillator holder and gently lower.
- When the hook catches on the stopper of the oscillator holder, secure the fixture of the immersion type holder.

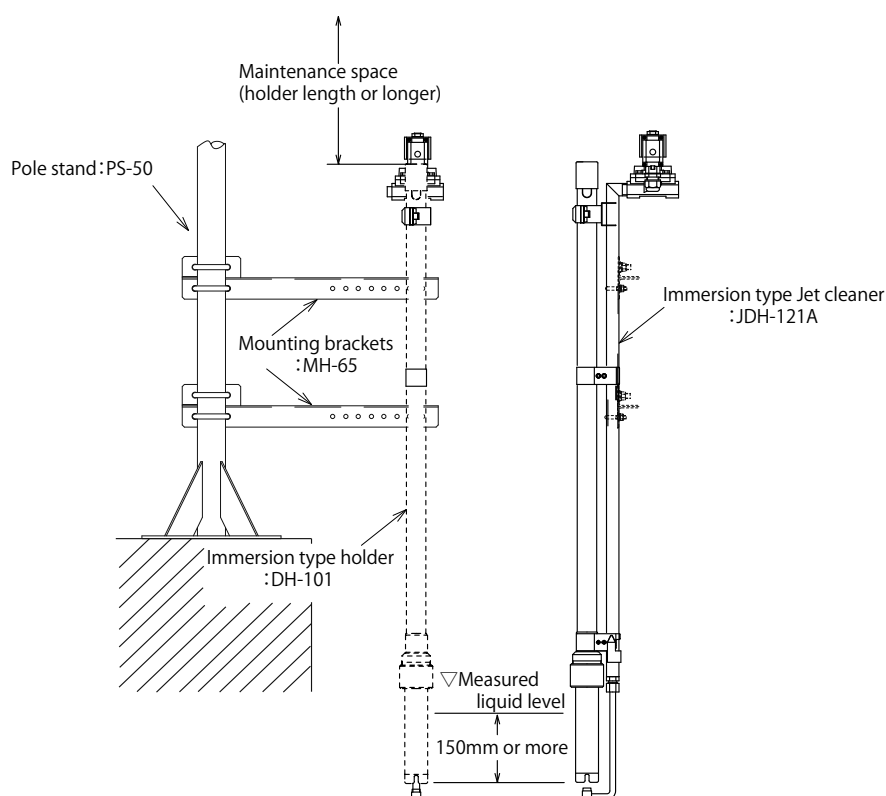
Removal

- Remove the fixture of the immersion type holder.
- Lift the immersion type holder directly upward.
- Remove the hook and support hook from the nozzle holder.



Immersion Type JetCleaner (JDH-121A) Installation

- Install in an area where operations such as maintenance can be performed easily.
- Install so that the sensor is always submerged regardless of fluctuations in the level of the measured liquid. • Avoid installing in areas with corrosive fluids or gases.
- Avoid installing in areas where the surface or ambient temperature will exceed 50°C , such as beside heating elements

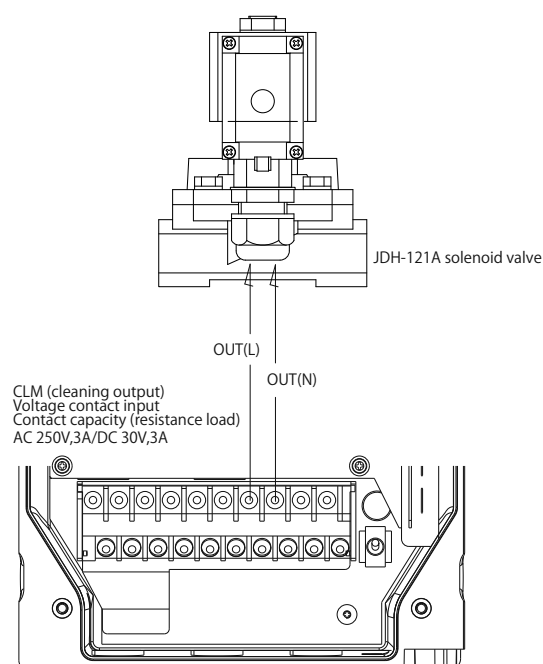


HU-200SS Cleaner(Installation-4.3)

Immersion Type Jet Cleaner (JDH-121A) Connection

Power source

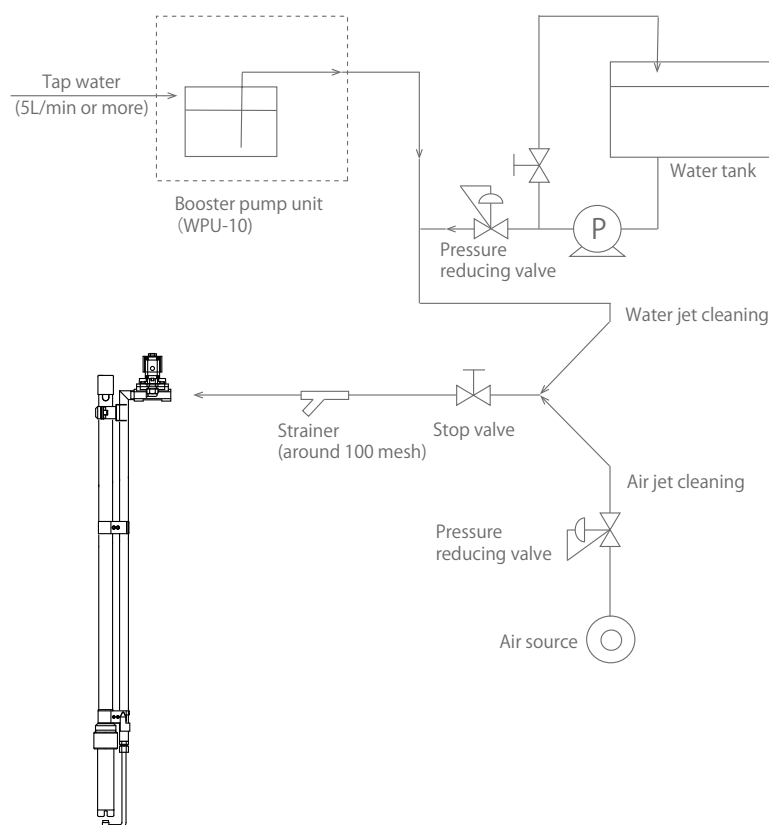
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction.
- Use the same voltage for the power source of the solenoid valve as that of the power source supplied to the converter. • For safety reasons, be sure to ground the earth terminal (class D grounding).
- The conduit cable diameter is Φ 7- Φ 12.



Immersion Type JetCleaner (JDH-121A) Piping

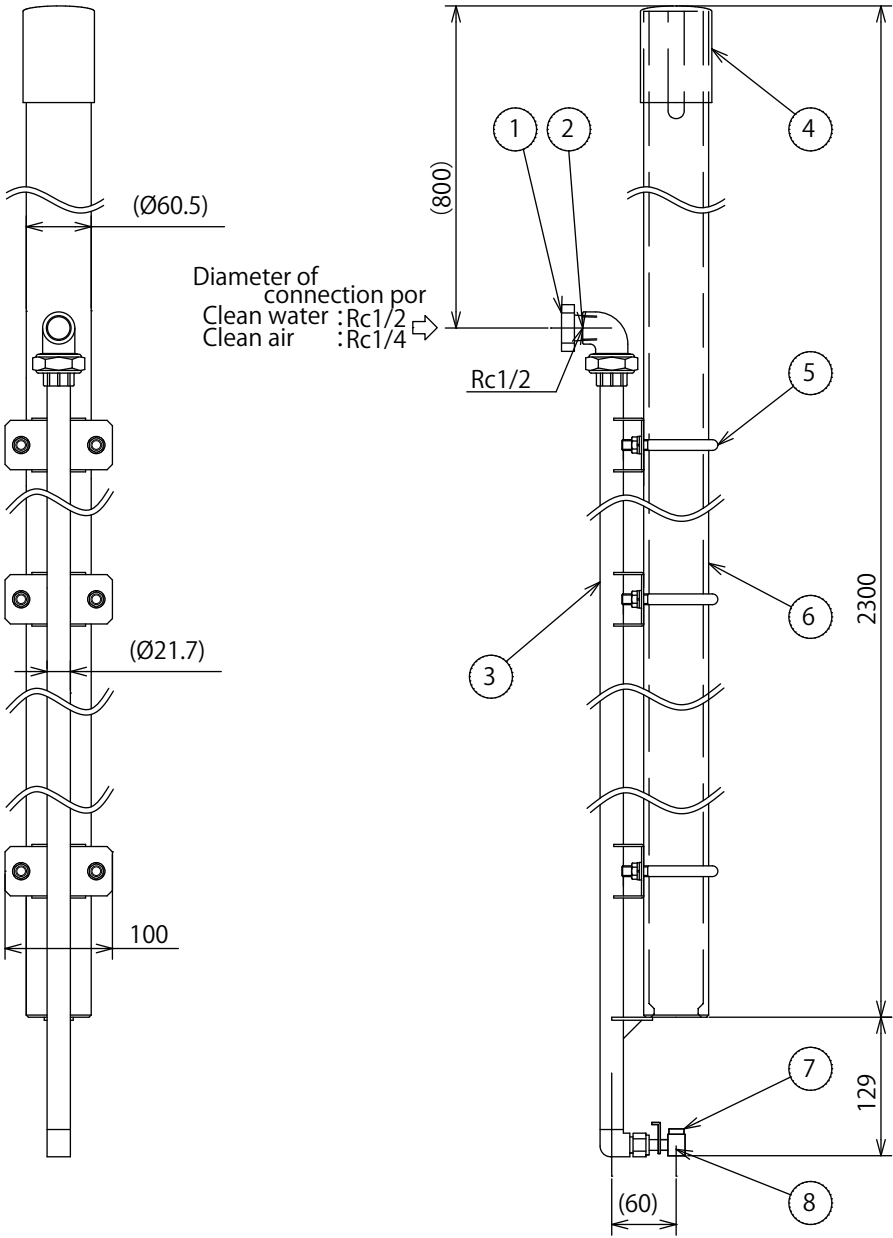
Be sure to follow the conditions below when installing.

- As the cleaner may be removed during maintenance, use flexible piping of a sufficient length to allow for this.
- Be sure to pass water through the piping to wash away impurities before connecting the piping to the cleaner.
- Use a regulator to adjust cleaning water to a prescribed pressure
- If using tap water as cleaning water, directly supplying tap water from the water supply is prohibited by Water Supply Act. Receive the water in a water receiving tank etc. and pressurize it using a pump. However, direct connection is possible if an organization uses its own industrial water (tertiary treatment water). It is also possible to connect to a tap water supply if the water is insulated by passing through a tank such as a rooftop tank.



HU-200SS Cleaner(Installation-5.1)

Concave type jet Cleaner (JH-11A) External Dimensions



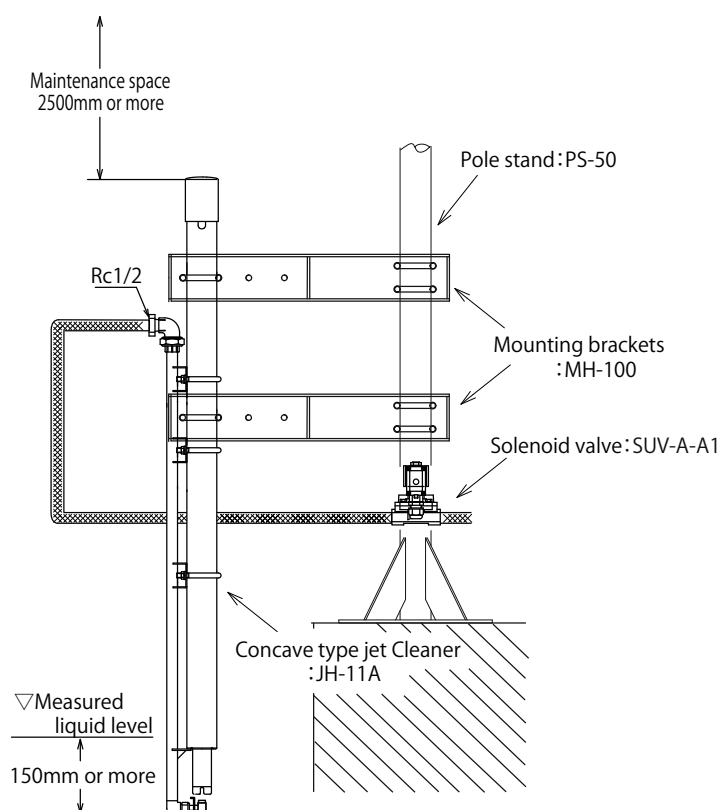
NO.	PARTS NAME	NOTES
1	bushing	R1/2xRc1/4 SUS304
2	clean water inlet	SUS304
3	nozzle holder pipe	SUS316
4	cap	PVC
5	U-bolt	SUS316
6	guide pipe	SUS316
7	nozzle	SUS316
8	nozzle holder	SUS316

model	nominal length	L1(mm)
JH-11A-2.0	2m	1800
JH-11A-2.5	2.5m	
JH-11A-3.0	3m	2800
JH-11A-3.5	3.5m	
JH-11A-4.0	4m	3800

HU-200SS Cleaner(Installation-5.2)

Concave type jet Cleaner (JH-11A) Installation

- Install in an area where operations such as maintenance can be performed easily.
- Install so that the sensor is always submerged regardless of fluctuations in the level of the measured liquid. • Avoid installing in areas with corrosive fluids or gases.
- Avoid installing in areas where the surface or ambient temperature will exceed 50°C , such as beside heating elements

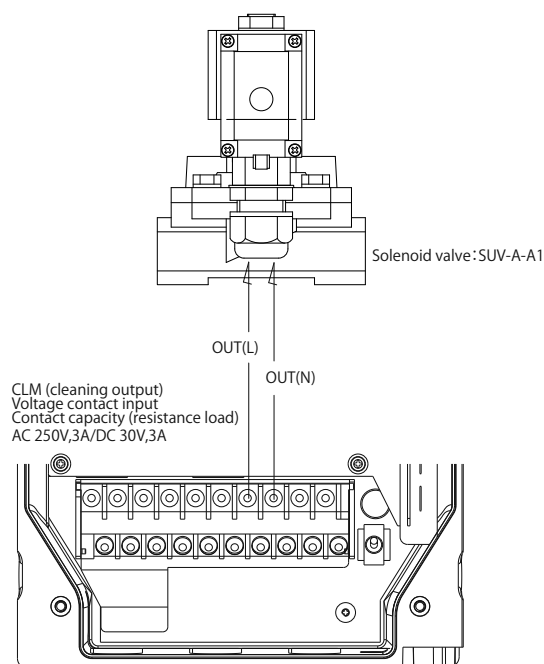


HU-200SS Cleaner(Installation-5.3)

Concave type jet Cleaner (JH-11A) Connection

Power source

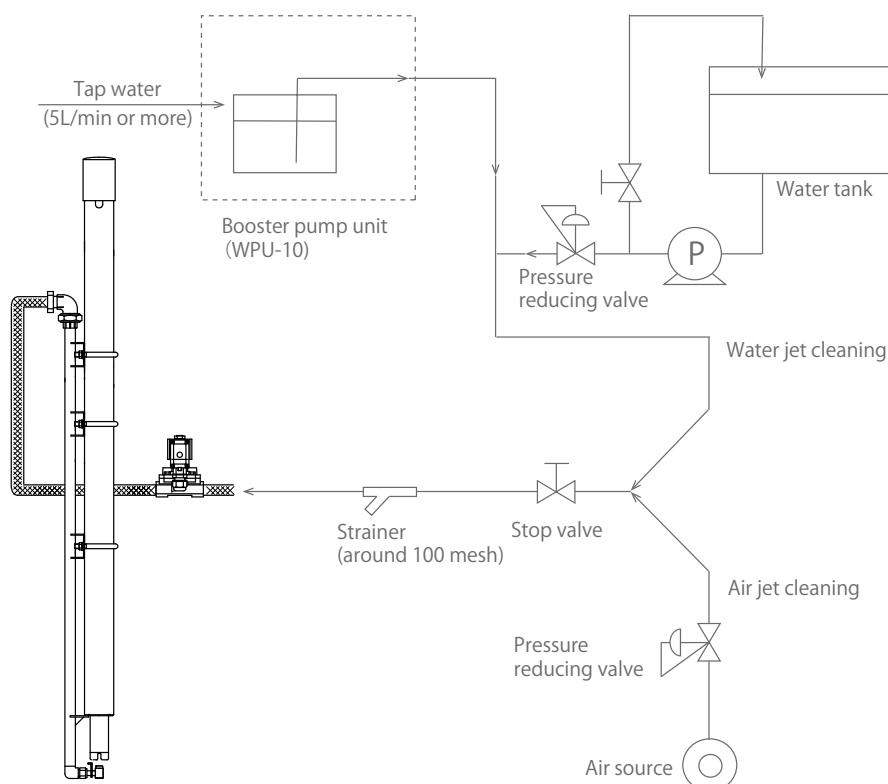
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction.
- Use the same voltage for the power source of the solenoid valve as that of the power source supplied to the converter.
- For safety reasons, be sure to ground the earth terminal (class D grounding).
- The conduit cable diameter is Φ 7- Φ 12.



Concave type jet Cleaner (JH-11A) Piping

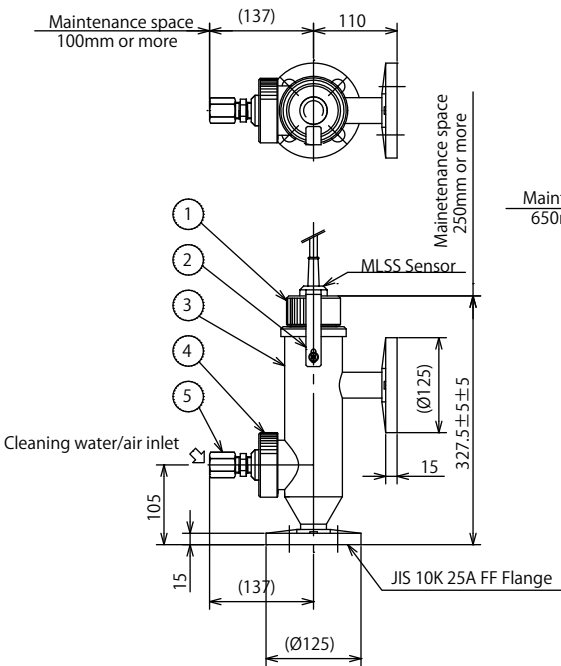
Be sure to follow the conditions below when installing.

- As the cleaner may be removed during maintenance, use flexible piping of a sufficient length to allow for this.
- Be sure to pass water through the piping to wash away impurities before connecting the piping to the cleaner.
- Use a regulator to adjust cleaning water to a prescribed pressure
- If using tap water as cleaning water, directly supplying tap water is prohibited by Water Supply Act. Receive the water in a water receiving tank etc. and pressurize it using a pump. However, direct connection is possible if an organization uses its own industrial water (tertiary treatment water). It is also possible to connect to a tap water supply if the water is insulated by passing through a tank such as a rooftop tank.



HU-200SS Cleaner(Installation-6.1)

Flow holder Cleaner（JM-F-311）External Dimensions



NO.	PARTS NAME	NOTES
1	Holder fixing nut	PVC
2	Locking plate	SUS304
3	Holder	PVC
4	Cleaner mounting nut	PVC
5	Cleaning water/air inlet	Rc1/2

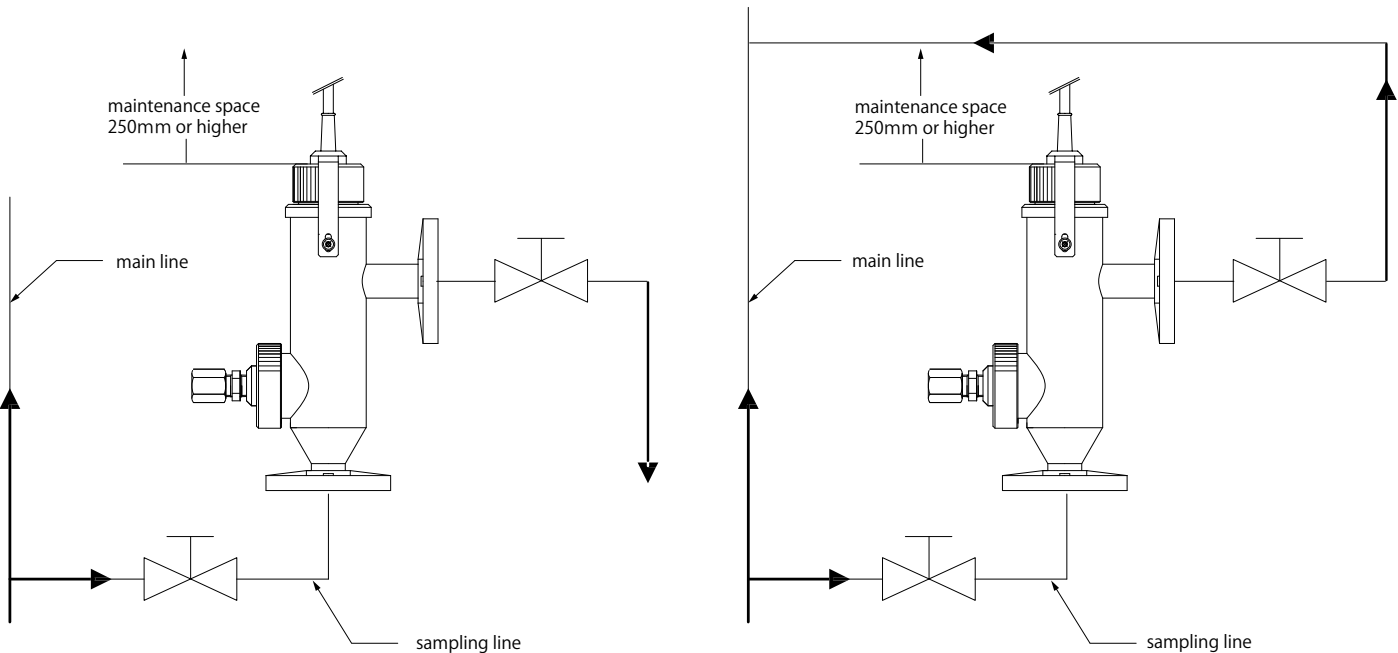
Specification
Sample
Pressure : 0 to 0.2MPa
Sample temperature : 5 to 50°C (Sample must not be frozen.)
※The temperature range might be limited by sensor, refer to the sensor specification.
Flow rate : 0.3 to 10L/min
Cleaning fluid pressure : 0.05 to 0.5MPa
(Set the cleaning pressure between 0.05 and 0.2MPa higher than sample pressure.)
Liquid end materials : PVC, EPDM, SUS316 (Not include sensor.)
Mass : approx. 1.6kg
Sensor : MLSS SS-90

Flow holder Cleaner（JM-F-311）Installation

- Be sure to following the following instructions for setup.
- Install the Flow Holder at a location where maintenance work can be easily penomed.
- Leave a maintenance space of 25 cm or more at the top of the Flow Holder. Give room to an electrode cable to detach it for maintenance, etc.
- Avoid installing the Flow Holder at a location exposed to violent vibrations or heavy dust.
- Avoid installing the Flow Holder at al location where corrosive liquid is splashed, or in an atmosphere of corrosive gas.
- Avoid installing the Flow Holder at al location where a surface temperature and an ambient temperature are 50 °C or higher in the vicinity of a heat source.
- Do not connect the Flow holder to the main line. Be sure to provide a bypass line or a sampling line to connect it to the Flow Holder. (Maintenance work cannot be penomed whthout closing the main line.)

For installation of the Flow Holder, provide a bypass line from the main line or a sampling line so that the measured liquid flows into the bottm side of the Flow Holder and flow out of the lateral side of the Flow Holder.

Be sure to provide valves on the inflow and outflow sides respectively. If the flow rate of measured liquid is too much, this may cause capitation, etc. or fluctuation of indicated values because the Sensor liquid junction section is pressurized by flow velocity. If a flow rate is too little, this may cause a response delay of indicated values. Regulate a flow rate according to the conditions of measured liquid. If many suspended solids are contained in the measured liquid, provide a strainer on the inflow side of the Flow Holder.

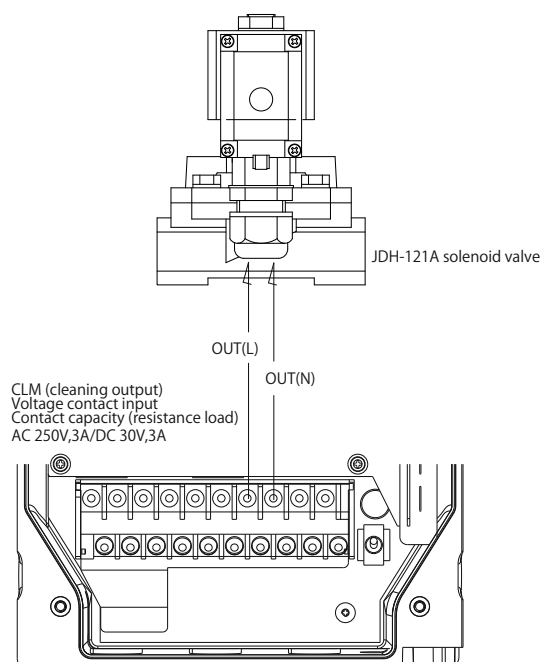


HU-200SS Cleaner(Installation-6.2)

Flow holder Cleaner (JM-F-311) Connection

Power source

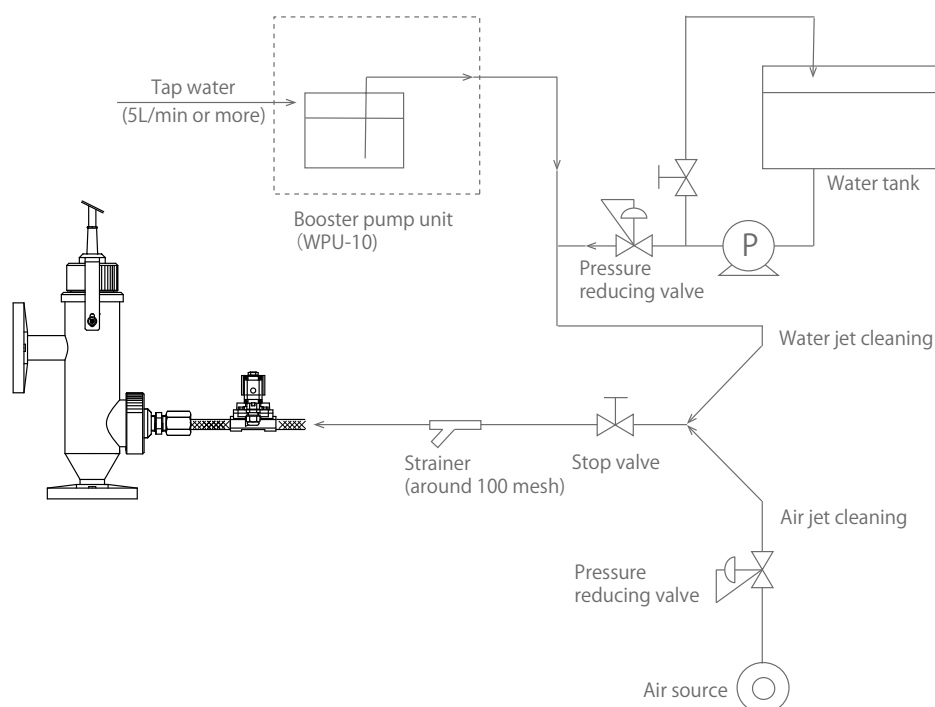
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction.
- Use the same voltage for the power source of the solenoid valve as that of the power source supplied to the converter. • For safety reasons, be sure to ground the earth terminal (class D grounding).
- The conduit cable diameter is $\Phi 7$ - $\Phi 12$.



Flow holder Cleaner (JM-F-311) Piping

Be sure to follow the conditions below when installing.

- As the cleaner may be removed during maintenance, use flexible piping of a sufficient length to allow for this.
- Be sure to pass water through the piping to wash away impurities before connecting the piping to the cleaner.
- Use a regulator to adjust cleaning water to a prescribed pressure
- If using tap water as cleaning water, directly supplying tap water from the water supply is prohibited by Water Supply Act. Receive the water in a water receiving tank etc. and pressurize it using a pump. However, direct connection is possible if an organization uses its own industrial water (tertiary treatment water). It is also possible to connect to a tap water supply if the water is insulated by passing through a tank such as a rooftop tank.



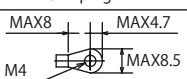
HU-200SS MLSS meter(Connection-1)

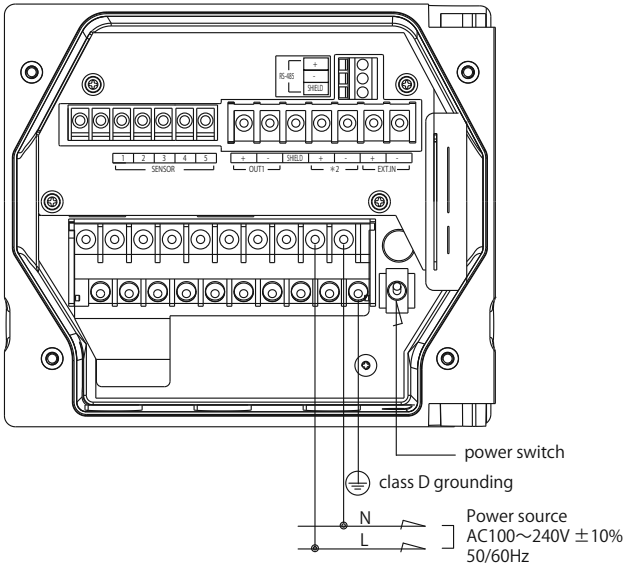
Power Source

- The power source is a free power source with a rated voltage of AC100-240 V.
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction.
- Also, check that the range of fluctuations in supply voltage does not exceed $\pm 10\%$.
- This instrument has a power switch

Main Specifications

- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm² (AWG18-10).
- Install the power switch near the instrument and ensure that the power source can be turned on and off.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- For safety reasons, be sure to ground the earth terminal (class D grounding).
- Ground separately from electrical equipment such as the motor.

Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

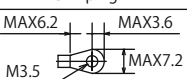


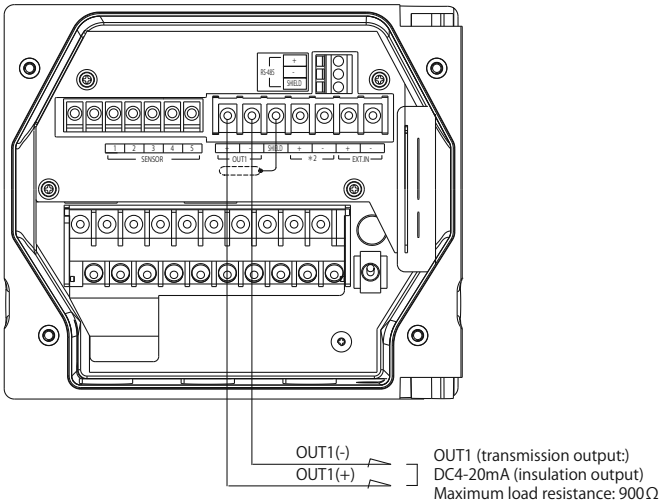
Transmission Output

- One transmission output (DC 4-20mA) is included.
- If desired, a full-scale transmission output range can be set, as long as it is within the full scale setting range of the measured values.
- Also, set a burnout (transmission output: 3.8mA or 21mA).It is possible to set whether to temporarily hold the output value at the last value or a preset value when holding the transmission output during an external signal.

Main Specifications

- The transmission output terminal screws are M3.5 screws.
- The wire size is 2mm² (AWG14) max.
- Use a twist pair shielded cable.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- Make sure that the maximum resistance of the contact input is 100 Ω or less.

Crimping	Wire size	Torque
	2mm ² /MAX (AWG14)	0.8~1.2 N·m



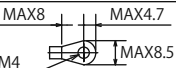
HU-200SS MLSS meter(Connection-2)

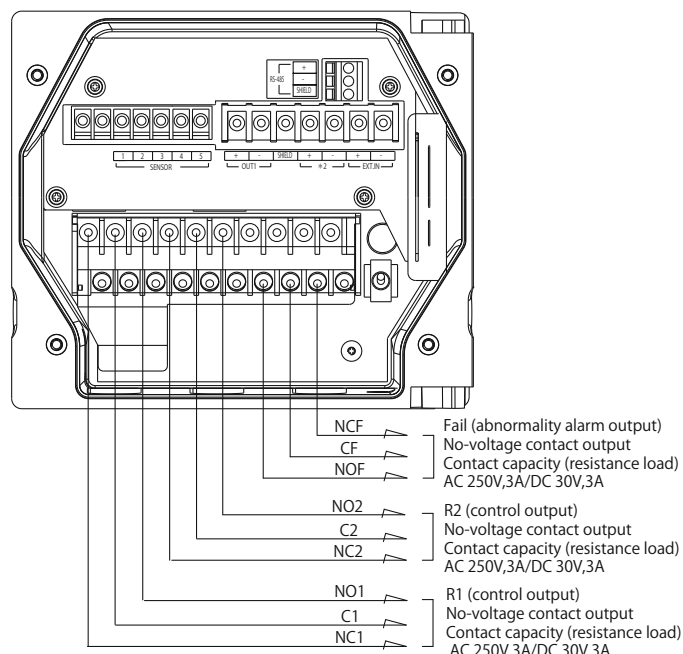
Contact Output

- Three contact outputs are included as a standard feature.
- The instrument includes contact outputs such as upper and lower limit alarms, error warnings and transmission output holds.

Main Specifications

- The contact capacity is a maximum resistance value load of AC250V and 3A or DC30V and 3A.
- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm² (AWG18-10).
- Use a varistor or noise killer if noise occurs in the load.
- The NO and NC arrangement is reversed only in the case of fail output. For normal (non-fail) output, the CF-NOF contact is open and the CF-NCF contact is shorted. The C-NOF contact is shorted when the power is off.
- If connecting a load higher than the contact capacity or an inductive load (such as a motor or pump), be sure to connect the load through a power relay with a rating higher than that of the load.
- Take care when connecting a load, as the C-NC contact of R1-R2 is shorted when the power source of this instrument is off.

Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

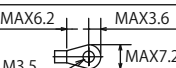


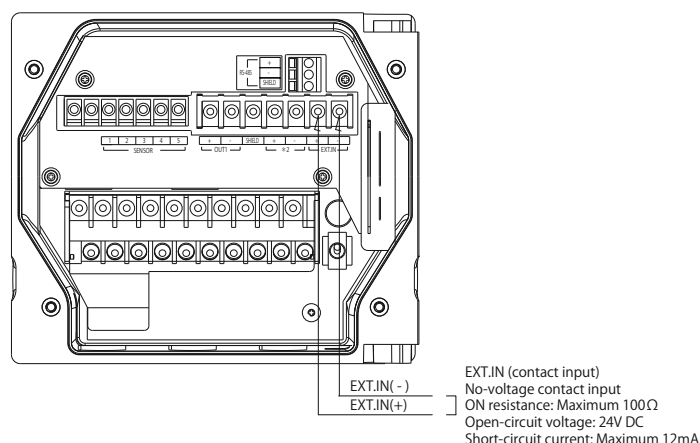
Contact Input

A contact input is included as a standard feature. The cleaner can be operated by an external signal.

Main Specifications

- The contact input terminal screws are M3.5 screws.
- The wire size is 0.14-2.5mm (AWG 26-AWG 14).
- Use a twist pair shielded cable. Install arresters on the output side and receiving instrument side of the instrument if there is a risk that it will be struck by lightning.
- Make sure that the maximum resistance of the contact input is 100 Ω or less.

Crimping	Wire size	Torque
	2mm ² /MAX (AWG14)	0.8~1.2 N·m




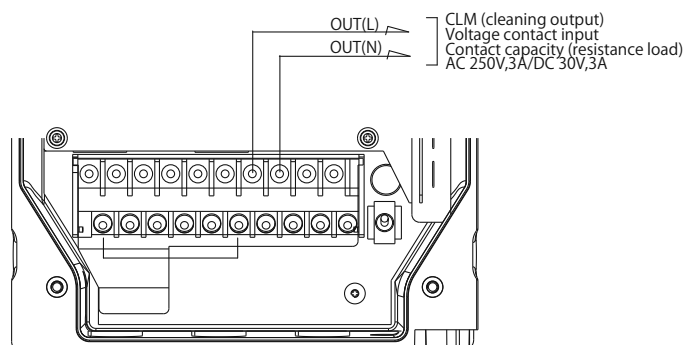
Cleaning output

- A cleaning output is included as a standard feature.
- Cleaning output terminal The cleaning output is a voltage output with the same electrical potential as the power source. (It is not a no-voltage contact.)

Main Specifications

- The contact capacity is a maximum resistance value load of AC250V and 3A or DC30V and 3A.
- The contact output terminal screws are M4 screws.
- The wire size is 0.75-5.5 mm² (AWG18-10).


Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m



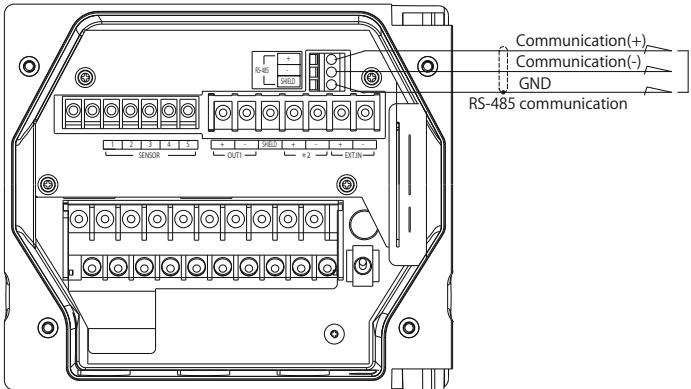
HU-200SS MLSS meter(Connection-3)

RS-485

- This instrument includes the RS-485 communication terminal.Connect the wiring before using.
- The wire size is 0.14-2.5mm (AWG 26-14).</885>
- Use a twist pair shielded cable for the communication output cable.
- Up to 32 terminals can be connected including the host computer.Set an address.
- The maximum cable length of the communication cable is 500 m.
- Provide termination resistance (Rt: 120 Ω) for instrument that is the terminus of the RS-485 communication line.

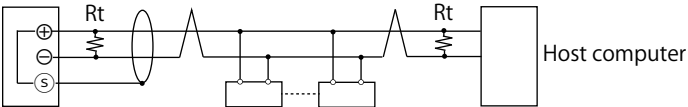
Crimping	Wire size	Torque
	0.14~2.5mm ² (AWG26~14)	0.5~0.6 N·m

Example of external communication connection



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

This instrument: RS-485 (communication output)




Sensor

A contact input is included as a standard feature.The cleaner can be operated by an external signal.

Main Specifications

- The contact input terminal screws are M3 screws.
- The wire size is 1.25mm² (AWG16).

Crimping	Wire size	Torque
	1.25mm ² /MAX (AWG16)	0.8N·n

- Do not allow the cable terminal and terminal block to come into contact with liquids such as water or soil them with finger marks or oil from hands. This decreases insulation. A decrease in insulation causes indication to become unstable, Be sure to keep dry and clean. If soiled, wipe with alcohol etc. and dry well.
- Make sure that the wiring is long enough to lift the detector, as this is required during maintenance.
- Do not wire the detector cable near equipment that supplies induction to parts such as the motor or the power cable of this equipment

