ISO-14001
ISO-9001

SPECIFICATION SHEET

SS CONCENTRATION ANALYZER

Model: **SSD-10-1**
Model: **SSD-20-1**
Model: **SSD-30-1**

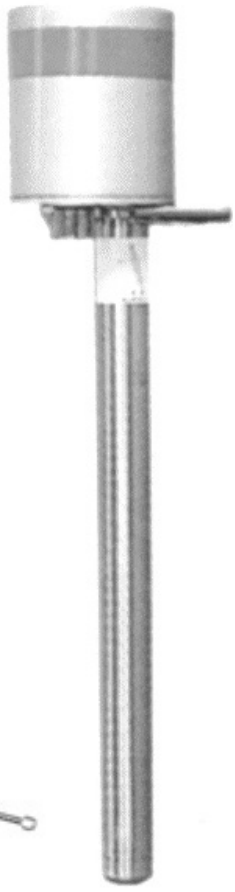
DKK-TOA manufactures three versions of suspended solids concentration analyzers according to the concentration level of the sample. Each version includes a sensor combined with a unique cleaning system and an indicator/transmitter unit. The most frequently used technique in sewage processes is the activated sludge method. The SSD series provides an indispensable tool for effective control of these types of process.

FEATURES

- High accuracy:
  Each model has a specific construction, designed for a particular concentration range, ensuring high accuracy over long periods.
- Simple installation:
  Immersion type sensor can be easily mounted on existing structures such as handrails etc.. Maintenance inspection can be conveniently carried out by simply withdrawing the unit out of the sample.
- No sample stagnation:
  Fresh sample flows into the sensor driven by piston reciprocation. This prevents sample stagnation and ensures correct and representative measurement.
- Minimal effect from background ambient light:
  Since sample is drawn in by piston reciprocation, natural light is prevented from entering the measurement cell.
- Pipe mounting device:
  Sensor can be directly inserted into process piping if required (requires optional adapter).
- Equipped with built-in lightning arrester:
  Preventing damage caused by lightning surges through power or transmission line.

Transmitter

Insertion/Retraction Equipment



Sensor

STANDARD SPECIFICATIONS

Product Name : Suspended Solid (SS) Concentration Analyzer
Measurement : SS concentration in water
Measurement Method : Range, Cell and Applications

Model	*Measurement method*	*Measurement range*	*Measurement cell*	*Measurement range switching*	*Example of application*
SS concentration analyzer (for low concentration) SSD-10-1	Comparison of transmitted light and scattered light	0-1000ppm	½ inch dia. cylinder cell	Manual four ranges (0-30, 0-100, 0-300, 0-1000ppm)	First precipitated effluent Processed water Incoming sewage Overflow of sludge concentration tank Plant effluent
SS concentration analyzer (for medium concentration) SSD-20-1	Transmitted light measurement	0-20000ppm	¼ inch dia. cylinder cell	Manual four ranges (0-3000, 0-5000, 0-10000, 0-20000ppm)	Aeration tank solution mixture Returning sludge Surplus sludge
SS concentration analyzer (for high concentration) *SSD-30-1	Transmitted light and scattered light measurement	0-5 or 0-10%	¼ inch dia. cylinder cell	One range (0-5 or 0-10 %)	First precipitated sludge Concentration sludge Mixed sludge

*SSD-30-1 Not available for certain black coloured samples.

Ambient Temperature	:	-20~50°C (sun shade required when ambient temperature exceeds 40°C and the sample is exposed to direct sunlight)
Ambient Humidity	:	85% RH or less
Output Signals	:	4~20mA DC (max load 600 ¤ , non isolated)
Power requirements	:	100 VAC +/-10%, 50/60Hz, 110 VAC +/- 10% (other operating voltages available as option)
Power consumption	:	Approx 40VA
Sample Temperature	:	0~50°C (No freezing)
Sample Pressure	:	Immersion type: open to atmosphere, Pipeline insertion type: 0~0.2 MPa, max 0.24 MPa
Sensor Mounting	:	Immersion Type Sensor To be fixed at an angle of 75° to the water surface using mounting bracket (Model ZSSC, optional) or U-bolts.
	:	Pipeline Type Sensor To be fixed into the pipeline using insertion/extraction accessories (Model ZSSP, optional)
Materials in Contact with Sample	:	SUS316, SUS304, Pyrex, urethane rubber, nitrile rubber.
Cell Cleaning Method	:	Automatic cleaning of the cell inner wall by sample suction and discharge in combination with a wiper system.
Cleaning Period	:	SSD-10-1, 20-1: 13 sec/cleaning (50Hz), 11 sec/cleaning (60 Hz). SSD-30-1: 60 sec/cleaning (50Hz), 50 sec/cleaning (60Hz). Note: measured output is held at previous value during cleaning process.
Weight	:	0.63m: 5.5Kg 1.0m: 7 Kg 1.6m: 9Kg 2.0m: 10 kg 2.5m: 11.5 Kg 3.0m: 13 Kg 3.5m: 14.5 Kg 4.0m: 16 Kg 6.3m: Approx 23Kg
Transmitter Construction	:	Rainproof cast aluminium
Transmitter Colour	:	Silver/light blue
Transmitter Weight	:	5 kg

PERFORMANCE

Repeatability	:	+/-2% FS (4% FS for 30ppm range)
Zero Drift	:	+/-2% FS/24Hr (within +/-4% FS/24Hr for 30ppm range)
Span Drift	:	+/-2%FS/24Hr (with equivalent input)
Response Time (90%)	:	DAMP 1: SSD-10-1,20-1: 2 mins, SSD-30-1: 5 mins DAMP 2: SSD-10-1,20-1: 10 mins, SSD-30-1: 15 mins
Warm-up Time	:	Approx 2 Hours.

CALIBRATION

Since sludge is very complex in its composition and properties, it is not possible to clearly define a specific substance as a standard sludge. It is therefore necessary to set the measured value to a manually analysed value for each type of sludge.

1. Calibration by analysis value.
   After the instrument is installed, perform an SS analysis (weight method) for as many samples as possible. Prepare a scatter diagram by comparing the analysis values with the instrument readings. Perform calibration of the instrument based on this diagram.

2. Calibration with check bar.
   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.

GRADUATION CALIBRATION

The SS analyzer's graduation is provisionally calibrated with class 5 flyash as specified by JIS 28901-1974. SS (Suspended solids) are defined as a substance separated from the sample by filtration or centrifugal separation, standard substances such as Kaolin and formalin are not applicable to SS measurement. Since DKK-TOA's SS concentration analyzer utilises the optical properties of suspended solids to determine their concentration, the graduation scale is affected by the type of substance. DKK-TOA's analyzer uses fly ash (thick grey) to perform preliminary calibration. The optical properties of flyash resemble those of activated sludge. We recommended that the instrument is re-calibrated after field installation and before commencing operation.

PRINCIPLE OF OPERATION

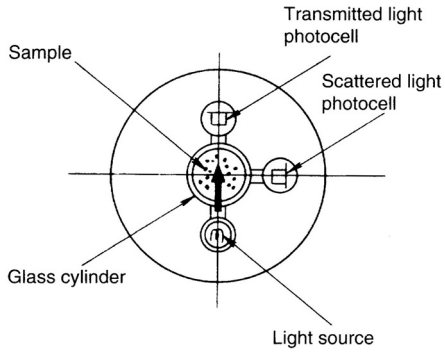
The optical system is arranged as shown on the right. The light source and light receiver are set around the cell window so that the electrical signals corresponding to the SS change of the sample can be converted, amplified and output as the measurement indication. The number and positions of the light receiving elements (photocells) are dependant on the instrument model version. Please refer to the photocell position diagrams.

In addition, the piston located at the centre continuously repeats an up/down motion to prevent window fouling. The piston wipes the glass surface by this motion and at the same time, continuously draws fresh sample in.

RELATED EQUIPMENT

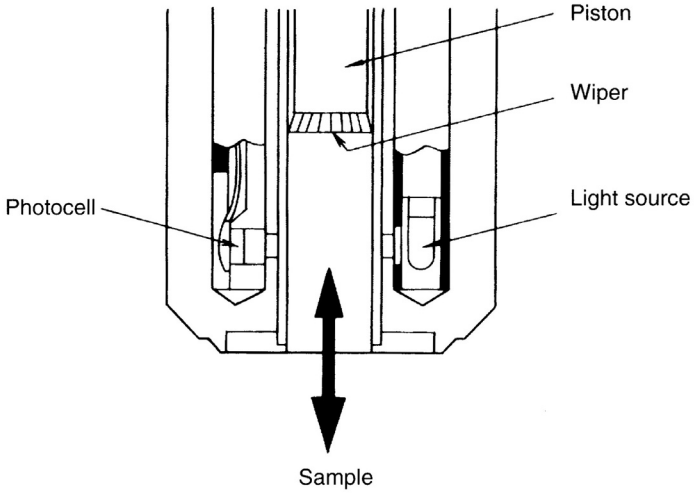
Model ZSSC-10	:	Mounting bracket for immersion type sensor (two brackets required).
Model ZSSP-11	:	Insertion / retraction equipment for use when the sensor is inserted directly into the process piping.
Model B-150	:	Pole stand for use in applications where there is no mounting stanchion (50A pipe) available.

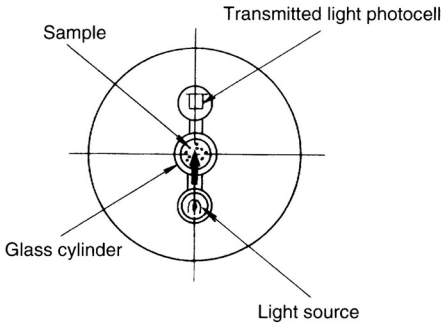
PHOTOCELL POSITION



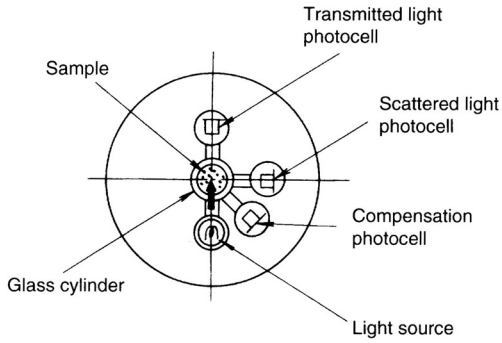
SSD-10-1
For low concentration

Sensor Construction



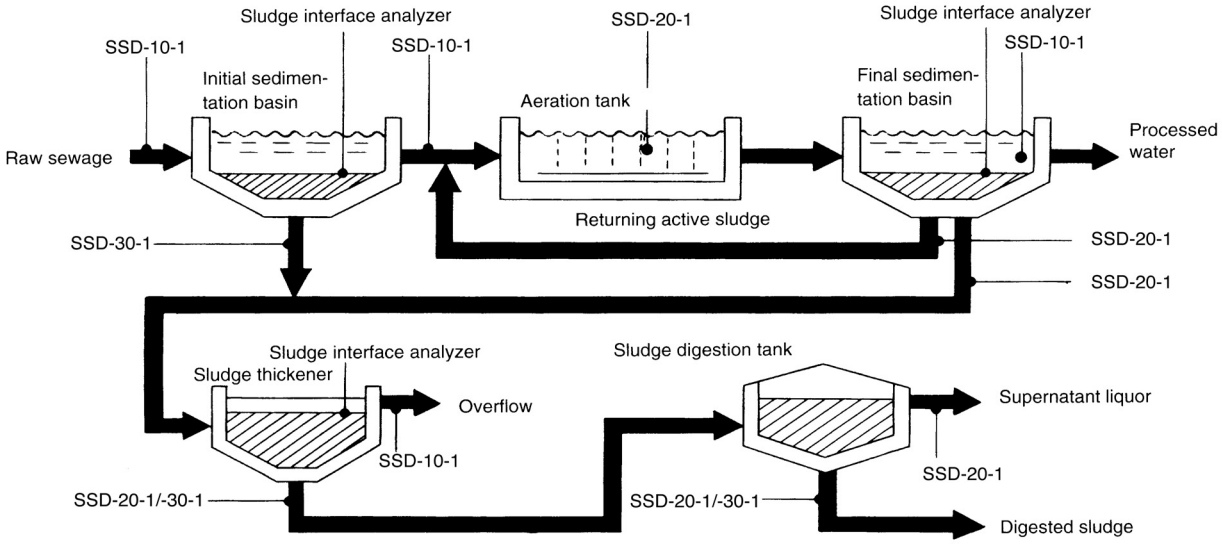


SSD-20-1
For medium concentration



SSD-30-1
For high concentration

PRACTICAL APPLICATION EXAMPLE



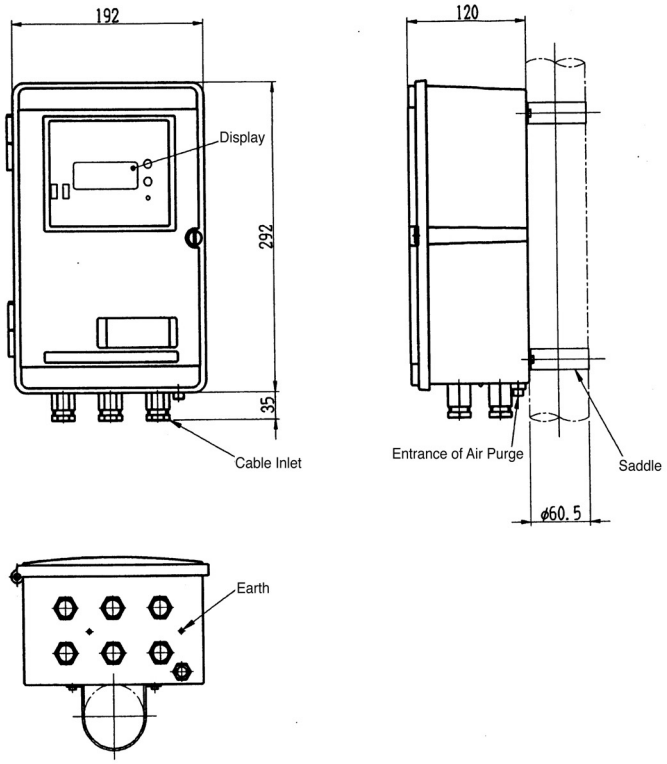
DIMENSIONS

Unit: mm

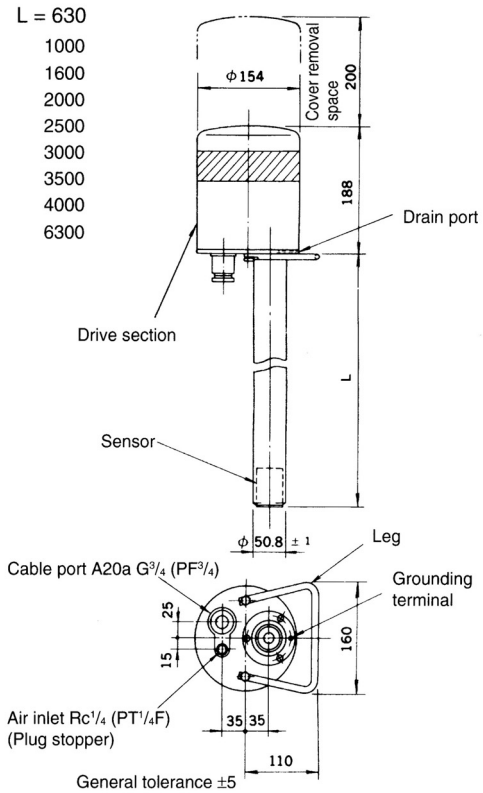
- **Transmitter**

  General Tolerance: Class "V" (JIS B 0405)

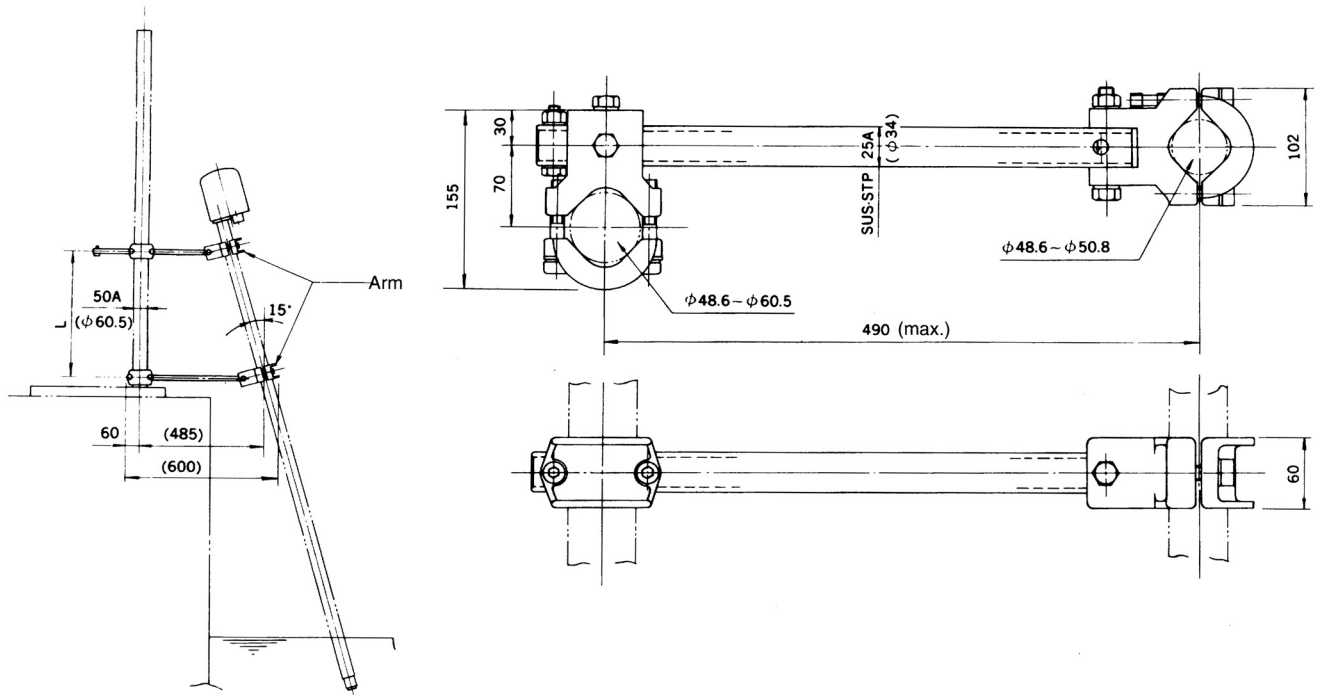
Description	Remarks
Cable Inlet	Cable Gland for 0D6~0D12 x 6p
Entrance of Air Purge	Rc1/4 (with plug)
Earth	M4



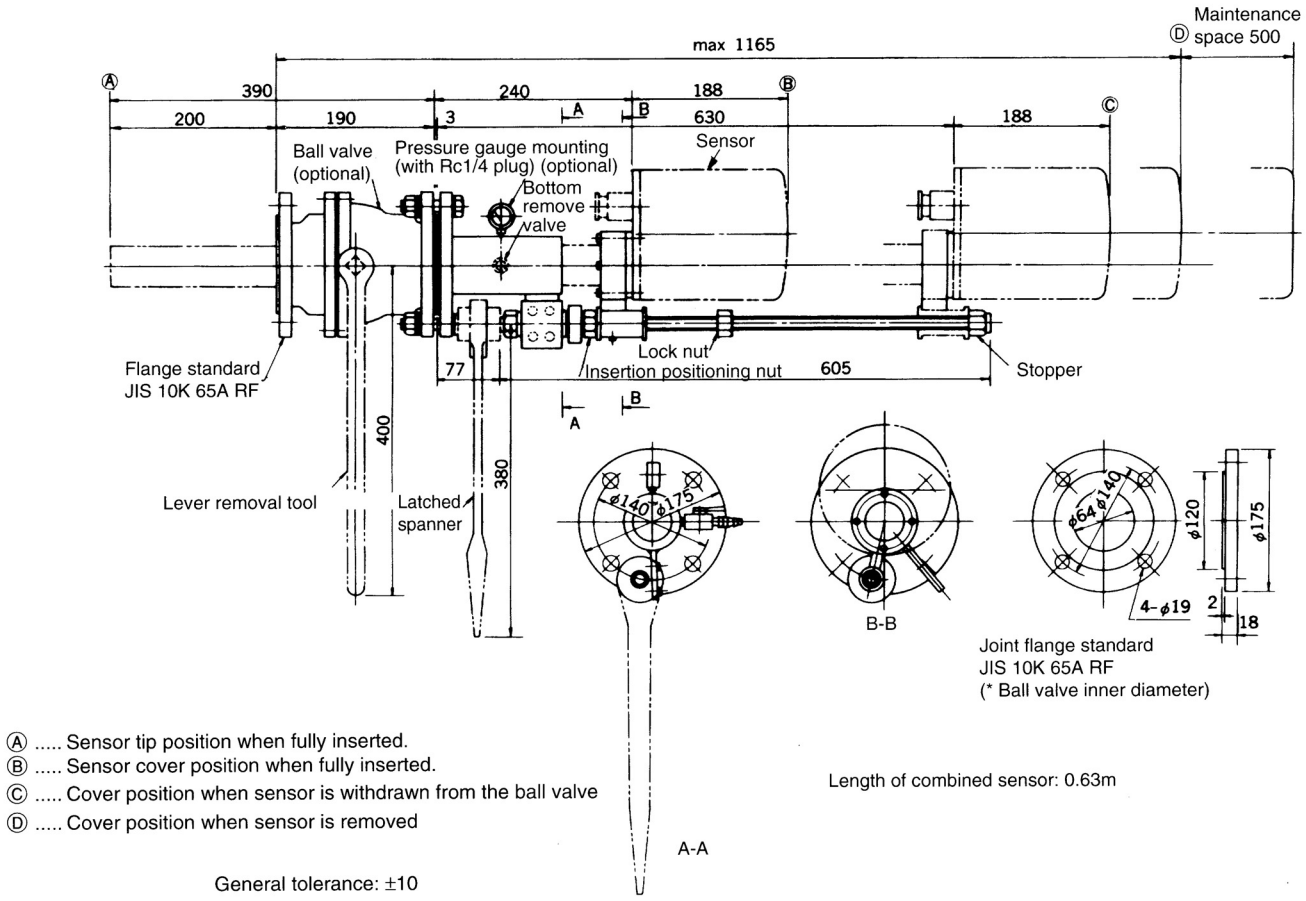
- **Sensor**



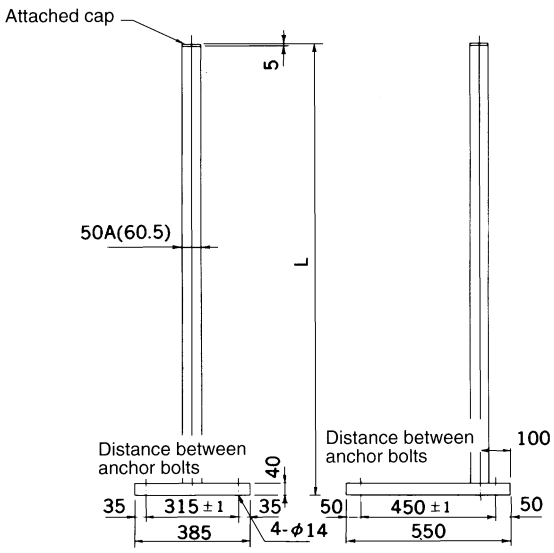
- **ZSSC-10 Bracket**



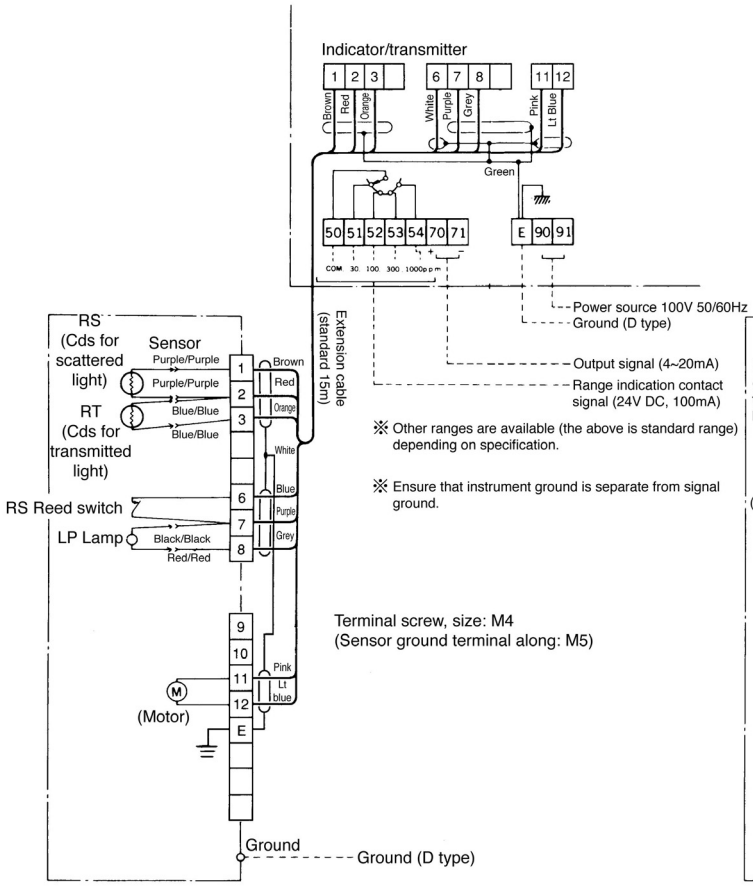
• **ZSSP-11 Insertion/Retraction Equipment**



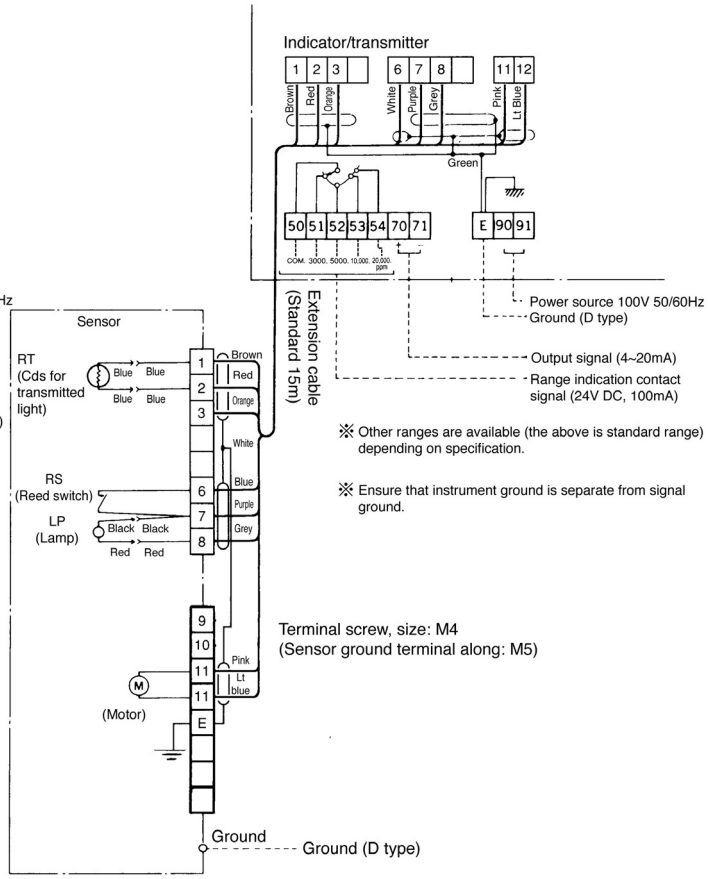
• **B-150 Pole Stand (optional)**



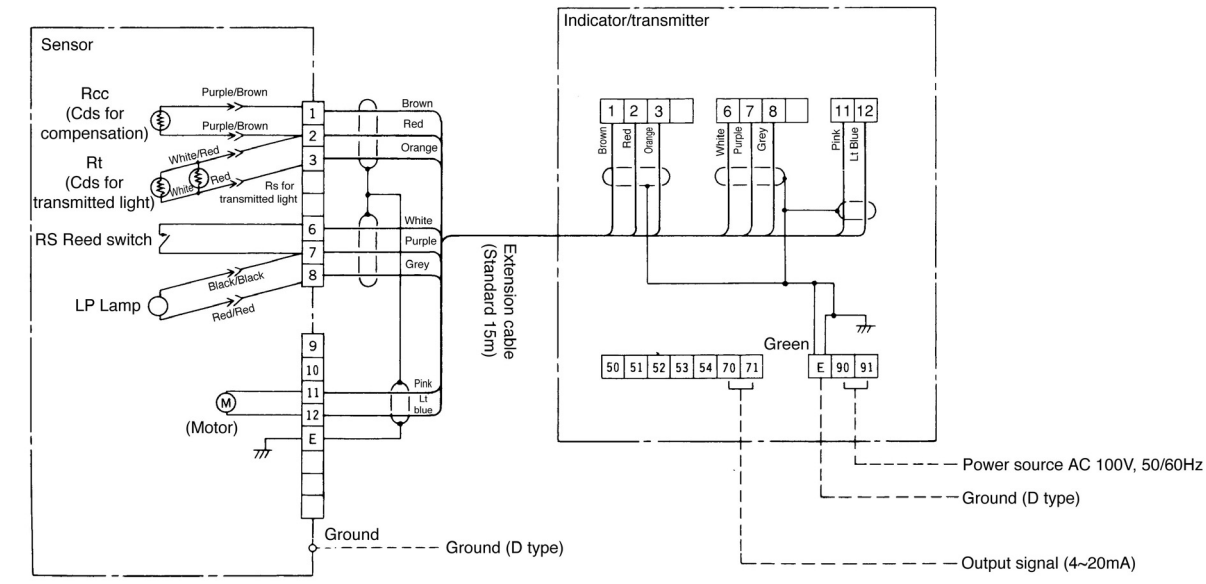
TERMINAL CONNECTIONS



SSD-10-1



SSD-20-1

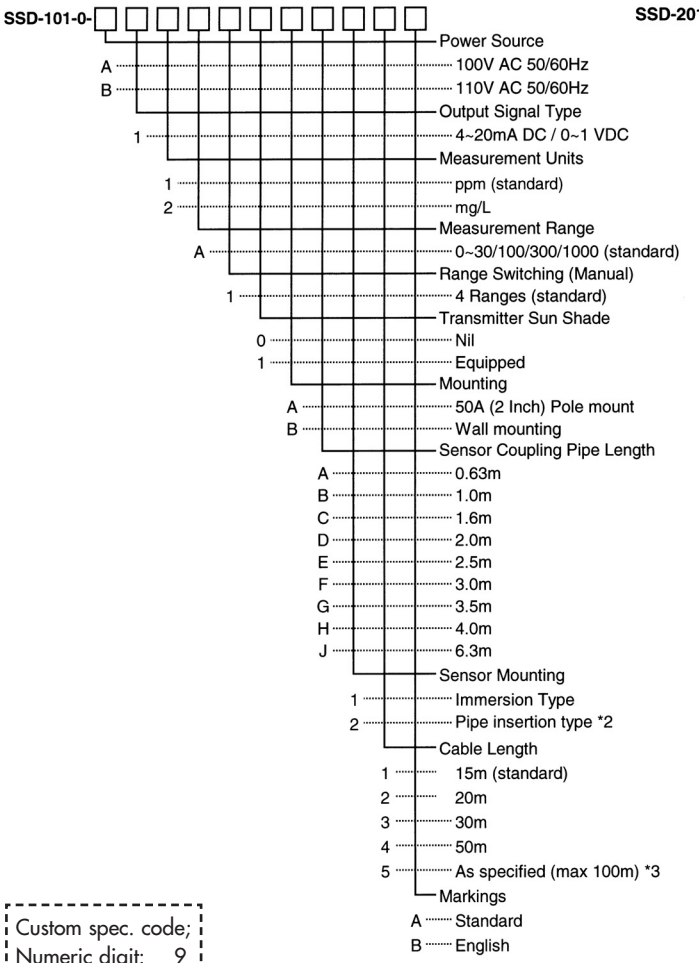


Terminal screw, size: M4
(Sensor ground terminal along: M5)

SSD-30-1

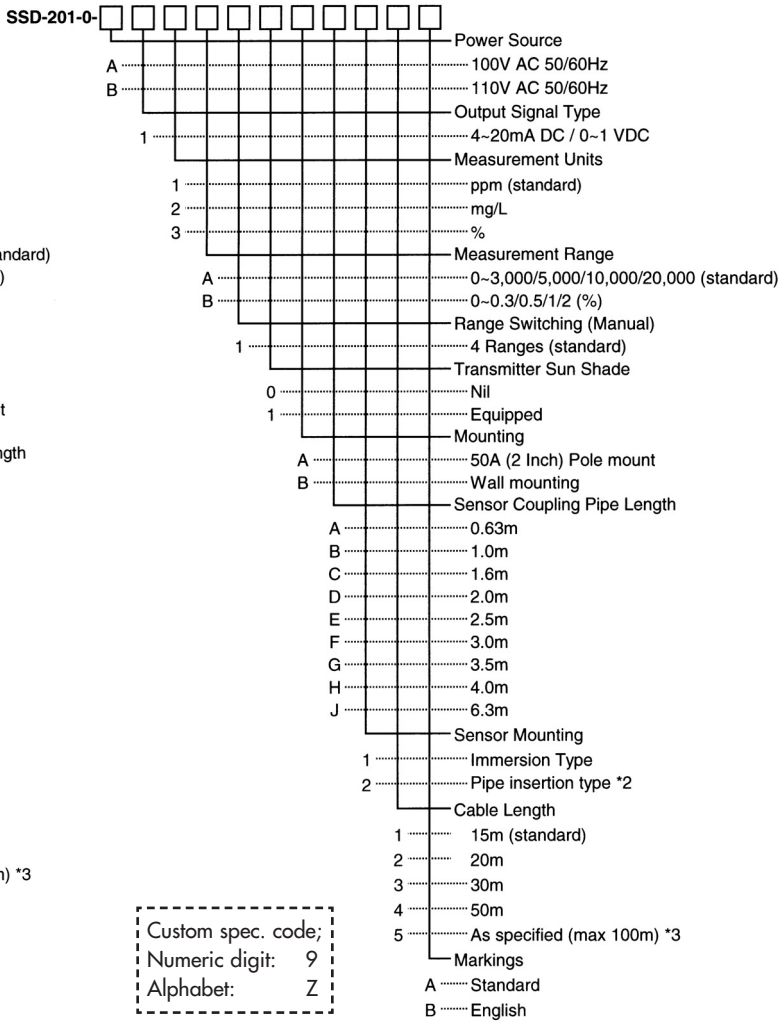
PRODUCT CODE

SSD-10-1 (for low concentration)



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

SSD-20-1 (for medium concentration)



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

*1 For a voltage other than that listed here, attach a stepdown transformer (ZP20-0-□2□). (Purchase separately.)

*2 The coupling pipe length for the insertion type sensor is limited to 0.63m.

*3 Be sure to specify the cable length.

[Due to continuous product development and improvement, our product codes are subject to change.
Please confirm product code with our authorized agents or our International Sales Department prior to order placement.]

SSD-30-1 (for high concentration)

SSD-301-0-□□□□□□□□□

- Power Source
  - A: 100V AC 50/60Hz
  - B: 110V AC 50/60Hz
  - Z: Custom Spec *1
- Output Signal Type
  - 1: 4~20mA DC / 0~1 VDC
  - 9: Custom spec.
- Measurement Range
  - 1: 0~10% (standard)
  - 2: 0~5% (standard)
  - 9: Custom spec.
- Transmitter Sun Shade
  - 0: Nil
  - 1: Equipped
  - 9: Custom spec.
- Mounting
  - A: 50A (2 Inch) Pole mount
  - B: Wall mount
  - Z: Custom spec.
- Sensor Coupling Pipe Length
  - A: 0.63m
  - B: 1.0m
  - C: 1.6m
  - D: 2.0m
  - E: 2.5m
  - F: 3.0m
  - G: 3.5m
  - H: 4.0m
  - J: 6.3m
  - Z: Custom spec.
- Sensor Mounting
  - 1: Immersion type
  - 2: Pipe insertion type *2
  - 9: Custom Spec.
- Cable Length
  - 1: 15m (standard)
  - 2: 20m
  - 3: 30m
  - 4: 50m
  - 5: As specified (max 100m) *3
- Markings
  - A: Standard
  - B: English
  - Z: Custom spec.

*1 For a voltage other than that listed here, attach a stepdown transformer (ZP20-0-□2□). (Purchase separately.)

*2 The coupling pipe length for the insertion type sensor is limited to 0.63m.

*3 Be sure to specify the cable length.

● ZSSP-11 Insertion/Retraction Equipment

ZSSP-11-2-□□□

- Ball Valve
  - 0: Nil.
  - 1: Equipped
  - 9: Custom spec.
- Press. Gauge
  - 0: Nil.
  - 1: Equipped
- Markings
  - 0: Standard
  - 1: English
  - 9: Custom spec.

Required for insertion-type sensor

● ZSSC-10 Mounting Bracket

ZSSC-10-0-□

- Material
  - 1: Standard
  - 9: Custom spec.

Two sets are required irrespective of sensor pole length.

● B-150 Pole Stand

B-150-2-□□□

- Pole Stand Length
  - A: 1.0m
  - B: 1.35m
  - C: 1.5m (Standard)
  - D: 1.6m
  - Z: Custom spec.
- Pole Material
  - 1: 2B Copper Pipe (SGP) Steel Base
  - 2: SUS304
  - 9: Custom spec.
- Paint Finish
  - 0: Nil.
  - 1: Metalic Silver
  - 9: Custom spec.

*SUS materials are not painted

● ZB-1 Pole Stand

ZB-1-0-□□□

- Pole Stand Length
  - A: 1.0m
  - B: 1.6m (Standard)
  - Z: Custom spec.
- Material
  - 1: 2B Copper Pipe (SGP) Steel Base
  - 2: SUS304
  - 9: Custom spec.
- Paint Finish
  - 0: Nil.
  - 1: Metalic Silver
  - 9: Custom spec.

*SUS materials are not painted

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DKK-TOA CORPORATION

CAUTION Do not operate products before consulting instruction manual.

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