

H-1 Series Industrial-use Optical DO Meter (4 Wire Type)
HD-200FL



Overview

This device is connected to a DO (dissolved oxygen) sensor to measure the amount of dissolved oxygen in a sample. This is an optical (fluorescence type) dissolved oxygen meter ideal for monitoring aeration tanks such as for water treatment or effluent treatment. Unlike conventional diaphragm polar type sensors, there is no need to replace internal fluid or perform warming up. For this reason, it also provides improved maintainability and reduced running costs.

Measurement target

DO in solution

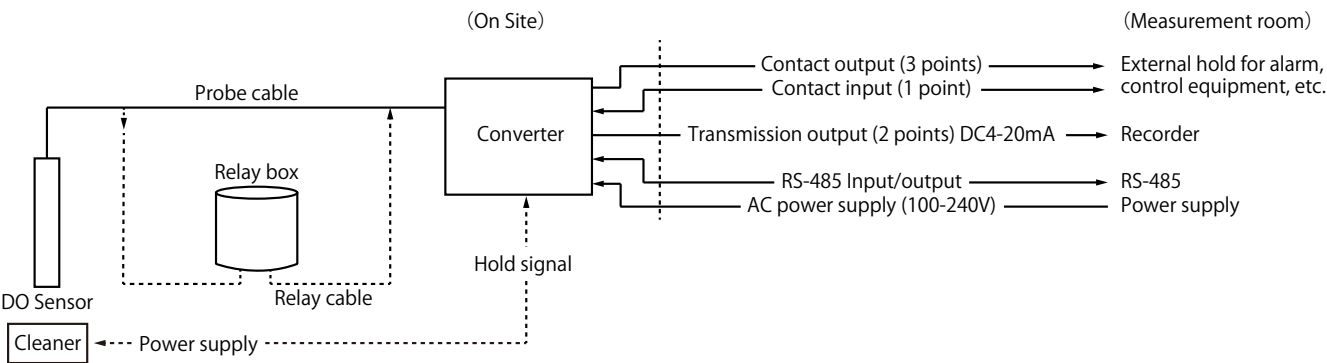
Measuring principle

Optical (fluorescent)

Uses

Dissolved oxygen in treated water. Dissolved oxygen in an aquaculture water tank, etc.

System Configuration

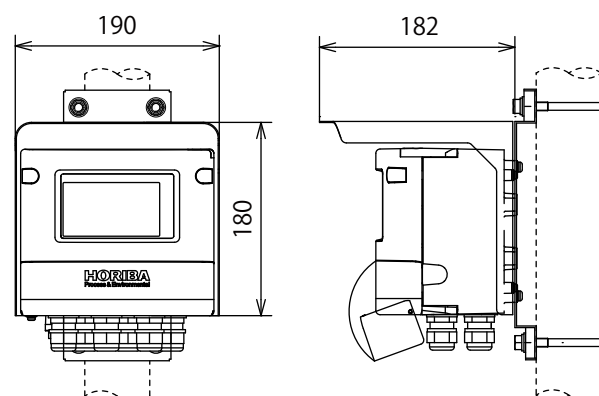


HD-200FL Optical DO Meter (Overview-1)

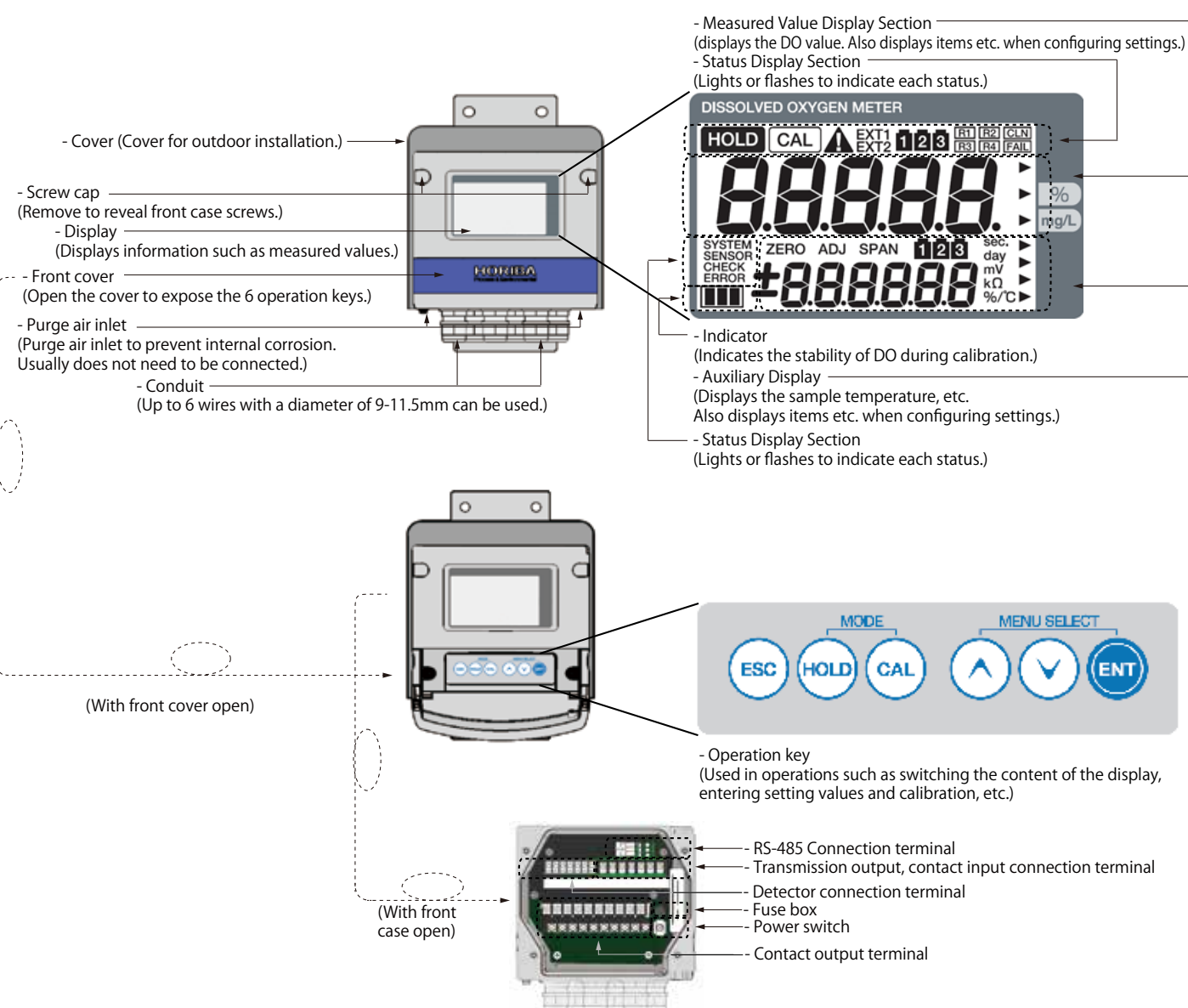
Features

- Outdoor installation model (IP65-equivalent splashproof construction)
- Selectable simultaneous temperature display
- All operations can be performed from front screen keys
- Full range of maintenance functions (self-diagnosis capabilities)
- Transmission output range can be set
- No tearing of the diaphragm
- No effect from flow rate
- Improved key operability through the use of embossed sheets

External dimensions



Names of Parts/Configuration



HD-200FL Optical DO Meter (Overview-2)

Power Source

- The instrument power source is a free power source with a rated voltage of AC100-240 V, 50/60Hz. Maximum power output is 20VA.

Contact output

- Two contact outputs are included. The contact capacity is less than AC 240V and 3A or DC 30V and 3 A.

Transmission Output

- There are two transmission output points. A DC 4 - 20 mA signal compatible with the measurement range is output.
- Receiving resistance on the receiving instrument side is a maximum of 900 Ω .

Contact input

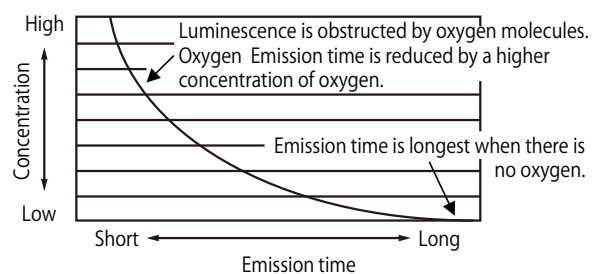
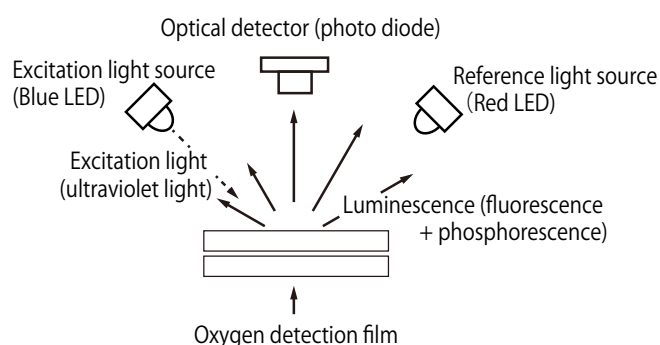
- There is one contact input point. The contact is an open collector no-voltage a contact.
- Maximum ON resistance is 100 Ω .
- Open voltage is 24V DC.
- Maximum short circuit voltage is 12mA DC.

DO Sensor

- A single DO sensor can be connected.

Optical DO Sensor

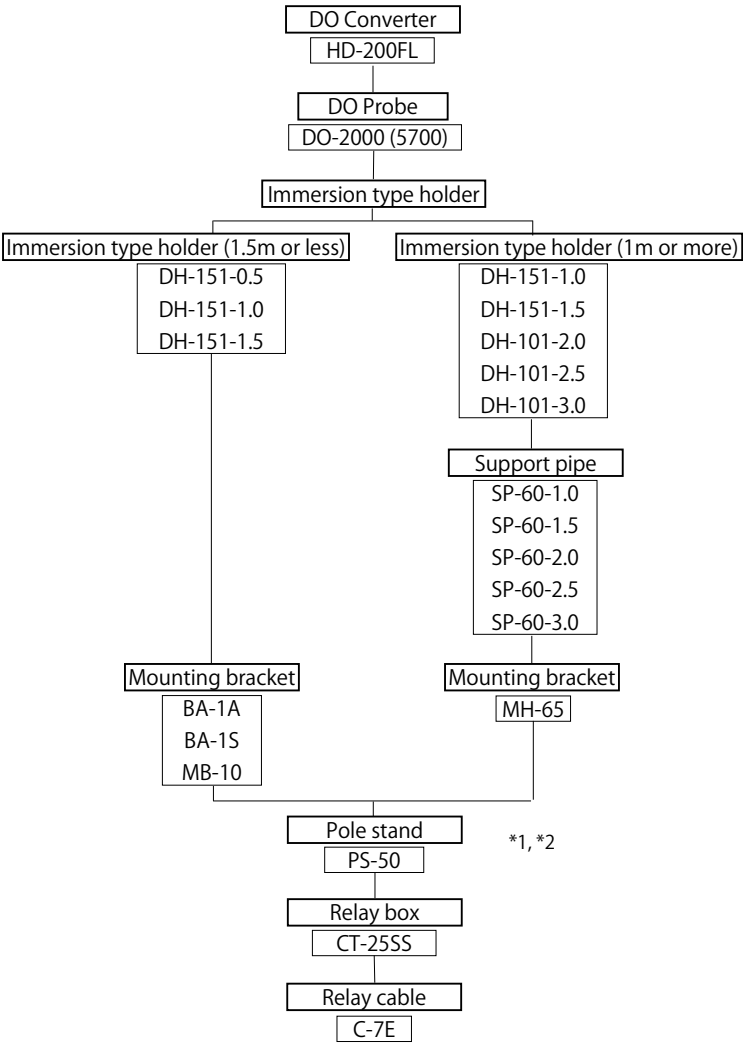
When excitation light is irradiated onto the oxygen detection film that contains special fluorescent material, the film emits fluorescent light. The emission intensity is at the strongest level when there is no oxygen, and reduces when oxygen particles exist due to quenching effects. Similarly, the emission time is longest when there is no oxygen, and decreases when oxygen particles exist. An inverse correlation relationship can be obtained from the relationship between oxygen concentration and emission time, as shown in the table on the right. A phase difference detection method is used to measure the emission time, reducing the effects of dirt on the sensor surface or desensitization.



HD-200FL Optical DO Meter (combination-1)

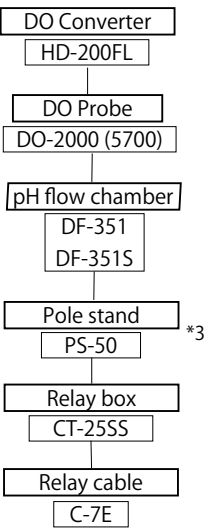
The table below shows combinations based on the specifications of converters, sensors and holders, etc. Refer to the section on each product for detailed specifications.

■ Combination 1 (When using an immersion type holder)



*1: Pole stand for mounting the converter, relay box (CT-25S) and mounting bracket (MB-10).
*2: Pole stand for mounting the converter, relay box (CT-25SS) and mounting bracket (MH-65).

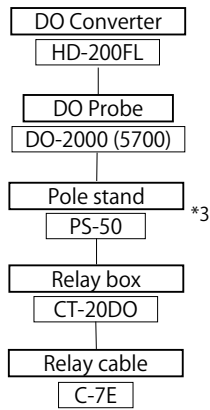
■ Combination 2 (when a flow through holder is used)



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

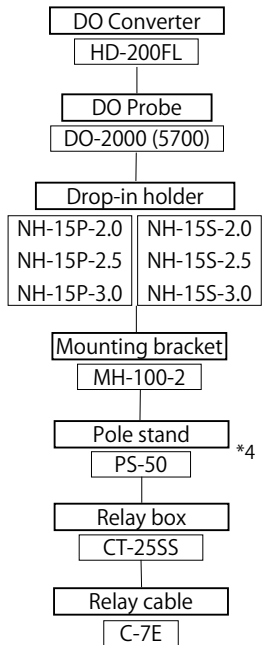
HD-200FL Optical DO Meter (combination-2)

■ **Combination 3 (When using by immersion)**



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

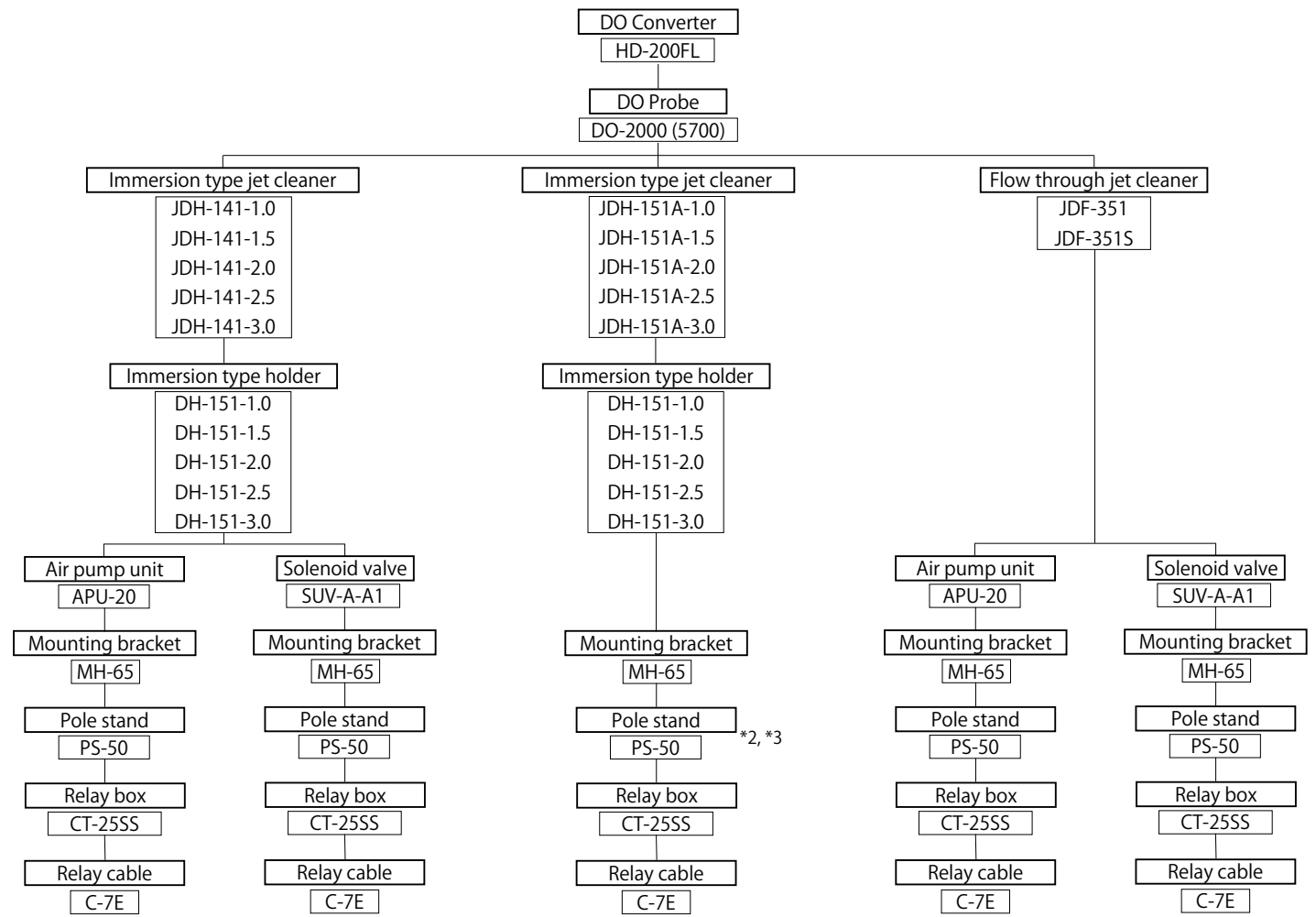
■ **Combination 4 (when a drop-in holder is used)**



*4: Pole stand for mounting the converter, relay box (CT-25SS) and mounting bracket (SDK-1 or MH-100-2).

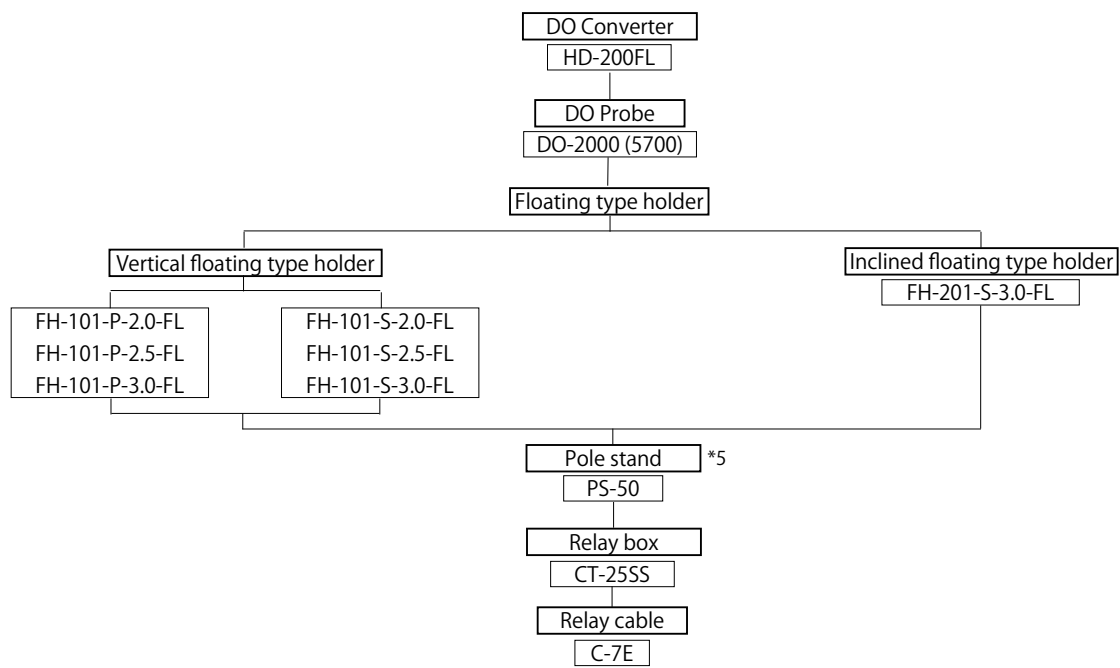
HD-200FL Optical DO Meter (combination-3)

■ Combination 5 (when a cleaner is used)



*2: Pole stand for mounting the converter, relay box (CT-20DO) and mounting bracket (MH-65).
*3: Pole stand for mounting the converter and relay box (CT-20DO).

■ Combination 6 (when a floating holder is used)

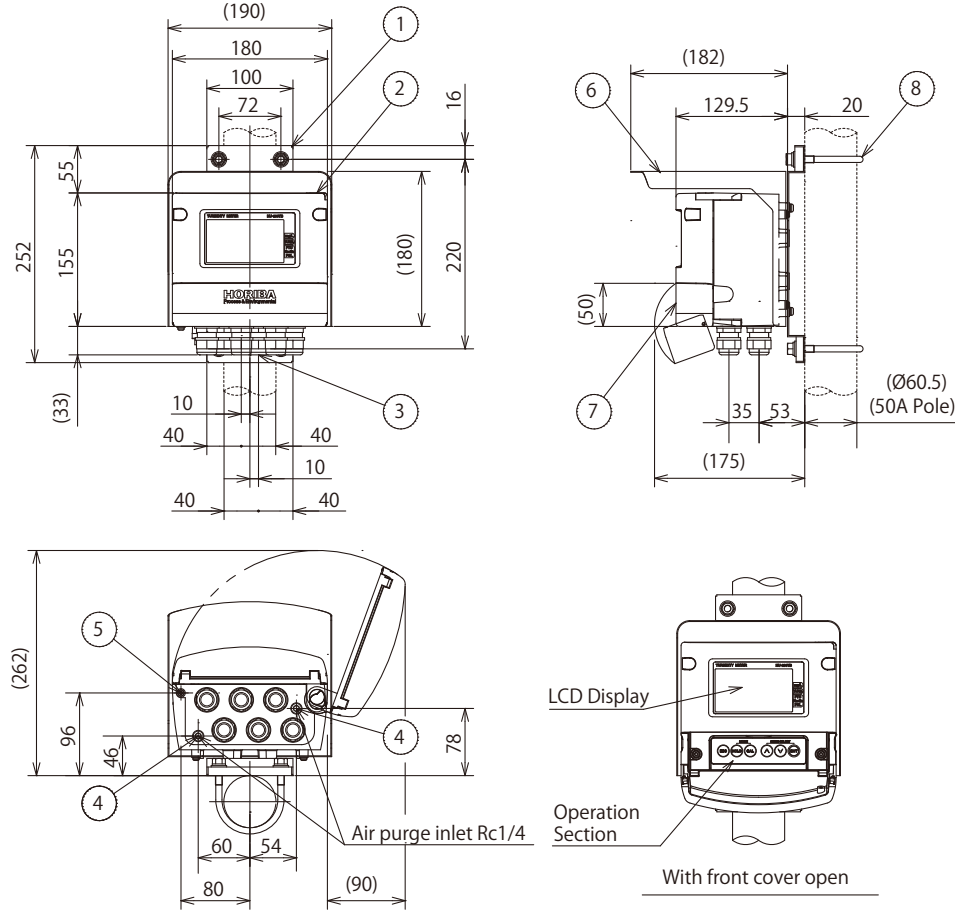


*5: Pole stand for mounting the converter, relay box (CT-20DO) and vertical floating holder.

HD-200FL Optical DO Meter (external dimension-1)

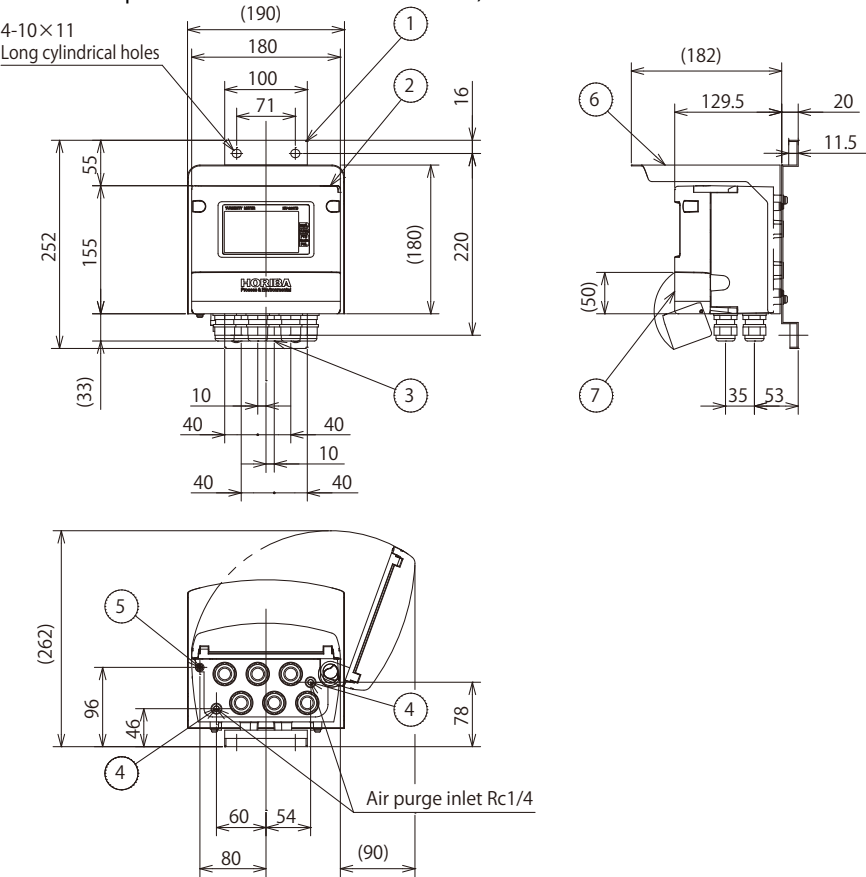
Converter

- Pole installation -



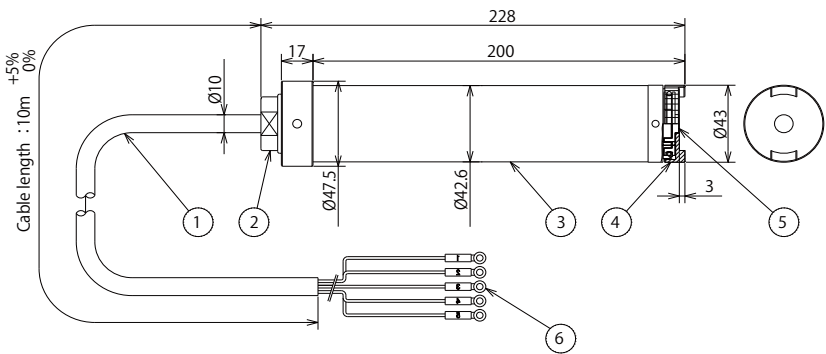
NO.	PARTS NAME	NOTES
1	Bracket	SUS304
2	Case	ADC12
3	Conduit (Cable gland)	Screw size G1/2 O.D Ø7~Ø12Cable
4	Plug	SUS304
5	Earth terminal	SUS304 M4
6	Cover	SUS304
7	Front cover	ADC12
8	U-bolt	SUS304 50A M8

- Wall Mounting (Part names and "With front cover open" sections are common to all) -



HD-200FL Optical DO Meter (external dimension-2)

DO Sensor (DO-2000)

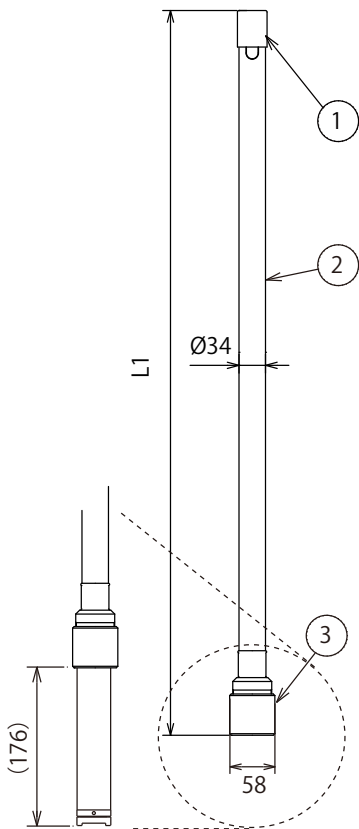


NO.	PARTS NAME	NOTES
1	Cable	PVC
2	Cable gland	SUS316
3	Probe unit	SUS316
4	Protective cap	SUS316
5	Sensor cap	#5700
6	Terminal	

Specifications

- Measured liquid temperature: 0 to 50°C (No condensation)
- Measured liquid pressure: 0 to 1.0MPa
- Material of wetted part: SUS316, PMMA, NBR, PVC
- Weight: Approx. 3.0kg (including 10m cable)
- Protection level: IP68 (IEC60529, JIS C0920)

Immersion holder (DH-151)



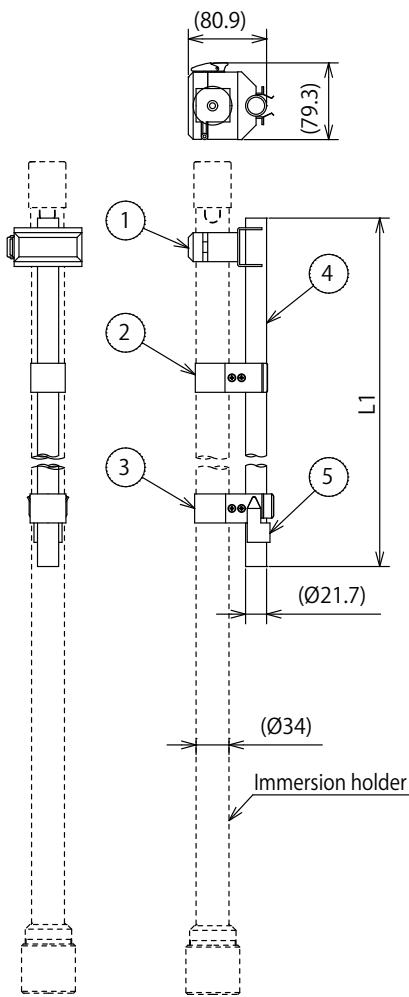
NO.	PARTS NAME	NOTES
1	Protective Cap	PVC
2	Holder	PVC
3	Nuts	PVC

Specifications

- Measured liquid temperature: -5 to 50°C (No condensation)
- Measured liquid pressure: Atmospheric pressure
- Flow rate: Less than 2.0m/sec
- Material of wetted part: PVC (excluding sensor material)

Nominal	L1 (mm)	Weight (kg)
0.5m	430±10	Approx. 0.28
1.0m	930±10	Approx. 0.5
1.5m	1430±10	Approx. 0.72
2.0m	1930±10	Approx. 0.94
2.5m	2430±10	Approx. 1.16
3.0m	2930±10	Approx. 1.38

Support pipe (SP-60)

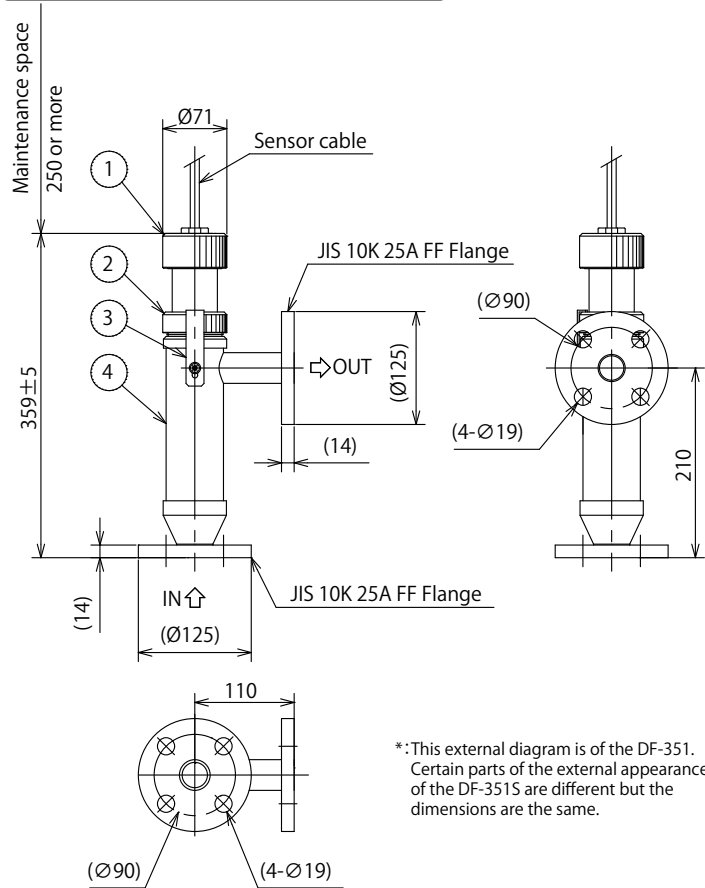


NO.	PARTS NAME	NOTES
1	Bracket	PVC
2	Support hook	SUS316
3	Hook	SUS316
4	Support pipe	SUS316
5	Stopper	SUS316

Immersion holder length	L1 (mm)
1.0m	500±10
1.5m	1000±10
2.0m	1500±10
2.5m	2000±10
3.0m	2500±10

HD-200FL Optical DO Meter (external dimension-3)

Flow through holder (DF-351/DF-351S)



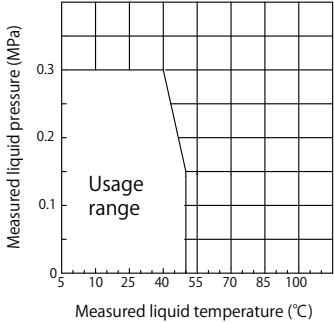
NO.	PARTS NAME	NOTES(*1)	NOTES(*2)
1	Installation nut 1	PVC	SUS304
2	Installation nut 2	PVC	SUS304
3	Lock plate	SUS304	SUS304
4	Holder	PVC	SUS316

*1:Material for DF-351.
*2:Material for DF-351S.

Specifications (DF-351)

Measured liquid
Pressure : -5 to 40°C: 0 - 0.3 MPa
50°C : 0.15MPa (See graph above for relationship between temperature and pressure)
Temperature : -5 to 50°C (no condensation)
Also check the specifications of the detector used with this instrument for the actual usable temperature range.
Material of wetted part: PVC, FKM (excluding detector)
Weight : Approx. 1.0kg

Relationship between temperature and pressure

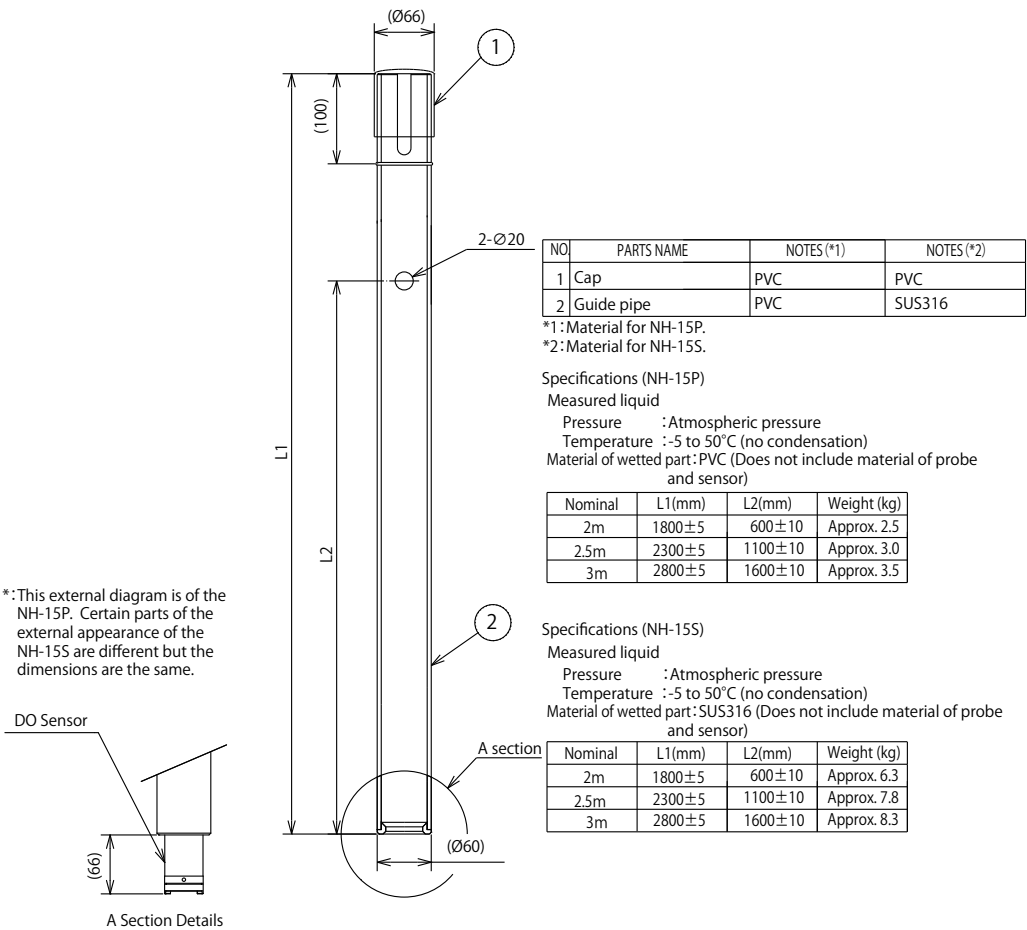


Specifications (DF-351S)

Measured liquid
Pressure : 0 - 0.6MPa
Temperature : -5 to 50°C (no condensation)
Also check the specifications of the detector used with this instrument for the actual usable temperature range.
Material of wetted part: SUS316, FKM (excluding detector)
Weight : Approx. 5.5kg

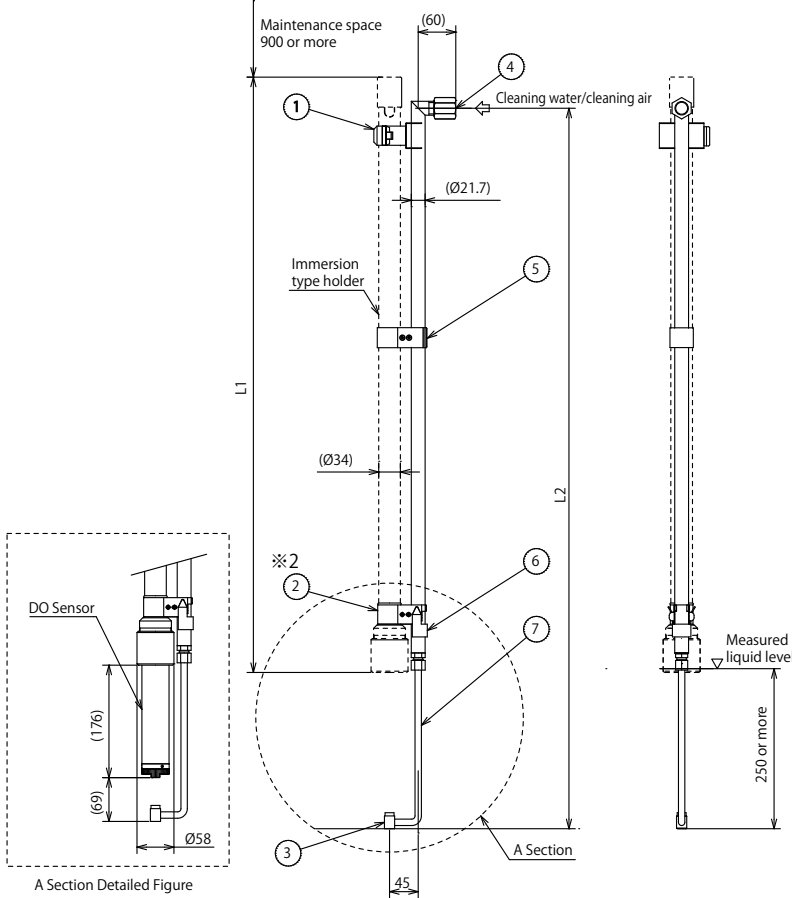
HD-200FL Optical DO Meter (external dimension-4)

Drop-in holder (NH-15P/NH-15S)



HD-200FL Optical DO Meter (external dimension-5)

Immersion type jet cleaner (JDH-141)



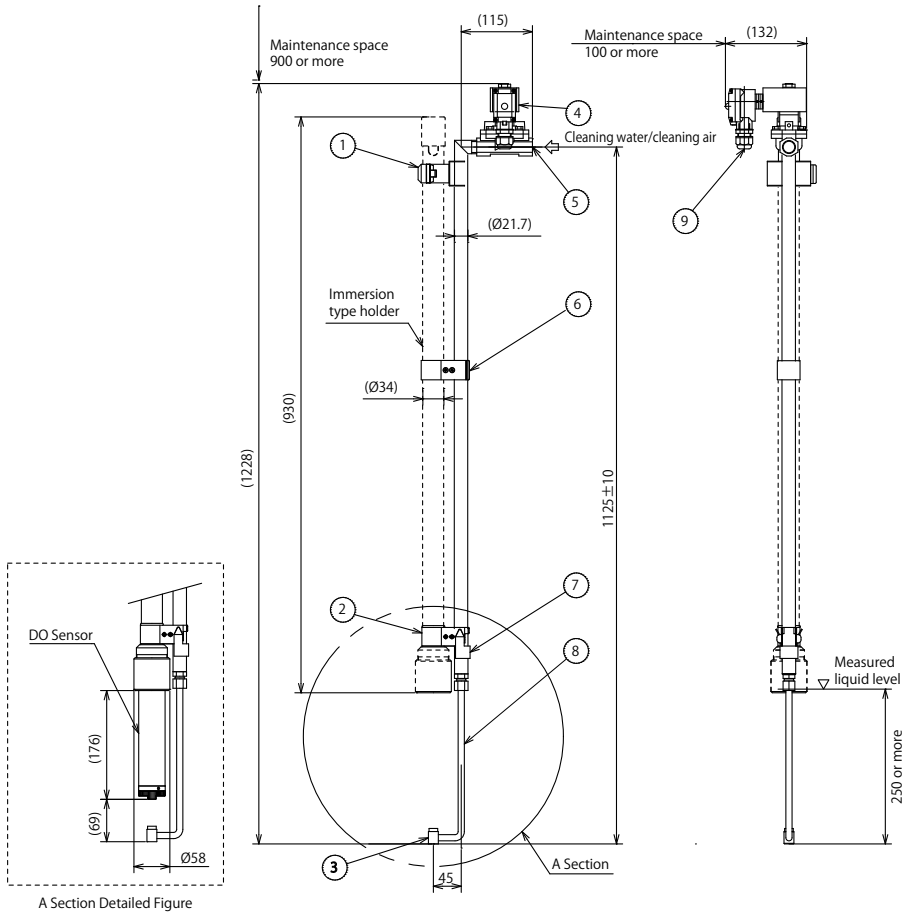
NO.	PARTS NAME	NOTES
1	Immersion type holder fixture	PVC
2	Hook	SUS316
3	Nozzle	SUS316
4	Cleaning water/ cleaning air	Rc1/2
5	Support hook	SUS316
6	Stopper	SUS316
7	Nozzle holder	SUS316

* Support hooks are supplied with cleaners over 1.5m.

Specifications
Measured Liquid
Pressure : Atmospheric pressure
Temperature : -5 to 50°C (no condensation)
Flow rate : Less than 2.0m/sec
Cleaning pressure
Water : 0.05-0.2MPa
Air : 0.03-0.05MPa
Material of wetted part: SUS316, FKM (Does not include material of probe and sensor)

Nominal	L1(mm)	L2(mm)	Weight (kg)
1m	930	1125±10	Approx. 2.3
1.5m	1430	1625±10	Approx. 3.0
2m	1930	2125±10	Approx. 3.7
2.5m	2430	2625±10	Approx. 4.4
3m	2930	3125±10	Approx. 5.1

Immersion type jet cleaner (JDH-151A)



NO.	PARTS NAME	NOTES
1	Immersion type holder fixture	PVC
2	Hook	SUS316
3	Nozzle	SUS316
4	Solenoid valve	
5	Cleaning water/ cleaning air	Rc1/2
6	Support hook	SUS316
7	Stopper	SUS316
8	Nozzle holder	SUS316
9	Conduit	ØD: Ø7 to Ø12 cable

* Support hooks are supplied with cleaners over 1.5m.

Specifications
Measured liquid
Pressure : Atmospheric pressure
Temperature : -5 to 50°C (no condensation)
Flow rate : Less than 2.0m/sec
Cleaning pressure
Water : 0.05 - 0.2M Pa
Air : 0.03 - 0.05M Pa
Material of wetted part: SUS316, FKM (Does not include material of probe and sensor)

Protection class : IP54 (IEC60529, JIS C0920) (Category 2)

Nominal	L1(mm)	L2(mm)	Weight (kg)
1m	930	1125±10	Approx. 3.5
1.5m	1430	1625±10	Approx. 4.2
2m	1930	2125±10	Approx. 4.9
2.5m	2430	2625±10	Approx. 5.6
3m	2930	3125±10	Approx. 6.3

The technical drawing illustrates the L4 level measurement system in two views: a side view (left) and a front view (right).

Side View (Left): Shows the vertical profile of the system. The total height is labeled as $(\#L1)$. It features a spherical float at the bottom and a horizontal arm with a detector cable outlet at the top.

Front View (Right): Provides a detailed view of the system's components and dimensions.

- The total height is labeled as **Maintenance space (#L4)**.
- The distance from the ground to the bottom of the float is $550+H$.
- The distance between the two horizontal arms is 450 .
- The height of the top arm is $H = \text{Max. } 100$.
- The diameter of the top arm is $(\varnothing 60.5)$.
- The diameter of the float is $\varnothing 230$.
- The minimum level of measured liquid is indicated by a dashed line at height (230) .
- The detector cable outlet is labeled **Detector cable outlet**.
- The maintenance position is indicated by a dashed line at height $(\#L2)$.
- The pole stand is labeled **Pole stand**.
- The minimum level of measured liquid is labeled **Minimum level of measured liquid: (#L3)**.
- The detector is labeled **Detector**.



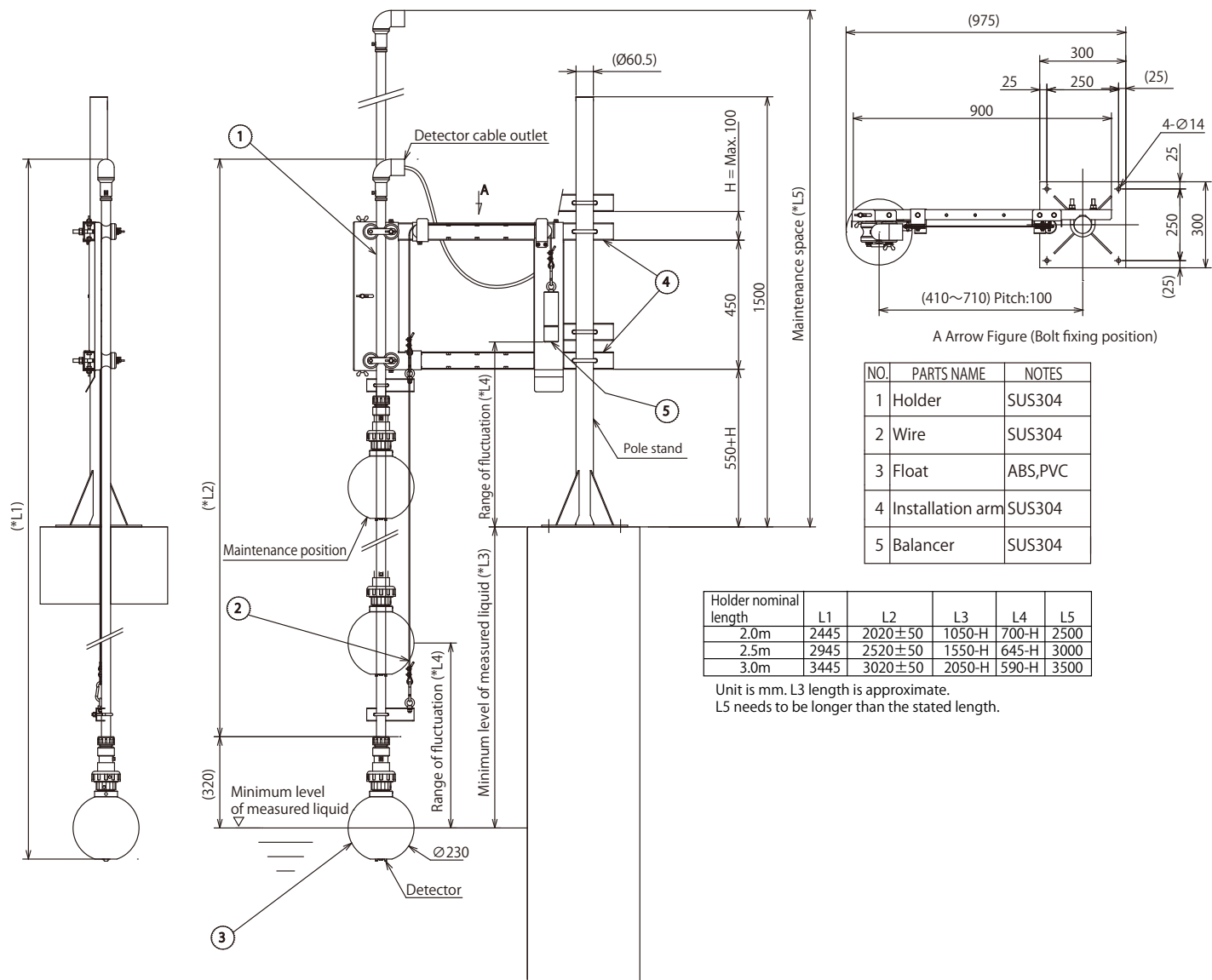
NO.	PARTS NAME	NOTES
1	Holder	PVC
2	Float	ABS,PVC
3	Installation arm	SUS304

Holder nominal length	L1	L2	L3	L4
2.0m	2360	2020±50	1050-H	2700
2.5m	2860	2520±50	1550-H	3200
3.0m	3360	3020±50	2050-H	3700

Unit is mm. L3 length is approximate.
L4 needs to be longer than the stated length.

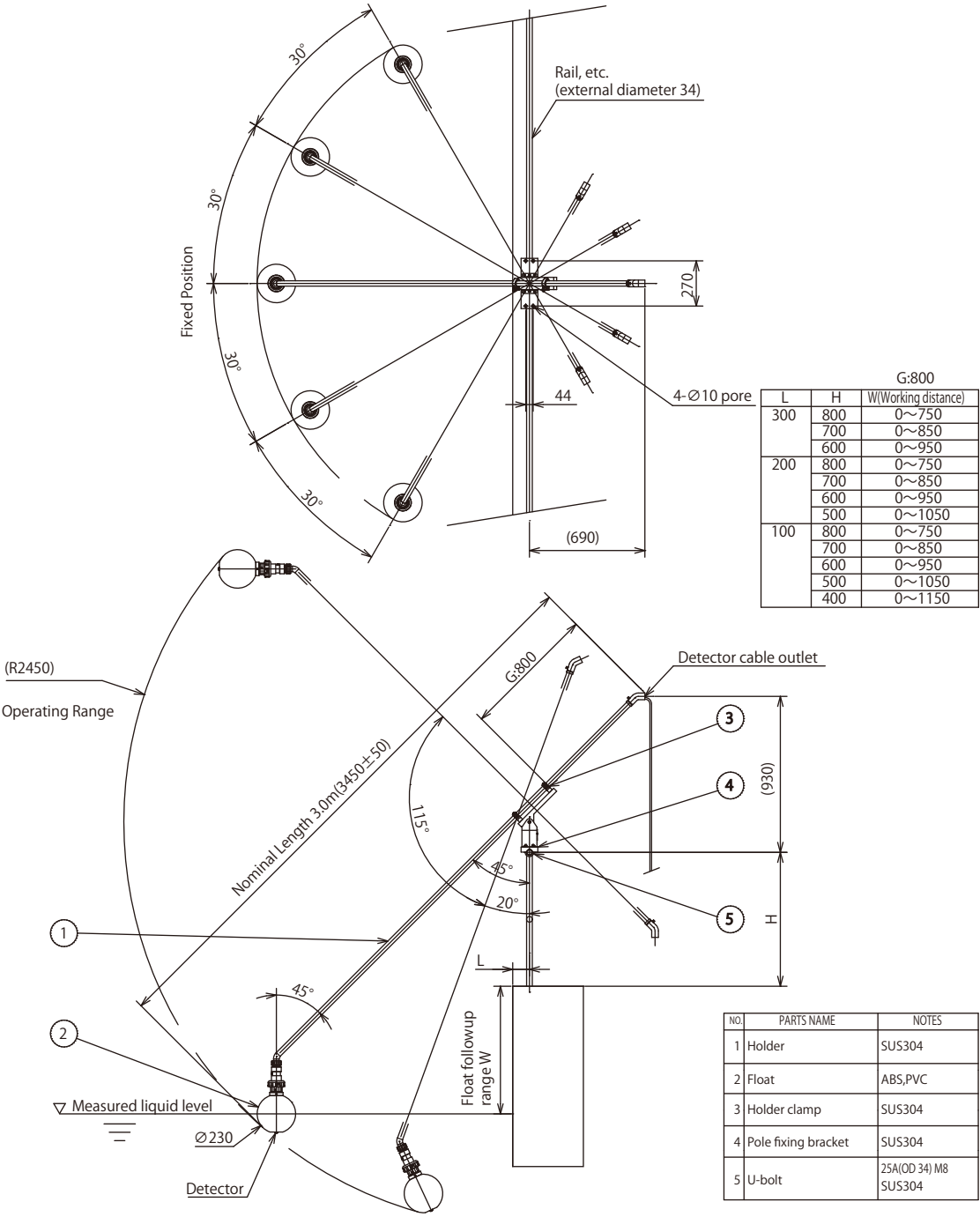
HD-200FL Optical DO Meter (external dimension-7)

Vertical floating holder (FH-101-S)



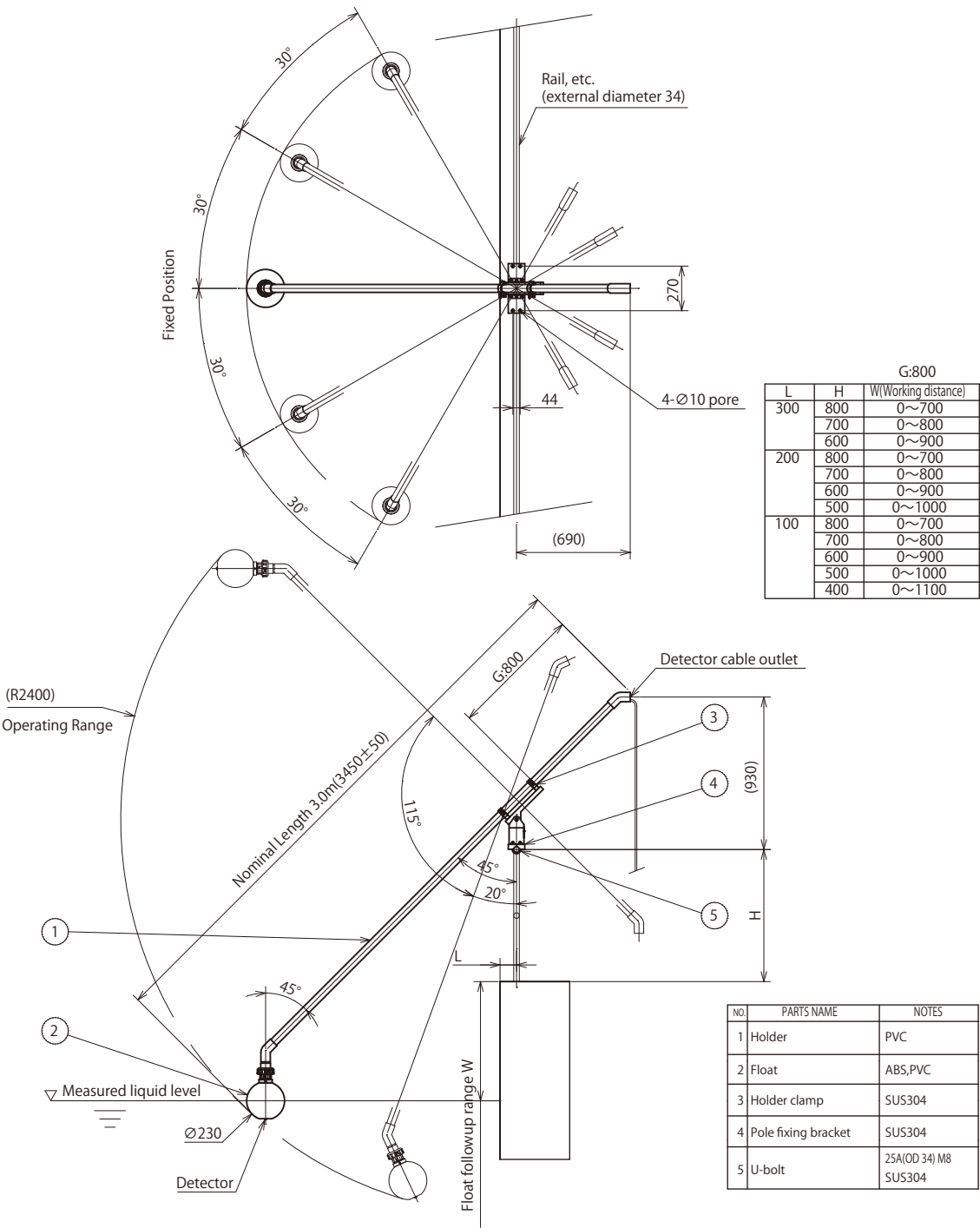
HD-200FL Optical DO Meter (external dimension-8)

Tilted floating holder (FH-201-S)



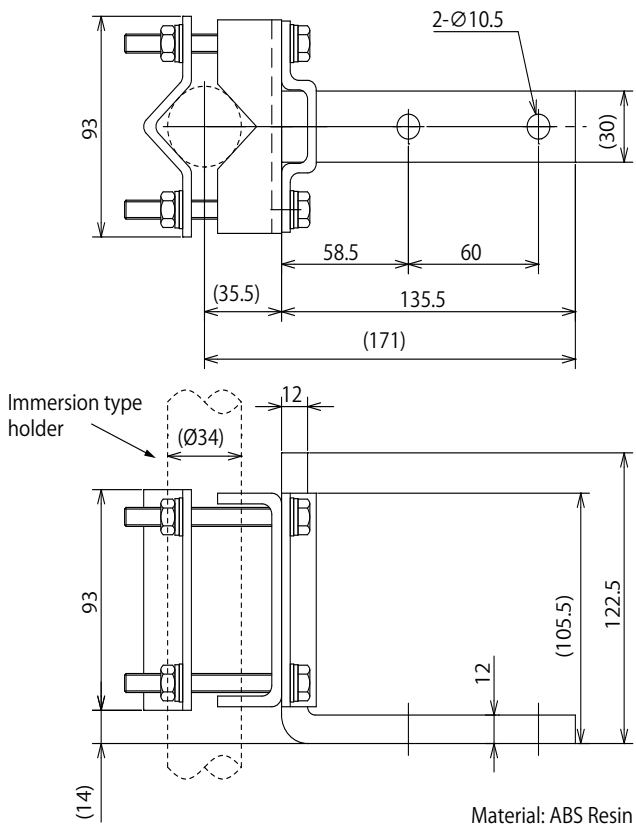
HD-200FL Optical DO Meter (external dimension-9)

Tilted floating holder (FH-201-P)

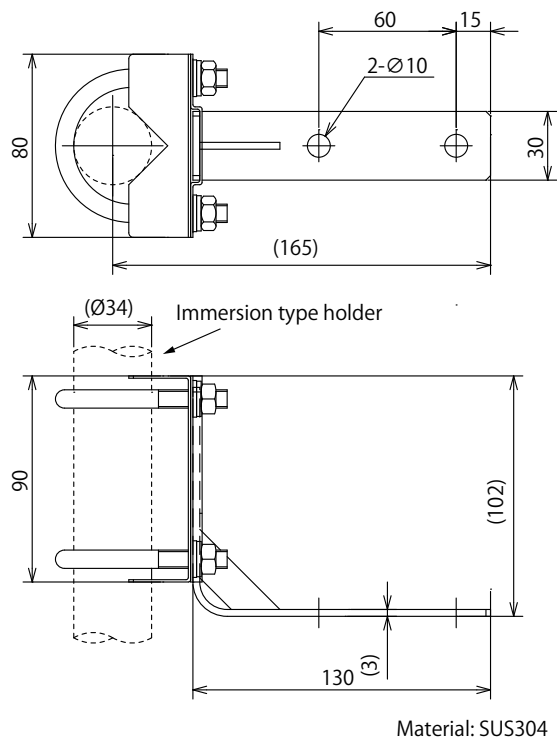


HD-200FL Optical DO Meter (external dimension-10)

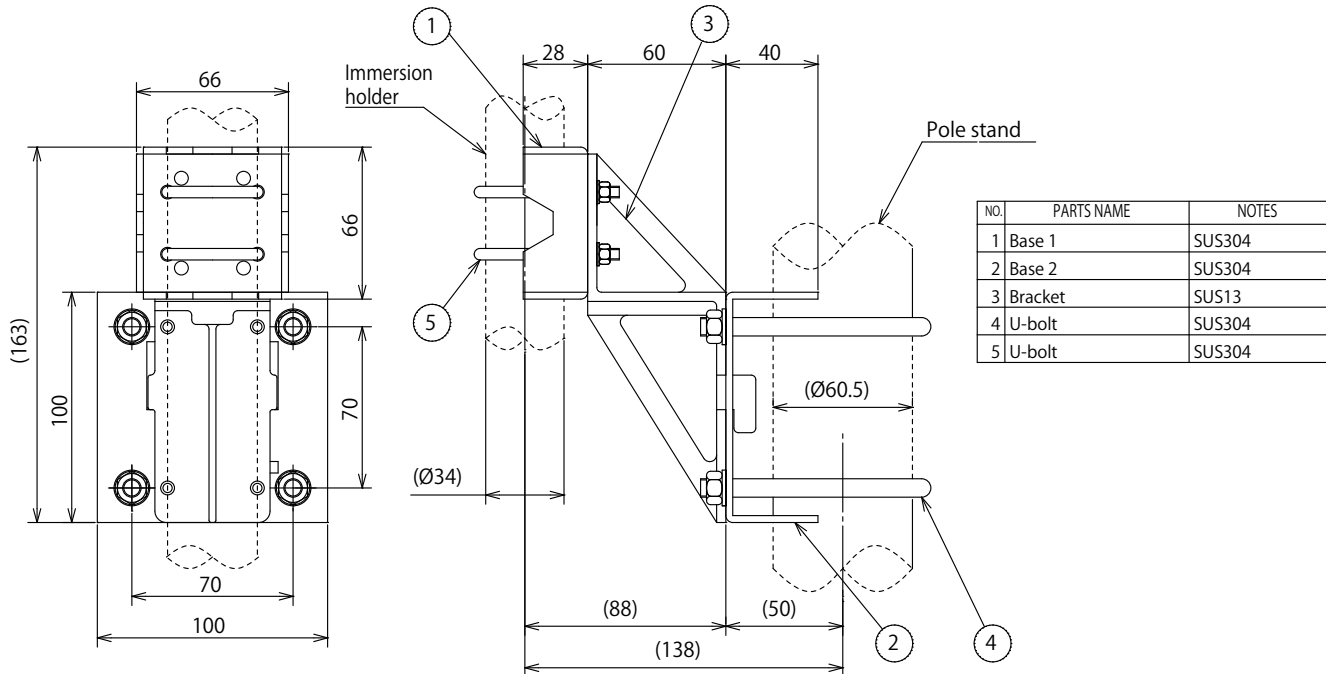
Mounting brackets (BA-1A)



Mounting brackets (BA-1S)



Mounting brackets (MB-10)



Technical drawing of a pole stand assembly, showing top and side views with dimensions and labels.

Top View Dimensions:

- Overall width: 600
- Overall height: 200
- Left side mounting bracket width: 68
- Distance from left bracket to centerline (C.L.): 300
- Distance from C.L. to right bracket: 60
- Right side mounting bracket width: 60
- Distance from right bracket to right edge: 60
- Vertical distance from top edge to mounting holes: 50
- Vertical distance from bottom edge to mounting holes: 100
- Horizontal distance from C.L. to mounting holes: (Ø60.5)
- Horizontal distance from C.L. to support pipe/cleaner: (Ø21.7)

Labels and Callouts:

- 1: Points to the top horizontal bar.
- 2: Points to the left mounting bracket.
- 3: Points to the right mounting bracket.
- Pole stand: Points to the central vertical structure.
- Support pipe or Cleaner: Points to the vertical pipe on the right side.

Side View Dimensions:

- Overall height: 109.9 (10.9)
- Distance from top edge to mounting holes: 50
- Distance from bottom edge to mounting holes: 30.3

Table:

NO.	PARTS NAME	NOTES

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

Technical drawing of the SUS304 50A Pole Mounting Bracket. The drawing includes a top view, a side view, and a detail view of the mounting arm.

Top View Dimensions:

- Total width: 545
- Central cutout width: 410
- Mounting hole diameter: $\varnothing 60.5$
- Bracket height: 50
- Mounting arm height: (52.8)

Side View Dimensions:

- Total height: 300
- Mounting arm height: 100

Detail View Dimensions:

- Mounting arm length: 100
- U-bolt diameter: $\varnothing 60.5$

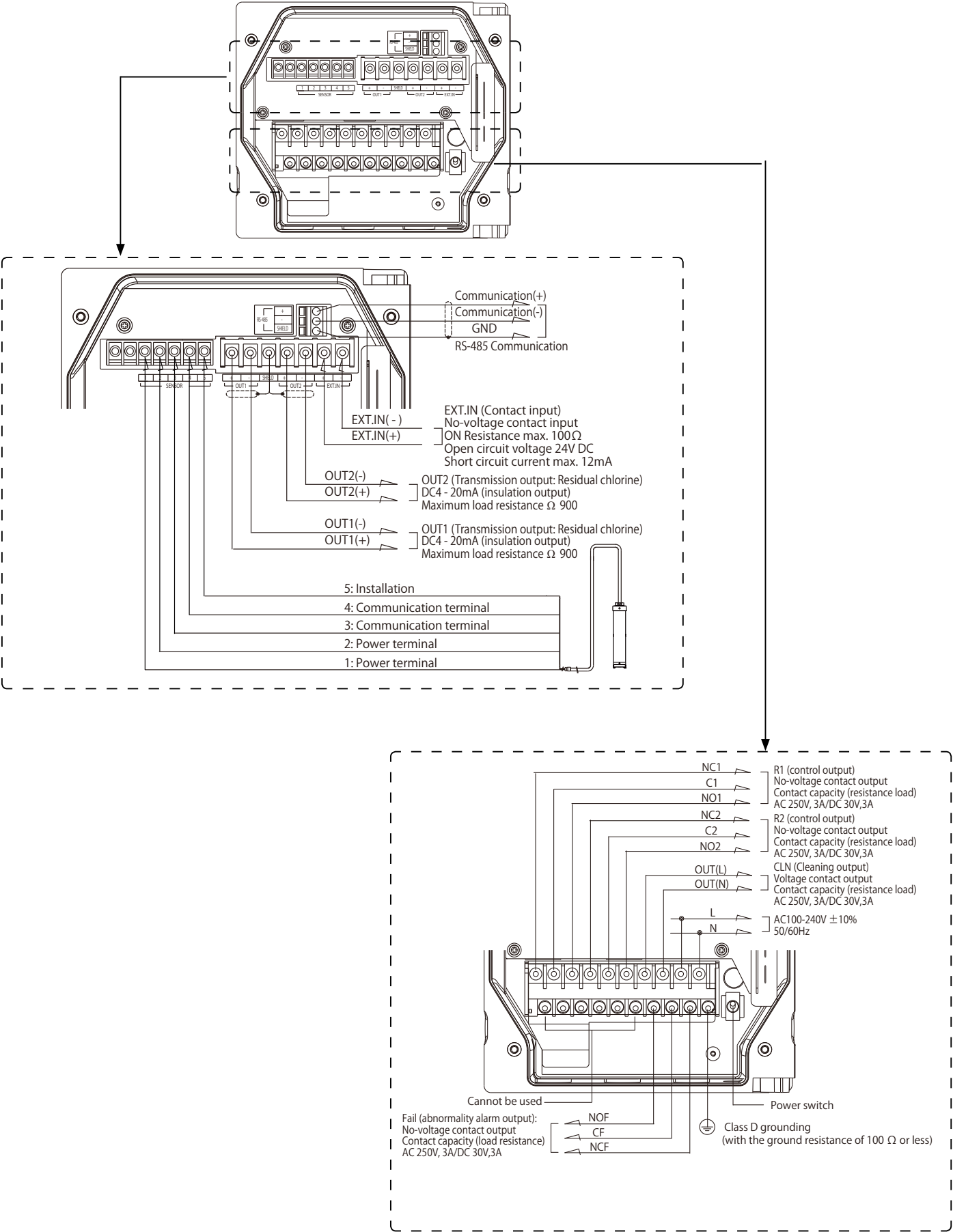
Parts List:

PARTS	NOTES
3 U-bolt	SUS304 M8
2 Installation arm	SUS304
1 U-bolt	SUS304 M12

HD-200FL Optical DO Meter (external wiring diagram)

Converter + DO Sensor

- The following section contains details of wiring the HD-200FL converter and DO sensor (DO-2000)



HD-200FL Optical DO Meter (Specifications-1)

Product name	Industrial-use Optical Dissolved Oxygen Meter	
Converter type	HD-200FL Industrial-use Optical Dissolved Oxygen Meter Converter	
Probe type	D-2000 Industrial-use Optical Dissolved Oxygen Meter Probe	
Sensor Cap Model	5700	
Measurable range	Dissolved oxygen concentration	0-20mg/L (display range: 0-22mg/L)
	Intensity	0-200% (display range: 0-200%)
	Temperature	0-50°C (display range: -10-110°C)
Display resolution	Dissolved oxygen concentration	0.01 mg/L
	Intensity	0.10%
	Temperature	0.1°C
Transmission Output	Number of output points	2 (the negative terminals of each transmission output are internally connected and have the same electrical potential.)
	Output type	4-20mA DC insulated input/output
	Load resistance	Maximum 900 Ω
	Linearity	Within ± 0.08mA (output only)
	Repeatability	Within ± 0.02mA (output only)
	Output range	Output 1 Output 2
		Dissolved oxygen concentration: Can be set as desired within the measurement range Temperature: Can be set as desired within the range of -10°C - 110°C
	Error output	With burnout function (selectable as 3.8mA or 21mA)
Contact output	Hold capability	Select a setting from last value hold or arbitrary value hold
	Number of output points	3
	Output type	No-voltage contact output
	Contact type	Relay contact, SPDT (1c)
	Contact capacity	AC 250V 3A, DC 30V 3A (resistance load)
	Contact capability	R1, R2 FAIL
		Upper limit alarm, ON/OFF control, lower limit alarm, transmission output hold, Select from cleaning output (closed when warning operates, normally open, open when power supply interrupted) Error warning (open normally, closed at error, closed at power-off)
	Warning operation	Output contents
	Description	Settings
	Control operation	ON/OFF
Cleaning output	Description	Dissolved oxygen concentration, intensity, temperature - Setting range: Within measurement range - Delay time: 0-600 seconds - Setting range: 0.00 - 20.00 mg/L - Control width: 0.02-4.00 mg/L (± 0.02 - ± 2.00 mg/L)
	Number of output points	1
	Output type	Voltage contact output (voltage output of connected power source)
	Contact type	Relay contact, SPDT (1a)
	Contact capacity	AC 250V 3A, DC 30V 3A (resistance load)
	Contact capability	Operation of solenoid valve for cleaning
	Settings	Cycle Cleaning time Hold time
		0.1-168.0 hours 2-600 seconds 2-600 seconds
	Timer accuracy	Monthly error margin less than 2 minutes
	Description of cleaning operation	Select 1 function from within - Built-in timer operation - Both operation of built-in timer and external contact input - Built-in timer only enabled when external contact is input - Cleaning trigger operation (built-in cleaning sequence starts more than 2 seconds after external contact input is on)
Contact input	Number of input points	1
	Contact type	No-voltage a contact for open collector
	Conditions	ON resistance: Maximum is 100 Open voltage: 24V DC Short circuit voltage: Maximum 12mA DC
	Contact capability	Cleaning operation external input or transmission output HOLD input can be selected
Communication capability	Method	RS-485
	Signal type	2 wire type, input/output insulation type (transmission output not insulated)
Temperature compensation	Temperature compensation range	0 - 50°C
	Temperature calibration function	Calibration of one comparison point with reference thermometer
Calibration	Calibration method	Atmospheric calibration, span calibration Zero fluid (sodium sulfite water) calibration Span fluid (atmospheric saturated water) calibration
	Added functions	Calibration history (zero, span, recommended sensor cap replacement timing)
Self-check	Calibration errors	Zero calibration error, span calibration error
	Sensor diagnosis error	Sensor communication error, film detection error, outside sensor temperature measurement, optical error
	Sensor check error	CPU errors, ADC errors, memory errors
Operating temperature range	-20 - 55°C (no condensation)	
Operating humidity range	Relative humidity 5 - 90% (no condensation)	
Storage temperature	-25 - 65°C	

HD-200FL Optical DO Meter (Specifications-2)

Power source	Power supply voltage range		AC90 - 264V 50/60Hz	
	Power consumption		20VA (max)	
	Other		Contains time lag fuse (250V, 1A)	
			Contains 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
			Electromagnetic radiation radio frequency field	IEC61000-4-3
			Electrical fast transit/burst	IEC61000-4-4
			Surge	IEC61000-4-5 (*1)
			Conduction obstruction induced by radio frequency	IEC61000-4-6
			Voltage dip, short term power cut and 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		50A pole or wall mounting	
	Protection class		IP65	
	Material of case		Aluminum alloy (epoxy glue degeneration melamine resin painting)	
	Material of mounting brackets		SUS304	
	Material of cover		SUS304 (epoxy glue degeneration melamine resin painting)	
	Material of display window		Polycarbonate	
	Display element		Reflective monochrome LCD	
External dimensions	180(W) × 155(H) × 115(D) (excluding mounting bracket)			
Mass	Unit: Approx. 3.5kg, hood, mounting bracket: Approx. 1kg			
*1 Extending the sensor cable, transmission cable or contact input cable longer than 30m will result in the surge test of the CE mark EMC directive becoming inapplicable.				
*2 An arrestor (open starting voltage: 400V) is mounted for the transmission output, contact input and communication. However, be sure to use in combination with a suitable surge absorption element on the connection line that corresponds to the surrounding environment, installed device status and connected external devices, etc.				

- *1 If the sensor cable, transmission cable and/or contact input cable are extended to longer than 30m, the surge test in the EMC directives of the CE marking is not applied.
- *2: An arrestor (open starting voltage: 400V) is mounted for the transmission output, contact input and communication. However, be sure to use in combination with a suitable surge absorption element on the connection line that corresponds to the surrounding environment, installed device status and connected external devices, etc.

Power Source

- The power supply for this instrument is 100 - 240V AC rated voltage free power supply.
- 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 ± 10%.
- This instrument is equipped with a power switch.

Main Specifications

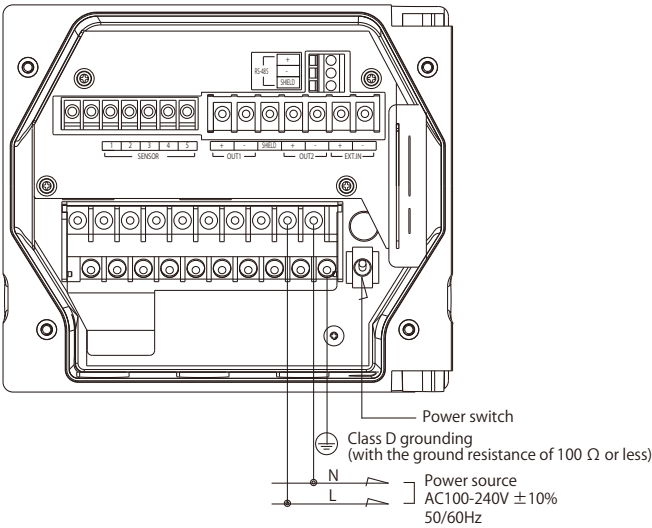
- M4 terminal screws are used for the power supply.
- The maximum compatible electrical wire is 0.75 - 5.5 mm² (AWG18 - 10).

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX8 MAX4.7 For M4 MAX8.5	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)

- Install the power switch near the instrument and ensure that the power source can be turned on and off.
- Install lightning arrestors if there is a risk of 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	
Rated Voltage	AC100 - 240V 50/60Hz
Power consumption	Maximum 20VA
Terminal screw	M4
Applicable wiring	0.75 - 5.5mm ² (AWG18 - 10)

HD-200FL Optical DO Meter (Specifications-3)

Transmission Output

- There are two transmission output points.
A DC 4 - 20 mA signal compatible with the measurement range is output.
- Receiving resistance on the receiving instrument side is a maximum of 900 Ω .
Select a receiving instrument whose input suits that of this instrument (recorder, meter relay).
- The transmission output can be set to the full-scale range provided the settings are within the full scale setting range for 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

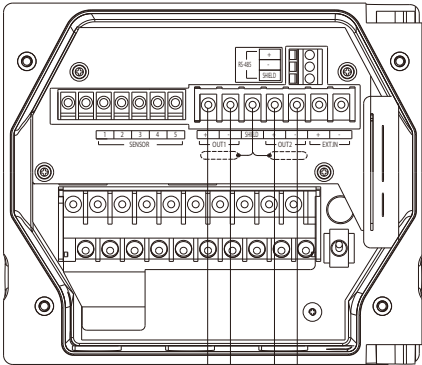
- The terminal screws of the transmission output are M3.5.
- The wire size is 2mm² (AWG14) max.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX6.2 MAX3.6 For M3.5 MAX7.2	2mm ² /MAX (AWG14)	0.8~1.2 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)

- Use shielded wires for the transmission output cables.
- 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.
- Set the contact input impedance to within 100Ω.
When the contact input is short circuited, "EXT1" lights on the display.



OUT2(-) OUT2(+)
OUT1(-) OUT1(+)
OUT2 (Transmission output: Residual chlorine)
DC4 - 20mA (insulation output)
Maximum load resistance Ω 900
OUT1 (Transmission output: Residual chlorine)
DC4 - 20mA (insulation output)
Maximum load resistance Ω 900

Main Specifications	
Transmission Output	4 - 20mA DC
Maximum load resistance	900Ω
Terminal screw	M3.5
Applicable wiring	2mm ² (AWG14)

Contact input

- There is one contact input point.
The cleaner can be operated by an external signal.

Main Specifications

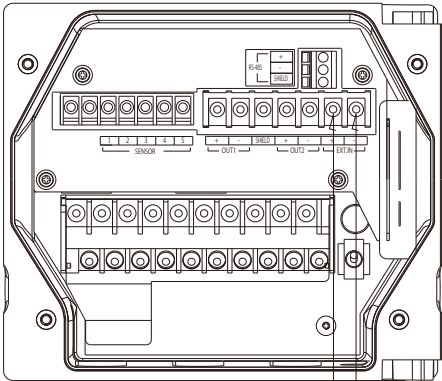
- The terminal screws are M3.5 screws.
- The maximum compatible electrical wire is 0.14 - 2.5mm² (AW26 - 14).

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX6.2 MAX3.6 For M3.5 MAX7.2	2mm ² /MAX (AWG14)	0.8~1.2 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)

- Use a twist pair shielded cable.
If there is a risk of lightening, install lightening arrestors on the output side of this instrument and on the receiver instrument.
- Set the contact point resistance below 100 Ω , even for the maximum setting.



EXT.IN(-)
EXT.IN(+)
EXT.IN (Contact input)
No-voltage contact input
ON Resistance max. 100Ω
Open circuit voltage 24V DC
Short circuit current max. 12mA

Main Specifications	
Input resistance	Maximum less than 100Ω
Terminal screw	M3.5
Applicable wiring	0.14 - 2.5mm ² (AWG26~14)

HD-200FL Optical DO Meter (Specifications-4)

Contact output

- There are 3 contact output points. (within which 1 point is a FAIL (for abnormality alarm))
- Can be selected from the six choices of "Control output (Ctrl)", "Alarm output (AL)", "Hold (HOLD)", "Cleaning (CLn)", "t (temperature alarm output)", and "None (non)".

Main Specifications

- The contact capacity is less than AC 250 V and 3A or DC 30V and 3 A.
- Terminal screws are M4.
- The maximum compatible electrical wire is 0.75 - 5.5mm² (AWG18 - 10).

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX8 MAX4.7 MAX8.5 For M4	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)

- 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.

! When the instrument power supply is off, be careful of the load connections because the C-NC contact of R1-R2 is shorted.

Main Specifications	
Contact capacity	Less than 250V DC, 3A or less than 30V DC, 3A
Type of Contact Output	Upper/lower limit operation, error warning (Error or FAIL), during maintenance, none
Terminal screw	M4
Applicable wiring	0.75 - 5.5mm ² (AWG18 - 10)

Types of contact (alarm) output		
non		
No contact (alarm) output settings.		
Ctrl	Upper limit operation	Performs ON/OFF control of the upper limit.
	Lower limit operation	Performs ON/OFF control of the lower limit.
AL	Upper limit operation	Performs ON/OFF control of the upper limit.
	Lower limit operation	Performs ON/OFF control of the lower limit.
HOLD		
Contact is output when the mode is switched to hold mode (when switching to the setting menu, calibration menu or user check).		
- Setting menu: Menu used for setting/changing measurements related to parameters		
- Calibration menu: Menu used for zero calibration and span calibration		
- User check menu: Menu used for confirming output status, measurement values, etc., and returning settings to the initial values		
CLn		
Contact is output for a few seconds during the cleaner operation of the detector or when the operation is complete.		
FAIL		
Contact is output when an error code (E-25/80/81/82/83/84/90/91/92) is issued.		

- Ctrl- Upper limit operation, lower limit operation
The control method, control value, type of control width (d.dif, S.dif), control width and delay time can be set.

Control method: Select whether to control the upper limit operation or lower limit operation.

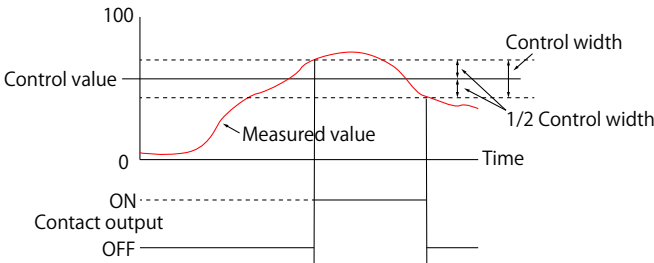
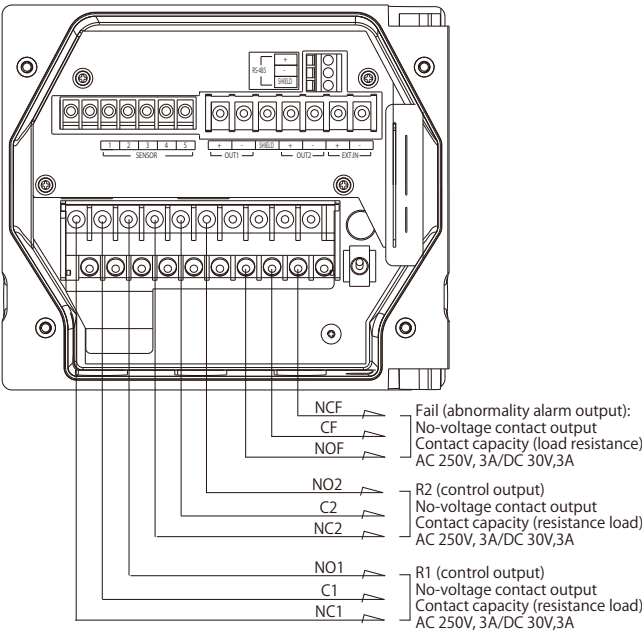
Controlled values: Value that is the standard for operating the contact (alarm) output. Enter this value.

Type of control range: It is necessary to select the type of control range in order actually operate the contact (alarm) output. Select one of the two following types.

d.dif: Configures the settings centered on the controlled value so that the upper limit side and lower limit side are at the same width.

S.dif: Configures the settings based on the controlled value so that the upper limit side and lower limit side are at a different width.

Delay time: The operation and cancellation of the contact (alarm) output operation can be delayed for a fixed length of time. None of the operations are performed if the values that perform or cancel the operation fall below the controlled values during the delay time.

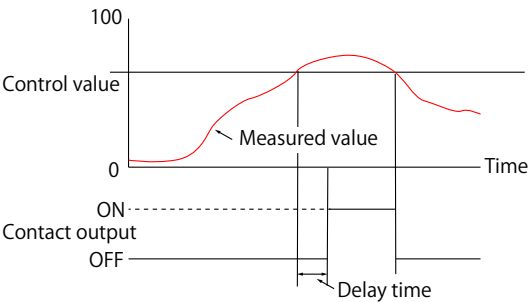


E.g: When the control method is upper limit operation, control value is 60, type of control width is d.dif and control width is 10
The contact point (alarm) contacts when 65 is exceeded, and the contact point (alarm) disconnects when the value falls below 55.

HD-200FL Optical DO Meter (Specifications-5)

Contact output

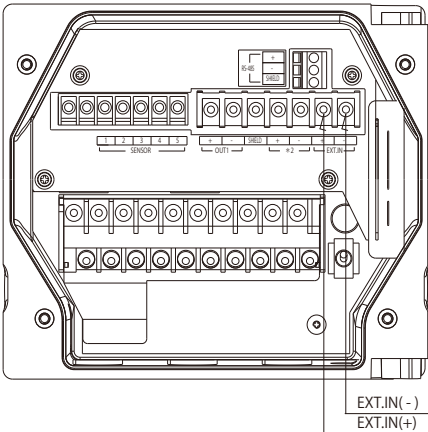
- AL- upper limit operation, lower limit operation
The control method, control value, control width and delay time can be set.
- Control method: Select whether to control using the upper limit operation or lower limit operation.
- Control value: Standard value for operating the contact (alarm) output. Enter this value.
- Delay time: The operation and cancellation of a contact (alarm) output can be extended for a set amount of time. None of the operations are performed if the values that perform or cancel the operation fall below the controlled values during the delay time.



Example: When the control method is upper limit operation, control value is 80, and delay time is set
When the measured value exceeds the contact value of 80, the alarm is indicated in the display after the set delay time has elapsed. The alarm stops when the measured value falls below the control value.

Contact input

- There is one contact input point.
The cleaner can be operated by an external signal.
 - Main Specifications
 - The terminal screws are M3.5 screws.
 - The maximum compatible electrical wire is 0.14 - 2.5mm² (AW26 - 14).
- Terminal Block Specifications
- | Compatible Crimping Terminal | Wire size | Screw installation torque |
|--|-------------------------------|---------------------------|
| MAX6.2
MAX3.6
For M3.5
MAX7.2 | 2mm ² /MAX (AWG14) | 0.8~1.2 N·m |
- ※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)
- Use a twist pair shielded cable.
If there is a risk of lightening, install lightning arrestors on the output side of this instrument and on the receiver instrument.
 - Set the contact point resistance below 100 Ω , even for the maximum setting.

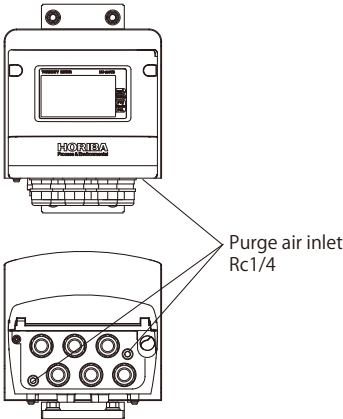


EXT.IN (Contact input)
No-voltage contact input
ON Resistance max. 100Ω
Open circuit voltage 24V DC
Short circuit current max. 12mA

Main Specifications	
Input resistance	Maximum less than 100Ω
Terminal screw	M3.5
Applicable wiring	0.14 - 2.5mm ² (AWG26~14)

Air parts

- 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.



- This instrument is equipped with an RS-485 communication terminal. Connect the wiring before using.
- The compatible electrical wire size is 0.14 - 2.5mm² (AWG 26-14).
- 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 the instrument that is the terminus of the RS-485 communication line.

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

HD-200FL Optical DO Meter (Installation method -1)

Installation environment

Install following the conditions below to ensure the instrument is installed in stable conditions.

Converter

- Well ventilated location where there is no humidity
- Ambient temperature is above -20° C and below 55° C
- Location that is not directly exposed to sunlight
- Location that is not directly exposed to radiant heat
- Location where the relative humidity is above 5% but less than 90%
- An area where the instrument will not be splashed with water or chemicals
- Location where there is little mechanical vibration
- Location where maintenance and wiring work can be performed
- Location where there are no fine particles or corrosive gases
- Location that is not affected by a magnetic field
- At an elevation less than 2000m
- Location where the variation range of the power supply voltage is within $\pm 10\%$ of 100 - 240V

DO Sensor

- Location where inspections and maintenance can be performed easily
- Location where air bubbles do not occur in the measured liquid
- The measured liquid is not mixed with the material of wetted part of the DO sensor

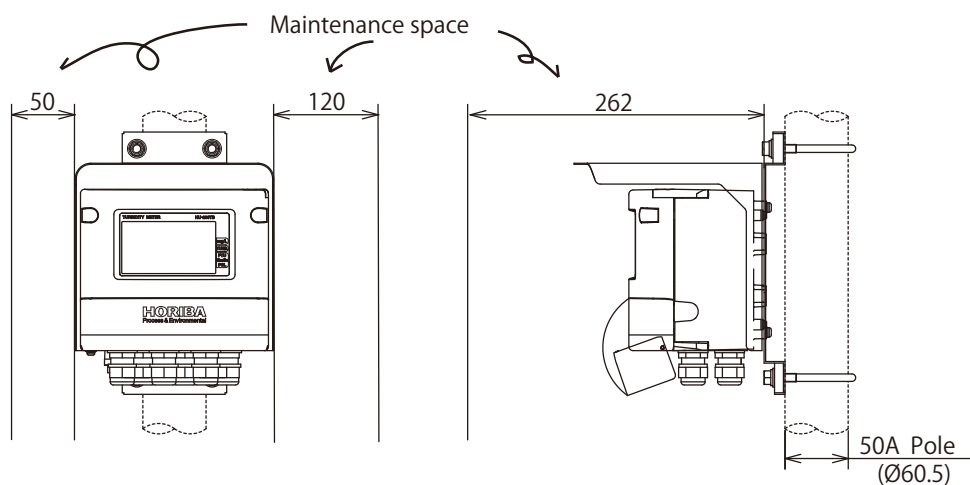
Note: It is recommended that a separate cleaner is installed when the measured liquid contains a large amount of SS. This instrument is not equipped with an atmospheric pressure correction function, and therefore measurement at standard air pressure is assumed.

Converter Installation

This instrument can be attached either onto the pole (50A) or onto a wall.

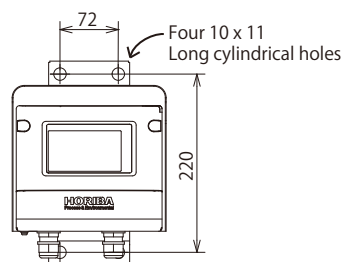
- Pole installation -

Ensure there is sufficient space to perform maintenance on this device.



- Wall mounting -

Ensure there is sufficient space to perform maintenance on this device. (The same amount of maintenance space as for pole installation is required.)



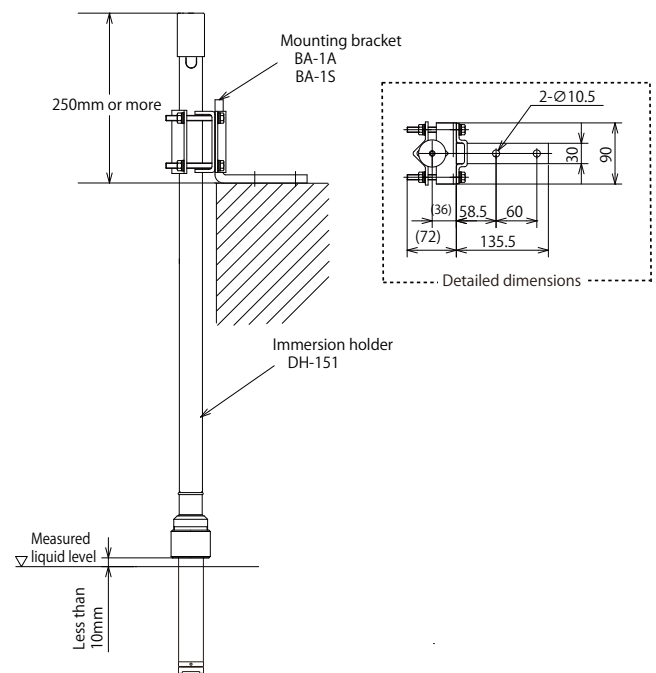
HD-200FL Optical DO Meter (Installation method -2)

Installation

The following section contains details on installation of the immersion holder.

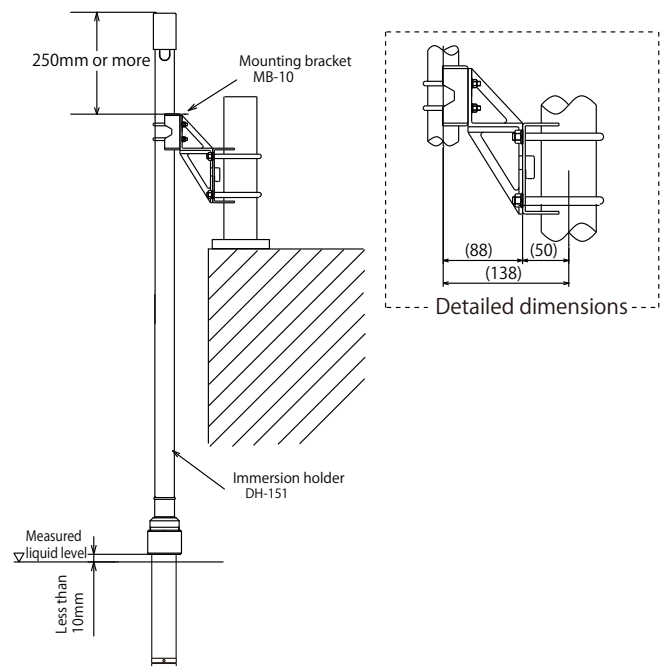
Immersion holder + mounting bracket 1

- This is the installation method for the immersion holder (DH-151) and BA-1A or BA-1S.
- A (resin) immersion type holder up to 1.5m can be installed.
- 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.
- When installing the immersion holder, install at a height so that the probe is immersed less than 10mm from the bottom of the immersion holder.



Immersion holder + mounting bracket 2

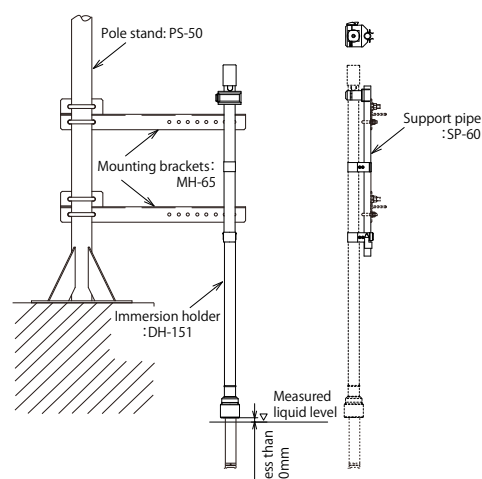
- This is the installation method for the immersion holder (DH-151) and MB-10.
- An immersion type holder up to 1.5m can be installed.
- Secure the MB-10 mounting brackets to the 50A pole.
- If installing an immersion holder to the MB-10, install the immersion holder of the MB-10 with approximately the upper 250mm of the U-bolt.
- When installing the immersion holder, install at a height so that the probe is immersed less than 10mm from the bottom of the immersion holder.



HD-200FL Optical DO Meter (Installation method -3)

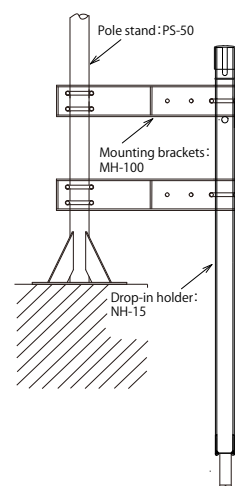
Immersion holder + mounting bracket 3

- When using an immersion holder greater than 1.5m, it is recommended that you use a support pipe to fix the immersion holder in place.
- 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.
- When installing the immersion holder, install at a height so that the probe is immersed less than 10mm from the bottom of the immersion holder.



Drop-in holder + mounting bracket

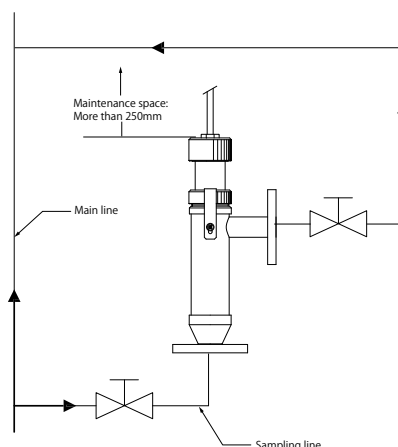
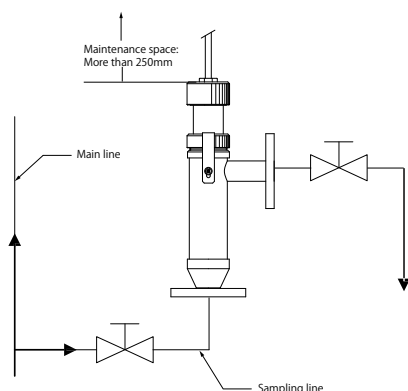
- When using the drop-in holder (NH-15), it is recommended that you fix it using the MH-100 mounting bracket.
- Secure the MB-100 mounting brackets to the 50A pole stand



pH flow chamber

- This is the installation (plumbing) method for the DF-351/DF-351S flow through holder.
- Install in an area where operations such as maintenance can be performed easily.
- Ensure there is approximately 250mm of maintenance space at the top of the flow through holder. Ensure there is enough space for attachment and removal.
- Do not install in a location where there is severe vibration or a lot of dust.
- Avoid locations where the holder may come into contact with corrosive liquids or gas.
- Avoid overheating the surface of the holder over 50°C .
- Be sure to install a bypass line. If a main line is installed, the main line needs to be stopped for maintenance work.

- To install the pH flow chamber, install a bypass line to the main line and mount so that the measured liquid flows in from the bottom of the pH flow chamber and out from the side.
- Always install valves on the inflow and outflow sides. If the flow rate of the measured liquid is too fast, capitation, etc. may occur or the sensor may become damaged by the pressure exerted by the increased flow rate. Adjust the flow rate according to the conditions of the measured liquid.



HD-200FL Optical DO Meter (Installation method -4)

Installation environment

Install following the conditions below to ensure the instrument is installed in stable conditions.

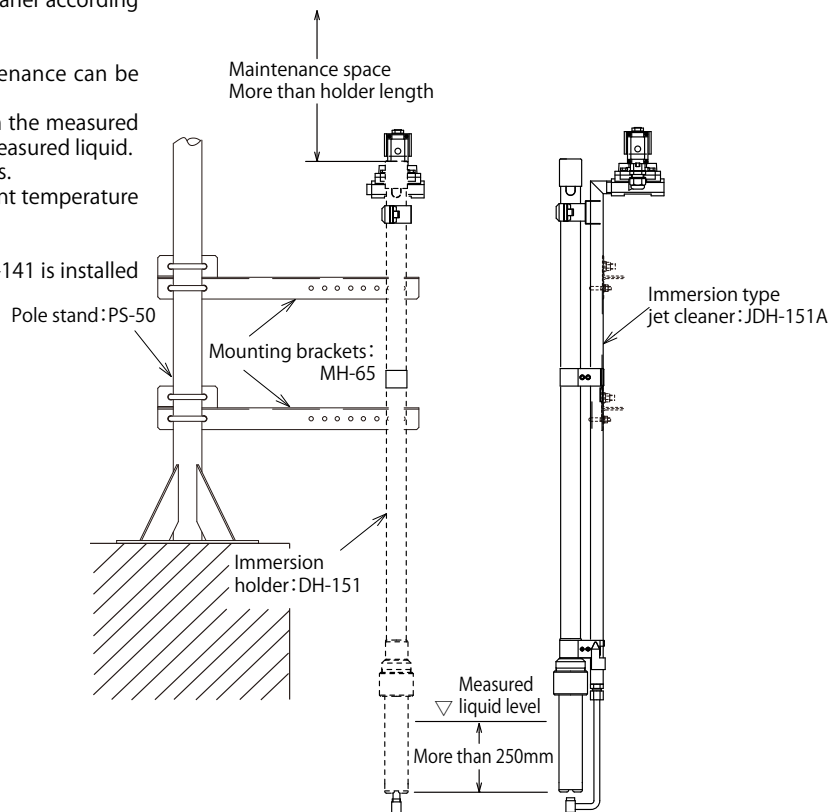
- Install in an area where operations such as maintenance can be performed easily.
- Install so that the electrode is always submerged in the measured liquid regardless of fluctuations in the level of the measured liquid.
- Avoid installing in areas with corrosive fluids or gases.
- Avoid installing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

Immersion type jet cleaner (JDH-141/JDH-151H) (installation)

- Install the JDH-141/JDH-151A immersion type jet cleaner according to the following points.

- Install in an area where operations such as maintenance can be performed easily.
- Install so that the electrode is always submerged in the measured liquid 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.

Note: The figure indicates the JDH-151A, but the JDH-141 is installed in the same way.



Immersion type jet cleaner (JDH-141/JDH-151H) (Installation and Removal)

- Install and remove the JDH-141/JDH-151A immersion type jet cleaner and immersion holder according to the following points.

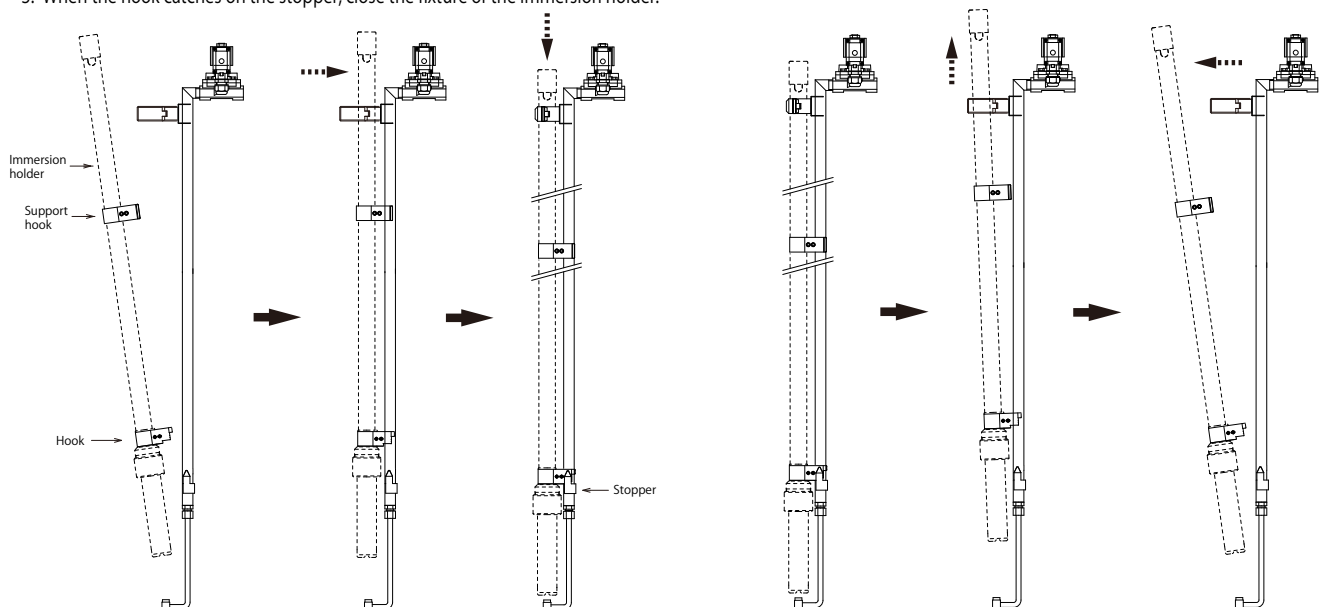
Note: The figure indicates the JDH-151A, but the JDH-141 is installed and removed in the same way.

Installation

1. Fit the hook and support hook attached to the immersion holder onto the immersion holder.
2. Align the hook with the immersion holder and gently lower.
3. When the hook catches on the stopper, close the fixture of the immersion holder.

Removal

1. Open the fixture of the immersion holder.
2. Lift the immersion holder directly upward.
3. Remove the hook and support hook from the oscillator holder.



HD-200FL Optical DO Meter (Installation method -5)

Immersion type jet cleaner (JDH-141/JDH-151H) (Solenoid valve: SUV-A-A1), (wired)

- Wire the JDH-141A (solenoid valve) immersion type jet cleaner according to the following points.

Note: Refer to the following contents for wiring the SUV-A-A1 solenoid valve used in the JDH-141 immersion type jet cleaner.

Caution - Electric Shock

- To prevent electric shock, always be sure to ground (class D grounding) protective grounding terminals.
- The conduit cable diameter is $\Phi 7$ - $\Phi 12$. Pass the cable through the conduit and pull to the solenoid valve.

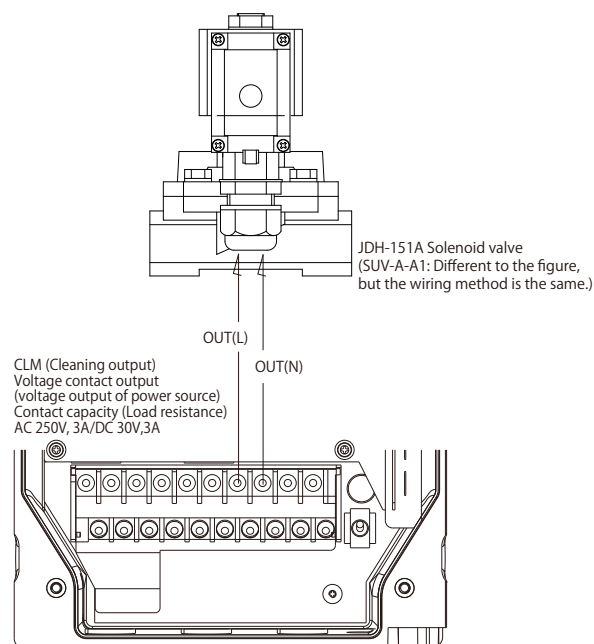
Power source wiring

- Do not turn the converter power supply "ON" until safety work is completed. Do not use a power supply other than that of the rated voltage. Using the wrong power supply will damage the circuit boards.
- Connect the cables to the "L, N" terminals of the terminal block.
- Ensure there is a small amount of excess in the cables.

Wiring for Protective Grounding

Caution - Electric Shock

- To prevent electric shock, always be sure to ground (class D grounding) protective grounding terminals.
- To prevent electric shocks, always ground the terminals of the terminal block.



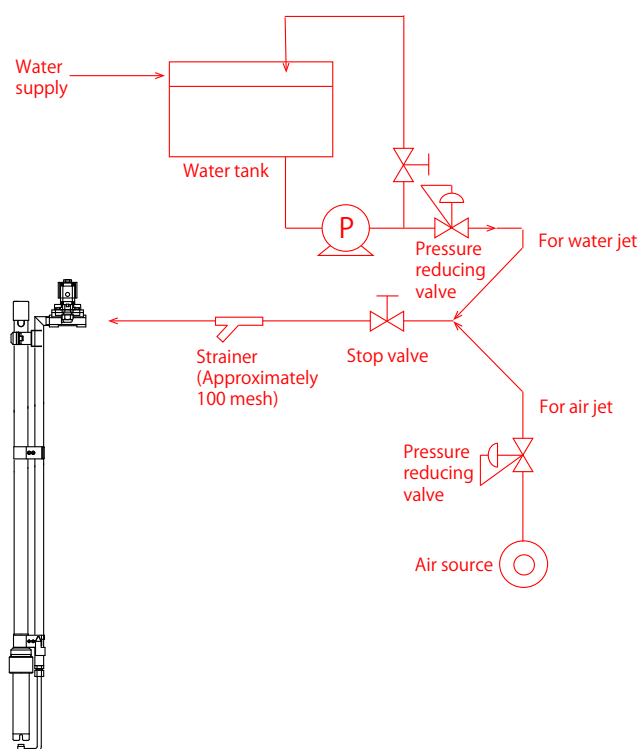
Immersion type jet cleaner (JDH-141/JDH-151H) (plumbing)

- Plumb the JDH-141/JDH-151A immersion type jet cleaner according to the following points.

- The cleaner may be removed when performing maintenance. Use flexible piping and ensure there is excess length.
- Before connecting pipes to the cleaner, rinse water through the inside of the pipe to clean out any dirt.
- Adjust the cleaning water to the specified pressure using a regulator.

Note: Refer to the following contents for plumbing the JDH-141 immersion type jet cleaner.

- When tap water is used, supplying water directly from the water supply system is prohibited by law. Therefore, use a tap water pressure device, etc. to isolate from general water pipes. However, it is possible to connect directly when using an independent industrial water supply (tertiary effluent). It is also possible to connect to tap water if the water is supplied via a rooftop tank.



HD-200FL Optical DO Meter (Installation method -6)

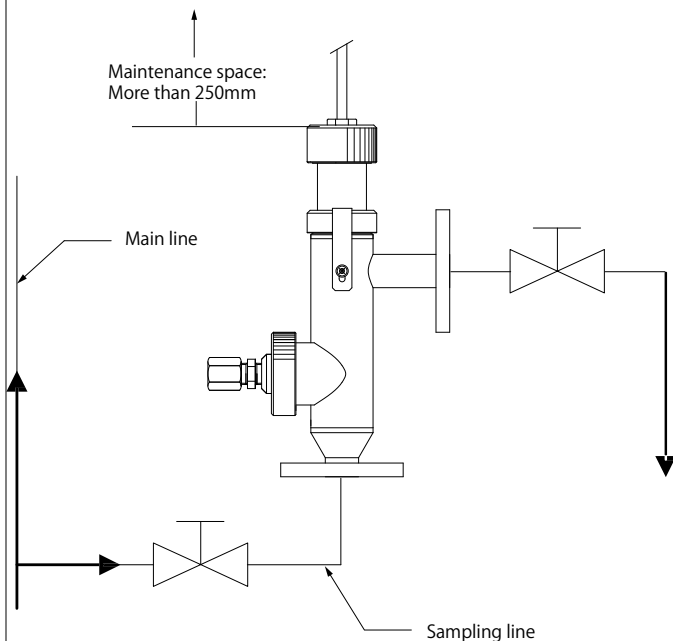
Installation environment

Install following the conditions below to ensure the instrument is installed in stable conditions.

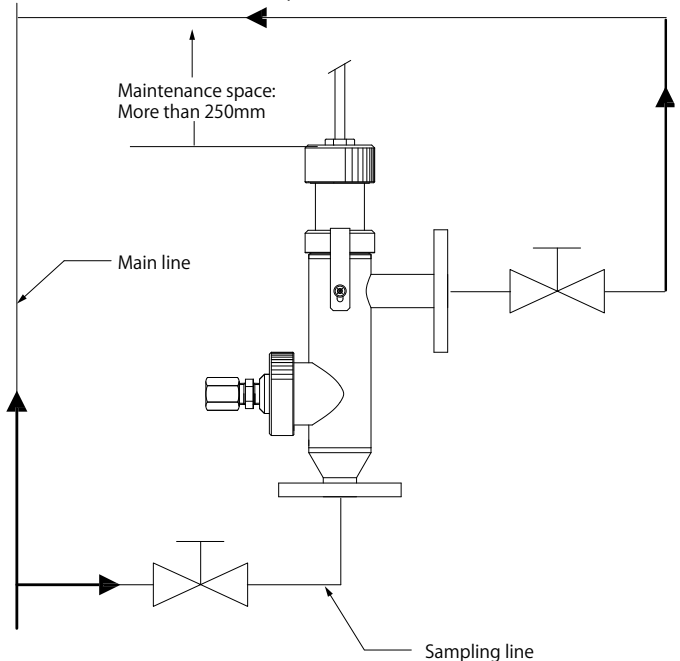
- Install in an area where operations such as maintenance can be performed easily.
- Ensure there is approximately 250mm of maintenance space at the top of the flow through holder. Ensure there is enough space for attachment and removal.
- Do not install in a location where there is severe vibration or a lot of dust.
- Avoid locations where the holder may come into contact with corrosive liquids or gas.
- Avoid overheating the surface of the holder over 50°C.
- Be sure to install a bypass line. If a main line is installed, the main line needs to be stopped for maintenance work.

Flow through jet cleaner (JDF-351/JDF-351S) (Installation)

- Install the JDF-351/JDF-351S flow through jet cleaner according to the points on the right.



- When installing the holder, install a bypass line from the main line so that measured fluid flows in from the bottom, and flows out from both.
- Always install valves on the inflow and outflow sides. If the flow rate of the measured liquid is too fast, capitation, etc. may occur or the sensor may become damaged by the pressure exerted by the increased flow rate. Adjust the flow rate according to the conditions of the measured liquid.



Flow through jet cleaner (JDF-351/JDF-351S) (Solenoid valve: SUV-A-A1), (wired)

- Wire the JDF-351/JDF-351S (solenoid valve) flow through jet cleaner according to the following points.

Caution - Electric Shock

- To prevent electric shock, always be sure to ground (class D grounding) protective grounding terminals.
- The conduit cable diameter is $\Phi 7$ - $\Phi 12$. Pass the cable through the conduit and pull to the solenoid valve.

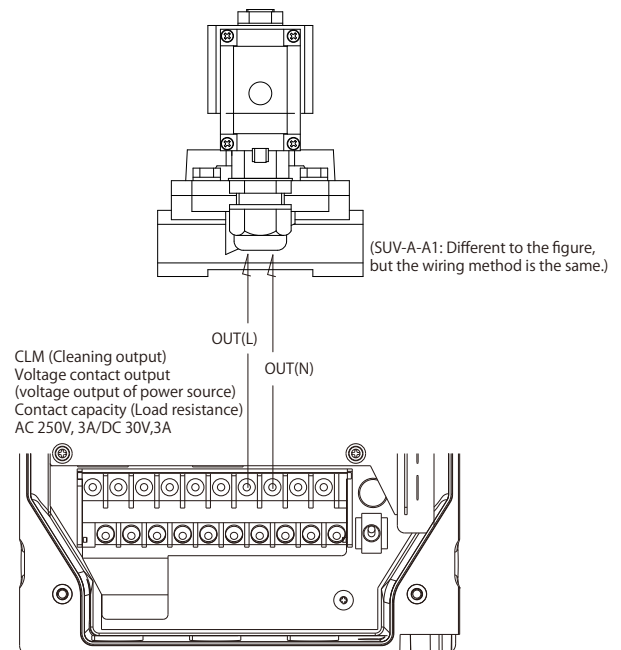
Power source wiring

- Do not turn the converter power supply "ON" until safety work is completed. Do not use a power supply other than that of the rated voltage. Using the wrong power supply will damage the circuit boards.
- Connect the cables to the "L, N" terminals of the terminal block.
- Ensure there is a small amount of excess in the cables.

Wiring for Protective Grounding

Caution - Electric Shock

- To prevent electric shock, always be sure to ground (class D grounding) protective grounding terminals.
- To prevent electric shocks, always ground the terminals of the terminal block.



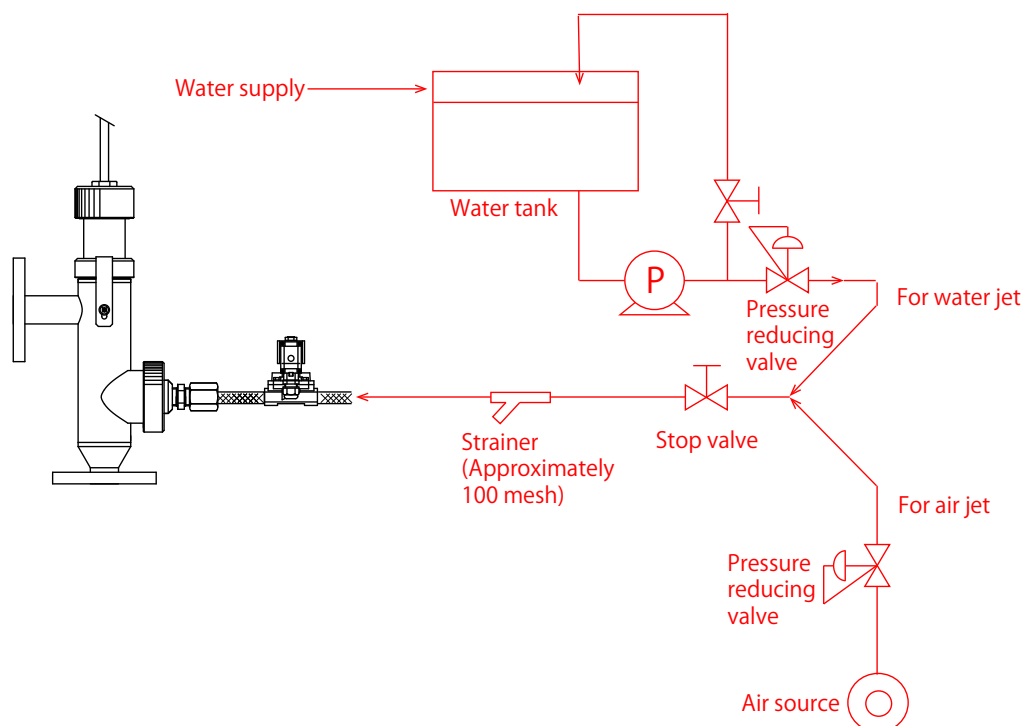
HD-200FL Optical DO Meter (Installation method -7)

Flow through jet cleaner (JDF-351/JDF-351H) (plumbing)

- Plumb the JDF-351/JDF-351S flow through jet cleaner according to the following points.

- The cleaner may be removed when performing maintenance. Use flexible piping and ensure there is excess length.
- Before connecting pipes to the cleaner, rinse water through the inside of the pipe to clean out any dirt.
- Adjust the cleaning water to the specified pressure using a regulator.

- When tap water is used, supplying water directly from the water supply system is prohibited by law. Therefore, use a tap water pressure device, etc. to isolate from general water pipes. However, it is possible to connect directly when using an independent industrial water supply (tertiary effluent). It is also possible to connect to tap water if the water is supplied via a rooftop tank.

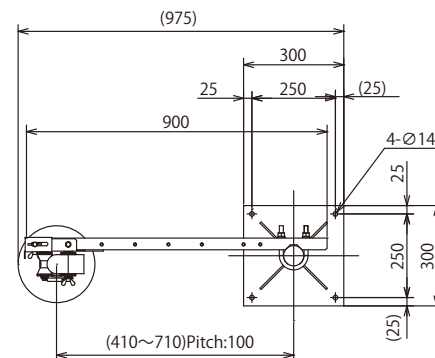


- Install in an area where operations such as maintenance can be performed easily.
- Install so that the electrode is always submerged in the measured liquid regardless of fluctuations in the level of the measured liquid.
- Avoid installing in areas with corrosive fluids or gases.
- Avoid installing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

- Details are written in the instruction manual.

- Install a movable section for the sensor cable between the holder and converter in preparation for fluctuations in the level of measured liquid and maintenance work.

- When a balancer is installed, adjust the length of the wire so that the balancer is at the top position when the level of liquid is at the lowest.

[illegible]

A Arrow Figure (Bolt fixing position)

NO.	PARTS NAME	NOTES
1	Holder	PVC
2	Float	ABS,PVC
3	Installation arm	SUS304

A balancer is used in the 3m nominal length holder (FH-101-P-3.0-PH).
(See FH-101-S series external diagram)

Holder nominal length	L1	L2	L3	L4
2.0m	2360	2020±50	1050-H	2700
2.5m	2860	2520±50	1550-H	3200
3.0m	3360	3020±50	2050-H	3700

Unit is mm. L3 length is approximate.
L4 needs to be longer than the stated length.

Technical drawing of the L3 level detector assembly, showing side and front views with dimensions and labels.

Side View (L1): Shows the detector cable outlet, the detector cable, and the detector head. The total height is indicated as 1500 mm.

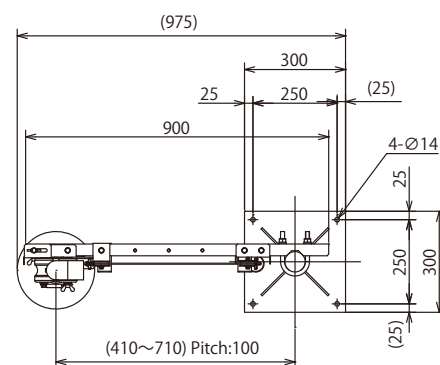
Front View (L2): Shows the detector head, the detector cable, and the detector cable outlet. The detector head has a diameter of $\varnothing 230$. The detector cable length is 450 mm. The detector head is labeled "Detector".

Dimensions:

- Total height: 1500 mm
- Detector cable length: 450 mm
- Detector head diameter: $\varnothing 230$
- Holder nominal length: 2.0m, 2.5m, or 3.0m

Labels:

- Detector cable outlet
- Detector
- Holder nominal length
- Unit is mm. L3 needs to be specified



A Arrow Figure (Bolt fixing position)

NO.	PARTS NAME	NOTES
1	Holder	SUS304
2	Wire	SUS304
3	Float	ABS,PVC
4	Installation arm	SUS304
5	Balancer	SUS304

Holder nominal length	L1	L2	L3	L4	L5
2.0m	2445	2020±50	1050-H	700-H	2500
2.5m	2945	2520±50	1550-H	645-H	3000
3.0m	3445	3020±50	2050-H	590-H	3500

Unit is mm. L3 length is approximate.
L5 needs to be longer than the stated length.

HD-200FL Optical DO Meter (Installation method -10)

Installation environment

- Install in an area where operations such as maintenance can be performed easily.
- Install so that the electrode is always submerged in the measured liquid 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.

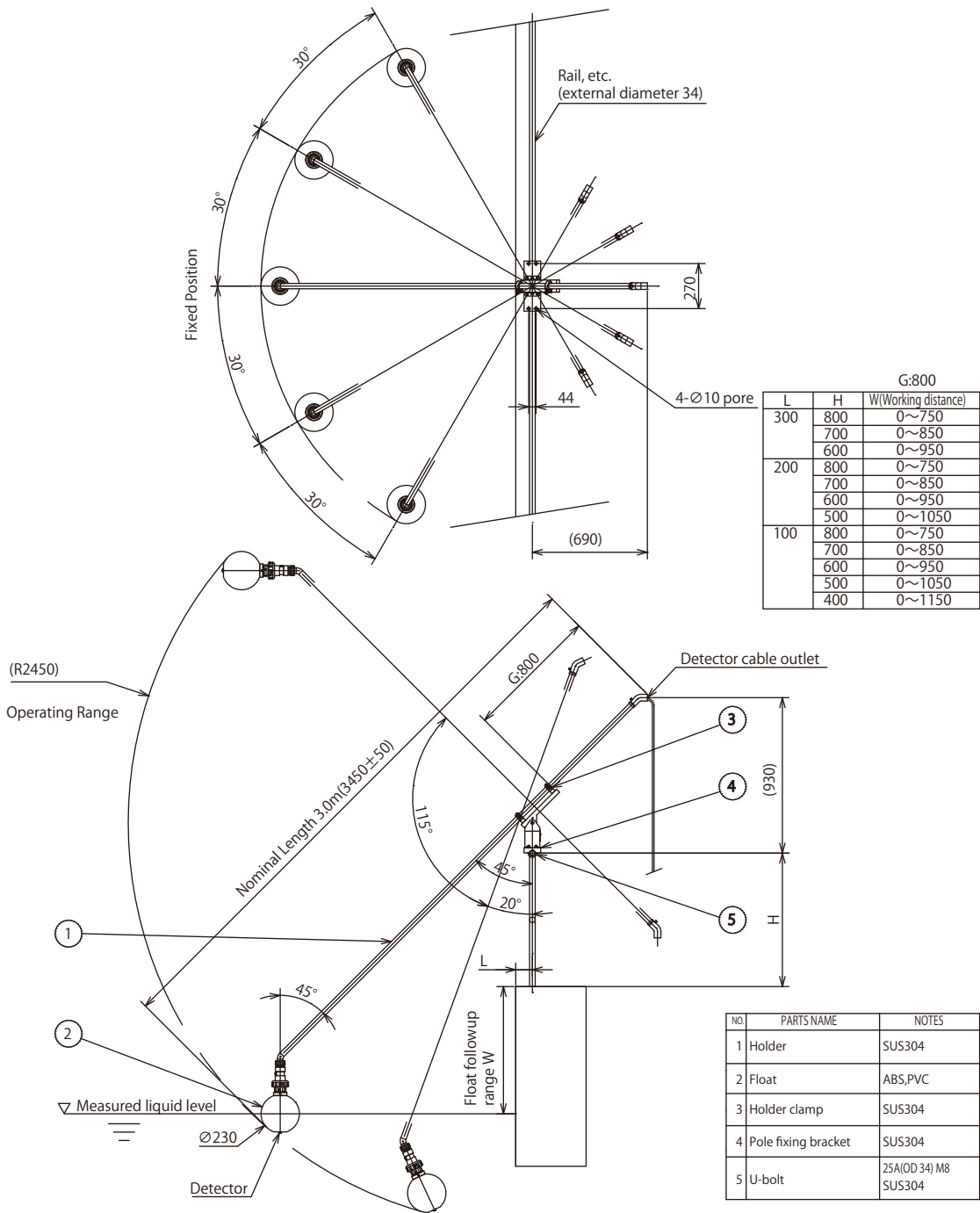
Assembly

- Details are written in the instruction manual.

Mounting

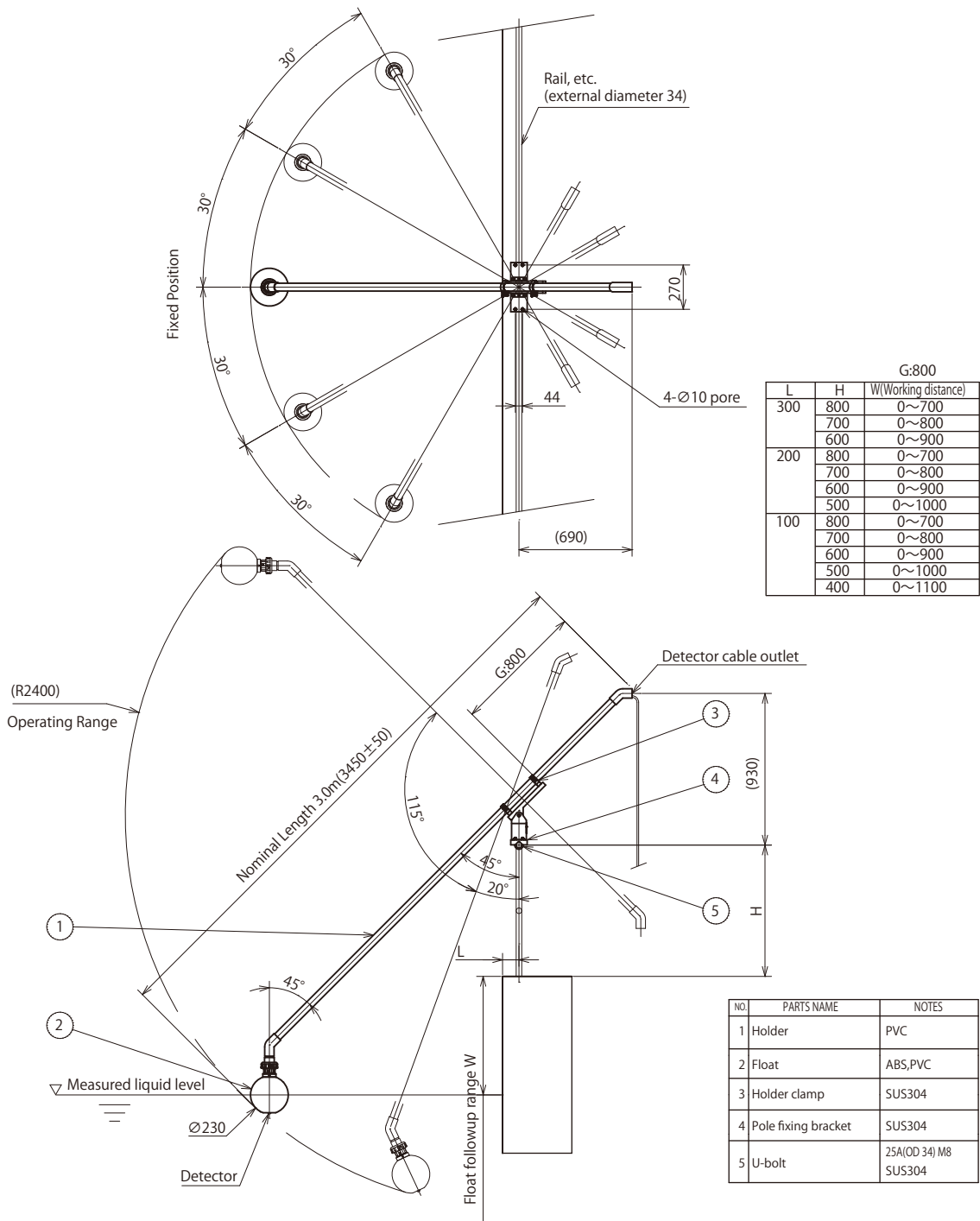
- Install a movable section for the sensor cable between the holder and converter in preparation for fluctuations in the level of measured liquid and maintenance work.
- Consider the weight of the instrument and flow speed of measured liquid for the attachment location (using the customer handrail, etc.) and ensure there is sufficient strength to support the instrument.
- G:800 (holder installation dimensions) are the standard dimensions and can be changed to suit the installation environment. However, note that in that case the float follow-up range changes.
(Contact HORIBA for details.)

Tilted floating holder (FH-201-S) (Installation)



HD-200FL Optical DO Meter (Installation method -11)

Tilted floating holder (FH-201-P) (Installation)



HD-200FL Optical DO Meter (Wiring method -1)

Power Source

- The power supply for this instrument is 100 - 240V AC rated voltage free power supply.
- 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 is equipped with a power switch.

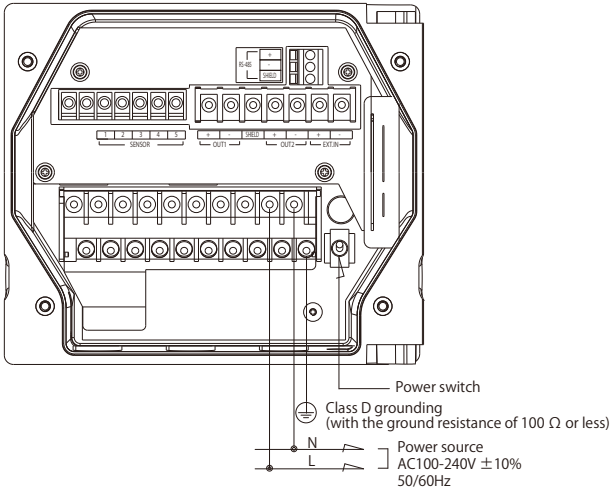
Main Specifications

- M4 terminal screws are used for the power supply.
- The maximum compatible electrical wire 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 lightening arrestors if there is a risk of lightening.
- For safety reasons, be sure to ground the earth terminal (class D grounding).
- Ground separately from electrical equipment such as the motor.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX8 For M4	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)



Main Specifications	
Rated Voltage	AC100 - 240V 50/60Hz
Power consumption	Maximum 20VA
Terminal screw	M4
Applicable wiring	0.75 - 5.5mm ² (AWG18 - 10)

Sensor

- A single DO sensor can be used.

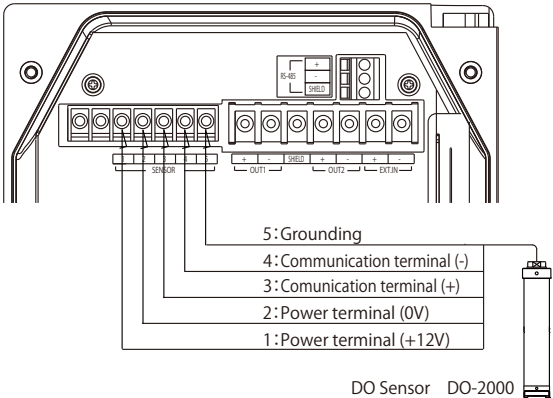
Main Specifications

- Terminal screws are M3.
- The maximum compatible electrical wire is 1.25mm² (AWG16). (The cable for the DO sensor is a specialized cable. To extend the cable, use a relay box and specialized cable (relay cable).)
- Do not wet the DO sensor cable terminals or terminal block, or allow them to become dirty with finger marks or oil. 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.
- Wire the DO sensor cables and relay cables away from devices such as motors which could cause induction, and away from power cables for such devices.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX6.5 For M3	1.25mm ² /MAX (AWG16)	0.8N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)



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

HD-200FL Optical DO Meter (Wiring method -2)

Transmission Output

- There are two transmission output points.
A DC 4 - 20 mA signal compatible with the measurement range is output.
- Receiving resistance on the receiving instrument side is a maximum of 900 Ω .
Select a receiving instrument whose input suits that of this instrument (recorder, meter relay).
- The transmission output can be set to the full-scale range provided the settings are within the full scale setting range for 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.

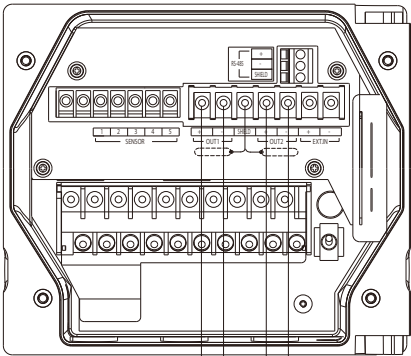
Main Specifications

- The terminal screws of the transmission output are M3.5.
- The wire size is 2mm2 (AWG14) max.
- Use shielded wires for the transmission output cables.
- 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.
- Set the contact input impedance to within 100Ω.
- When the contact input is short circuited, "EXT1" lights on the display.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX6.2 MAX3.6 For M3.5	2mm ² /MAX (AWG14)	0.8~1.2 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)

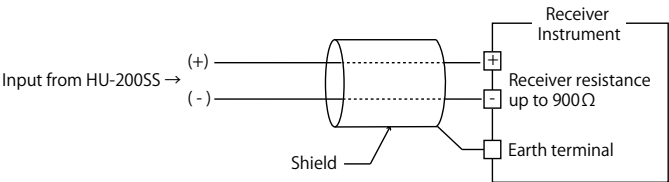


OUT2(-) OUT2(+) OUT1(-) OUT1(+)
OUT2 (Transmission output: Residual chlorine)
DC4 - 20mA (insulation output)
Maximum load resistance Ω 900
OUT1 (Transmission output: Residual chlorine)
DC4 - 20mA (insulation output)
Maximum load resistance Ω 900

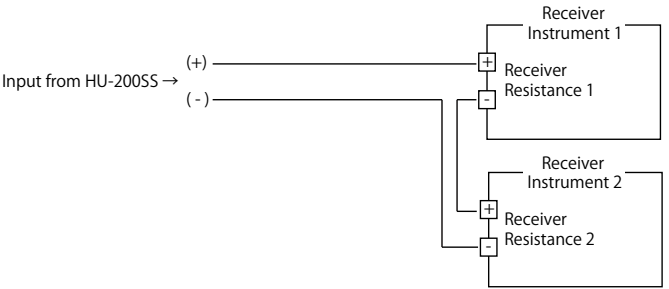
Main Specifications	
Transmission Output	4 - 20mA DC
Maximum load resistance	900Ω
Terminal screw	M3.5
Applicable wiring	2mm ² (AWG14)

Receiver side

- Ground the shielded cable on the receiving instrument side.



- When making multiple connections to the receiving instrument
Connect to the series as shown in the figure on the right.
The total resistance for the connected receiving instrument is 900 Ω .



HD-200FL Optical DO Meter (Wiring method -3)

Contact output

- There are 3 contact output points.

Main Specifications

- The contact capacity is less than AC 250 V and 3A or DC 30V and 3 A.
- Terminal screws are M4.
- The maximum compatible electrical wire is 0.75 - 5.5mm² (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.

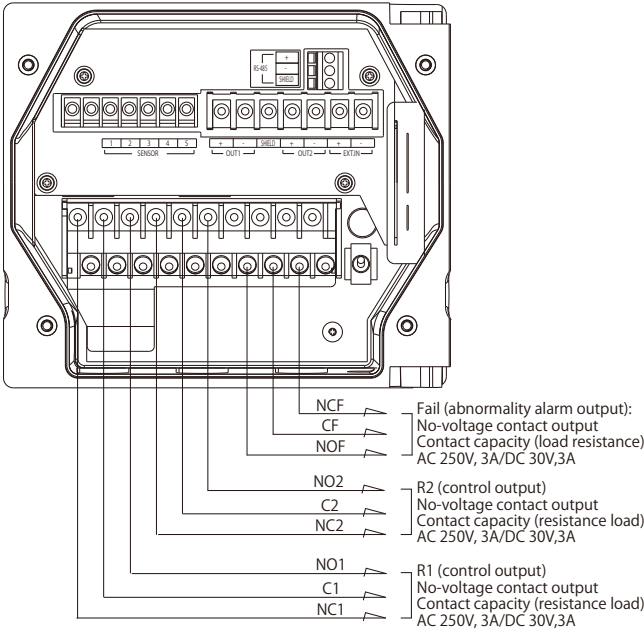
! If connecting a load higher than the contact capacity or an inductive load (such as a motor or pump), be sure to connect the load through a power relay with a rating higher than that of the load.

! When the instrument power supply is off, be careful of the load connections because the C-NC contact of R1-R2 is shorted.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX8 MAX4.7 MAX8.5 For M4	5.5mm ² /MAX (AWG10)	1.2~1.8 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)



Main Specifications	
Contact capacity	Less than 250V DC, 3A or less than 30V DC, 3A
Type of Contact Output	Upper/lower limit operation, error warning (Error or FAIL), during maintenance, none
Terminal screw	M4
Applicable wiring	0.75 - 5.5mm ² (AWG18 - 10)

Contact input

- There is one contact input point.

Main Specifications

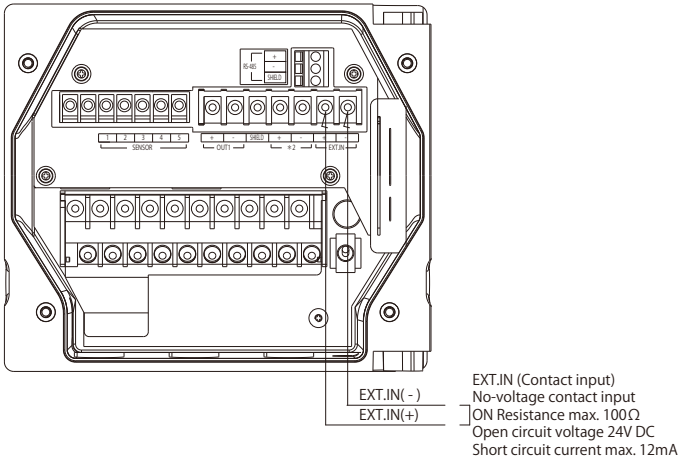
- The terminal screws are M3.5 screws.
- The maximum compatible electrical wire is 0.14 - 2.5mm² (AW26 - 14).

- Use a twist pair shielded cable.
If there is a risk of lightening, install lightening arrestors on the output side of this instrument and on the receiver instrument.
- Set the contact point resistance below 100 Ω , even for the maximum setting.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
MAX6.2 MAX3.6 MAX7.2 For M3.5	2mm ² /MAX (AWG14)	0.8~1.2 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)



Main Specifications	
Input resistance	Maximum less than 100Ω
Terminal screw	M3.5
Applicable wiring	0.14 - 2.5mm ² (AWG26~14)

HD-200FL Optical DO Meter (Wiring method -4)

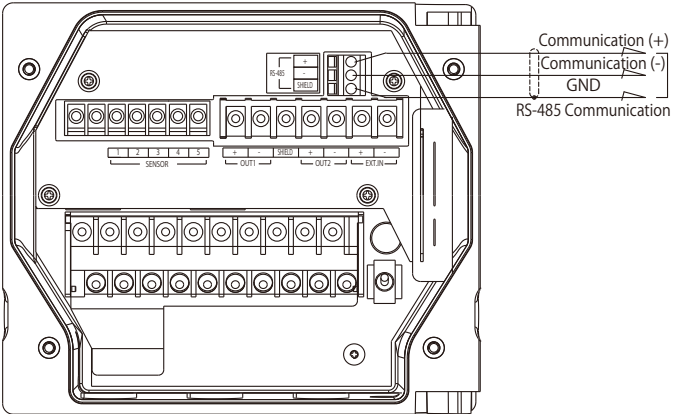
RS-485

- This instrument is equipped with an RS-485 communication terminal.
Connect the wiring before using.
- The compatible electrical wire size is 0.14 - 2.5mm² (AWG 26-14).
- 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 the instrument that is the terminus of the RS-485 communication line.

Terminal Block Specifications

Compatible Crimping Terminal	Wire size	Screw installation torque
	0.14~2.5mm ² (AWG26~14) Single wire or strand wire	0.5~0.6 N·m

※ Note
The terminal block screws are designed to prevent dislocation.
When mounting the terminal, turn the screws until they lift. (Screw up construction)



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

Example
of external
communication
connection

This instrument
RS-485
(Communication
Output)

