

SUSPENDED SOLIDS ANALYZER

Model SSF-1600

The SSF-1600 is an analyzer used to conduct continuous optical measurements of the concentration of solids. It can measure the concentration of suspended solids (SS) in sewage, night soil, and industrial waste treatment plants, as well as the concentration of mixed liquor suspended solids (MLSS) in aeration tanks.

The SSF-1600 consists of a small lightweight infrared detector, which is designed to be immersed in sample solutions, and a transmitter for converting the measured SS concentration to 4 - 20mA DC analog output signals and RS-485 digital signals.

Features

- Extensive measurement ranges
The SSF-1600 can conduct measurements across wide concentration ranges, such as ranges of 0 - 1000 mg/L (ppm) and 0 - 30000 mg/L (ppm). You can choose a 2-range type or a 3-range type. There are 3 selectable modes for switching, manual ranging, auto ranging and remote-ranging for each model.
- Infrared detector
The light source of the SSF-1600 is an infrared light-emitting diode (LED). This LED is long lasting and is almost completely unaffected by colored samples. In addition, the pulsed light signals processing prevents it from being affected by sunlight and other forms of ambient light.
- Practical calculation features
The SSF-1600 comes with useful features for calculation functions. The unit employs piecewise linear approximation to correct values that were analyzed manually. It also performs 3-point calibration to correct approximate calculations. And self-diagnosis including system error, calibration error and others is available.
- Detector options: Throw-in type and drop-in type
Detectors are classified by installation conditions into 2

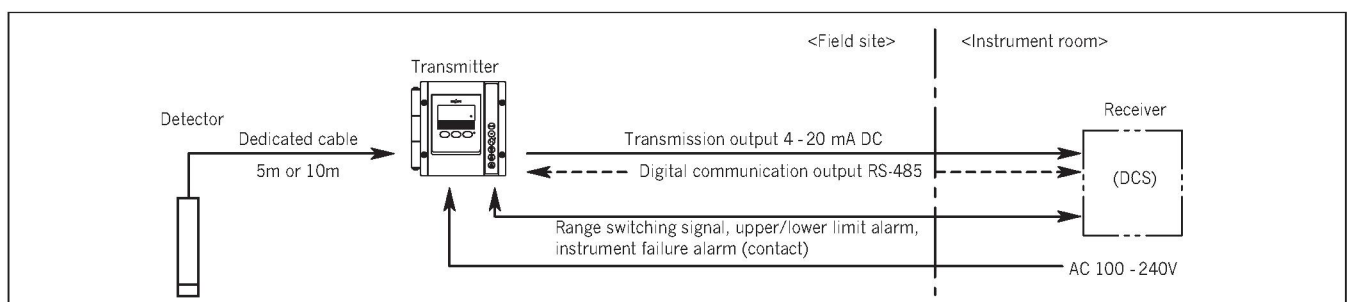


Drop-in type detector

different types: throw-in type and drop-in type, the latter in which the detector is inserted into a long protection pipe that is 2 - 6 meters long.

- Stain-resistant design
The small and lightweight detector is made of stainless steel and has a stain-resistant design. The detector plane is washed by the flow of sample water, which helps to prevent dirt deposits from accumulating.
- Jet cleaner (option for the drop-in type)
A water (air) jet cleaner or pulse air jet cleaner can be purchased as an option to remove thick layers of dirt deposits that form on the detector plane, such as when the flow rate of sample water is too slow.
- Digital signal RS-485 equipped as standard.
Supports Modbus communication.

Configuration



Standard Specifications

Model	: SSF-1600	*1: If automatic or remote is selected as the range switching mode for the 3-range type, 2 contact points are used exclusively to display the range.
Measurement method	: Infrared scattered light measurement	
Items measured	: SS concentration in water and MLSS concentration in activated sludge	
Entire measurement range	: 0 - 30000 mg/L	
Measurement ranges	: The following ranges are available. 2-range; 0 - 1000/3000 0 - 3000/5000 0 - 5000/10000 0 - 10000/20000 0 - 20000/30000 3-range; 0 - 3000/5000/10000 0 - 5000/10000/20000 0 - 10000/20000/30000 (3 selectable range switching; manual, automatic, and remote.)	
Measurement unit	: mg/L or ppm	
Display	: LCD display with backlight Minimum value displayed; 10 (the first digit is fixed at zero.)	
Power supply	: 100 - 240VAC \pm 10%, 50/60Hz	
Power consumption	: Approx. 10VA	
Transmission output	: DC 4 - 20mA (isolated) Load resistance; 600 Ω or less	
Contact output	: Six items available between under maintenance, instrument failure, range display *1, concentration upper alarm, concentration lower alarm, output for cleaner, under cleaning, and power interrupt.(For details about connecting when the resistance load is 30VDC 0.1A and the load is 100VAC, see Note 4 in "Terminal Connections".)	
Contact input	: Remote range switching, cleaning command	
Repeatability	: \pm 2% FS (with standard solution)	
Stability	: Zero drift; \pm 2% FS/7 days (with zero water) Span drift; \pm 2% FS/7 days (with standard solution)	
Response time	: 5 minutes or less for 90% response when set at position 4. (9 selectable settings between 10s and 128min)	
Ambient conditions	: -10 - 55°C, 95%RH or less (no condensation)	
Sample conditions	: Temperature; 0 - 50°C (no freezing). Flow rate; 0.5 - 1.5m/s (0.5 - 1.0m/s for float type)	
Protective construction	: Transmitter; IP65	
Detector construction	: Underwater; Withstanding pressure 0.2 MPa	
Detector cable length	: 5 m (standard)	
Light source	: Infrared LED 945nm	
Photo sensor	: Silicon photodiode	
Cable entry	: Cable gland (6 pcs) for ϕ 6 - 12cable Conduit thread G1/2 (when cable glands are removed)	
Mounting	: Transmitter; Mounted on a 50A pipe or wall/rack Detector; Throw-in type or drop-in type with protection pipe	
Material	: Transmitter; ADC12 (aluminum die-cast) Color; Metallic silver Detector; SUS316 *2, glass BK7	
Weight	: Transmitter; Approx. 2.2kg Detector; Approx. 3kg (including 5 m cable)	
		*2: Contact us for details about how to prevent possible corrosion caused by samples or ambient condition at site.

Calibration

Because the composition and properties of suspended solids (mixed liquor suspended solids) are extremely complex, it is impossible to clearly define specific substances as standard suspended solids (mixed liquor suspended solids). Thus, calibration using manual analysis data at each site is required.

1) Calibration using manual analysis (weight method) as standard

Conduct manual analyses (weight method) and record SSF-1600 readings for as many samples as possible. Plot the regression line on the scatter diagram by comparing the manual analysis values to the SSF-1600 readings.

Using this regression line, calibrate the instrument.

2) Using the standard scatter plate to perform calibration

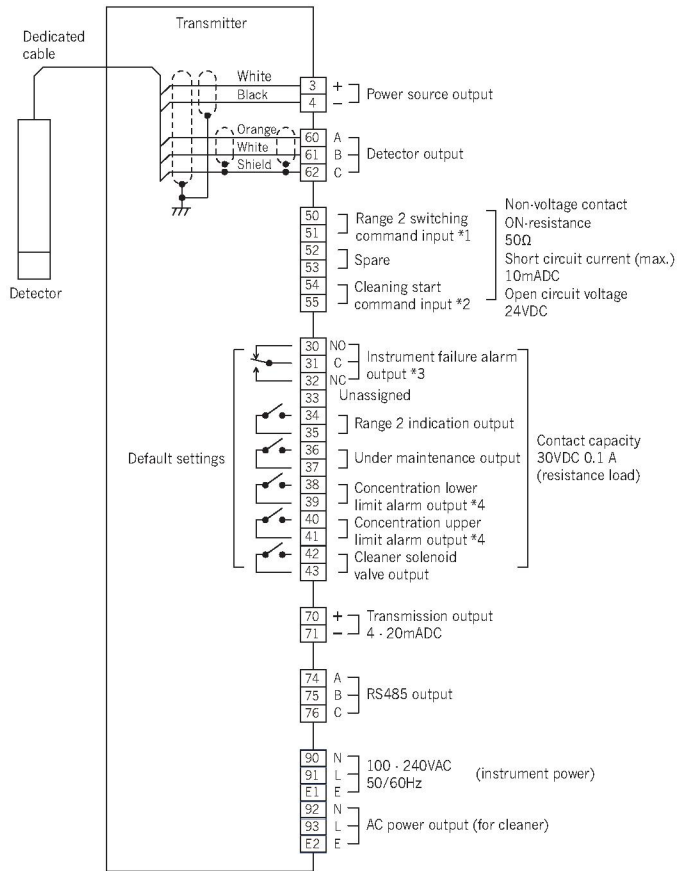
After calibration using manual analyses (weight method), measure the supplied scatter plate and record the indicated values. Then calibration using the scatter plate will be available.

Detector installation conditions

- Avoid installing the detector in a location where the sample flow rate is slow or stagnant.
- If a thick layer of dirt deposits forms on the detector plane of the drop-in type, we recommend that you purchase the optional water (air) jet cleaner or pulse air jet cleaner to remove the deposits.
- Note that samples containing dissimilar metals (particularly iron) can cause crevice corrosion. If corrosion occurs after installation, we recommend covering the unit with anti-corrosion zinc tape (code No. 141A082).

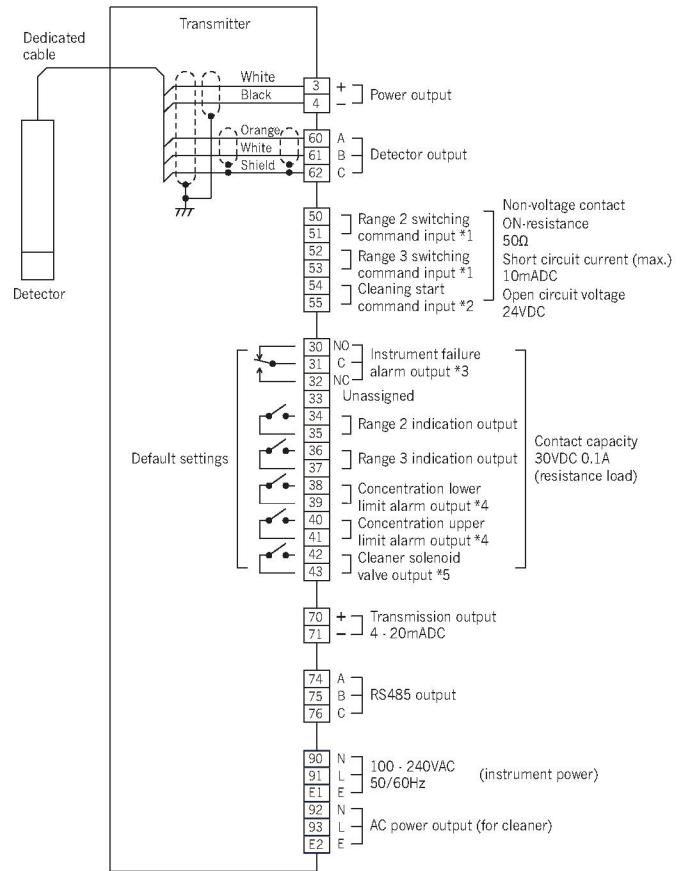
Terminal Connections

● 2-range type



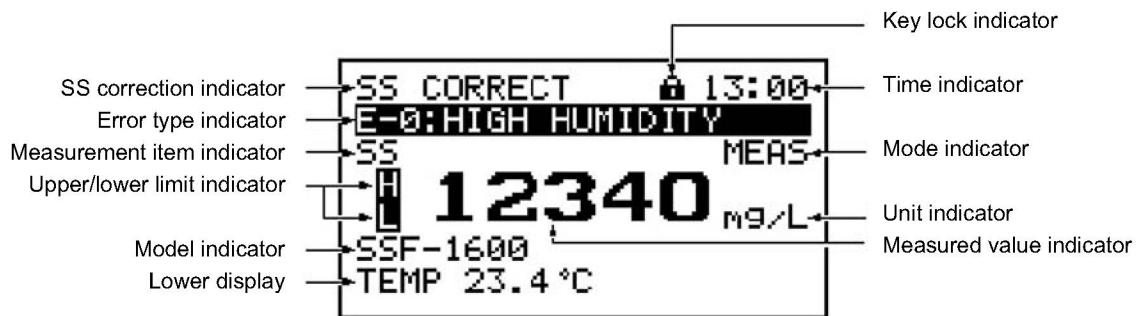
- *1: Range 2 when closed.
- *2: Pulse width 100mS or longer.
- *3: Can be changed to "Power interrupt".
- *4: 100VAC, 1A possible when protection element is connected.

● 3-range type



- *1: Range 2 and 3 when closed.
- *2: Pulse width 100mS or longer.
- *3: Can be changed to "Power interrupt".
- *4: 100VAC, 1A possible when protection element is connected.
- *5: Can be changed to "Under maintenance".

Display indication

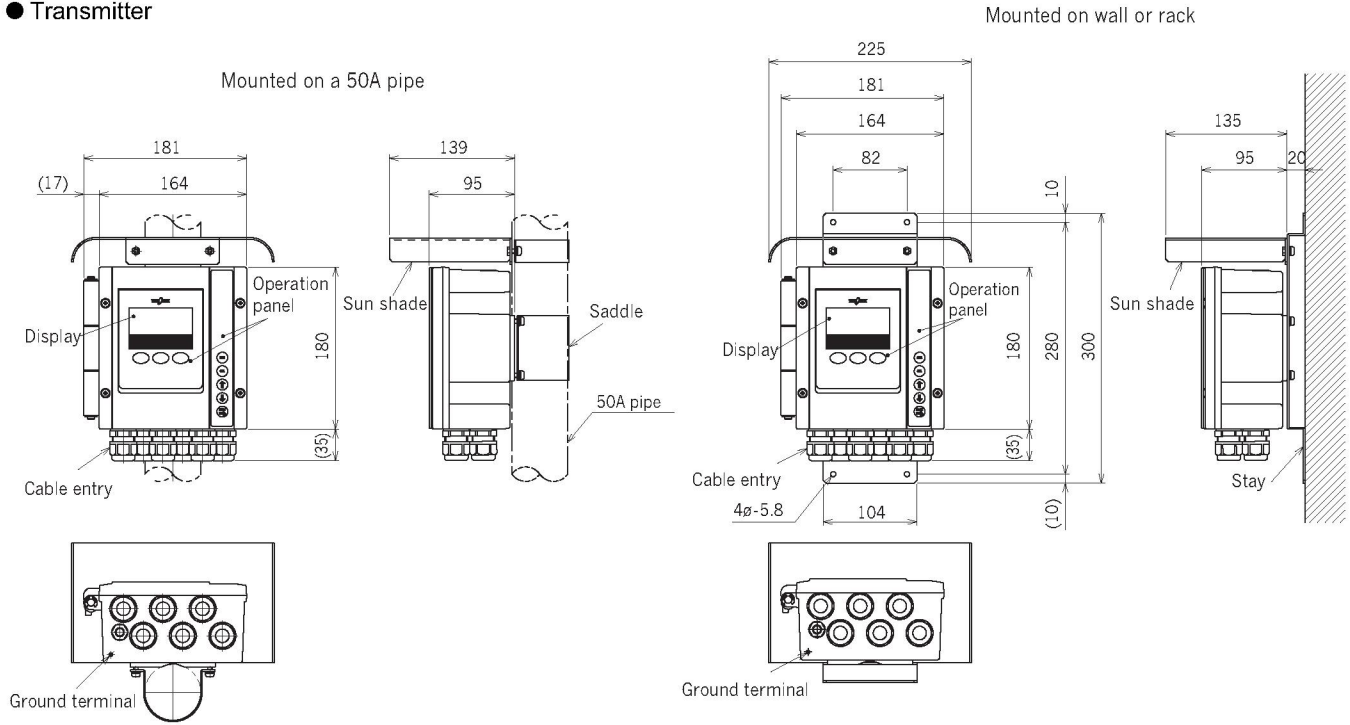


<Display in measurement mode>

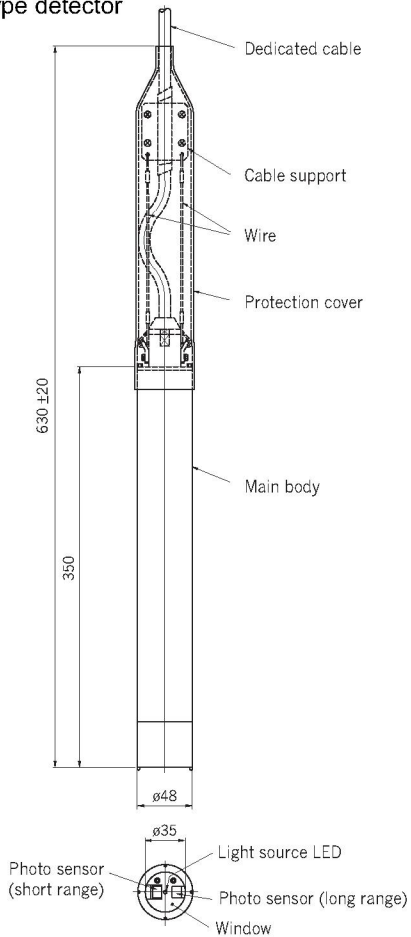
Dimensions

Unit : mm

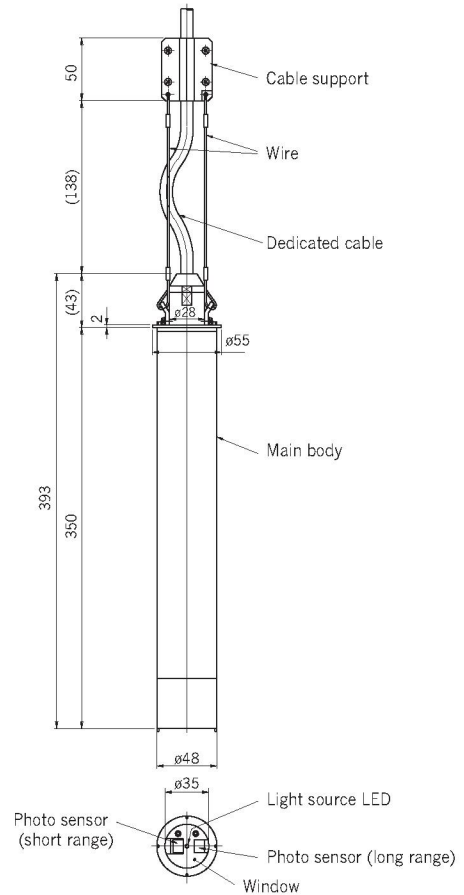
● **Transmitter**



● **Throw-in type detector**

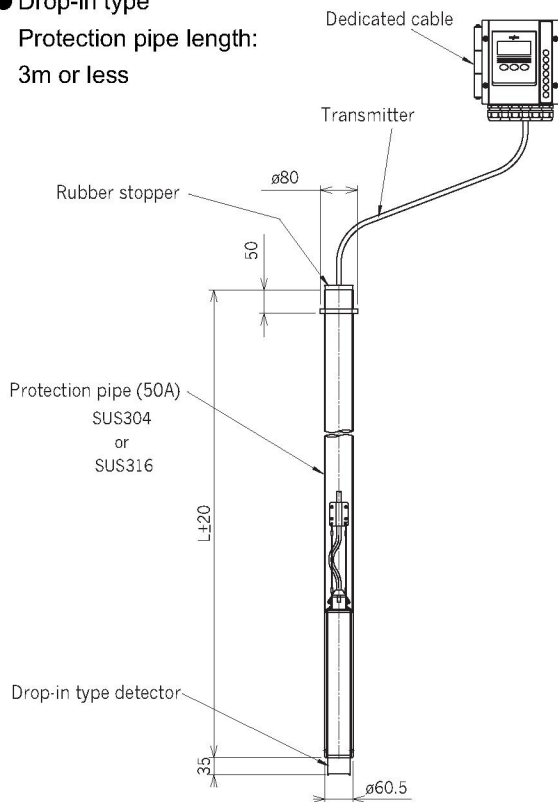


● **Drop-in type detector (no protection pipe)**



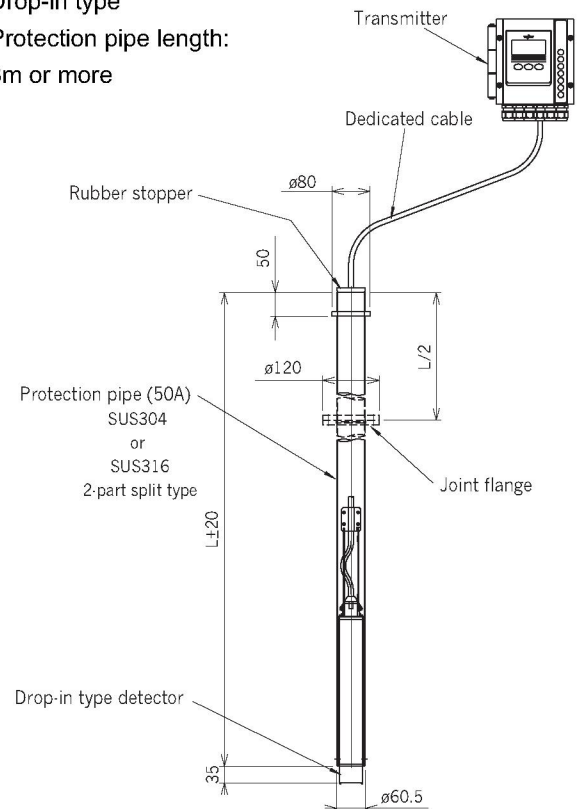
● Drop-in type

Protection pipe length:
3m or less



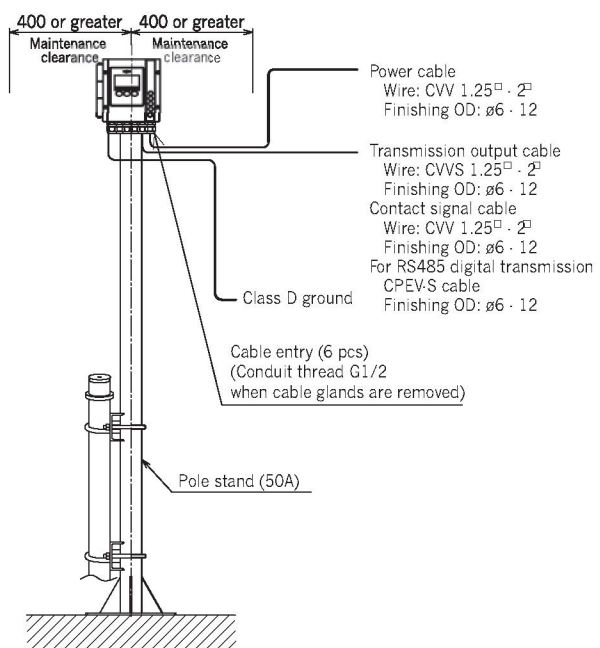
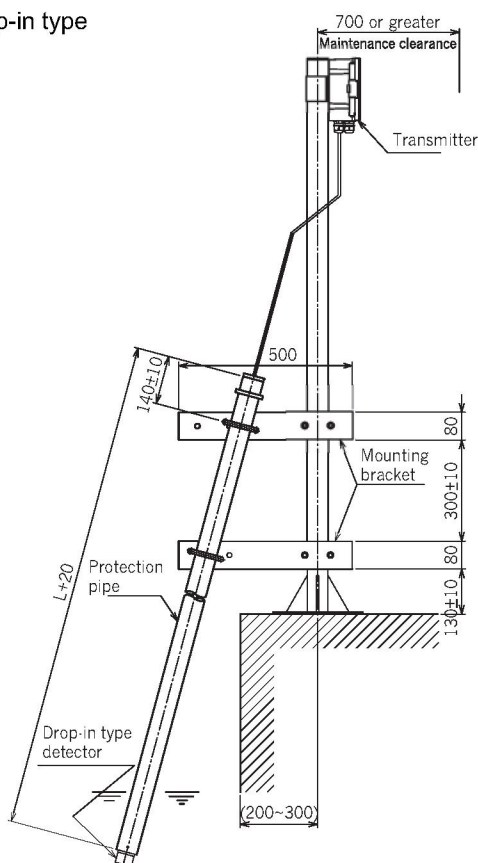
● Drop-in type

Protection pipe length:
3m or more



Installation example

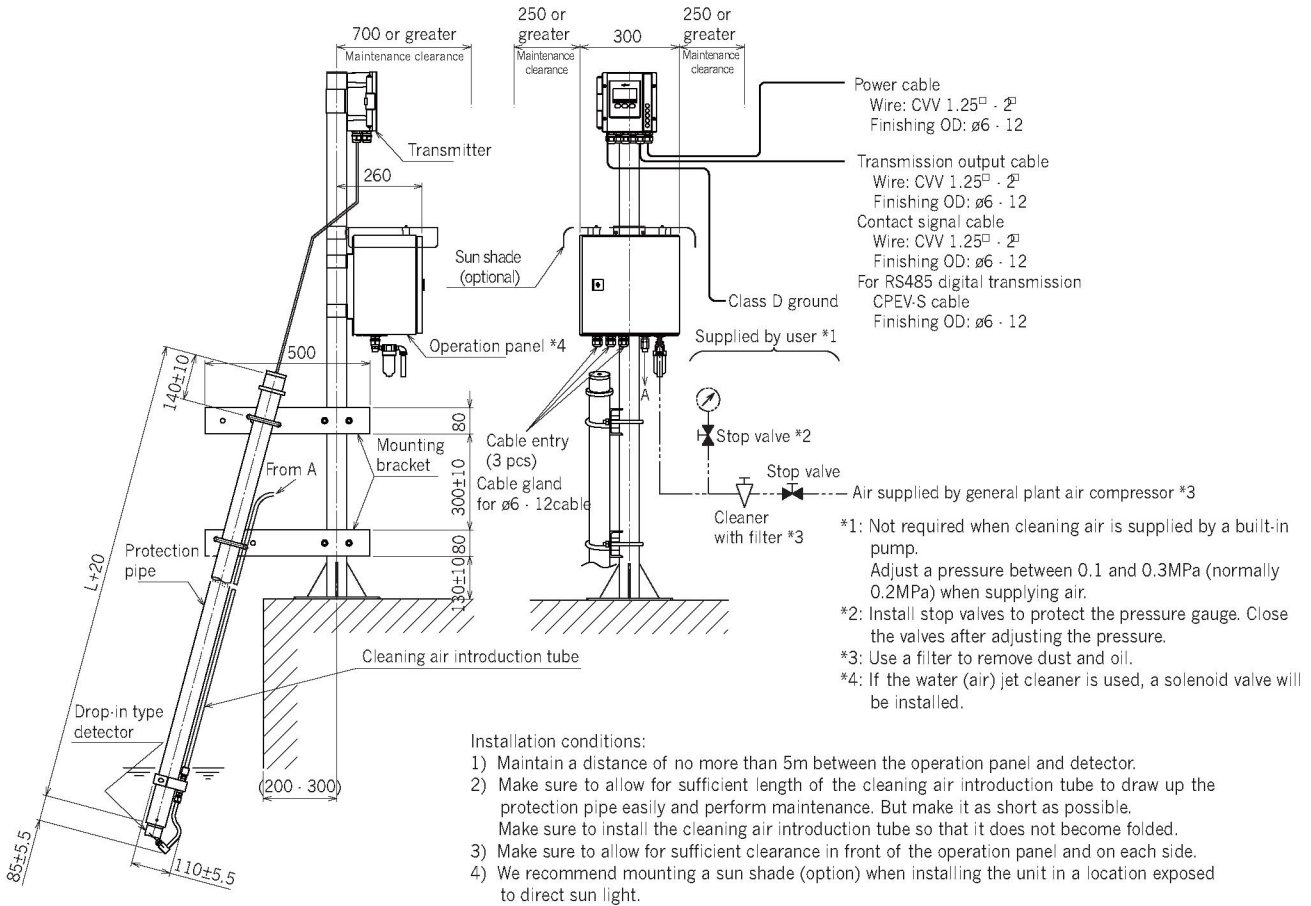
● Drop-in type



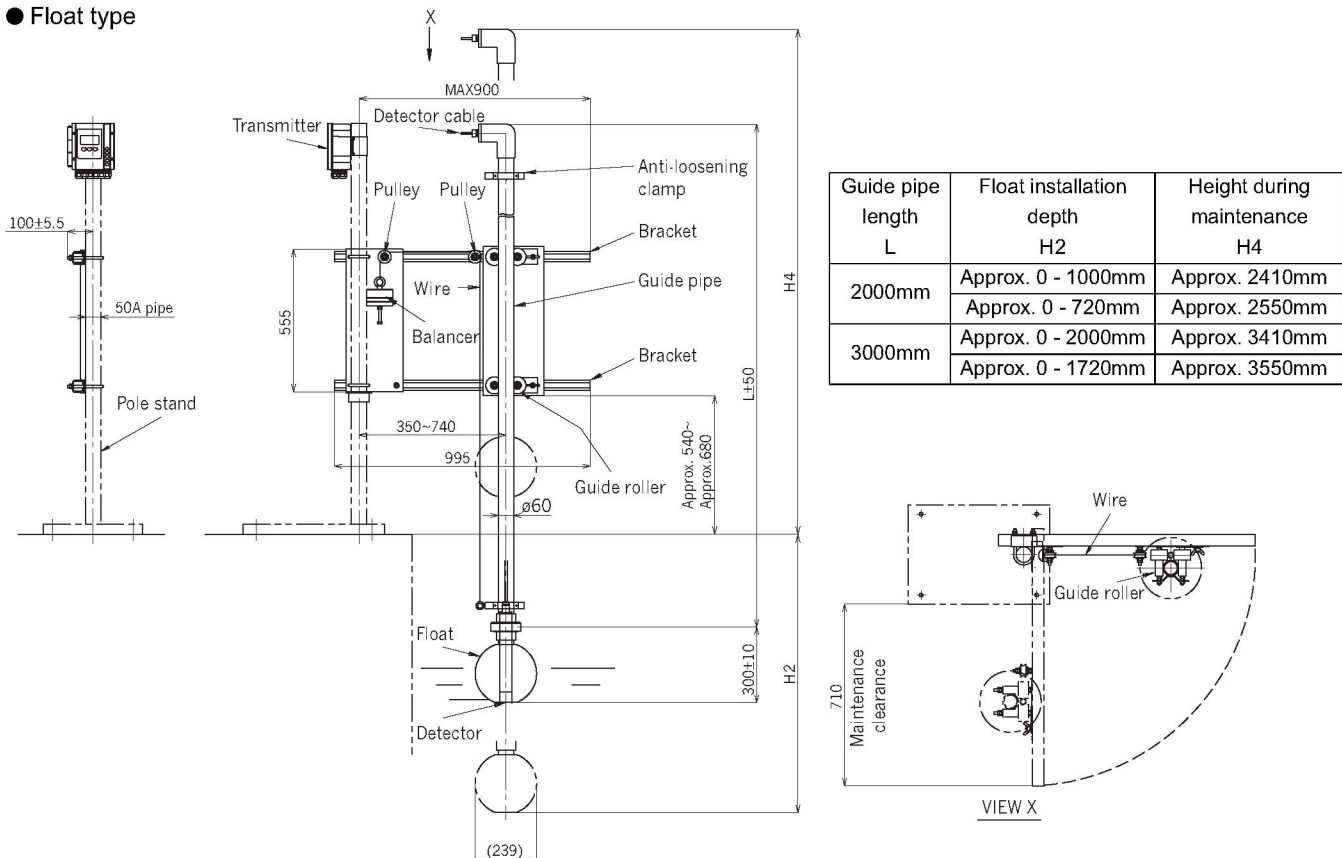
Installation conditions

We recommend mounting a sun shade (option) when installing the unit in a location exposed to direct sun light.

● Drop-in type with pulse air jet cleaner



● Float type





DKK-TOA CORPORATION

International Operations:
DKK-TOA Corporation
29-10, 1-Chome, Takadanobaba, Shinjuku-ku,
Tokyo 169-8648 Japan
Tel : +81-3-3202-0225 Fax : +81-3-3202-5685



CAUTION

Do not operate products before consulting instruction manual.