ISO 14001 Certified

SPECIFICATION SHEET

TOA DKK

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 - 20mADC analog output signals and RS-485 digital signals.

Drop-in type detector

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 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.

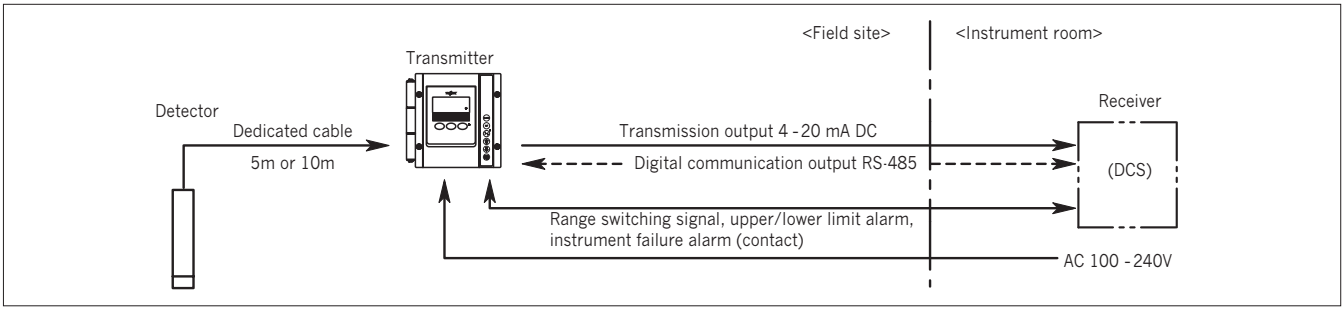
○ Jet cleaner (option for the drop-in type)

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
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 ±10%, 50/60Hz
Power consumption : Approx. 10VA
Transmission output : DC 4 - 20mA (isolated)
Load resistance; 600Ω 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".)
*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.
Contact input : Remote range switching, cleaning command
Repeatability : ±2% FS (with standard solution)
Stability : Zero drift; ±2% FS/7 days (with zero water)
Span drift; ±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 - 55ºC, 95%RH or less (no condensation)
Sample conditions : Temperature; 0 - 50ºC (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 ø6 - 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.

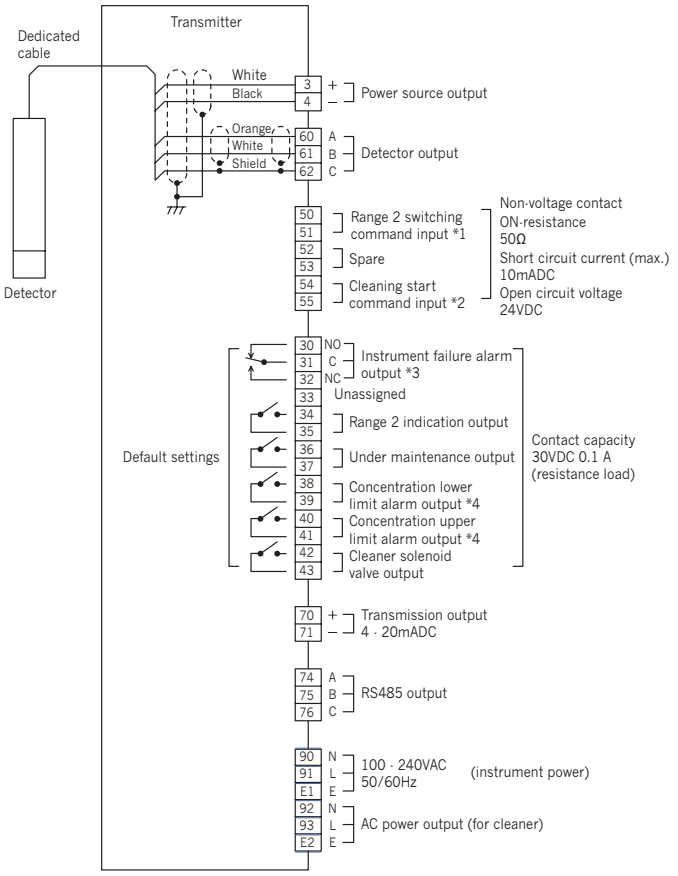
1) Calibration using manual analysis (weight method) as standard
Conduct manual analysises (weight method) and record SSF-1600 readings for as many samples as possible. Plot the regression line on the scatter diagram by comparing the manual analysis values to the SSF-1600 readings.
Using this regression line, calibrate the instrument.
2) Using the standard scatter plate to perform calibration
After calibration using manual analysises (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).

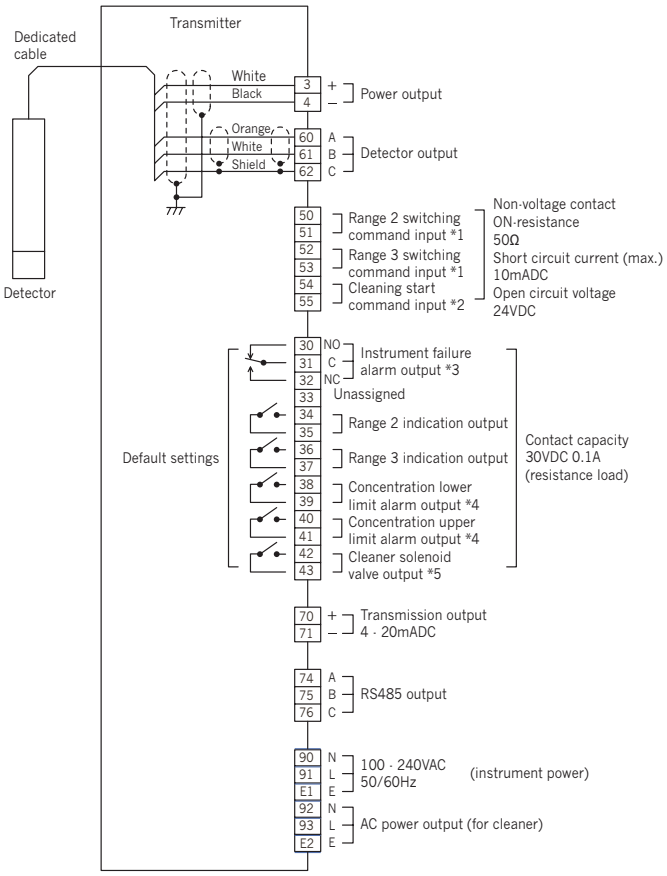
Terminal Connections

● 2-range type



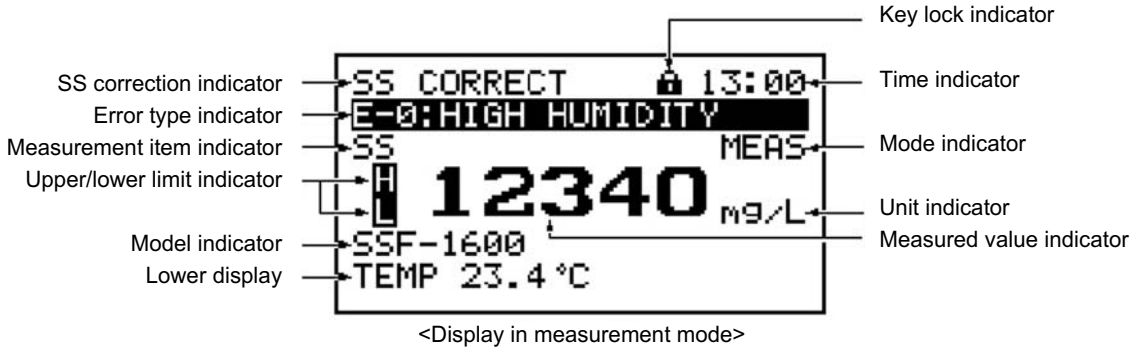
*1: Range 2 when closed.
*2: Pulse width 100mS or longer.
*3: Can be changed to "Power interrupt".
*4: 100VAC, 1A possible when protection element is connected.

● 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



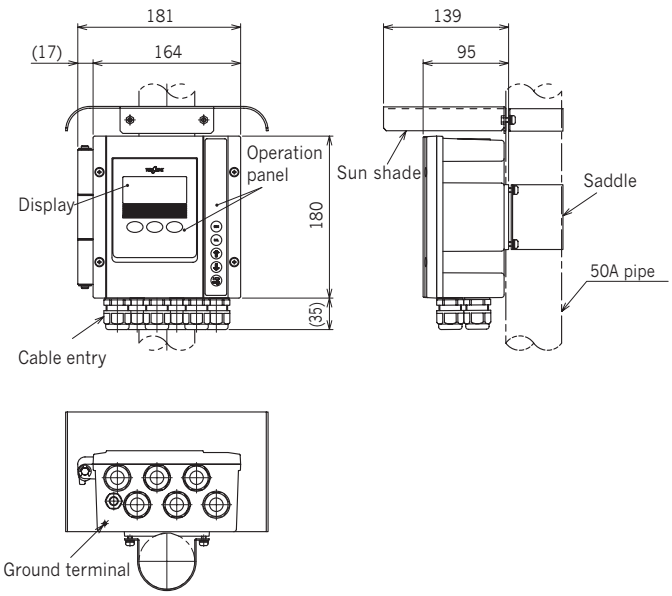
<Display in measurement mode>

Dimensions

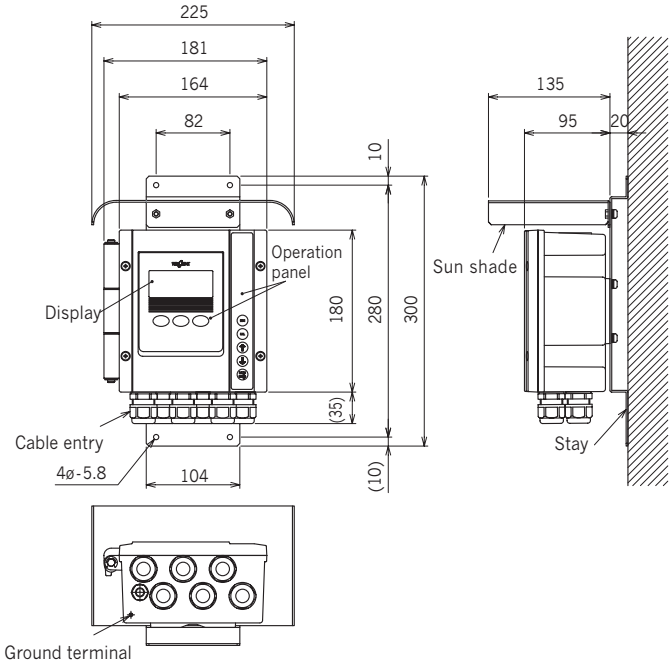
Unit : mm

● Transmitter

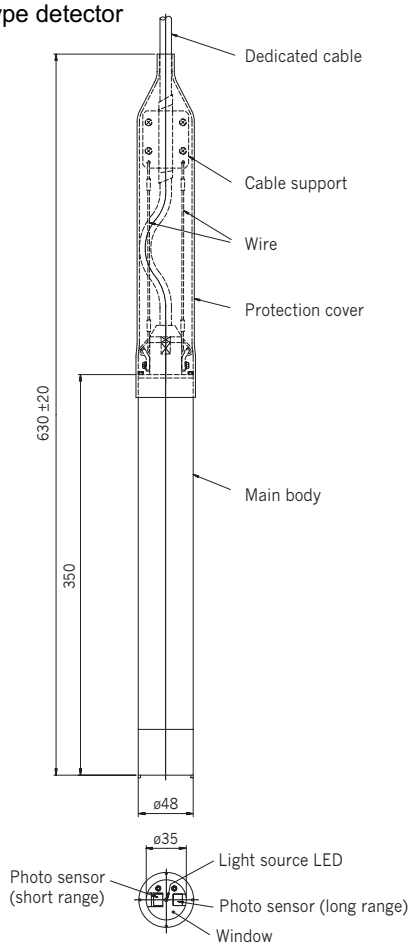
Mounted on a 50A pipe



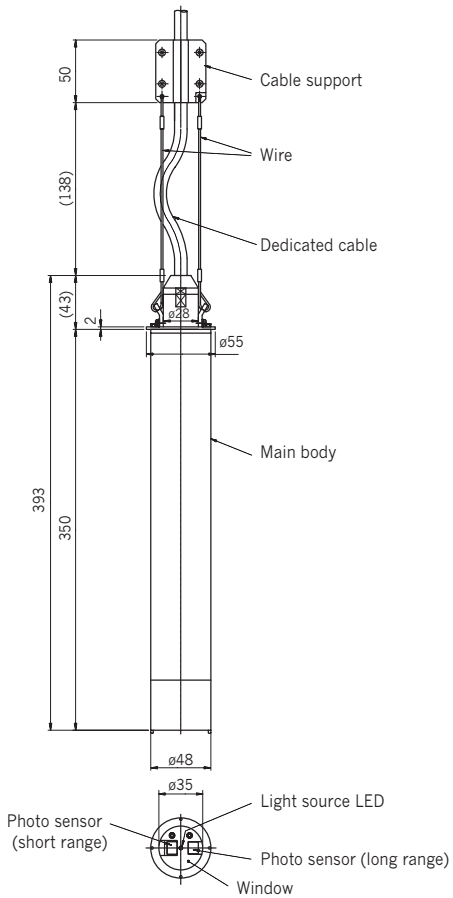
Mounted on wall or rack



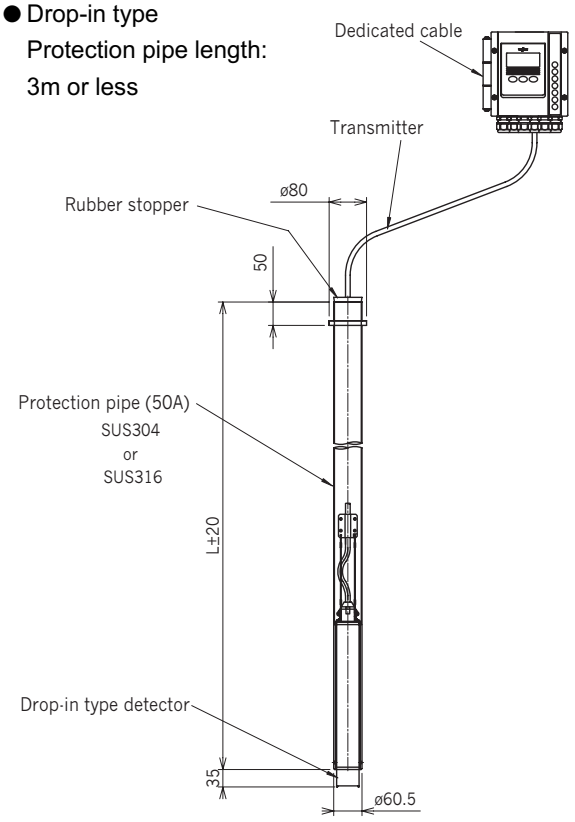
● Throw-in type detector



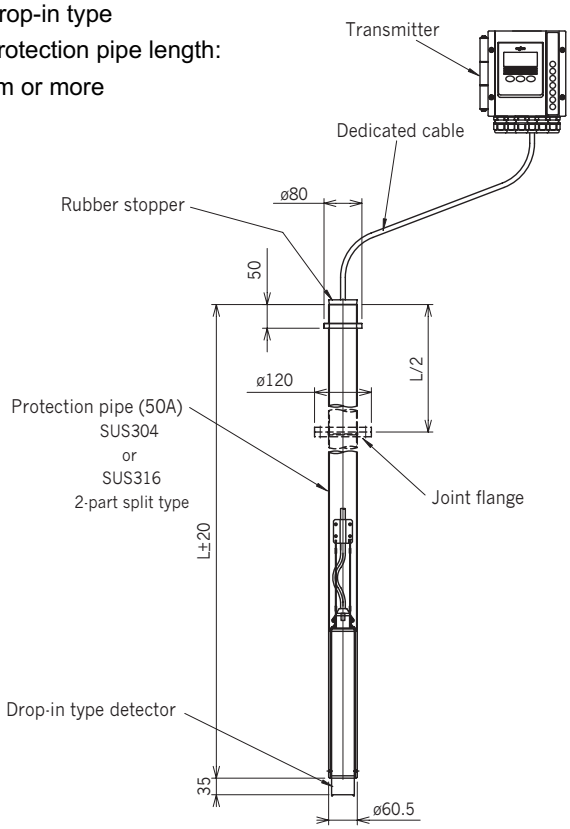
● Drop-in type detector (no protection pipe)



● Drop-in type
Protection pipe length:
3m or less

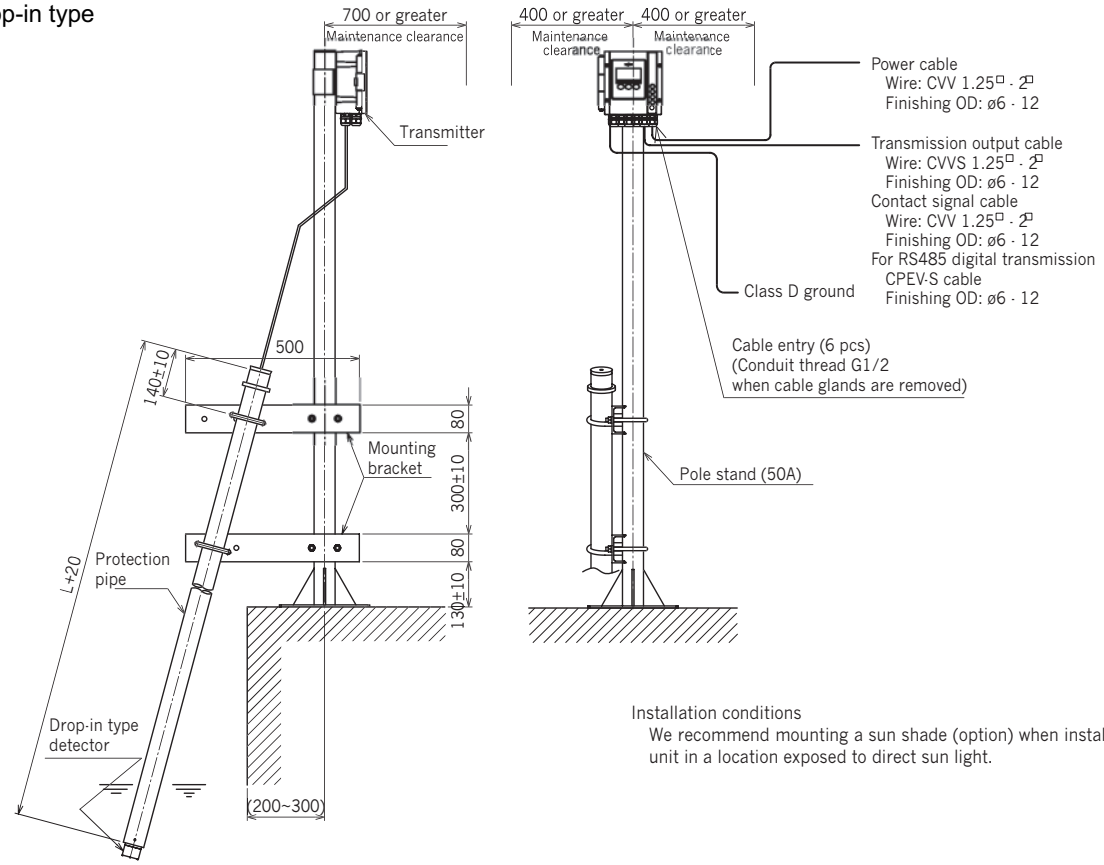


● Drop-in type
Protection pipe length:
3m or more



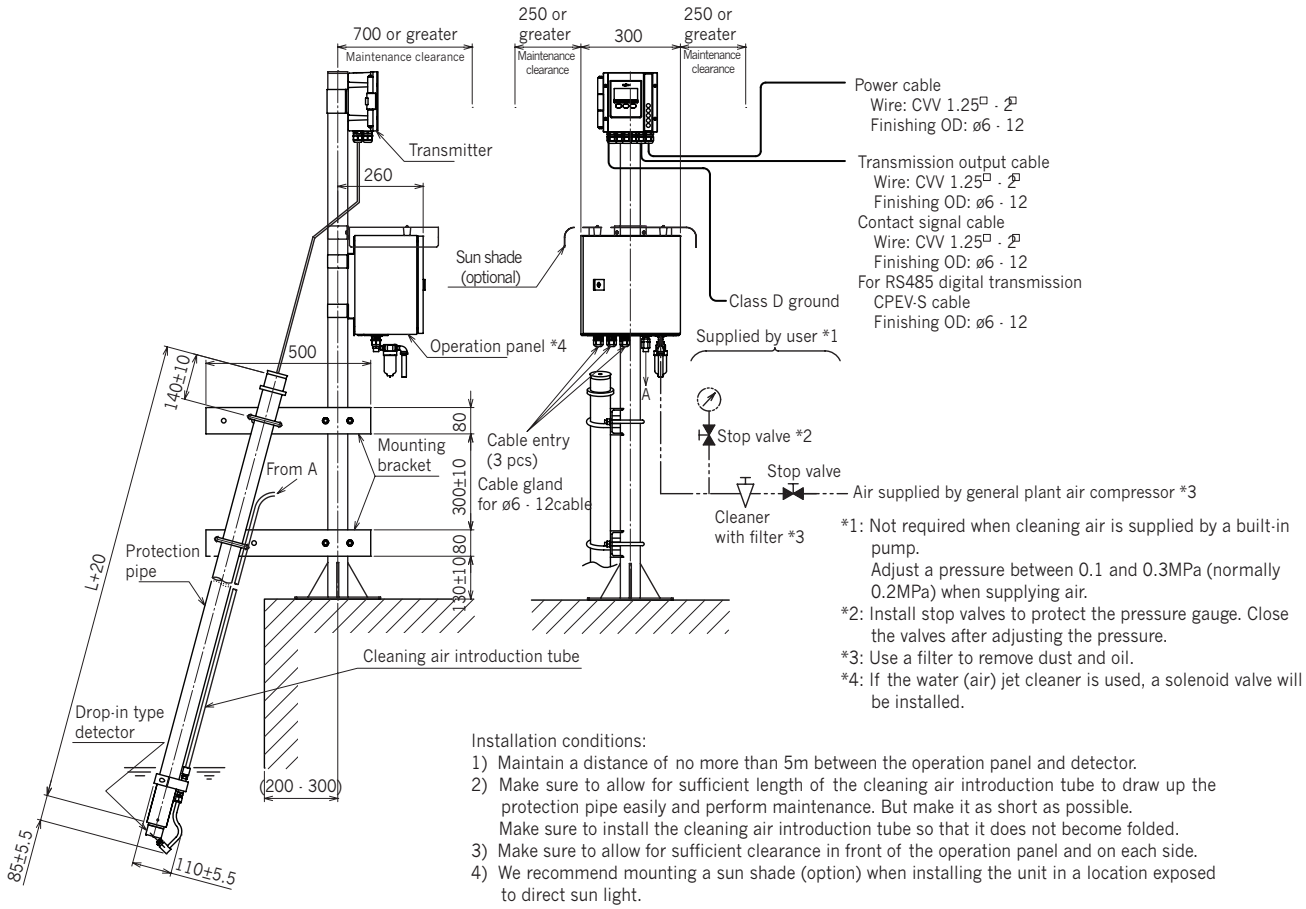
Installation example

● Drop-in type



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

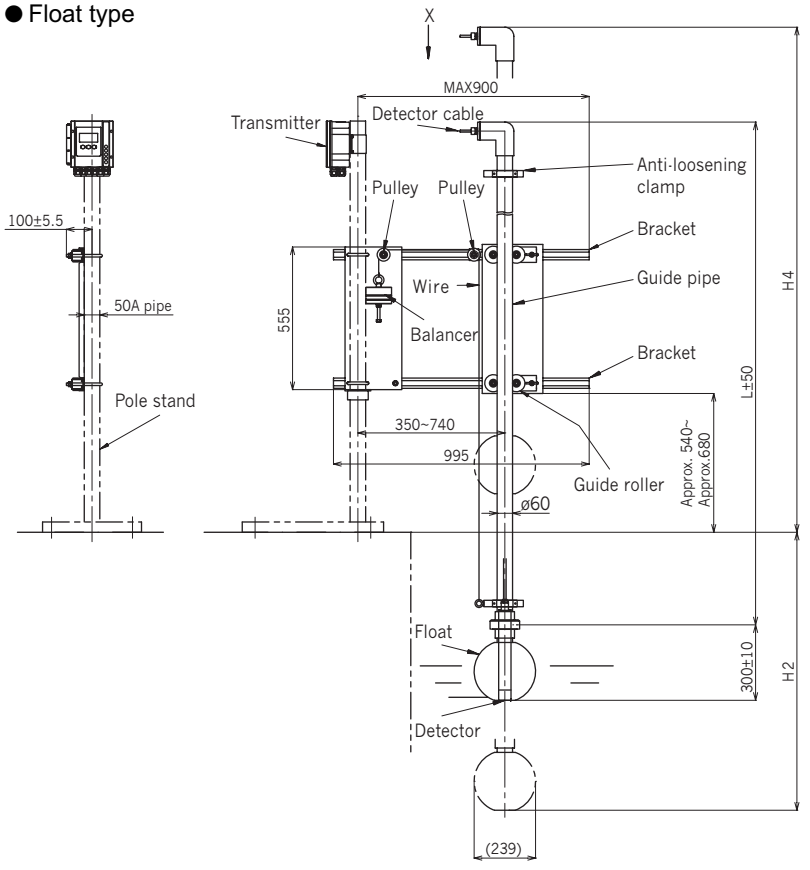
● Drop-in type with pulse air jet cleaner



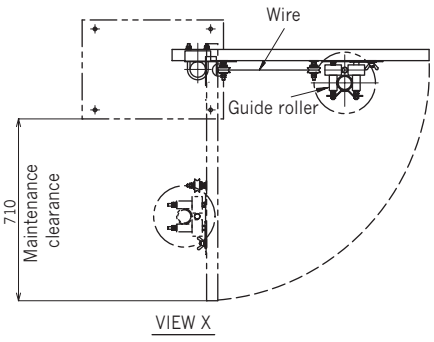
*1: Not required when cleaning air is supplied by a built-in pump.
Adjust a pressure between 0.1 and 0.3MPa (normally 0.2MPa) when supplying air.
*2: Install stop valves to protect the pressure gauge. Close the valves after adjusting the pressure.
*3: Use a filter to remove dust and oil.
*4: If the water (air) jet cleaner is used, a solenoid valve will be installed.

Installation conditions:
1) Maintain a distance of no more than 5m between the operation panel and detector.
2) Make sure to allow for sufficient length of the cleaning air introduction tube to draw up the protection pipe easily and perform maintenance. But make it as short as possible.
Make sure to install the cleaning air introduction tube so that it does not become folded.
3) Make sure to allow for sufficient clearance in front of the operation panel and on each side.
4) We recommend mounting a sun shade (option) when installing the unit in a location exposed to direct sun light.

● Float type



Guide pipe length L	Float installation depth H2	Height during maintenance H4
2000mm	Approx. 0 - 1000mm	Approx. 2410mm
	Approx. 0 - 720mm	Approx. 2550mm
3000mm	Approx. 0 - 2000mm	Approx. 3410mm
	Approx. 0 - 1720mm	Approx. 3550mm



Product code ● Throw-in type / Drop-in type

SSF1600-1-□□□□□□□□□□□□□□

- Measurement range (3 selectable range switching: manual, automatic, and remote)
  - A: 0 - 1000/3000
  - B: 0 - 3000/5000
  - C: 0 - 5000/10000
  - D: 0 - 10000/20000
  - E: 0 - 20000/30000
  - (A - E: 2-range)
  - F: 0 - 3000/5000/10000
  - G: 0 - 5000/10000/20000
  - H: 0 - 10000/20000/30000
  - (F - H: 3-range)
  - Y: Other specifications*1
- Measurement units
  - 1: mg/L (standard)
  - 2: ppm
- Measurement items
  - 1: General SS (calibration solution: fly ash)
  - 2: MLSS (calibration solution: fly ash and kaolin)
- Transmitter mounting
  - A: 50A pipe mounting (standard)
  - B: Wall or rack mounting
- Surface finish (coating) *2
  - 1: Standard coating
  - 2: High performance coating
- Arrester (power line/transmission line) *3
  - 0: None
  - 1: Included
- Cable entries for power, transmission and signal cable *4
  - 1: Cable glands for ø6 - 12 cable (standard
  - 2: Cable glands (G1/2 conduit threads when the cable glands are detached)
  - 3: NPT 1/2 supplied with 3 adapters
- Transmitter hood(sun shade)
  - 0: None (standard)
  - 1: Equipped (50A pipe mount) (Code No. 7049930K)
  - 2: Equipped (wall mount) (Code No. 69304500)
- Detector mounting
  - A: Throw-in type
  - B: Drop-in type, protection pipe not required
- Protection pipe length
  - Y: NA (no protection pipe)
- Combined equipment

Custom spec. code;
Numeric digit: 9
Alphabet: Z

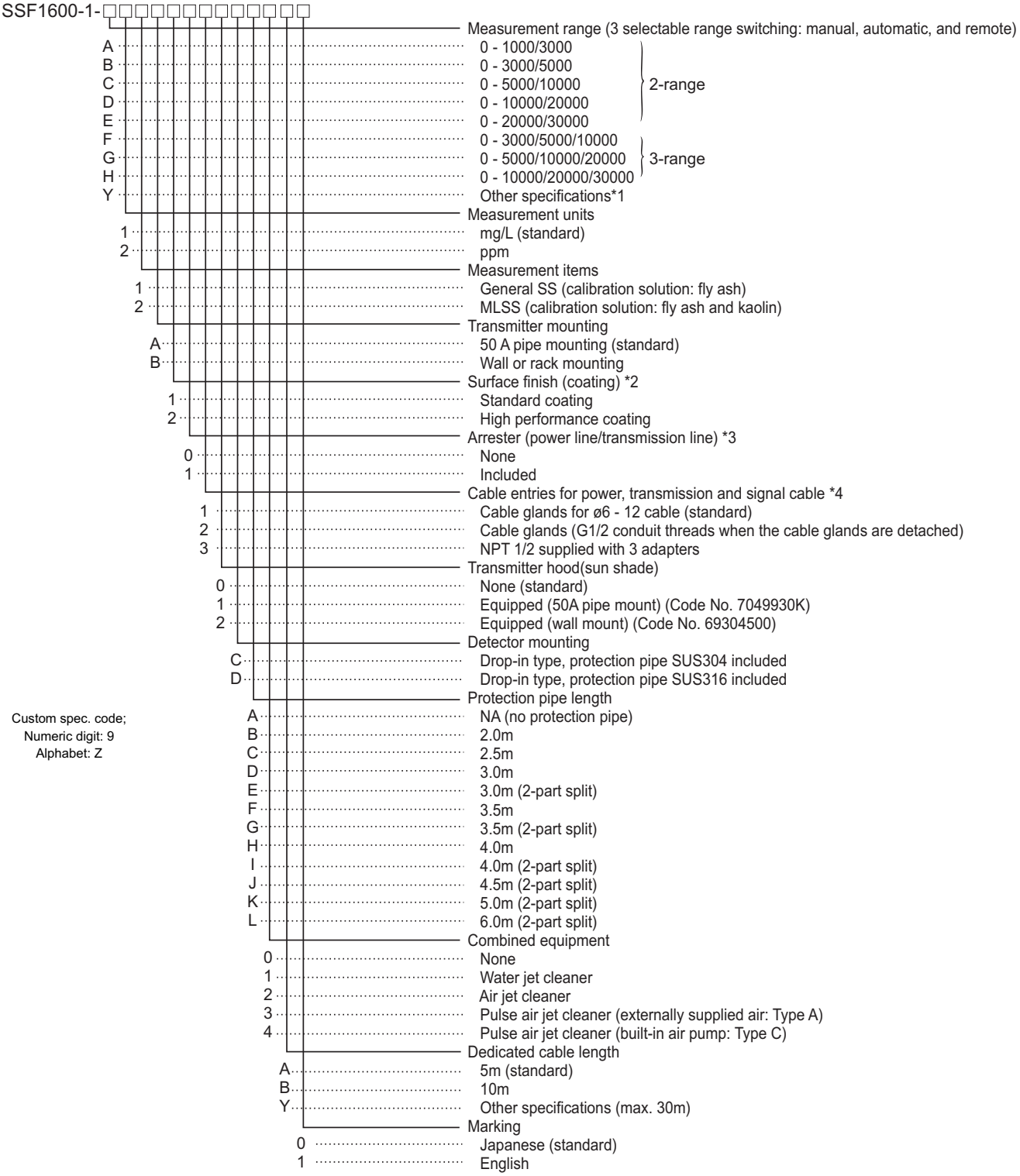
  - 0: None
  - 5: Float type detector (2m guide pipe: self-cleaning, used for surface measurements) mounting unit
  - 6: Float type detector (3m guide pipe: self-cleaning, used for surface measurements) mounting unit
- Dedicated cable length
  - A: 5m (standard)
  - B: 10m
  - Y: Other specifications (max. 30m)
- Marking
  - 0: Japanese (standard)
  - 1: English

*1. Specify a value in the range of 1000 - 30000.
*2. Standard coating: Melamine primer and topcoat. Average film thickness: Greater than 30μm. Glossiness: G40.
High performance coating: Epoxy primer and middle coat, polyurethane resin topcoat. Average film thickness: Greater than 100μm. Glossiness: G80.
*3. A (simplified) ceramic surge arrester is mounted on the power line and transmission line.
*4. There are 6 cable entries with cable glands for a ø6 - 2 cable (G 1/2 conduit threads when the cable glands are detached).
The NPT 1/2 comes with 3 SUS316 adapters. After detaching the cable glands, insert the required number of adapters into the cable entries and screw them into place.
When cable entries ports are not used, make sure to leave the standard cable glands in place. These glands function as a seal.
*5. For more information detailed specifications of combined equipment, please contact one of our sales representatives.

Notes 1. This model is the successor to the SSF-10. (Maximum measurement range expanded from 20000 - 30000. Adjustable-voltage AC power supply. RS-485 equipped as standard.)
2. The optional protection pipe mounting brackets for the drop-in type ZCH-3 (for both vertical and diagonal installation) or ZSSC-20 (flexible type) can be ordered separately as needed. The optional pole stand ZB-1 can be ordered separately as needed.
3. The optional calibration kit for SS concentration analysis can be ordered separately as needed.

● Drop-in type with protection pipe

SSF1600-1-□□□□□□□□□□□□□



Custom spec. code;
Numeric digit: 9
Alphabet: Z

Accessories

● Pole stand

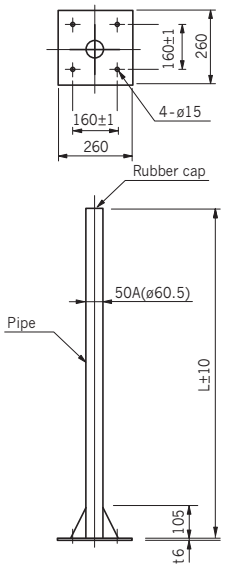
50A pole stanchion used to mount the transmitter and detector.

ZB1-1-□□

Pole stand length
- A ····· 1.0m
- B ····· 1.6m (standard)
- Z ····· Custom spec.

Materials and finish
- 1 ····· 50A steel pipe (SGP) and steel plate, Metallic silver coating
- 2 ····· 50A SUS304, no coating
- 3 ····· 50A SUS304, metallic silver coating
- 9 ····· Custom spec.

Note 1. A general pole stanchion used to mount the on-site transmitter/detector.
Note 2. The pole stanchion has a flat plate base with reinforcement ribs to support the pole.

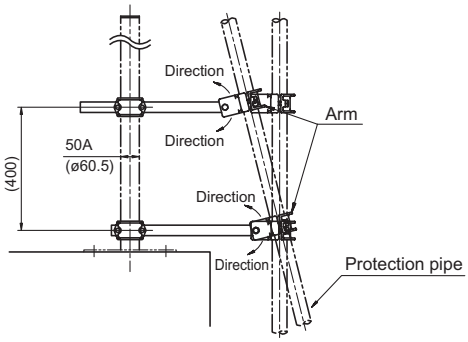


● Mounting brackets

ZSSC20-0-□

Material
- A ····· SUS304 AC 7A (standard)
- Z ····· Custom spec.

Note 1. The stainless steel and aluminum casting brackets used to fasten the 50A protection pipe for the drop-in type pH/ORP/DO/SS analyzer detector (SUS) to the 50A pole stanchion.
The brackets are mounted in sets of 2. The mounting position can be easily adjusted, enabling the protection pipe to be fastened vertically or diagonally.
Note 2. Combined detectors: HC-N95, JHC-95C, HC-G95, PHC-95D, OC-950, JOC-950C, POC-95D or SSD-1610/SSD-1620/SSF-1600.



Arm mounting reference diagram

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CAUTION Do not operate producuts before consulting instruction manual.

http://www.toadkk.co.jp/english

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