ISO 14001 Certified

SPECIFICATION SHEET

TOA DKK

SS Concentration Analyzer

Model : SSD-1610 (for Low Concentration Measurement)
SSD-1620 (for Medium Concentration Measurement)

An SS concentration analyzer is an optically based measurement instrument for continuously measuring the concentration of suspended solids in sewage, human waste, or industrial wastewater treatment plants or mixed liquor suspended solids in an aeration tank.

There are two types of SS concentration analyzers: low concentration measurement and medium concentration measurement. The former mainly measures the concentration of suspended solids and the latter measures mixed liquor suspended solids.
(MLSS: Mixed Liquor Suspended Solid)

An SS concentration analyzer consists of a compact piston detector, designed to be immersed in the sample water; and a transmitter, designed to convert SS concentration into an amount of direct current from 4mA to 20mA, as well as an RS-485 digital output.

Immersion type detector

Features

○ Compact immersible piston detector design
The detector has an optical cylinder cell with a wiper that is moved up and down slowly by a small DC motor, allowing sample water to be suctioned and discharged while cleaning the cell window, for long-term stable measurement.

○ Wide measurement range
There are three manually selectable ranges: 0~ 30/ 500/1000mg/L for low concentration measurement and 0~5000/10000/20000mg/L for medium concentration measurement.

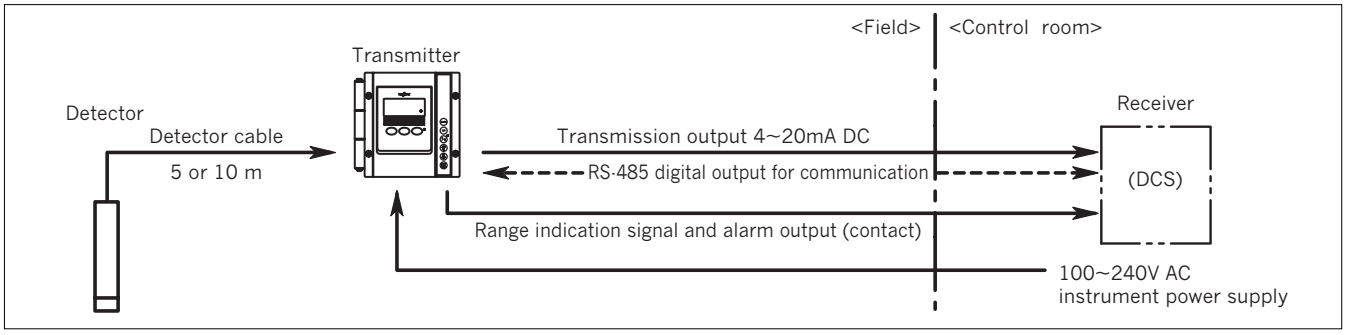
○ Less susceptible to external light
The detector is almost unsusceptible to external light, because blank measurement is always performed by turning off the light source to correct the calculation.

○ Different types of detectors available to support various applications
There are three types of detectors available: a 1.0 to 2.5m immersion-type detector, a small, light-weight Drop-in-type detector designed for use in a 2 to 6m long protection pipe, and a pipe insertion-type detector designed to be directly inserted into a pressurized pipe.

○ Long-life optical system
The optical system consists of a set of high-intensity infrared LEDs and photodiodes, and provides high reliability and long life.

○ RS-485 (standard) digital signal
Supports Modbus communication.

Configuration



Standard Specifications

Model	Measurement method	Measurement cell	Measurement range	Transmission output range	Major application
SS concentration analyzer (for low concentration measurement) SSD-1610	Transmitted and scattered light comparison	Cylindrical glass cell, ø1/2 inch	0~ 1000 mg/L	Three manually selected ranges (0~30/500/1000 mg/L, (The range can be set in steps of 1 mg/L from 30 to 1000 mg/L.)	Water from treated primary settled wastewater, inflow wastewater, clear water in sludge concentration tanks, and industrial wastewater
SS concentration analyzer (for medium concentration measurement) SSD-1620	Transmitted light measurement	Cylindrical glass cell, ø1/4 inch	0~ 20000 mg/L	Three manually selected ranges (0~5000/10000/20000 mg/L, (The range can be set in steps of 10 mg/L from 3000 to 20000 mg/L.)	Mixed liquid in an aeration tank, return sludge, and surplus sludge

● Transmitter

Installation : On-site installation
50A pipe or wall/rack mount
Enclosure : IP65 (dust-protected, water jet-protected)
Material and finish : Die-cast aluminum, polyester resin
Coating color : Metallic silver
Display : Digital LCD display
Measurement (or cleaning) interval : Approx. 15 seconds
Transmission output : 4~20 mA DC, insulated
Load resistance••••600Ω or less
Communication : RS-485 (insulated)
Protocol•••••••Modbus/RTU
Data length•••8 bits
Baud rate•••••Select from 1200/2400/4800 /9600/19200/38400/57600 bps.
Parity•••••Select from NONE/ODD/EVEN.
Stop bits••••••1 bit
Data orde•••••BIG ENDIAN
Contact output : 6 circuit-make contacts (contact "a")
Power-Off, Ranges, Under Maintenance, Analyzer Fault,
Contact capacity•••30V DC, 0.1A (resistive load)
Operation switch : Waterproof touch keys (7)
Operating power : 100~240V AC ±10% 50/60Hz
Power consumption : Approx. 10VA (15VA maximum)
Cable ports : G1/2 x 6 (grounded for ø6~12 cable)
Ambient temperature /humidity : -10-50ºC
95% RH or lower (non-condensing)
Weight : Approx. 2kg

● Detector

Installation : Immersion type•••••••1.0~2.5m long
Drop-in typ •••••••2~6m protection pipe used
Pipe insertion type•••0.6m
(Special installation device available for each type)
Materials : Enclosure••••••••••••••SUS316/rigid PVC
Measurement cell••••Pyrex glass
Wiper••••••••••••••••••Urethane rubber
Detector cable••••••••PVC
Extension pipe for immersion type••• ••••••••••••••••SUS316
Protection pipe for tube type•••SUS304/SUS316
Outside dimension : ø50.8 (basic length : 650mm)
Cell cleaning : The inside of the measurement cell is automatically cleaned while suctioning or discharging sample water with the wiper.
Wiper drive : Compact DC motor and slide mechanism
Vertical travel time•••Approx. 15 seconds
Detector cable length : 5 or 10m
Sample water requirements : Pressure •••Ambient pressure for immersion and protective tube types (maximum water depth ; 6.3m)
0.2 MPa or lower for pipe insertion type
Temperature••••••••••0~50 ºC
Velocity of flow•••••••1 m/sec or less
Weight : Body length 0.6m / Insertion type : •••Approx. 3kg
Immersion type 1.0~2.5m•••Approx. 4~7kg
Drop-in type 2~6m•••Approx. 5~15kg

Performance

Repeatability : ±2% FS (by the supplied check bar)
Zero drift : ±2% FS/week (based on simulated input)
Span drift : ±2% FS/week (based on simulated input)
Responsiveness : 90% response can be set in steps of one minute from one minute to 60minutes.
Warm-up time : Approx. 5minutes

For the factory settings, the supplied check bar value is a Formazin value for low concentration measurement, and a value based on Class 5 fly ash (as specified in JIS Z 8901-2006 "test powder and test particles") for the medium concentration measurement.

Calibration

Because sludge is complex and diverse in composition and characteristics, it is impossible to clearly define a specific substance as standard sludge. It is therefore necessary to set the measured value to a manually analyzed value for each sludge sample.

(1) Analysis data-based calibration

After installing the instrument, perform SS analysis (weight method) for as many samples as possible. Prepare a calibration curve by comparing the analysis data with the instrument readings and calibrate the instrument based on the calibration curve.

(2) Check bar-based calibration

After calibration with analysis data, measure against the supplied check bar and record the indicated values. After this, calibration of the instrument is performed with the check bar.

Principle of Measurement

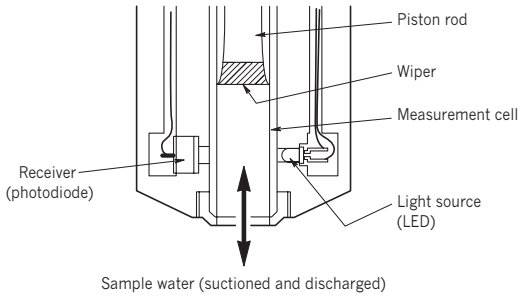
Sample water without SS particles is transparent, but sample water with SS particles is opaque. Because the opacity (or the number of particles) is proportional to the SS concentration, it is possible to determine the SS concentration by illuminating the sample water with light and measuring a change in the light intensity. (SS : Suspended Solid)

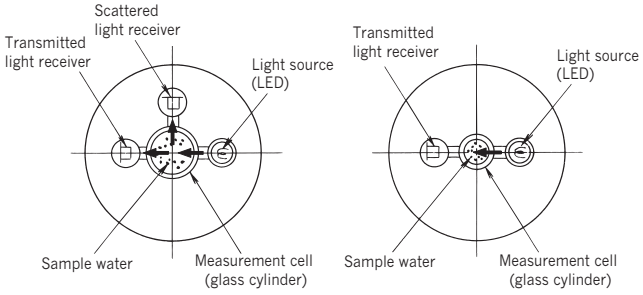
The Model SSD-1610 for low concentration (SS : 1000 mg/L or less) measures and compares scattered and transmitted light and converts the comparison result into a more accurate SS concentration value.

The Model SSD-1620 for medium concentration (SS : 5000~20000 mg/L) measures only transmitted light and converts the result into a SS concentration value.

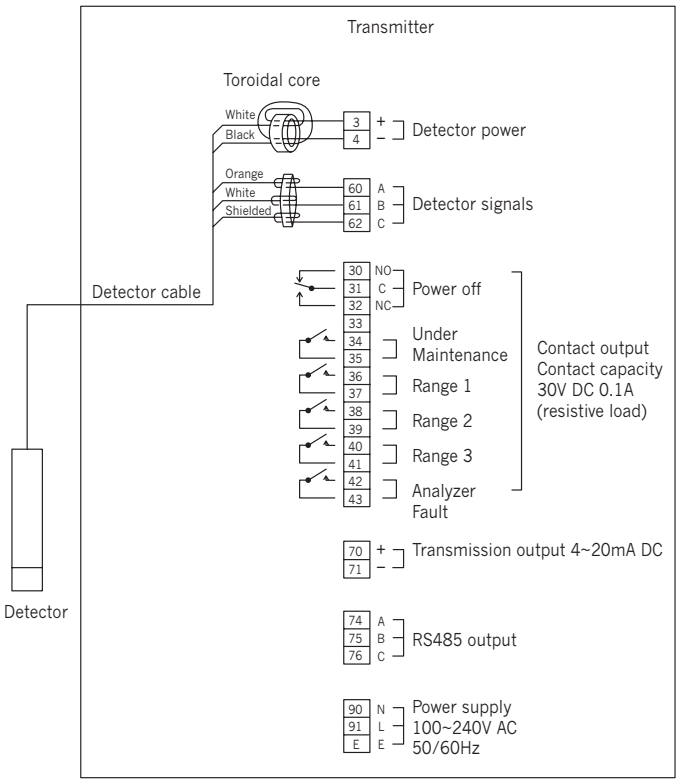
The light source LED, measurement cell, and transmitted light (and scattered light) receivers are arranged as shown in the figure on the right. The wiper continuously moves vertically in the cylindrical measurement cell. When the wiper moves up, sample water is suctioned into the measurement cell for measuring the amount of light. When the wiper moves down, the sample water is discharged. The wiper also serves to clean the inside of the measurement cell (cell window).

Detector assembly structure

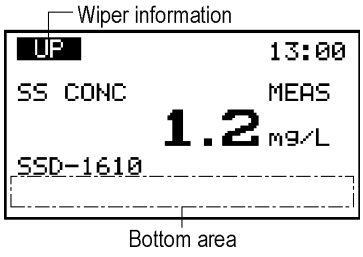




Terminal Connection



Measurement display

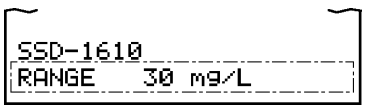


- Measured value: SS value
- Wiper status: UP or DOWN (rough wiper position information)
- Information shown at the bottom

(Each time the [READ] key is pressed, the measurement range is displayed:)

(READ) 30 mg/L : Range 1
500 mg/L : Range 2
1000 mg/L : Range 3

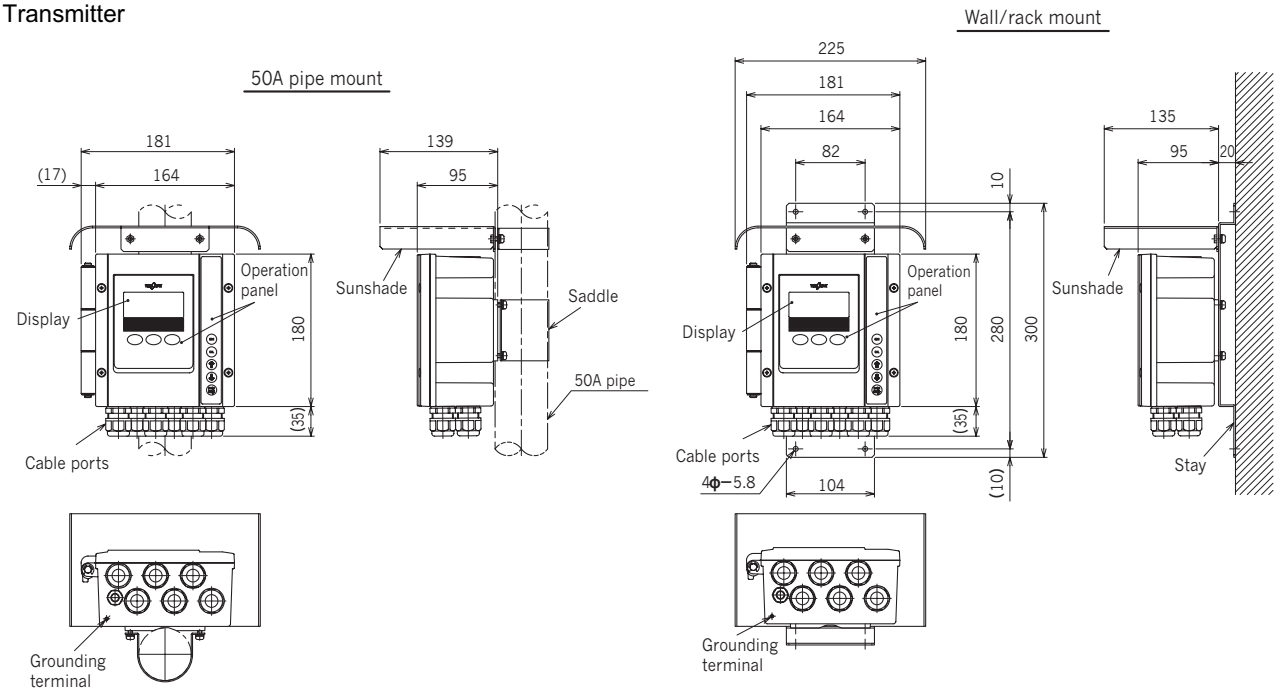
Currently selected range is displayed by pressing the [READ] key.



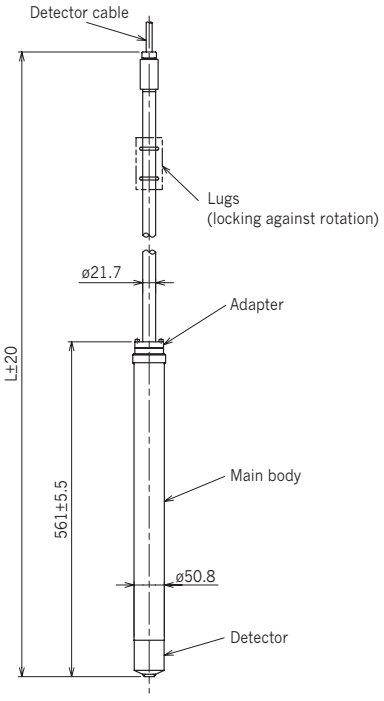
Dimensions

Unit : mm

● Transmitter

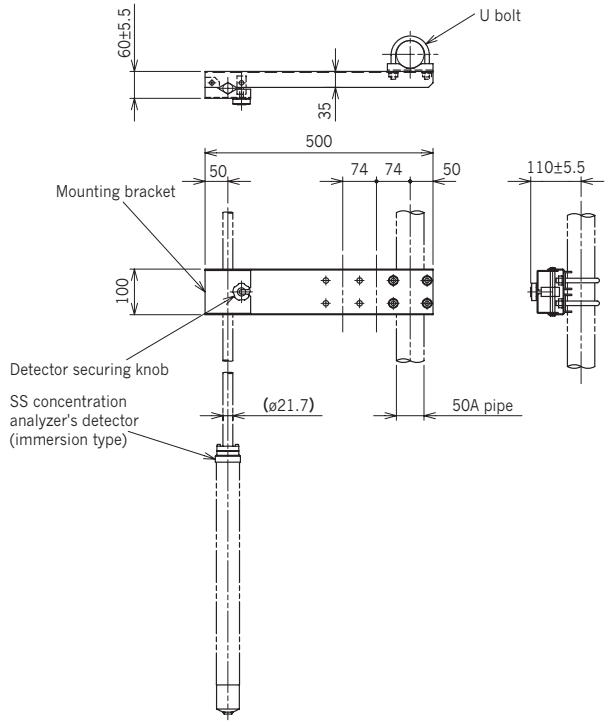


● Immersion type detector

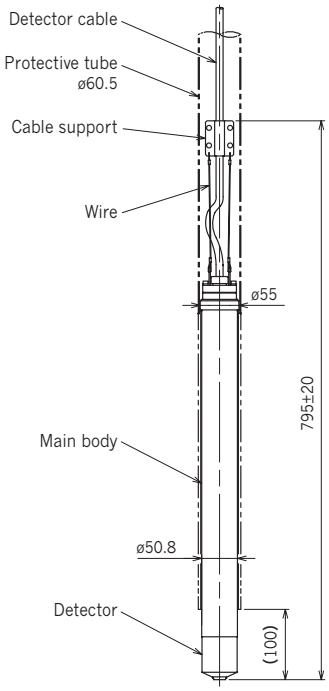


L=1m, 1.5m, 2m, 2.5m

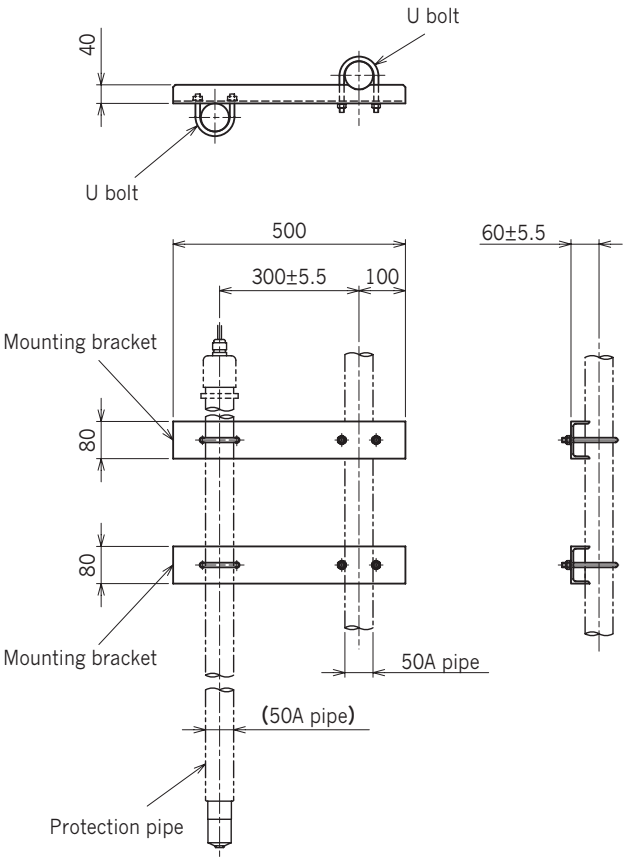
● Mounting bracket for immersion type detector



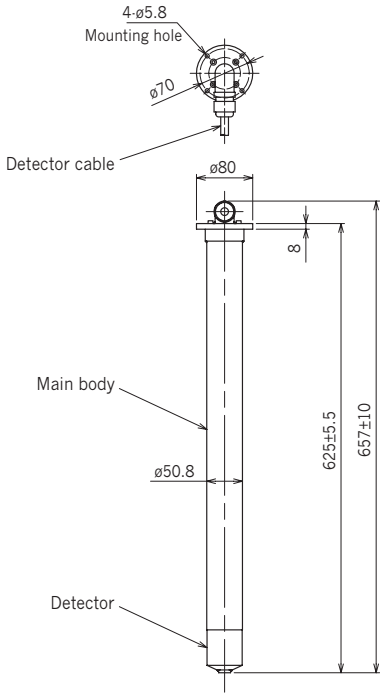
● Drop-in type detector



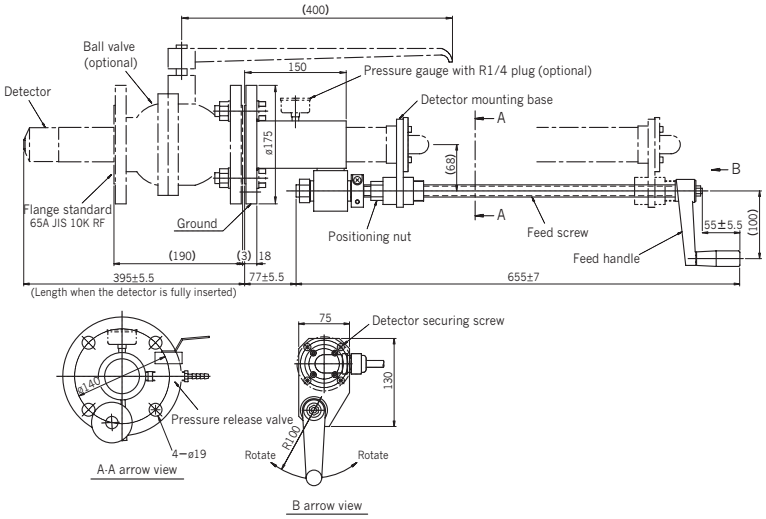
● Mounting bracket for Drop-in type detector



● Pipe insertion type detector



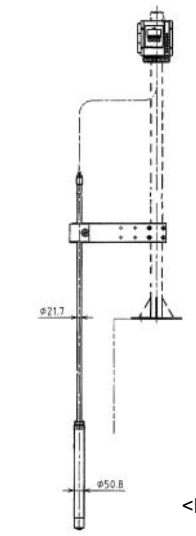
● Pipe inserter / remover (ZSSP-30)



Product code ● Immersion and pipe insertion types

SSD1610-0-□□□□□□□□□□
SSD1620-0-□□□□□□□□□□

- Measurement range*1
  - A ····· SSD-1610 ····· 0~1000 (three manual ranges (0~30/500/1000))
  - Y ····· Other (within the three manual measurement ranges (30~1000))
  - A ····· SSD-1620 ····· 0~20000 (three manual ranges (0~5000/10000/20000)
  - Y ····· Other (within the three manual measurement ranges (3000~20000))
- Measurement unit
  - 1 ····· mg/L (standard)
  - 2 ····· ppm
- Transmitter mounting type
  - A ····· 50A pipe mount
  - B ····· Wall/rack mount
- Transmitter sunshade
  - 0 ····· Not provided
  - 1 ····· Provided
- Built-in arrester (power and transmission lines)*2
  - 0 ····· Not provided
  - 1 ····· Provided
- Detector mounting type and length*3
  - A ····· Pipe insertion type 0.65m (Order Pipe inserter/remover ZSSP-30 separately)
  - B ····· Immersion type 1.0m
  - C ····· Immersion type 1.5m
  - D ····· Immersion type 2.0m
  - E ····· Immersion type 2.5m
- Protection pipe material
  - Y ····· N/A
- Detector mounting bracket*4
  - 0 ····· Not provided
  - 1 ····· One for the immersion type
  - 2 ····· Two for the immersion type
- Detector cable length*5
  - 1 ····· 5m
  - 2 ····· 10m
  - 8 ····· Other (up to 100m)
- Marking
  - A ····· Japanese
  - B ····· English



<Immersion type>


<Pipe insertion type>

Code indicating special specifications
Numeric digit: 9
Alphabetic character: Z

*1. The upper limit of the range available for low concentration measurement is 30~1000mg/L and can be set in steps of 1mg/L with the transmitter key switch.
Example : 0~30/100/300, 0~50/300/1000, 0~100/500/1000
The upper limit of the range available for medium concentration measurement is 3000~20000mg/L and can be set in steps of 10mg/L with the transmitter key switch.
Example : 0~3000/6000/12000, 0~10000/15000/20000
*2. Ceramic surge arresters (simple type) are attached to the power and transmission lines.
*3. In principle, no other length is available. If you need a length exceeding 2.5m, select the Drop-in type detector.
*4. This is a vertical mounting bracket for a 50A pole stand (SUS304). In principle, two brackets are necessary for a detector exceeding 2m.
If you want the detector and transmitter to be mounted non-vertically or allow the angle to be changed during use (ZSSC-10 or equivalent), contact our sales office for more information.
*5. The required detector cable length is 5m for an up to 2m long detector and 10 m for a 2.5m long detector.

● Pipe inserter / remover

ZSSP30-0-□□□

- Ball valve
  - 0 ····· Not provided
  - 1 ····· Provided
  - 9 ····· Special
- Pressure gauge
  - 0 ····· Not provided
  - 1 ····· Provided (GK258-271 0.4MPa)
- Marking
  - 1 ····· Japanese
  - 2 ····· English

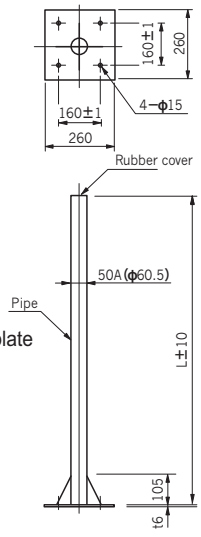
● Pole stand

This is a 50A pole stanchion for mounting the transmitter or detector.

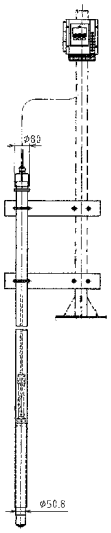
ZB1-0-□□□

- Pole stand length
  - A ····· 1.0 m
  - B ····· 1.6 m (standard)
  - Z ····· Special
- Material*
  - 1 ····· 50A steel pipe (SGP) and iron plate
  - 2 ····· SUS304
  - 9 ····· Special
- Coating color
  - 0 ····· None
  - 1 ····· Metallic silver
  - 9 ····· Special

* No coating is applied for the SUS.



● Drop-in type



SSD1610-0-□□□□□□□□□□
SSD1620-0-□□□□□□□□□□

- Measurement range*1
  - A … SSD-1610 … 0~1000 (three manual ranges (0~30/500/1000))
  - Y … Other (within the three manual measurement ranges (30~1000))
  - A … SSD-1620 … 0~20000 (three manual ranges (0~5000/10000/20000))
  - Y … Other (within the three manual measurement ranges (3000~20000))
- Measurement unit
  - 1 … mg/L (standard)
  - 2 … ppm
- Transmitter mounting type
  - A … 50A pipe mount
  - B … Wall/rack mount
- Transmitter sunshade
  - 0 … Not provided
  - 1 … Provide
- Built-in arrester (power and transmission lines)*2
  - 0 … Not provided
  - 1 … Provide
- Detector mounting type and length*3
  - F … Drop-in type without protection pipe
  - G … Drop-in type with protection pipe 2.0m
  - H … Drop-in type with protection pipe 2.5m
  - J … Drop-in type with protection pipe 3.0m
  - K … Drop-in type with protection pipe 3.0m (in two pieces)
  - L … Drop-in type with protection pipe 3.5m
  - M … Drop-in type with protection pipe 3.5m (in two pieces)
  - N … Drop-in type with protection pipe 4.0m
  - P … Drop-in type with protection pipe 4.0m (in two pieces)
  - Q … Drop-in type with protection pipe 4.5m (in two pieces)
  - R … Drop-in type with protection pipe 5.0m (in two pieces)
  - S … Drop-in type with protection pipe 6.0m (in two pieces)
- Protection pipe material
  - A … SUS304 (standard)
  - B … SUS316
- Detector mounting bracke*4
  - 0 … Not provided
  - 3 … Two for protective tube type
- Detector cable length*5
  - 1 … 5m
  - 2 … 10m
  - 8 … Other (up to 100m)
- Marking
  - A … Japanese
  - B … English

Code indicating special specifications
Numeric digit: 9
Alphabetic character: Z

*1. The upper limit of the range available for low concentration measurement is 30~1000mg/L and can be set in steps of 1mg/L with the transmitter key switch.
Example : 0~30/100/300, 0~50/300/1000, 0~100/500/1000
The upper limit of the range available for medium concentration measurement is 3000-20000 mg/L and can be set in steps of 1mg/L with the transmitter key switch.
Example : 0~3000/6000/12000, 0~10000/15000/20000

*2. Ceramic surge arresters (simple type) are attached to the power and transmission lines.

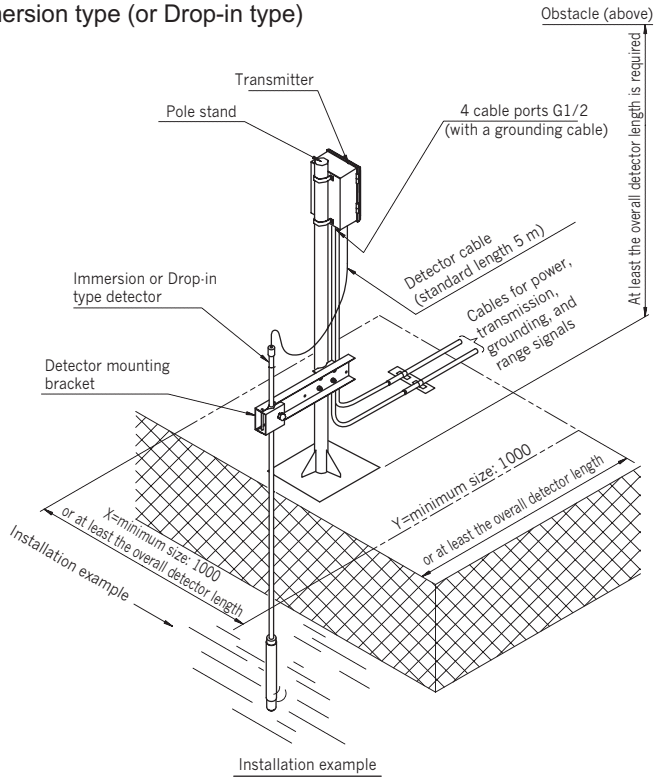
*3. In principle, no other length is available. If you need a length of 2.0m or less, select the immersion type detector.

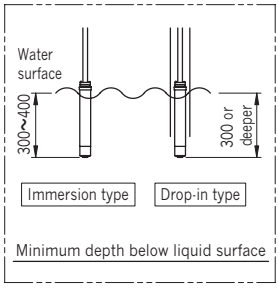
*4. These are two vertical mounting brackets for a 50A pole stand (SUS304). If you want the detector and transmitter to be mounted non-vertically or allow the angle to be changed during use (ZSSC-10 or equivalent), contact our sales office for more information.

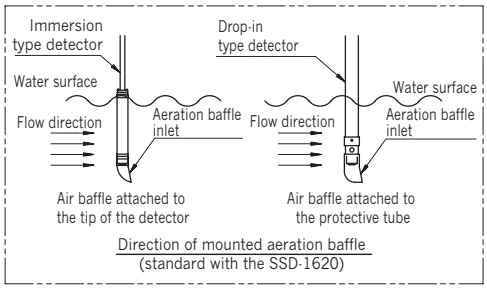
*5. For an up to 3m long protective tube, the 5m detector cable is necessary. Otherwise, the 10m detector cable is necessary.

Installation Example

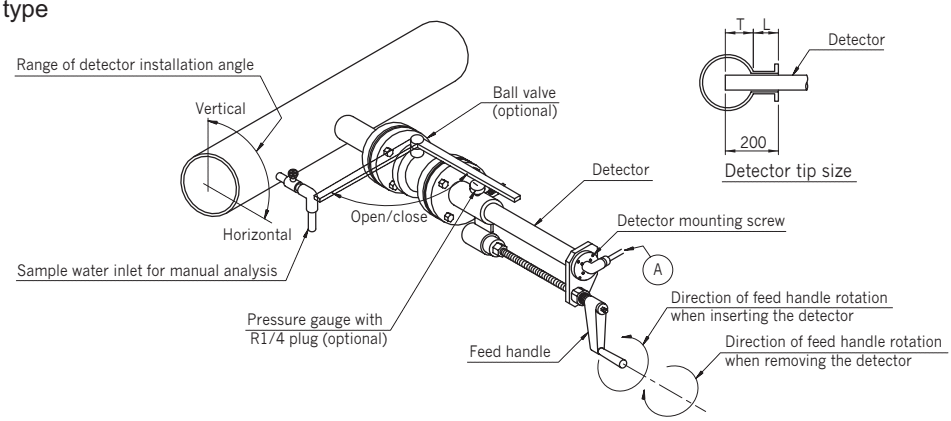
● Immersion type (or Drop-in type)







● Pipe insertion type



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⚠CAUTION

Do not operate products before consulting instruction manual.

Local Representative