

SPECIFICATION SHEET



SS Concentration Analyzer

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

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)



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.

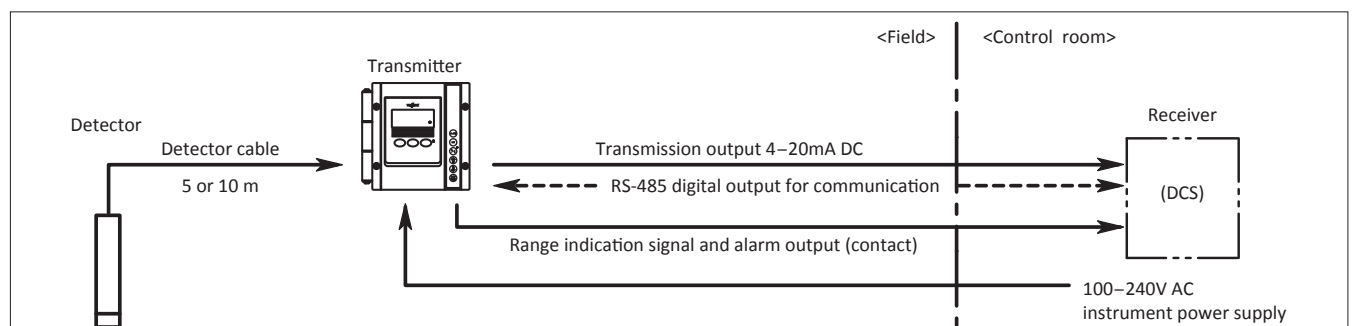
○ Long-life optical system

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, $\phi 1/2$ 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, $\phi 1/4$ 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) cycle interval	: Approx. 30 seconds (15 - 999 seconds selectable) Because it takes approx.15 seconds for the one batch for measurement during measurement (cleaning) cycle, the measurement value will be renewed every 15 seconds if the cycle is set at 15 seconds. In case of 30 seconds of the interval by factory setting, the measurement will be repeated at every 15 seconds being intermittent with 15 seconds of waiting time between.
Transmission output	: 4 - 20 mA DC, insulated Load resistance...600 Ω 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 $\pm 10\%$ 50/60Hz
Power consumption	: Approx. 10VA (15VA maximum)
Cable ports	: G1/2 x 6 (grounded for $\phi 6$ - 12 cable)
Ambient temperature /humidity	: -10 - 50°C 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 cel.....Pyrex glass Wiper.....Urethane rubber Detector cable.....PVC Extension pipe for immersion type .....SUS316 Protection pipe for tube type...SUS304/SUS316
Outside dimension	: $\phi 50.8$ (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 °C 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	: $\pm 2\%$ FS (by the supplied check bar)
Zero drift	: $\pm 2\%$ FS/week (based on simulated input)
Span drift	: $\pm 2\%$ 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

(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

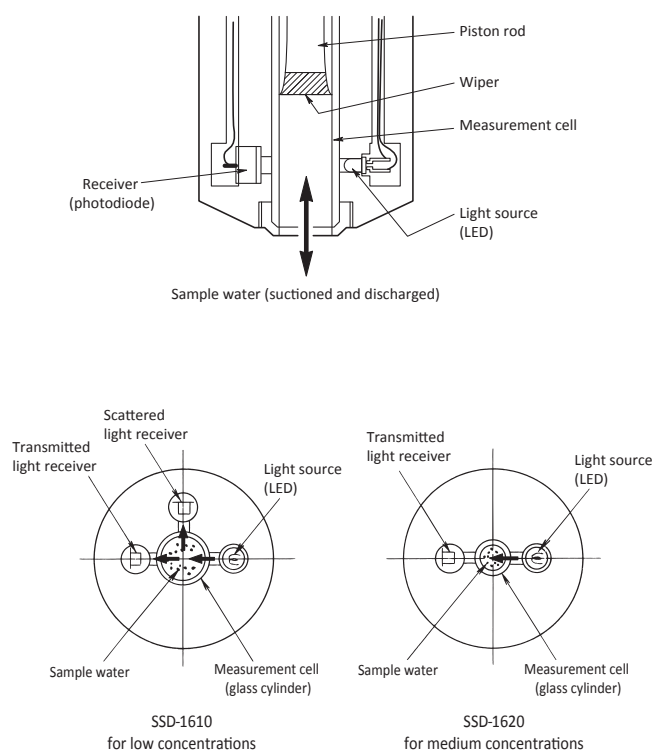
Sample water without SS particles is transparent, but sample water with SS particles is opaque. Because the opacity (or the number of particles) is proportional to the SS concentration, it is possible to determine the SS concentration by illuminating the sample water with light and measuring a change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

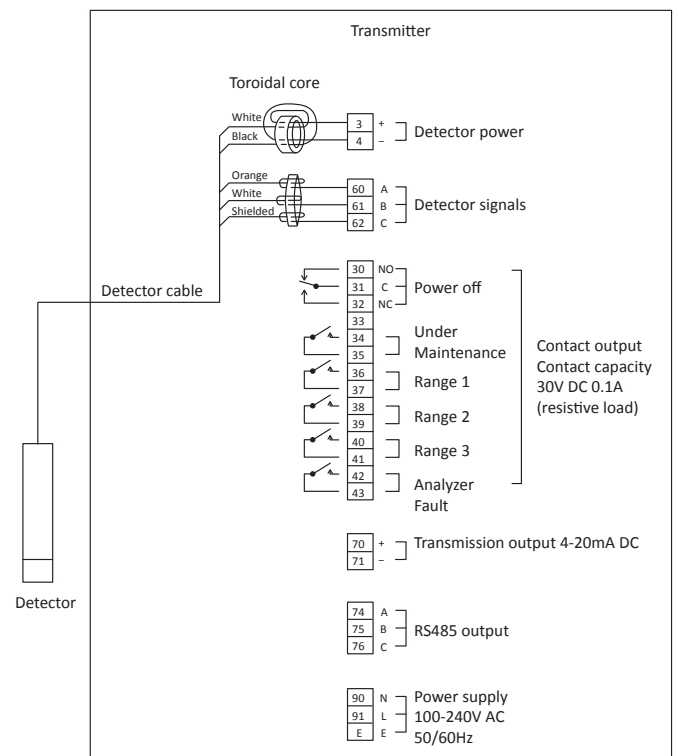
The Model SSD-1620 for medium concentration (SS : 5000 - 20000 mg/L) measures only transmitted light and converts the result into a SS concentration value.

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).

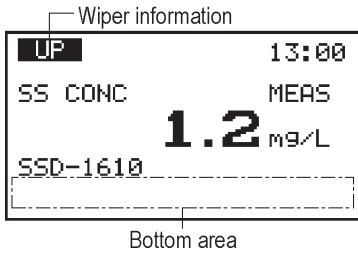
Detector assembly structure



Terminal Connection



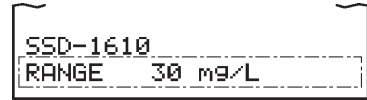
Measurement display



- 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.



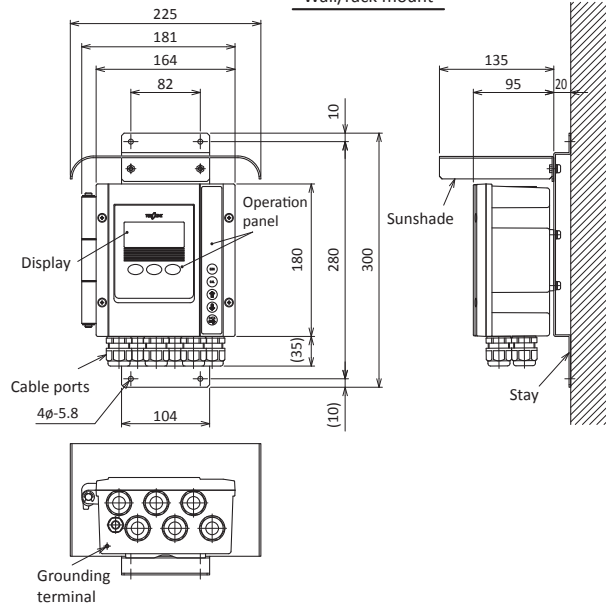
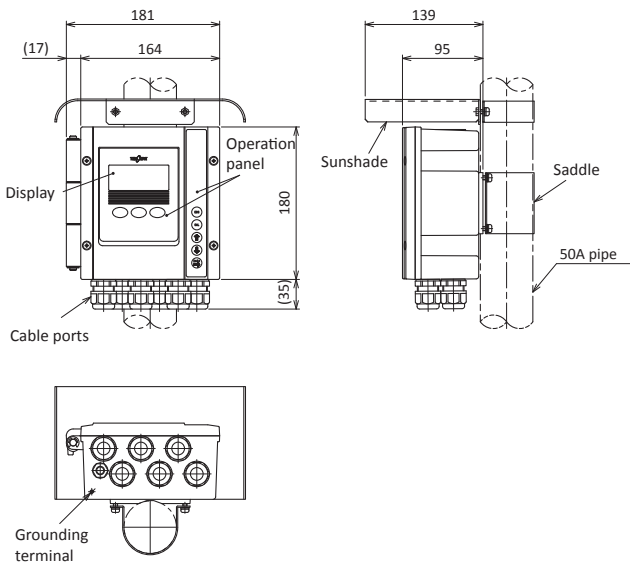
Dimensions

Unit : mm

● Transmitter

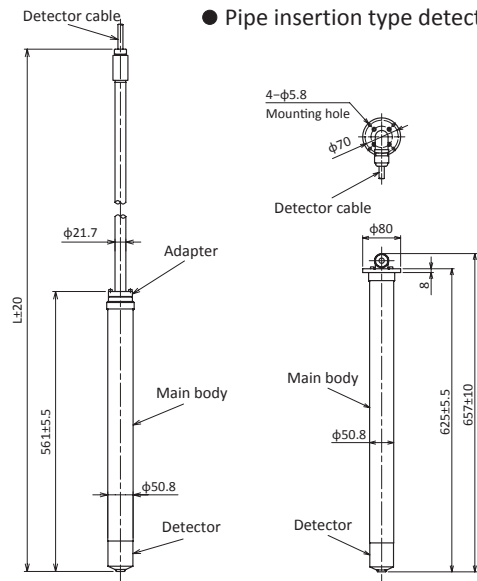
50A pipe mount

Wall/rack mount

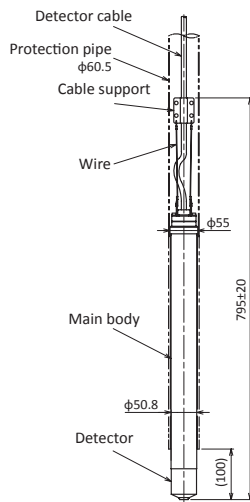


● Immersion type detector

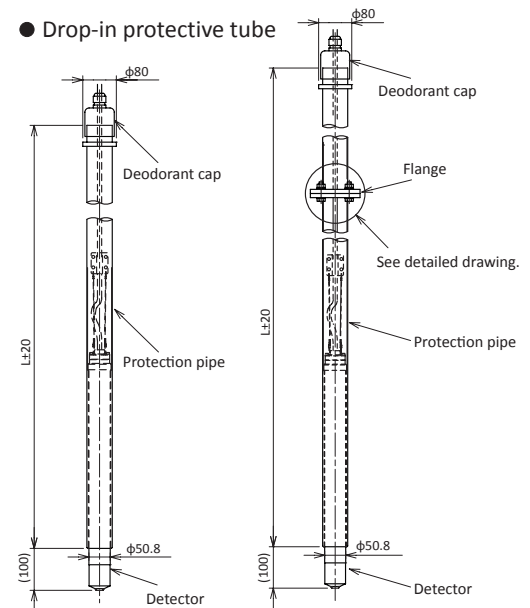
● Pipe insertion type detector



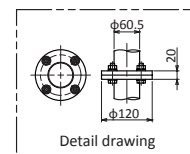
● Drop-in type detector



● Drop-in protective tube



L=2m, 2.5m
3m, 3.5m,



L=4m, 4.5m, 5m, 6m
is a two-part
equation

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

Related equipment

Please order you if necessary.

● Mounting bracket for immersion detector

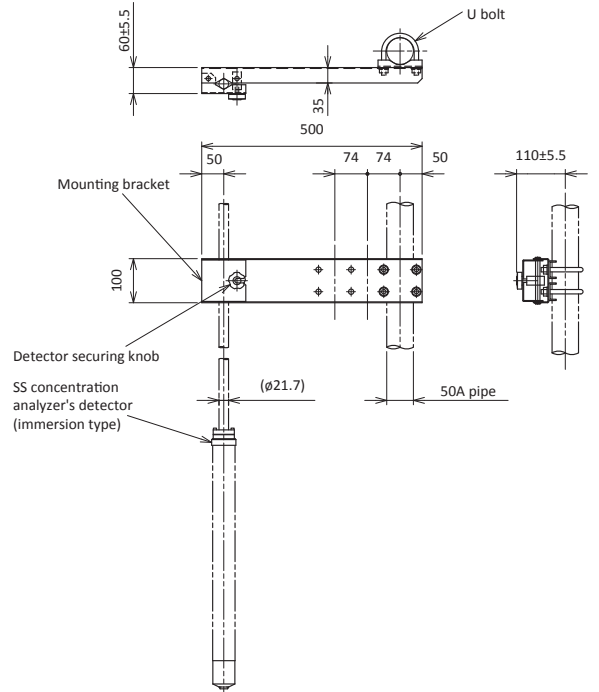
Code No. 6804640K

Install the immersion detector. If it is 2.5 m or more, two pieces are required.

● Drop-in detector protective tube fittings

Model Name : ZSSC-20

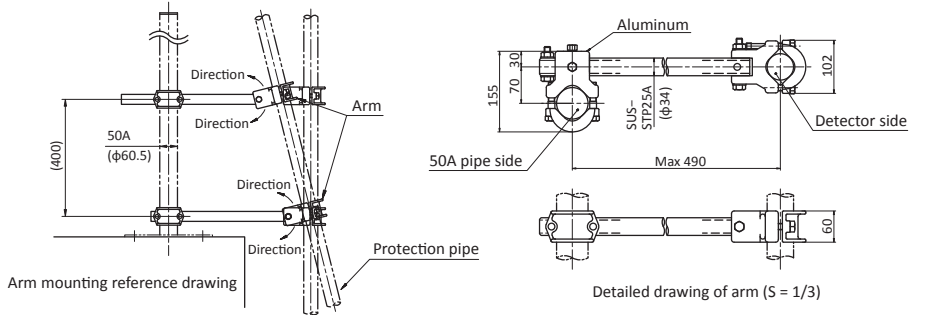
Mount two drop-in protective tubes vertically or diagonally (15 degrees recommended).



ZSSC20-1-□□

A	.....	Material and finish
Z	.....	Type of detector to install
1	.....	Drop-in type 50A
9	.....	Special

A SUS304/ aluminum castings (AC 7A) No paint
 Z Special
 1 Drop-in type 50A (SUS or PVC) protective tube
 9 Special



Protective pipe length 2 to 6 m mountable

● Pipeline insertion type, mounting and demounting device

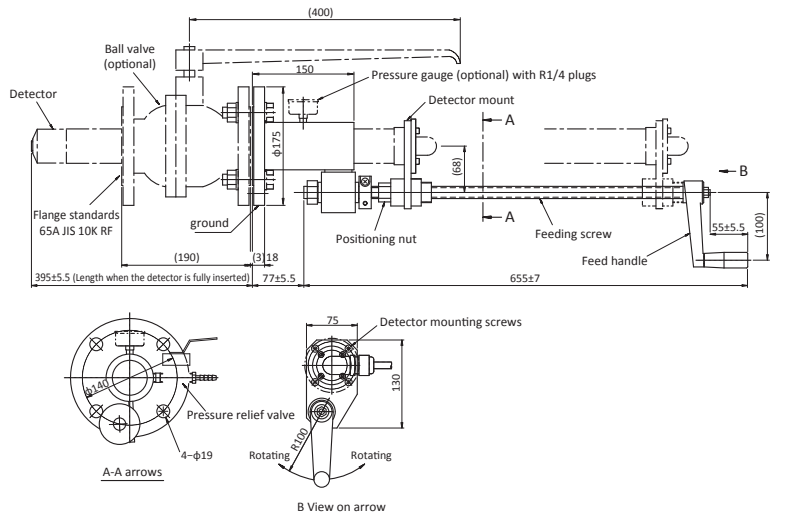
Model Name : ZSSP-30

This is necessary when the piping insertion type detector is inserted directly into the process piping for measurement.

ZSSP30-0-□□□

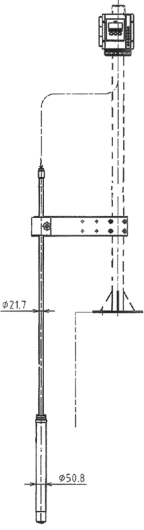
0	.....	Ball valve
1	.....	Pressure gauge
9	.....	Marking
0	.....	Not provided
1	.....	Provided
9	.....	Special

0 Not provided
 1 Provided (GK258-271 0.4MPa)
 9 Special
 0 Marking
 0 Japanese
 1 English
 9 Special



Product code

● Immersion and pipe insertion types



SSD1610-2-□□□□□□□□□□	
SSD1620-2-□□□□□□□□□□	
A	Measurement range*1
SSD-1610	SSD-1610 0 - 1000 (three manual ranges (0 - 30/500/1000) (standard))
SSD-1620	SSD-1620 0 - 20000 (three manual ranges (0 - 5000/10000/20000) (standard))
1	Measurement unit
2	mg/L (standard)
	ppm
1	Transmitter mounting type
2	50A pipe mount
	Wall/rack mount
A	Surface finish (coating)*2
B	Standard coating
	High performance coating
0	Built-in arrester (power and transmission lines)*3
1	Not provided
	Provided
1	Cable entry for power, transmission and signal cable*4
2	Cable glands for φ6 - 12 cable (standard)
3	Cable glands (G1/2 conduit threads when the cable glands are detached)
	NPT 1/2 supplied with 6 adapters
0	Transmitter sunshade
1	Not provided (standard)
2	Provided (50A pipe mount code : 7049930K)
	Provided (Wall mount code : 69304500)
A	Detector mounting type and length*5
B	Pipe insertion type 0.65m (Order Pipe inserter/remover ZSSP-30 separately)
C	Immersion type 1.0m
D	Immersion type 1.5m
E	Immersion type 2.0m
	Immersion type 2.5m
Y	Protection pipe material
	N/A
1	Detector cable length*6
2	5m
8	10m
	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
 If the range of transmission output other than standard range is wanted to specify at the time of delivery from factory, please specify the range and confirm it with us before ordering.
- *2. Melamine resin is applied to primer coat and finish coat for the standard painting.
 The average thickness of film of paint is 30μ or more and the glossiness is G40.
 Melamine resin is applied to primer coat and middle coat and polyurethane resin is applied to finish coat for heavy-duty coating.
 The average thickness of film of paint is 100μ or more and the

- glossiness is G80.
 (The selection code for painting above covers only for the transmitter, therefore, if painting is required at solenoid valve in detector, pump unit section and etc, we will quote the cost separately.)
- *3. Ceramic surge arresters (simple type) are attached to the power and transmission lines.
- *4. There are 6 cable ports which are mounted with φ6 - 12 of cable glands. When cable gland is removed, G1/2 of conduit threads of the entry port is appeared. When NPT1/2 of cable port is requested, as 6 adaptors (SUS-316) shall be supplied, replace the necessary number of the cable glands with adaptors from the ports. If some ports are not used for conduit, please leave the cable glands for sealing.
- *5. In principle, no other length is available. If you need a length exceeding 2.5m, select the Drop-in type detector.
- *6. 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-□□

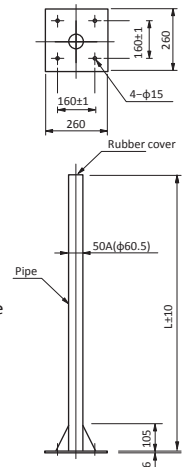
0	Ball valve
1	Not provided
9	Provided
	Special
0	Pressure gauge
1	Not provided
9	Provided (GK258-271 0.4MPa)
	Special
	Marking
0	Japanese
1	English
9	Special

● Pole stand

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

ZB1-0-□□

A	Pole stand length
B	1.0 m
Z	1.6 m (standard)
	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

SSD1610-2-□□□□□□□□□□		
SSD1620-2-□□□□□□□□□□		
A	SSD-1610	SSD-1610 0 - 1000 (three manual ranges (0 - 30/500/1000) (standard))
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		Measurement range*1
1		mg/L (standard)
2		ppm
		Measurement unit
1		50A pipe mount
2		Wall/rack mount
		Transmitter mounting type
A		Standard coating
B		High performance coating
		Surface finish (coating)*2
0		Not provided
1		Provided
		Built-in arrester (power and transmission lines)*3
1		Cable entry for power, transmission and signal cable*4
2		Cable glands for $\phi 6 - 12$ cable (standard)
3		Cable glands (G1/2 conduit threads when the cable glands are detached)
		NPT 1/2 supplied with 6 adapters
		Transmitter sunshade
0		Not provided (standard)
1		Provided (50A pipe mount code : 7049930K)
2		Provided (Wall mount code : 69304500)
		Detector mounting type and length*5
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 cable length*6
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.
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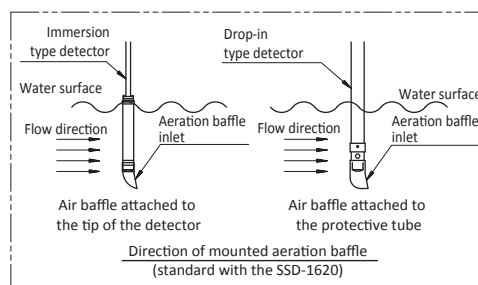
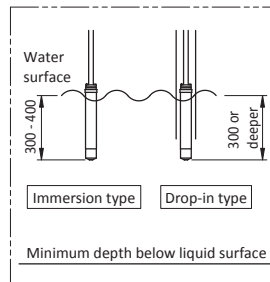
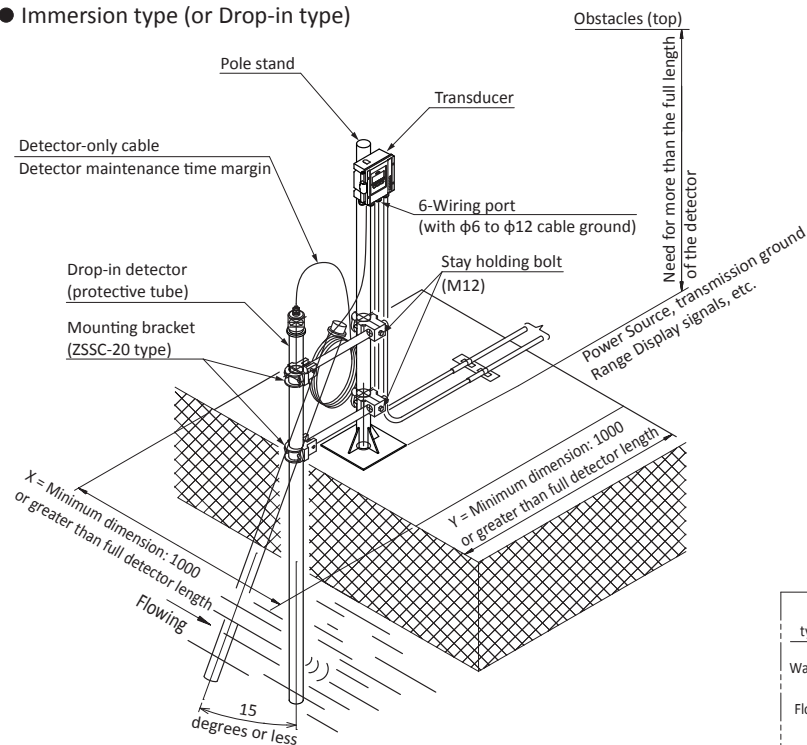
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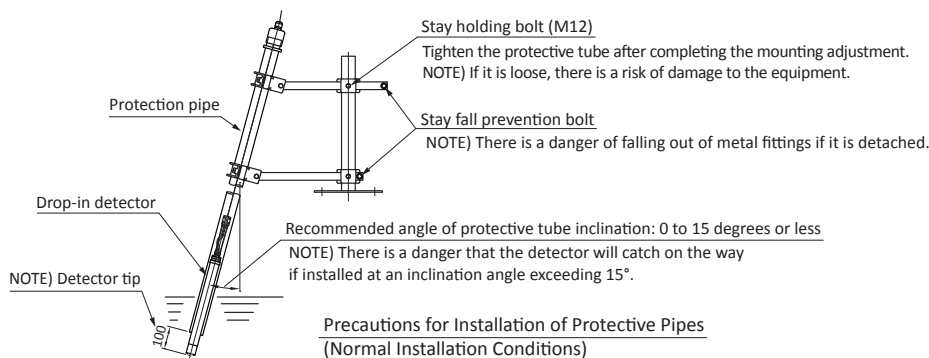
*6. For an up to 3m long protective tube, the 5m detector cable is necessary. Otherwise, the 10m detector cable is necessary.

Installation Example

● Immersion type (or Drop-in type)



● Pipe insertion type



DKK-TOA CORPORATION



Please read the operation manual carefully before using products.

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