General Specifications

Conductivity
Detectors/Sensors

GS 12D08G02-E

■ GENERAL

YOKOGAWA has been supplying superior on-line analyzers for monitoring or controlling the conductivity of liquid or solutions.

Now, YOKOGAWA provides the 4-Wire Converter (FLXA™402), the 2-Wire Liquid Analyzer (FLXA™202, FLXA™21).

YOKOGAWA also provides many kinds of detectors/ sensors for accurately measuring liquid conductivity when using analyzers.

The combination of YOKOGAWA's analyzers and detectors/sensors meets the demanding ultrapurewater requirements of the growing semiconductor and pharmacentical markets in addition to traditional water quality measurements for standard power plant and chemical applications.

SC4AJ

Adapter Mounting

SC8SG

Flow-through Type

SC210G

Screw-in Type

4-Wire Converter FLXA402

Refer to GS 12A01F01-01EN

Liquid Analyzer for Turbidity and Chlorine FLXA402T

Refer to GS 12F05B10-01EN (FC800D, FLXA402T),
GS 12E01B30-01EN (TB820D, FLXA402T),
GS 12E04B40-01EN (TB830D, FLXA402T)

2-Wire Liquid Analyzer FLXA21

Refer to GS 12A01A02-01E

2-Wire Liquid Analyzer FLXA202

Refer to GS 12A01A03-01EN

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GS 12D08G02-E
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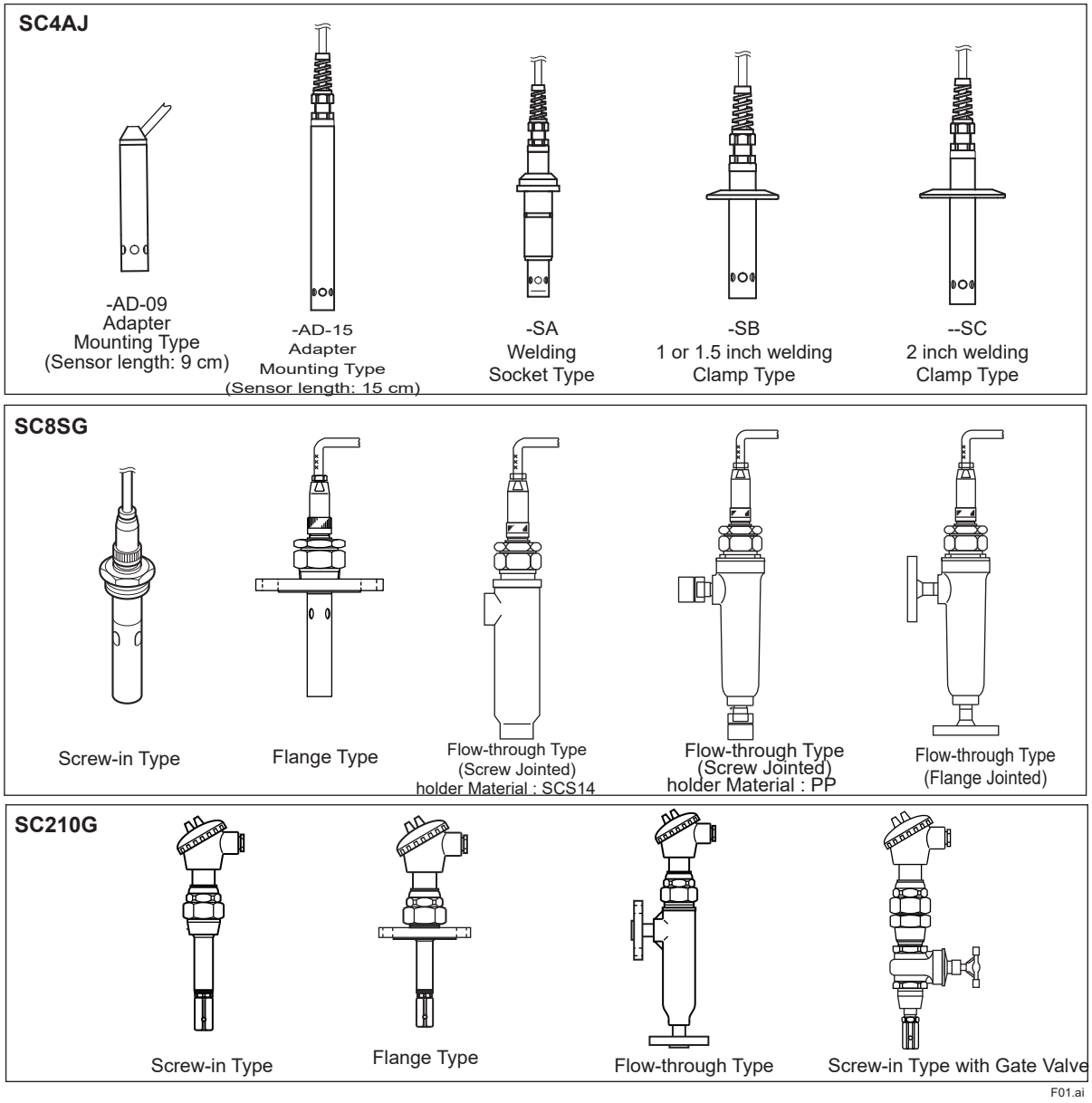
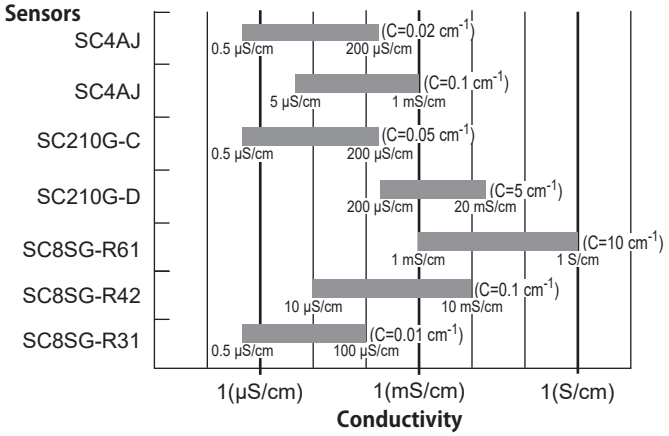
■ Models of Conductivity Detectors/Sensors



■ RANGE OF MEASURING UPPER RANGE LIMIT OF EACH SENSORS



Note

The bar graph at the left shows the range of the upper range limit of each sensor.

For example, in the case of SC8SG-R61, the measuring range is from 0-1 mS/cm to 0-1 S/cm.

In measurement in high conductivity range, polluted solution may affect measured values of any sensors. C represents cell constant.

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■ GENERAL SPECIFICATIONS

1. SC4AJ:

Cable with pin terminals (applicable to FLXA202, FLXA21, FLXA402, FLXA402T)
Cable with M4 ring terminals (applicable to FLXA202, FLXA21)
Cable with M3 ring terminals (applicable to FLXA402, FLXA402T)
Variopin connector (applicable to SA11)
Object of measurement: Conductivity of solutions
Measuring principle: Two-electrode system
Cell constant: 0.02 cm^{-1}, 0.1 cm^{-1}
Measuring range:
For a cell constant: 0.02 cm^{-1}:
0-0.5 µS/cm to 0-200 µS/cm
For a cell constant: 0.1 cm^{-1}:
0-5 µS/cm to 1 mS/cm
Temperature Range: For electrode, 0 to 110°C
For holder, see Figure 1
Sterilization for electrode:
135°C (275°F), within 30 minutes in Steam Sterilization
Pressure range : For electrode, 0 to 1 MPa
For holder, see Figure 1

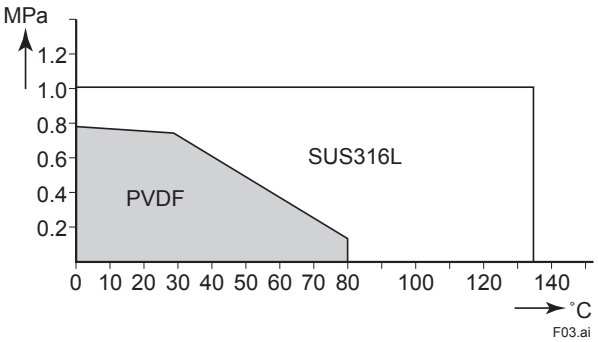

Figure1: The range of tolerance of holders (option: /PS, /PF, /RS, /RF, /SA1, /SA2, /SB1, /SB2, /SC1) for temperature and pressure

Sample solution condition:
Although flow rate is not limited in measurement, air bubbles should not be mixed in the sample solutions to obtain correct measured values.
Temperature sensor: Pt1000
Materials: Stainless steel (316L SS) (for all Fitting-type) or Titanium (only for adapter mounting type-AD), Fluoro rubber (FKM) O-ring. EPDM O-ring (for -SA with Variopin)
Mounting adapter: Polyvinylidene difluoride (for /PF and /RF) or Stainless steel (316 SS), Stainless steel (316L SS)
Weight:
Sensors:
Adapter mounting type
(SC4AJ-S-AD-09-002-03): approx. 0.3 kg
Adapter mounting type
(SC4AJ-S-AD-15-002-03): approx. 0.4 kg
Welding socket type
(SC4AJ-S-SA-NN-002-03): approx. 0.5 kg
1 or 1.5 inch welding clamp type
(SC4AJ-S-SB-NN-002-03): approx. 0.4 kg
2 inch welding clamp type
(SC4AJ-S-SC-NN-002-03): approx. 0.5 kg

Note: There are weight differences among SC4AJ sensors. In order to know the more accurate weight of each type of sensors, please calculate it from following information. The cable weighs 0.07 kg/m. The SC4AJ with 0.02 cm^{-1} cell constant is 0.02 kg heavier than the SC4AJ with 0.1 cm^{-1} cell constant. 314L SS electrode is 0.04 kg heavier than Titanium electrode.
Adapters:

3/4NPT stainless steel adapter (/PS):	approx. 0.1 kg
R3/4 stainless steel adapter (/RS):	approx. 0.1 kg
3/4NPT PVDF adapter (/PF):	approx. 0.04 kg
R3/4 PVDF adapter (/RF):	approx. 0.04 kg
Straight welding socket (/SA1):	approx. 0.3 kg
Angle welding socket 15 (/SA2):	approx. 0.3 kg
Welding clamp 1 inch (/SB1):	approx. 0.3 kg
Welding clamp 1.5 inch (/SB2):	approx. 0.3 kg
Welding clamp 2 inch (/SC1):	approx. 0.4 kg

note: Do not submerge the sensor itself in process water, as the seams between the mold and the metal of the sensor are not waterproof.

2. SC8SG:

Cable with pin terminals (applicable to FLXA202, FLXA21, FLXA402, FLXA402T)
Cable with M4 ring terminals (applicable to FLXA202, FLXA21)
Cable with M3 ring terminals (applicable to FLXA402, FLXA402T)
Variopin connector (applicable to SA11)
Object of measurement:
Conductivity of liquids
Measuring Principle: 2-electrode system or 4-electrode system
Cell Constants: 0.01 cm^{-1}, 0.1 cm^{-1}, 10 cm^{-1} (for two-electrode system)
10 cm^{-1} (for four-electrode system)
Measuring Ranges: 0-0.5 µS/cm to 0-100 µS/cm for a cell constant of 0.01 cm^{-1}
0-10 µS/cm to 0-10 mS/cm for a cell constant of 0.1cm^{-1}
0-1 mS/cm to 0-1000 mS/cm for a cell constant of 10 cm^{1}
Temperature Range: 0˚ to 100˚C (130˚C maximum only for 0.01 cm^{-1} cell constant detectors, excluding those with polypropylene holders)
Pressure: 1000 kPa max. (500 kPa maximum for detectors with polypropylene holders)
Flow rate of Sample Solution:
No particular limitation applies, although a value of less than 20 L/min. is recommended for flow-through detectors.
Note: No limitation applies to flow rate (flow velocity) as far as measurement is concerned. However, when using flow-through detectors, electrodes or the inner walls of a liquid holder may be worn out drastically at higher flow speeds if a measured solution contains slurry. Air bubbles should not be mixed in the sample solutions to obtain correct measured values.
RTD for Temperature Compensation:
Pt1000 (built into the sensor)
Construction: Direct insertion (in-situ) type or flow-through types.
Rainproof encapsulation (equivalent to JIS C0920 Japanese Industrial Standard)

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Installation :
- •Screw-in type: held by the process piping
- •Flange type: held by the process piping
- •Flow-through type (polypropylene holder) : mounted on a pipe (nominal diameter of 50 mm ±2 in.)
- •Flow-through type (SCS14 holder) : held by the process piping

Process Connection: Screw-in, Flange, flow-through
Construction of Wetted Part:
- •Sensor-holding base: Stainless steel (316 SS) and Fluoro rubber when using screw-in type holder or the holder made of stainless steel. PP and Fluoro rubber when using the holder made of PP.
- •0.01 cm^{-1}, 0.1 cm^{-1} cell constant, two-electrode sensor: Stainless steel (316 SS) and ethylene chloride trifluoride
- •10 cm^{-1} cell constant, two-electrode sensor: reinforced epoxy resin and graphite
- •10 cm^{-1} cell constant, four-electrode sensor: polyvinylidene difluoride (PVDF), glass and platinum
- •Stem (flow-through type): SCS14 or polypropylene resin

Weight:
- Screw-in type: approx. 0.9 kg (-R31) (excluding the cable)
- Flange type: approx. 2.8 kg (-R31) (excluding the cable)
- Flow-through type (SCS14 holder): approx. 3.1 kg (excluding the cable)
- Flow-through type (SCS14 holder, flanged): approx. 4.5 kg (excluding the cable)
- Flow-through type (polypropylene holder): approx. 2.7 kg (excluding the cable)
- Flow-through type (polypropylene holder, flanged): approx. 3.2 kg (excluding the cable)
- Cable ; approx. 0.3 kg for 5.5 m length ; approx. 0.5 kg for 10 m length ; approx. 0.9 kg for 20 m length.

- **WU41: Dedicated cable for the SC8SG**

Cable : Six multicore wire
Diameter: 9.2 mm
Material : Thermoplastic PVC

3. SC210G:

Cable with pin terminals (applicable to FLXA202, FLXA21, FLXA402, FLXA402T)
Cable with M4 ring terminals (applicable to FLXA202, FLXA21)
Cable with M3 ring terminals (applicable to FLXA402, FLXA402T)

Object of measurement: Conductivity of solutions
Measuring principle : Two-electrode system
Cell constant : 0.05 cm^{-1}, 5 cm^{-1}
Measuring range : 0-0.5 µS/cm to 0-200 µS/cm (Cell constant: 0.05 cm^{-1})
0-200 µS/cm to 0-20 mS/cm (Cell constant: 5 cm^{-1})
Temperature Range: 0 to 105°C
0 to 100°C (when holder material is Polypropylene in Flow-through type)
Pressure range : 0 to 1 MPa
0 to 500 kPa (when holder material is Polypropylene in Flow-through type)
Flow rate of Sample Solution: No particular limitation applies, although a value of less than 20 L/min. is recommended for flow-through detectors.

Note: No limitation applies to flow rate (flow velocity) as far as measurement is concerned. However, when using flow-through detectors, electrodes or the inner walls of a liquid holder may be worn out drastically at higher flow speeds if a measured solution contains slurry. Air bubbles should not be mixed in the sample solutions to obtain correct measured values.

Temperature sensor: Pt1000
Wet part Materials
- SC210G-C: For sensor, Stainless steel (316 SS), Fluoro rubber (FKM) (O-ring) and Polytrifluorochloroethylene For body, Stainless steel (316 SS), polypropylene and Fluoro rubber (FKM) (O-ring)
- SC210G-D: For sensor, Platinum, glass and Fluoro rubber (FKM) (O-ring) For body, Stainless steel (316 SS), polypropylene and Fluoro rubber (FKM) (O-ring)
- Flange (Flange type): Stainless steel (316 SS)
- Flow-through type holder: SCS14 or polypropylene resin, Fluororubber(FKM) (O-ring)
- Gate valve: SCS13A, Stainless steel (304 SS), Stainless steel (316 SS Hard chrome plating), Expanded graphite, PTFE

Construction: JIS C0920 watertight (equal to NEMA 4)
Weight:
- Screw-in type: approx. 2.1 kg (-L015) (excluding the cable)
- Flange type: approx. 4.3 kg (-L015) (excluding the cable)
- Flow-through type (SCS14 holder): approx. 3.7 kg (excluding the cable)
- Flow-through type (SCS14 holder, flanged): approx. 5.0 kg (excluding the cable)
- Flow-through type (polypropylene holder): approx. 3.1 kg (excluding the cable)
- Flow-through type (polypropylene holder, flanged): approx. 3.3 kg (excluding the cable)
- With gate valve: approx. 3.9 kg (excluding the cable)
- Cable ; approx. 0.9 kg for 3 m length ; approx. 1.5 kg for 5 m length ; approx. 3.0 kg for 10 m length ; approx. 1.5 kg for 15 m length ; approx. 6.0 kg for 20 m length.

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■ Compliance with the simple apparatus requirements

SC210G and SC4AJ meet the simple apparatus requirements defined in the following standards.

Note: TIIS certified types cannot be connected.

Use the sensors under the conditions of use required by the standards.

Applicable standards:

ANSI/ISA-60079-11 (2014)
ANSI/ISA-60079-0 (2009)
CAN/CSA-C22.2 NO. 60079-11:14
CAN/CSA-C22.2 NO. 60079-0:11
IEC 60079-11

방호장치 의무안전인증 고시
GB 3836.4-2010

Conditions of use:

(1) Use in combination with an internally isolated analyzer, or use with, an analyzer in combination with isolated barrier.
The FLXA202/FLXA21 is internally isolated.

(2) Upper limit of the process temperature.
The upper limit of process temperature is indicated below when the sensor is used in combination with a YOKOGAWA analyzer.
For FLXA202/FLXA21, model and suffix code below is available.
FLXA21-D-□-D-◊-C1-○-A-N-LA-N-NN
□: can be any value.
◊: must be CB, CD, CH, or EG.
○: must be NN or C1.
Any option code is available.
FLXA202-D-□-D-◊-C1-○-A-N-LA-N-NN
□: can be any value.
◊: must be CB, CD, CG, or CH.
○: must be NN or C1.
Any option code is available.
For SC202S, model and suffix code below is available.
SC202S-A-E
There are no SC202S models that meet the Korean explosion proof standards.
Any option code is available.

Upper limit of process temperature on the SC210G-C

Analyzer used in combination	FLXA202/FLXA21		SC202S	
Ambient temperature Ta / Temperature class	40°C	60°C	40°C	60°C
T6	N.A	N.A	57	57
T5	54	N.A	95 (*1)	72
T4	105	39	105	105
T3	105	104	105	105
T2	105	105	105	105
T1	105	105	105	105

*1: Care about upper limit 100°C of temperature class T5 should be taken.

Upper limit of process temperature on the SC210G-D

Analyzer used in combination	FLXA202/FLXA21		SC202S	
Ambient temperature Ta / Temperature class	40°C	60°C	40°C	60°C
T6	49	49	72	72
T5	95 (*1)	64	95 (*1)	87
T4	105	99	105	105
T3	105	105	105	105
T2	105	105	105	105
T1	105	105	105	105

*1: Care about upper limit 100°C of temperature class T5 should be taken.

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Upper limit of process temperature on the SC4AJ

Analyzer used in combination	FLXA202/FLXA21		SC202S	
Ambient temperature Ta / Temperature class	40°C	60°C	40°C	60°C
T6	49	49	72	72
T5	95 (*1)	64	95 (*1)	87
T4	110	99	110	110
T3	110	110	110	110
T2	110	110	110	110
T1	110	110	110	110

*1: Care about upper limit 100°C of temperature class T5 should be taken.

(3) Condition of upper limit of temperature
Condition of upper limit of temperature is often different from that of actual temperature. Use under condition which meets both of them.

Caution: Since upper limit of process temperature on SC210G-C is lower than that of SC210G-A,-B (discontinued products). Take carefully when SC210G-A,-B is replaced by SC210G-C.

Other warnings are provided in the user's manual.

■ Applicable analyzer with various detectors

Detector	SC4AJ			SC8SG			SC210G		
Type of terminals	Pin	Ring M4	Ring M3	Pin	Ring M4	Ring M3	Pin	Ring M4	Ring M3
Analyzer: FLXA402 (*), FLXA402T	Yes	N.A.	Yes	Yes	N.A.	Yes	Yes	N.A.	Yes
Analyzer: FLXA202 (*), FLXA21	Yes	Yes	N.A.	Yes	Yes	N.A.	Yes	Yes	N.A.

*: FLXA402 or FLXA202 when connected to a SA11 can be connected with sensors equipped with Variopin connector. (SC4A..-VS, SC42-□V, SX42..□V, SC4AJ..-VS, SC8SG..-VS)

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■ MODEL AND SUFFIX CODES

1. SC4AJ

Model	Suffix Code	Option Code	Description
SC4AJ	.....	.....	Conductivity sensor
Material	**-T**	.....	Titanium (Only for -AD)
	-S	.....	316L SS
Fitting type	**-AD**	.....	Adapter mounting type
	-SA	.....	Welding socket type (*1)
	-SB	.....	1 or 1.5 inch welding clamp type (*2)
	-SC	.....	2 inch welding clamp type (*2)
Sensor length	**-09**	.....	9 cm (Code for -AD)
	-15	.....	15 cm (Code for -AD)
	-NN	.....	fixed length (Code for -SA, -SB, -SC)
Cell constant	**-002**	.....	0.02 cm^{-1}
	-010	.....	0.1 cm^{-1}
Cable length	**-03**	.....	3 m pin terminals) (*3)
	-05	.....	5 m pin terminals) (*3)
	-10	.....	10 m pin terminals) (*3)
	-15	.....	15 m pin terminals) (*3)
	-20	.....	20 m pin terminals) (*3)
	-X1	.....	3 m M4 ring terminals) (*4)
	-X2	.....	5 m M4 ring terminals) (*4)
	-X3	.....	10 m M4 ring terminals) (*4)
	-X4	.....	15 m M4 ring terminals) (*4)
	-X5	.....	20 m M4 ring terminals) (*4)
	-Y1	.....	3 m M3 ring terminals) (*5)
	-Y2	.....	5 m M3 ring terminals) (*5)
	-Y3	.....	10 m M3 ring terminals) (*5)
	-Y4	.....	15 m M3 ring terminals) (*5)
	-Y5	.....	20 m M3 ring terminals) (*5)
	-VS	.....	Variopin connector (*6)
Temperature sensor	**-T1**	.....	Pt1000
Option	For AD only	**/PS**	3/4NPT adapter 316 SS
		/PF	3/4NPT adapter PVDF
		/RS	R3/4 adapter 316 SS
		/RF	R3/4 adapter PVDF
	For SA only	**/SA1**	Straight welding socket 316L SS
		/SA2	Angled welding socket 15° 316L SS
	For SB only	**/SB1**	Welding clamp 1 inch 316L SS
		/SB2	Welding clamp 1.5 inch 316L SS
	For SC only	**/SC1**	Welding clamp 2 inch 316L SS
	Oil prohibit	**/DG1**	Oil-prohibited use (*7)

*1: When you select Fitting type -SA, place an order on the SC4AJ with Option code /SA1 or /SA2.
*2: When you select Fitting type -SB, place an order on the SC4AJ with Option code /SB1 or /SB2 (including seal ring).
When you select Fitting type -SC, place an order on the SC4AJ with Option code /SC1 (including seal ring).
*3: Used for connection to FLXA202, FLXA21, FLXA402, FLXA402T.
*4: Used for connection to FLXA202, FLXA21.
*5: Used for connection to FLXA402, FLXA402T, SC450G.
*6: Used for connection with SA11. Sensor length -09 is not selectable.
*7: Washing treatment of wet part with alcohol.

Spare parts for SC4AJ

Parts No.	Description
K9670MA	O-ring for -SA (excluding -VS)
K9675VY	O-ring set for -SA (for -VS)
K9670MK	Seal rings for /SB1 or /SB2
K9670MP	Seal rings for /SC1
K9670MT	3/4 NPT Stainless steel adapter for -AD
K9670MU	3/4 NPT PVDF Adapter for -AD
K9670MV	R3/4 Stainless steel adapter for -AD
K9670MW	R3/4 PVDF Adapter for -AD
K9670MD	Angled welding socket and mounting nut for -SA
K9670ME	Staight welding socket for -SA
K9670MB	Angled welding socket for -SA
K9670MC	Straight welding socket for -SA
K9670ML	Welding clamp 1 or 1.5 inch for -SB
K9670MQ	Welding clamp 2 inch for -SC

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2. SC8SG

Model	Suffix Code	Option Code	Description
SC8SG	.....	.....	Conductivity detector
Measuring range	**-R31**	.....	Low range; cell constant: 0.01 cm^{-1}
	-R42	.....	Medium range; cell constant: 0.1 cm^{-1}
	-R61	.....	High range; cell constant: 10 cm^{-1}
Electrode configuration	**-T**	.....	2-electrode system (for both 0.01 cm^{-1}, 0.1 cm^{-1}, 10cm^{-1} cell constants) - for general measurements
	-F	.....	4-electrode system (for 10 cm^{-1} cell constant only) - for countermeasures against polarization due to contamination (*1)
Construction: Screw-in type	**-100**	.....	with welding socket (*2)
	-101	.....	without welding soket(a welding socket [K9208BK] should be ordered separately)
	-102	.....	R1-1/2 material: SCS14
Construction: Flange type	**-206**	.....	JIS 10 K 50 RF Flange
	-207	.....	ANSI Class 150 2 RF flange (with serration)
	-208	.....	JPI Class 150 2 RF flange
Construction: Flow-through type (*3)	**-302**	.....	Rc1/2 female threaded; holder material: SCS14
	-312	.....	Rc1/2 female threaded; holder material: PP
	-303	.....	1/2NPT female threaded; holder material: SCS14
	-313	.....	1/2NPT female threaded; holder material: PP
	-304	.....	JIS 10K 15 RF flange; holder material: SCS14
	-314	.....	JIS 10K 15 FF flange; holder material: PP
	-305	.....	ANSI Class150 1/2 RF flange with serration; holder material: SCS14
	-315	.....	ANSI Class150 1/2 FF flange; holder material: PP
Cable length	**-P1**	.....	5.5 m (special cable supplied with detector) (pin terminals) (*4)
	-P2	.....	10 m (special cable supplied with detector) (pin terminals) (*4)
	-P3	.....	20 m (special cable supplied with detector) (pin terminals) (*4)
	-X1	.....	5.5 m (special cable supplied with detector) (M4 ring terminal) (*5)
	-X2	.....	10 m (special cable supplied with detector) (M4 ring terminal) (*5)
	-X3	.....	20 m (special cable supplied with detector) (M4 ring terminal) (*5)
	-Y1	.....	5.5 m (special cable supplied with detector) (M3 ring terminal) (*6)
	-Y2	.....	10 m (special cable supplied with detector) (M3 ring terminal) (*6)
	-Y3	.....	20 m (special cable supplied with detector) (M3 ring terminal) (*6)
	-VS	.....	Variopin connector (*7)
Style code	***A**	.....	Style A
Option		**/PS**	Stainless Steel Mounting hardware (for PP holder)
		/SS	Stainless Steel Mounting hardware (for SCS14 holder)
		/DG1	Oil-Prohibited Use (*8)

*1: Electrode configuration -F cannot be selected when -R31 or -R42 is selected.
When -R61 is selected, 2-electrode system -T is normally used, however, for process where detectors are susceptible to contamination, a 4-electrode system -F should be used.
*2: If a welding socket (K9208BK) needs to be ordered beforehand, either place a separate order or prepare one by referring to the Dimensions later in this brochure.
*3: No holder is equipped with a mounting hardware. Please place an order on the SC8SG with option code /PS or /SS when you select flow-through model.
The PP holder can have cracks or splits unless it is supported by a mounting hardware.
*4: Used for connection to FLXA202, FLXA21, FLXA402, FLXA402T.
*5: Used for connection to FLXA202, FLXA21.
*6: Used for connection to FLXA402, FLXA402T, SC450G.
*7: Used for connection with SA11. SC8SG-R61-T (Measuring range: -R61 with Electrode configuration -T) is not selectable.
*8: Washing treatment of wet part with alcohol.

Spare parts for SC8SG

Parts No.	Description
K9208BA	0.01 cm^{-1} cell constant, two-electrode sensor
K9208BB	0.1 cm^{-1} cell constant, two-electrode sensor
K9208BC	10 cm^{-1} cell constant, two-electrode sensor
K9208BD	10 cm^{-1} cell constant, four-electrode sensor
K9208BV	0.01 cm^{-1} cell constant, two-electrode sensor, Variopin connector
K9208BY	0.1 cm^{-1} cell constant, two-electrode sensor, Variopin connector
K9208BZ	10 cm^{-1} cell constant, four-electrode sensor, Variopin connector
K9208BK	Welding socket for screw-in model
G9303EB	O-ring

*1: For the sensor for oil-prohibited use (/DG1), please contact Yokogawa.

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WU41

This cable can be purchased additionally. SC8SG is supplied with cables of selected length.

Model	Suffix code	Option code	Description
WU41	·····	·····	Dedicated Cable for SC8SG
Cable end	-P	·····	pin terminals (*1)
	-X	·····	M4 ring terminals (*2)
	-Y	·····	M3 ring terminals (*3)
Cable length	-05	·····	5.5 m
	-10	·····	10 m
	-20	·····	20 m

*1: Used for connection to FLXA202, FLXA21, FLXA402, FLXA402T.
*2: Used for connection to FLXA202, FLXA21.
*3: Used for connection to FLXA402, FLXA402T, SC450G

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3. SC210G

Model	Suffix Code	Option Code	Description
SC210G	.....	.....	Conductivity detector
Measuring range	**-C**	.....	Low range; cell constant: 0.05 cm^{-1}, Pt1000
	-D	.....	Medium range; cell constant: 5 cm^{-1}, Pt1000
Construction — Screw-in type	**-100**	.....	R1-1/2 male
	-103	.....	1-1/2NPT male
Flange type	**-206**	.....	JIS 10K 50 RF flange
	-207	.....	ANSI Class150 2 RF flange (with serration)
	-208	.....	JPI Class150 2 RF flange
Flow-through type (*1)	**-302**	.....	Rc1/2 female, holder material: SCS14
	-312	.....	Rc1/2 female, holder material: PP
	-303	.....	1/2NPT female, holder material: SCS14
	-313	.....	1/2NPT female, holder material: PP
	-304	.....	JIS 10K 15 RF flange, holder material: SCS14
	-314	.....	JIS 10K 15 FF flange, holder material: PP
	-305	.....	ANSI Class150 1/2 RF flange with serration, holder material: SCS14
	-315	.....	ANSI Class150 1/2 FF flange, holder material: PP
	-306	.....	JPI Class150 1/2 RF flange, holder material: SCS14
With gate valve	**-402**	.....	R1-1/4 male
	-403	.....	1-1/4NPT male
Sensor length	**-L015**	.....	150 mm (Standard)
	-L030	.....	300 mm (*2)
	-L050	.....	500 mm (*2)
	-L100	.....	1000 mm (*2)
	-L150	.....	1500 mm (*2)
	-L200	.....	2000 mm (*2)
Cable length	**-03**	.....	3 m (M4 ring terminals) (*3)
	-05	.....	5 m (M4 ring terminals) (*3)
	-10	.....	10 m (M4 ring terminals) (*3)
	-15	.....	15 m (M4 ring terminals) (*3)
	-20	.....	20 m (M4 ring terminals) (*3)
	-AA	.....	3 m (pin terminals) (*4)
	-BB	.....	5 m (pin terminals) (*4)
	-CC	.....	10 m (pin terminals) (*4)
	-DD	.....	15 m (pin terminals) (*4)
	-EE	.....	20 m (pin terminals) (*4)
	-Y1	.....	3 m (M3 ring terminals) (*5)
	-Y2	.....	5 m (M3 ring terminals) (*5)
	-Y3	.....	10 m (M3 ring terminals) (*5)
	-Y4	.....	15 m (M3 ring terminals) (*5)
	-Y5	.....	20 m (M3 ring terminals) (*5)
Style code	***A**	.....	Style A
Option		**/SCT**	Stainless steel tag plate
		/ANSI	With ANSI connection adaptor (*6)
		/PF	DAI-ELperfrow (perfluoro-elastomer) specification (*7)
		/PS	SUS mounting hardware (for PP construction)
		/SS	SUS mounting hardware (for SCS14 construction)
		/X1	Epoxy-coated (baked)
		/DG1	Oil-prohibited use (Degrease cleaning treatment) (except for the type with gate valve) (*8)
		/MCT	Material Certificate (*9) (except for gate valve)

*1: The model is not equipped with a mounting brackets, place an order on the SC210G with option code /PS or /SS when you select flow-through model. The PP holder material can have cracks or splits unless it is not supported by a mounting hardware.
*2: Only for Screw-in type and Flange type
*3: Used for connection to FLXA202, FLXA21.
*4: Used for connection to FLXA202, FLXA21, FLXA402, FLXA402T.
*5: Used for connection to FLXA402, FLXA402T, SC450G.
*6: Adaptor for cable inlet (carbon steel)
*7: Materials for O-ring of electrode assembly and holder seal become perfluoro-elastomer. But, in construction -402 and -403, the sealing part of gate valve doesn't become the elastomer.
*8: Washing treatment of wet part with alcohol.
*9: Additional lead time is required.

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Spare Parts for SC210G

Name	Part No.	Remarks
Electrode Assembly (*1) (*3) (for SC210G-C)	K9209EA K9209EF K9209EB K9209EC K9209ED K9209EE K9209NA K9209NB K9209NC K9209ND K9209NE K9209NF	150 mm (C=0.05 cm^{-1}) 500 mm (C=0.05 cm^{-1}) 1000 mm (C=0.05 cm^{-1}) 1500 mm (C=0.05 cm^{-1}) 2000 mm (C=0.05 cm^{-1}) 300 mm (C=0.05 cm^{-1}) 150 mm (C=0.05 cm^{-1}) with perfluoro-elastomer 300 mm (C=0.05 cm^{-1}) with perfluoro-elastomer 500 mm (C=0.05 cm^{-1}) with perfluoro-elastomer 1000 mm (C=0.05 cm^{-1}) with perfluoro-elastomer 1500 mm (C=0.05 cm^{-1}) with perfluoro-elastomer 2000 mm (C=0.05 cm^{-1}) with perfluoro-elastomer
Electrode Assembly (*2) (*3) (for SC210G-C with gate valve)	K9209KA K9209NN	(C=0.05 cm^{-1}) (C=0.05 cm^{-1}) with perfluoro-elastomer
Electrode Assembly (*1) (*3) (for SC210G-D)	K9315KJ K9315KK K9315KL K9315KM K9315KN K9315KP K9315LJ K9315LK K9315LL K9315LM K9315LN K9315LP	150 mm (C=5 cm^{-1}) 300 mm (C=5 cm^{-1}) 500 mm (C=5 cm^{-1}) 1000 mm (C=5 cm^{-1}) 1500 mm (C=5 cm^{-1}) 2000 mm (C=5 cm^{-1}) 150 mm (C=5 cm^{-1}) with perfluoro-elastomer 300 mm (C=5 cm^{-1}) with perfluoro-elastomer 500 mm (C=5 cm^{-1}) with perfluoro-elastomer 1000 mm (C=5 cm^{-1}) with perfluoro-elastomer 1500 mm (C=5 cm^{-1}) with perfluoro-elastomer 2000 mm (C=5 cm^{-1}) with perfluoro-elastomer
Electrode Assembly (*2) (*3) (for SC210G-D with gate valve)	K9315KQ K9315LQ	(C=5 cm^{-1}) (C=5 cm^{-1}) with perfluoro-elastomer
Cable	K9315QA K9315QB K9315QC K9315QF K9315QG K9315QR K9315QS K9315QT K9315QU K9315QV K9315QJ K9315QK K9315QL K9315QM K9315QQ	3 m (M4 ring terminals, SC210G...-03) 5 m (M4 ring terminals, SC210G...-05) 10 m (M4 ring terminals, SC210G...-10) 15 m (M4 ring terminals, SC210G...-15) 20 m (M4 ring terminals, SC210G...-20) 3 m (pin terminals) 5 m (pin terminals) 10 m (pin terminals) 15 m (pin terminals) 20 m (pin terminals) 3 m (M3 ring terminals) 5 m (M3 ring terminals) 10 m (M3 ring terminals) 15 m (M3 ring terminals) 20 m (M3 ring terminals)
O-ring	K9050AT K9050MR K9319RN	Fluoro-rubber (FKM) O-ring (for screw-in type, flange type and flow-through type) Fluoro-rubber (FKM) O-ring (for gate valve type) Perfluoro-elastomer O-ring (for all types)

*1: For the electrode assembly for oil-prohibited use (/DG1) and/or with material certificate (/MCT), please contact Yokogawa.
*2: For the electrode assembly with material certificate (/MCT), please contact Yokogawa.
*3: Spare parts for SC210G-C, -D can be used for SC210-A, -B (discontinued products).
In this case, temperature sensor has been changed from the thermistor (PB36NTC) to Pt1000, so refer to instruction manual and change the settings of temperature sensor.

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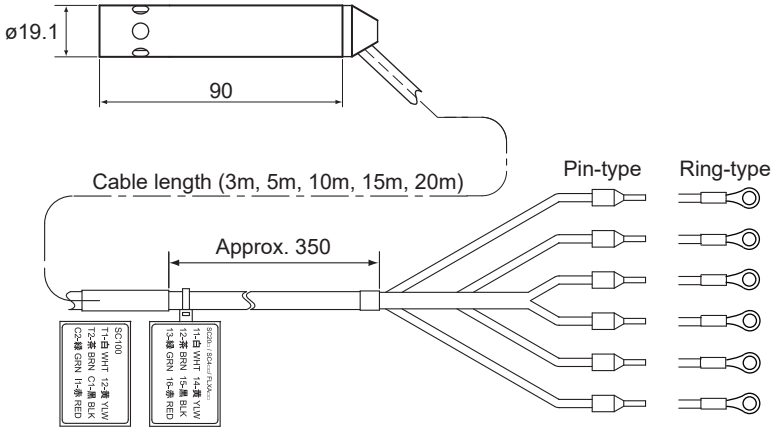
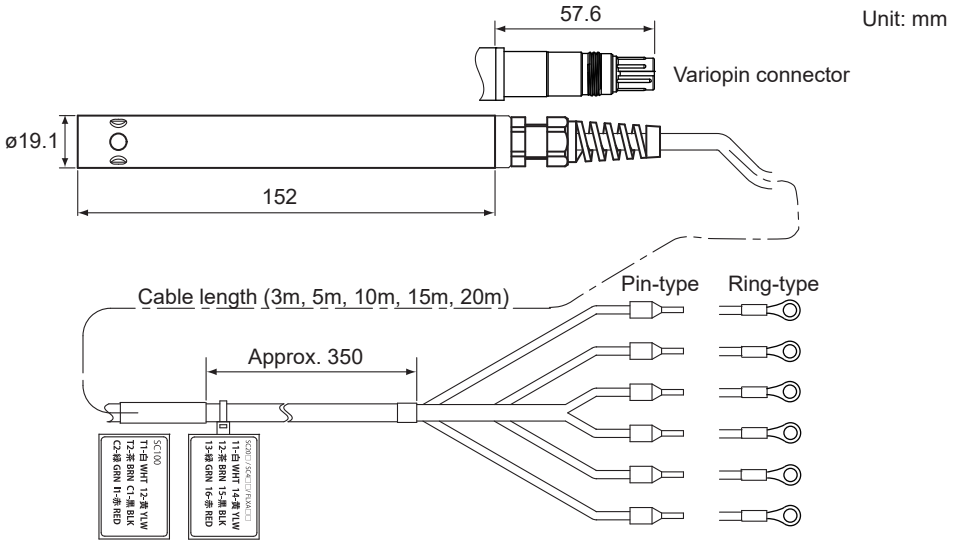
■ DIMENSIONS

1. SC4AJ

<Adapter mounting type>
SC4AJ-□-AD-09
Sensor length: 09 (9 cm)

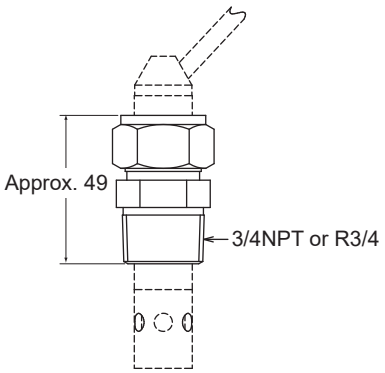


SC4AJ-□-AD-15
Sensor length: 15 (15 cm)



● **Option: Adapter mounting type (-AD)** **/PS (Stainless Steel)** **/PF (PVDF)**
/RS (Stainless Steel) **/RF (PVDF)**

Unit: mm



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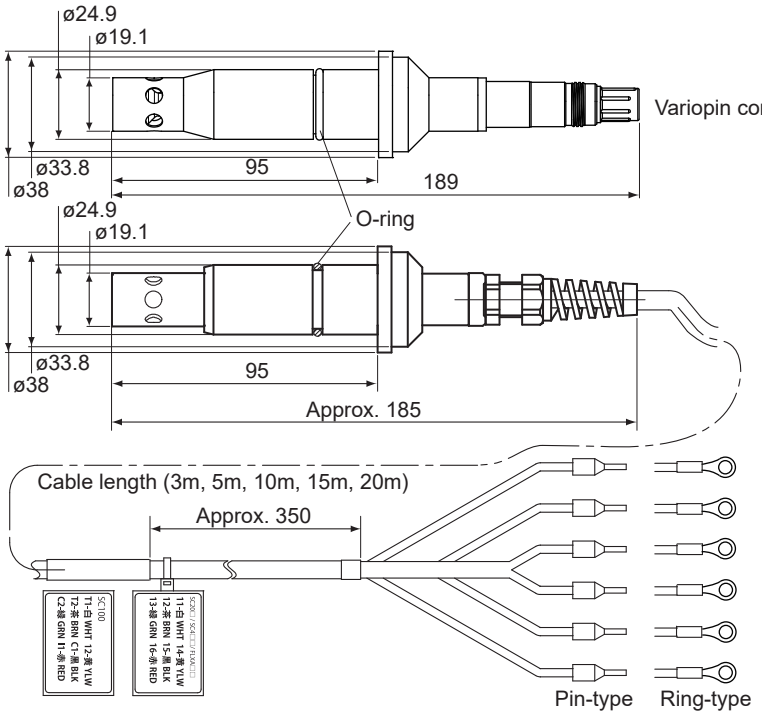
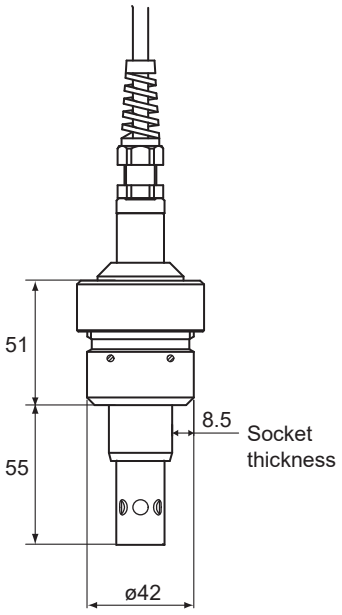
<Welding socket type>
SC4AJ-□-SA-NN

Unit: mm



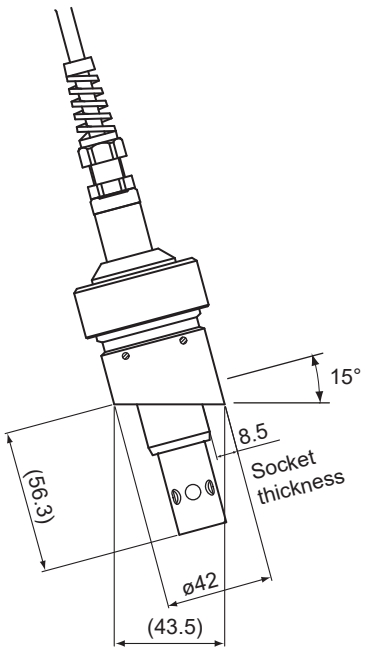
● **Option: Welding socket type (-SA)**

Straight welding socket: /SA1



Angled welding socket: /SA2

Unit: mm



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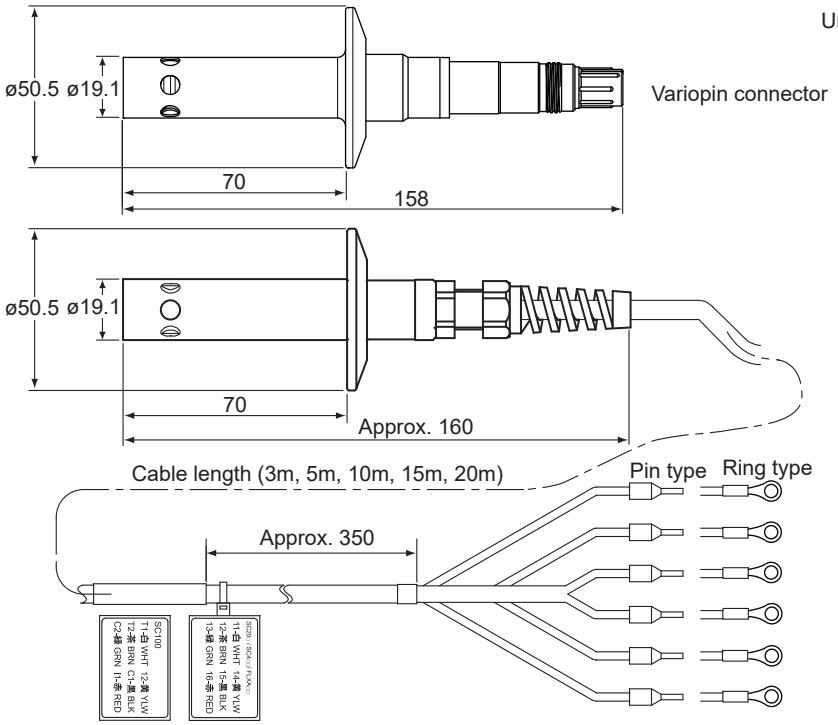
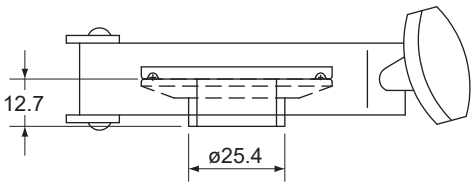
<Welding clamp type>
SC4AJ-□-SB-NN

Unit: mm

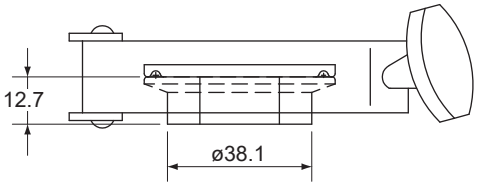


● **Option: Welding clamp type (-SB)**

Welding clamp 1 inch: /SB1



Welding clamp 1.5 inch: /SB2



Unit: mm

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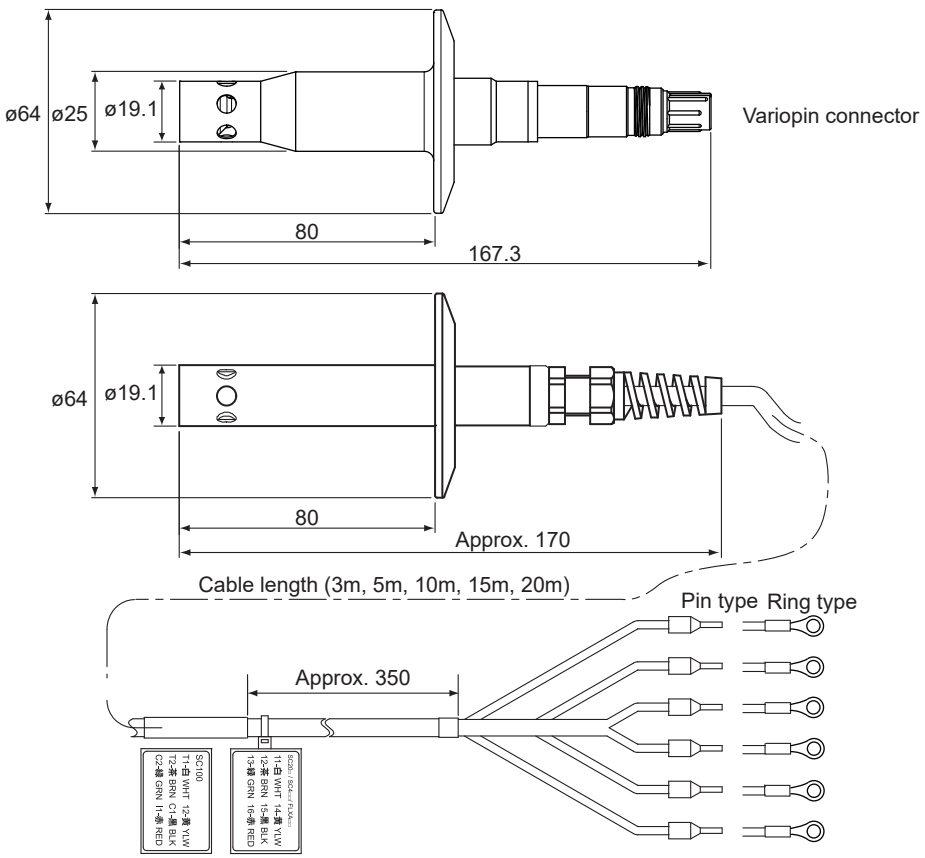
Sensor SC4AJ-□-SC-NN

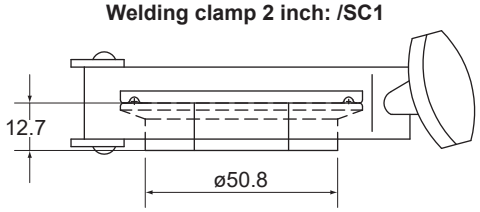
Unit: mm



● **Option: Welding clamp type (-SC)**

Welding clamp 2 inch: /SC1

Unit: mm



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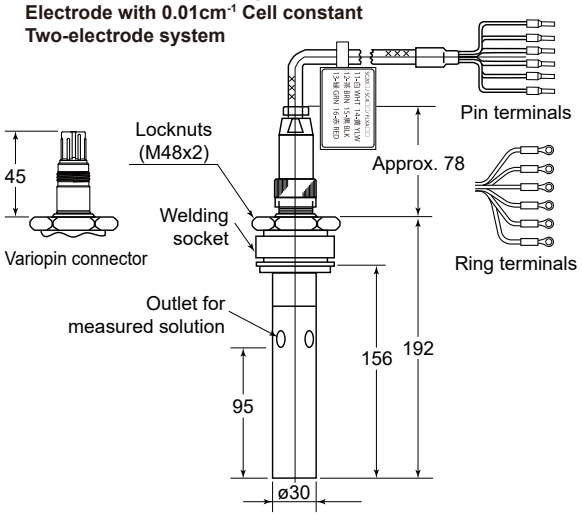
2. SC8SG

<Screw-in type> Only the difference between SC8SG-R □□-□-100 and SC8SG-R□□-□-101 is whether or not having a welding socket. SC8SG-R □□-□-100 has a welding socket but SC8SG-R□□-□-101 does not.

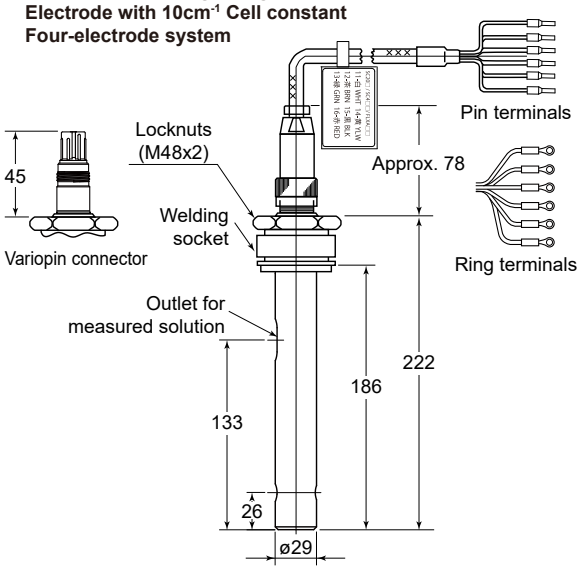
SC8SG-R31-T-100 (Low range)
Electrode with 0.01cm^{-1} Cell constant
Two-electrode system

Unit: mm



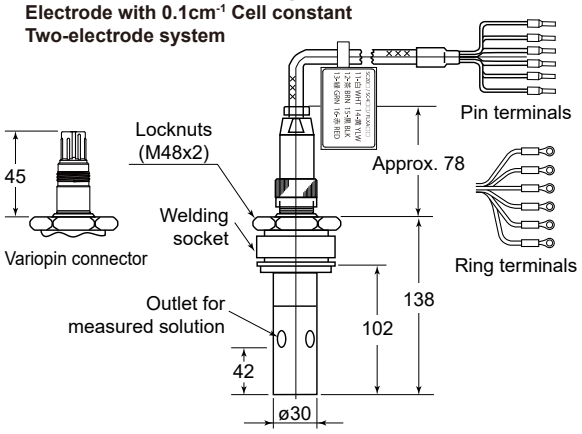
SC8SG-R61-F-100 (High range)
Electrode with 10cm^{-1} Cell constant
Four-electrode system

Unit: mm



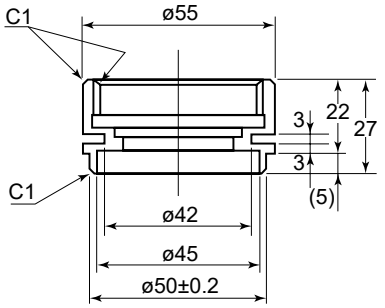
SC8SG-R42-T-100 (Medium range)
Electrode with 0.1cm^{-1} Cell constant
Two-electrode system

Unit: mm



Welding socket
Parts No: K9208BK (Material: 316SS)

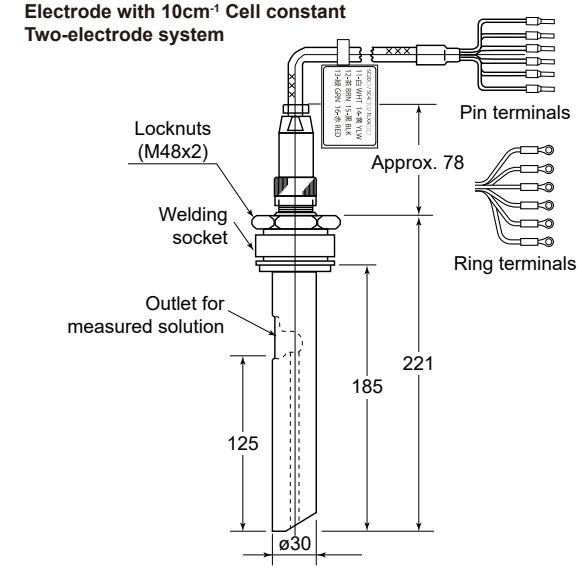
Unit : mm



Note: If you make the welding socket for screw-in type, refer to the above drawing.

SC8SG-R61-T-100 (High range)
Electrode with 10cm^{-1} Cell constant
Two-electrode system

Unit: mm



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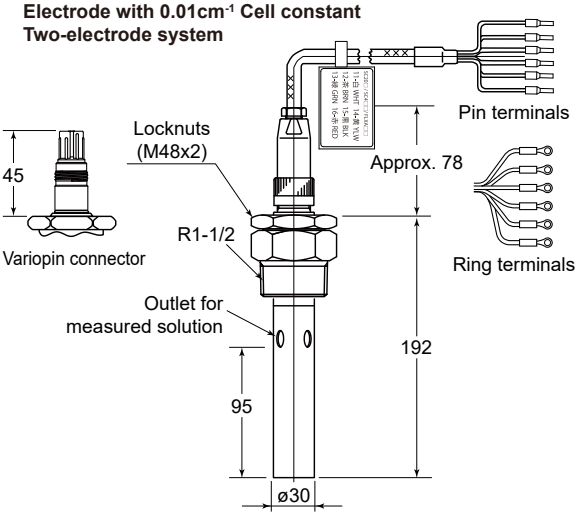
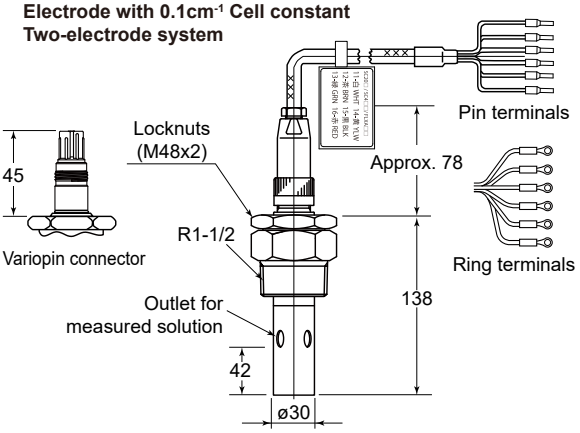
SC8SG-R31-T-102 (Low range)
Electrode with 0.01cm^{-1} Cell constant
Two-electrode system

Unit: mm



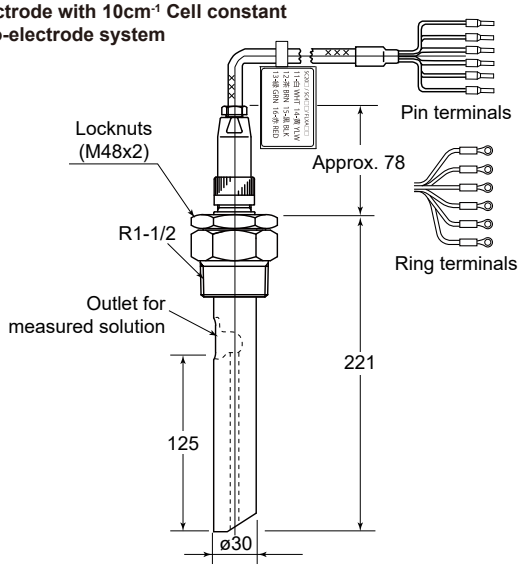
SC8SG-R42-T-102 (Medium range)
Electrode with 0.1cm^{-1} Cell constant
Two-electrode system

Unit: mm



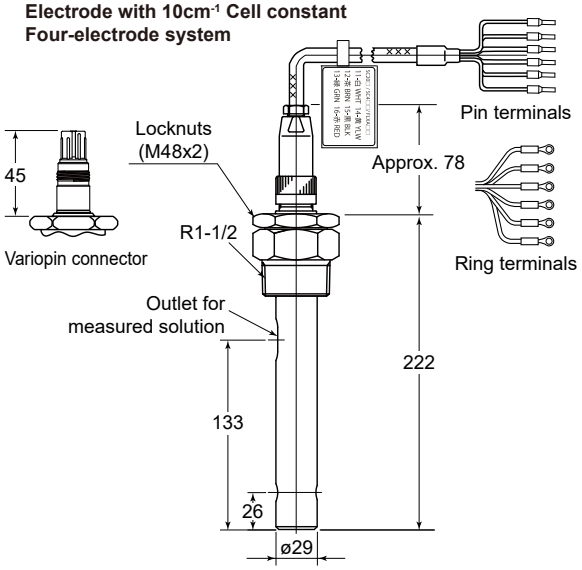
SC8SG-R61-T-102 (High range)
Electrode with 10cm^{-1} Cell constant
Two-electrode system

Unit: mm



SC8SG-R61-F-102 (High range)
Electrode with 10cm^{-1} Cell constant
Four-electrode system

Unit: mm



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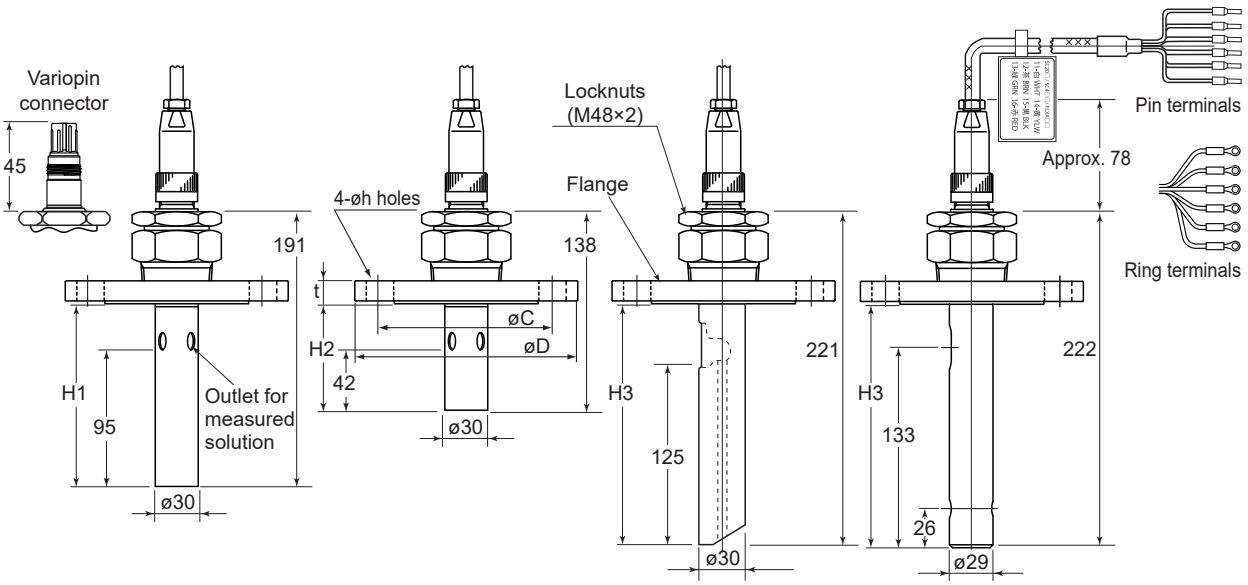
<Flange type>

SC8SG-R□□-□-20□

Unit: mm



SC8SG-R31-T **SC8SG-R42-T** **SC8SG-R61-T** **SC8SG-R61-F**

<Flange> **<Insertion length>**

Model and Code	Flange rating	øC	øD	t	øh	H1	H2	H3
SC8SG - R□□ - □ - 206 - □□ *A	JIS 10K 50 RF	120	155	16	19	127	74	157
SC8SG - R□□ - □ - 207 - □□ *A	ANSI Class150 2 RF	120.7	152.4	19.1	19.1	124	71	154
SC8SG - R□□ - □ - 208 - □□ *A	JPI Class150 2 RF	120.6	152	19.5	20	123.5	70.5	153.5

Note: ANSI flange with serrations

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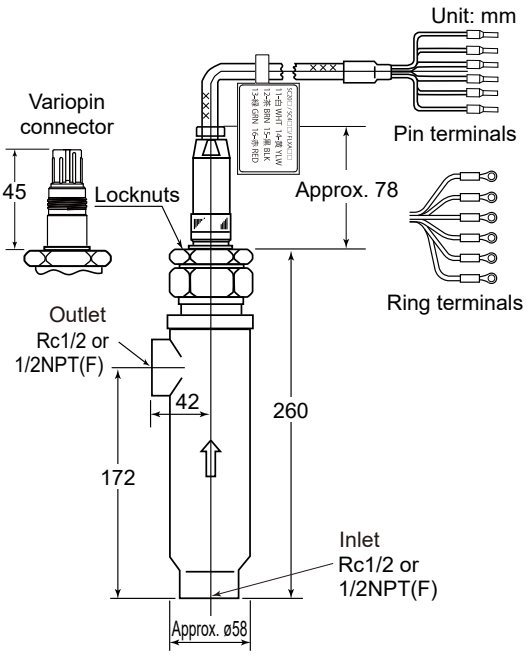
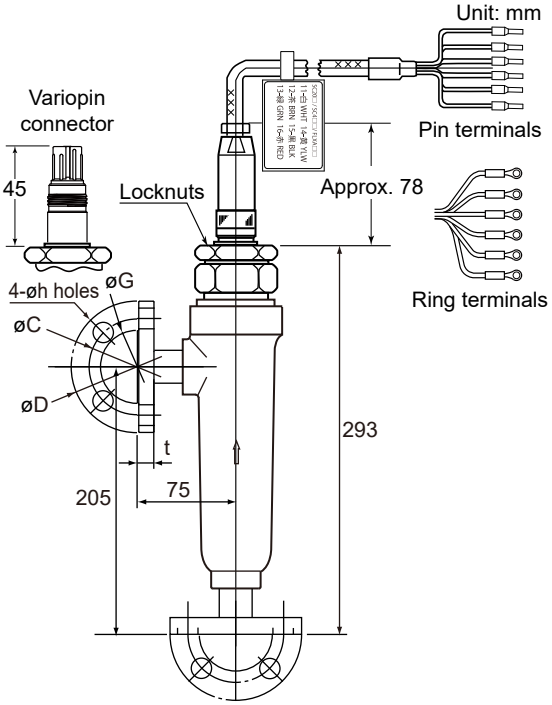
<Flow-through type>
SC8SG-R□□-□-302,
SC8SG-R□□-□-303,
Screw connection (Holder Material: SCS14)

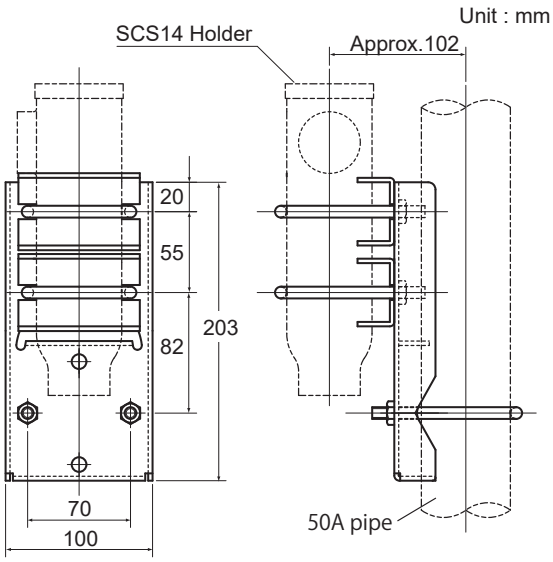


SC8SG-R□□-□-304,
SC8SG-R□□-□-305,
Flange connection (Holder Material: SCS14)



Flange rating	øC	øD	øG	øh	t
JIS 10K 15 RF	70	95	52	15	12
ANSI Class150 1/2 RF (with serretion)	60.5	88.9	34.9	15.7	11.2

● Option: Mounting hardware (/SS)



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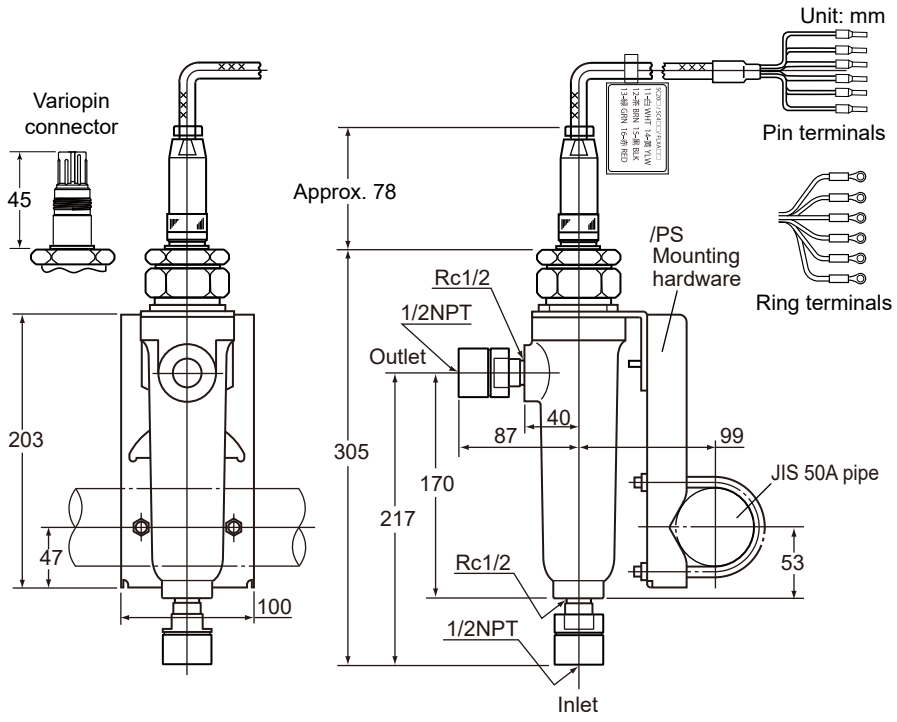
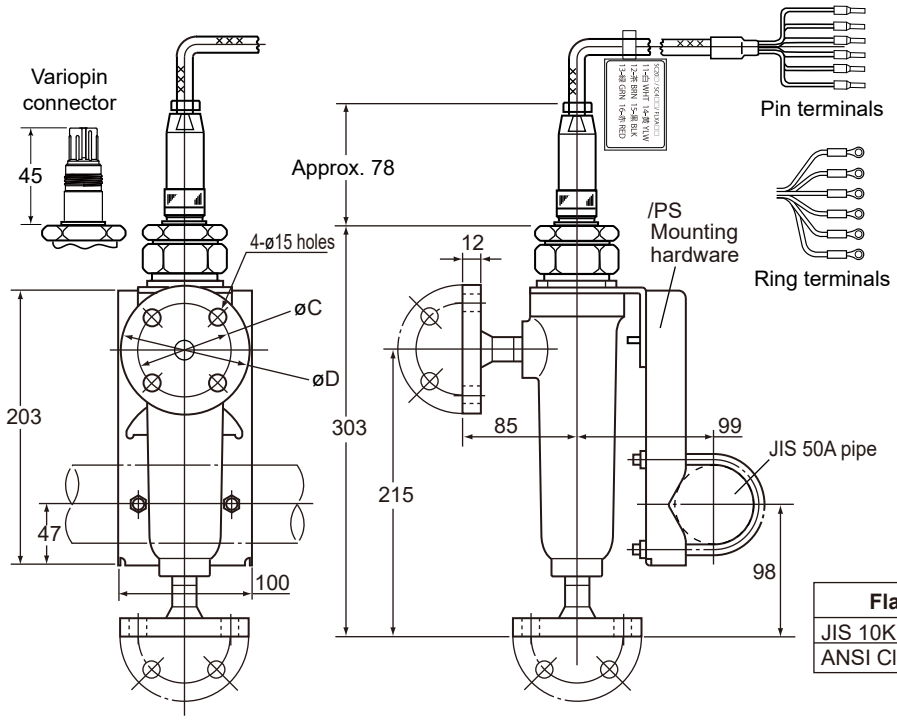
SC8SG-R□□-□-312, SC8SG-R□□-□-313,
Screw connection (Holder Material: PP) + Option (Mounting hardware (/PS)



SC8SG-R□□-□-314, SC8SG-R□□-□-315,
Flange connection (Holder Material: PP) + Option (Mounting hardware (/PS))

Unit: mm



Flange rating	øC	øD
JIS 10K 15 FF	70	95
ANSI Class150 1/2 FF	60.5	88.9

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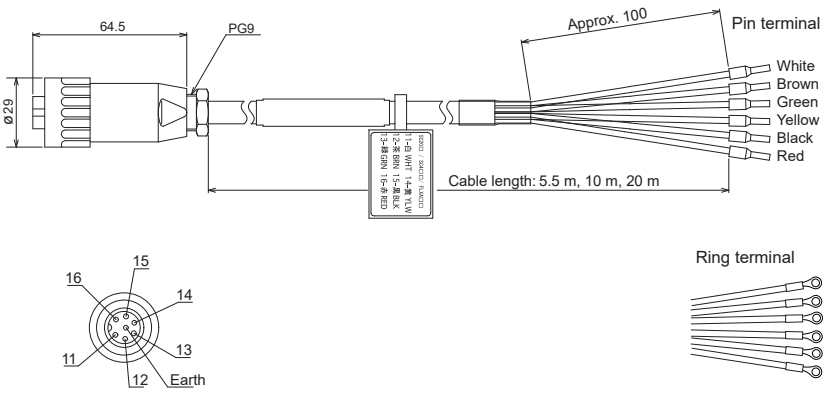
- **WU41 for SC8SG**

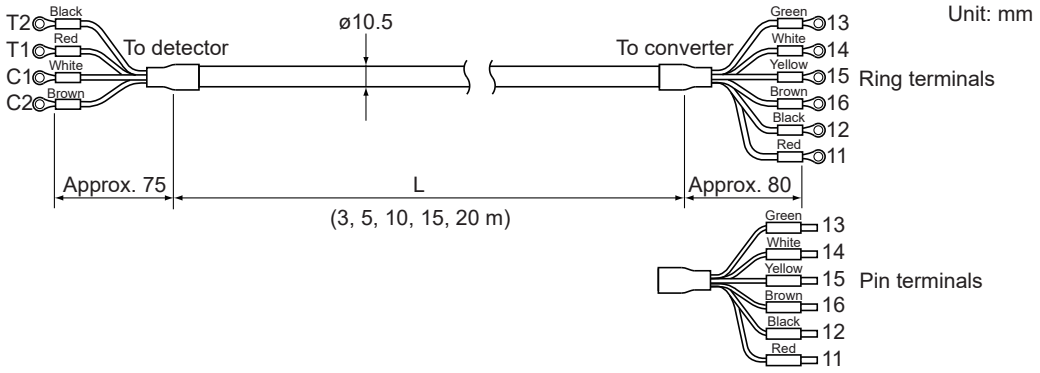
Unit : mm



3. SC210G

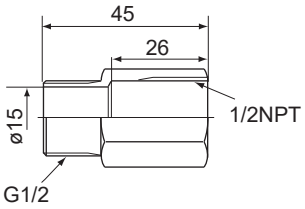
- **SC210G Detector - converter connection cable (accessory)**

Unit: mm



- **Option: With ANSI connection adaptor (/ANSI)**

Unit: mm



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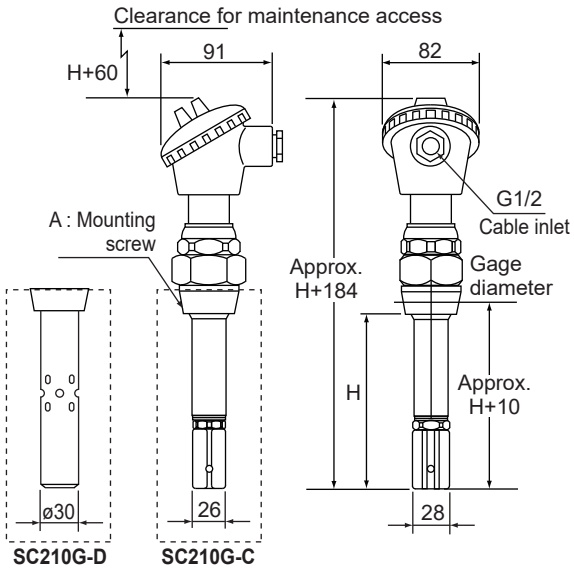
<Screw-in type>
SC210G-□-100, SC210G-□-103

Unit : mm



< Mounting screw >

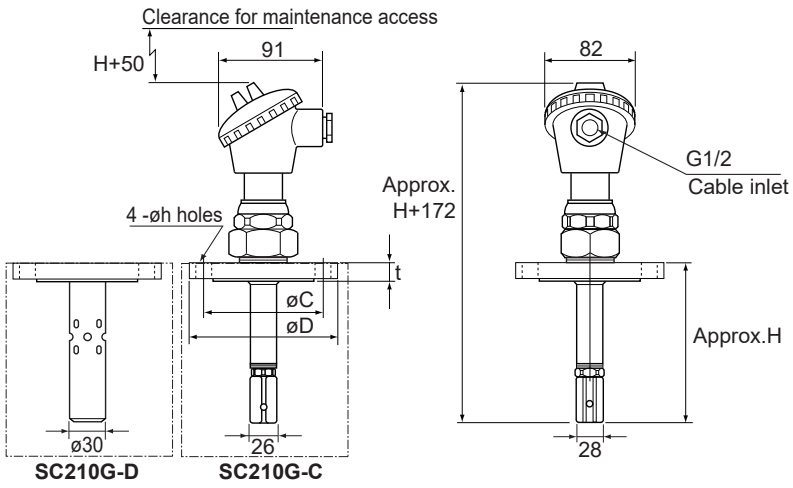
Model and Code	A
SC210G - □ - 100	R 1-1/2
SC210G - □ - 103	1-1/2 NPT

< Sensor length >

Model and Code	H
SC210G - □ - 10□ - L015 - □ □ *A	150
SC210G - □ - 10□ - L030 - □ □ *A	300
SC210G - □ - 10□ - L050 - □ □ *A	500
SC210G - □ - 10□ - L100 - □ □ *A	1000
SC210G - □ - 10□ - L150 - □ □ *A	1500
SC210G - □ - 10□ - L200 - □ □ *A	2000

<Flange Type>
SC210G-□-206, SC210G-□-207, SC210G-□-208

Unit: mm



<Flange>

Model and code	Flange rating	øC	øD	t	øh
SC210G - □ - 206 -L □ □ □ - □ □ * A	JIS 10K 50 RF	120	155	16	19
SC210G - □ - 207 -L □ □ □ - □ □ * A	ANSI Class150 2 RF	120.7	152.4	19.1	19.1
SC210G - □ - 208 -L □ □ □ - □ □ * A	JPI Class150 2 RF	120.6	152	19.5	20

Note : ANSI flange with serrations.

<Sensor length>

Model and code	H
SC210G - □ - 20□ - L015 - □ □ * A	162
SC210G - □ - 20□ - L030 - □ □ * A	312
SC210G - □ - 20□ - L050 - □ □ * A	512
SC210G - □ - 20□ - L100 - □ □ * A	1012
SC210G - □ - 20□ - L150 - □ □ * A	1512
SC210G - □ - 20□ - L200 - □ □ * A	2012

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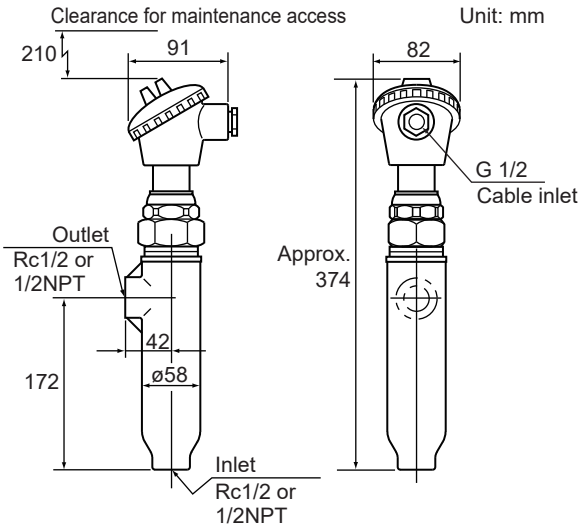
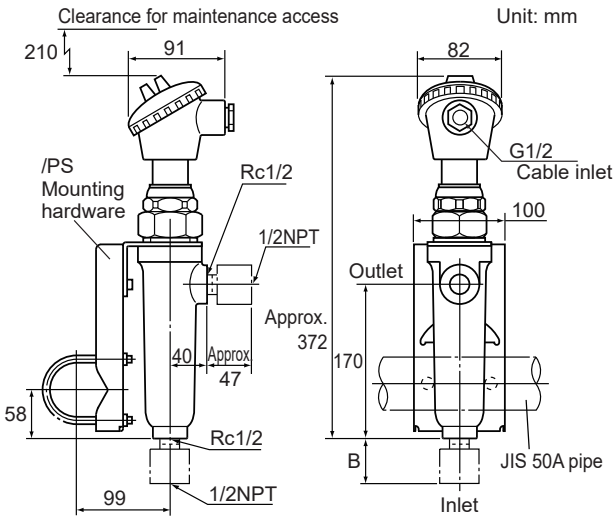
<Flow-through type>
SC210G-□-302, SC210G-□-303 *1
Screw connection (Holder Material: SCS14)

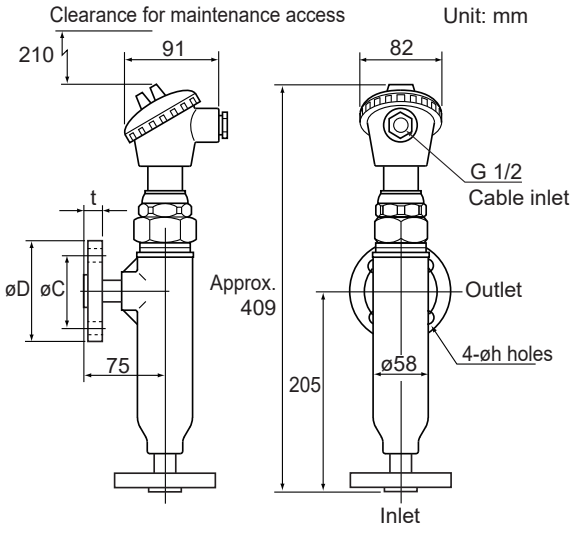


*1: Refer to p19 for Dimension and Fitting of Option (Mounting hardware (/SS)).

SC210G-□-312, SC210G-□-313
Screw connection (Holder Material: PP)



SC210G-□-304, SC210G-□-305
SC210G-□-306 *1
Flange connection (Holder Material: SCS14)



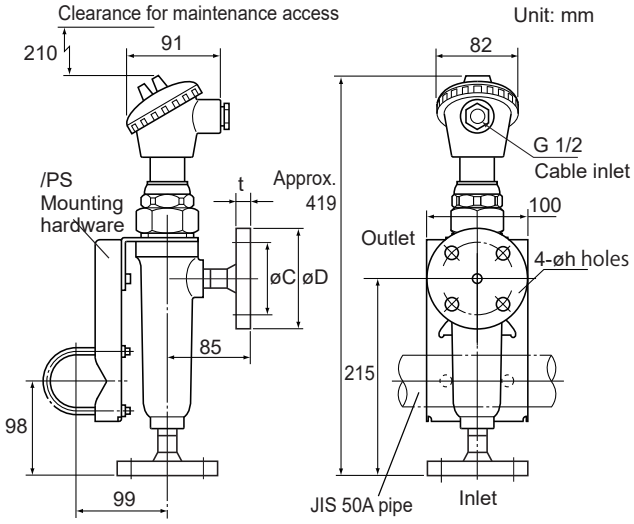
Flange rating	ØC	ØD	t	Øh
JIS 10K 15 RF	70	95	12	15
ANSI Class150 1/2 RF	60.5	88.9	11.2	15.7
JPI Class150 1/2 RF	60.3	89	10.9	16

Note: ANSI flange is serration.

*1: Refer to p19 for Dimension and Fitting of Option (Mounting hardware (/SS)).

SC210G-□-314, SC210G-□-315

Flange connection (Holder Material: PP)



Flange rating	ØC	ØD	t	Øh
JIS 10K 15 FF	70	95	12	15
ANSI Class150 1/2 FF	60.5	88.9	12	15

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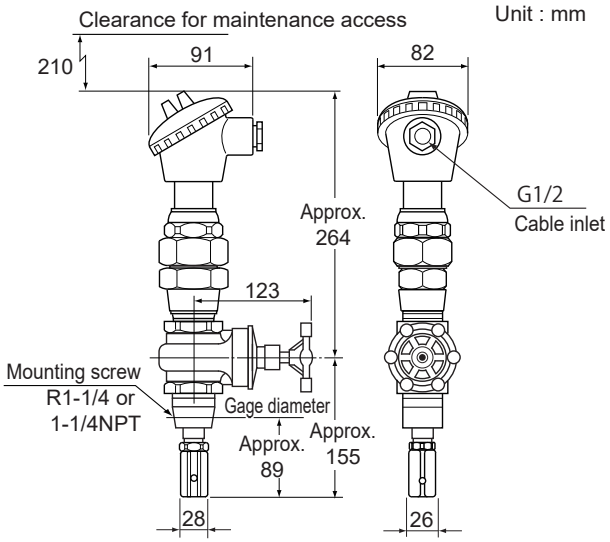
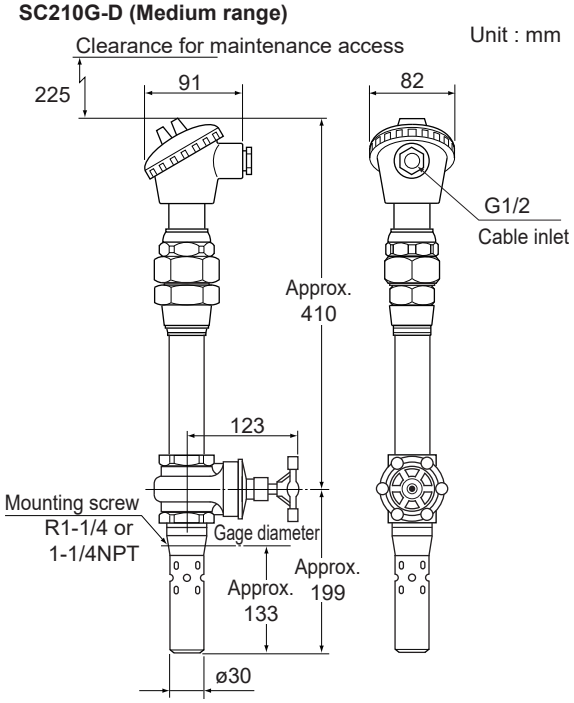
<With gate valve>
SC210G-□-402, SC210G-□-403

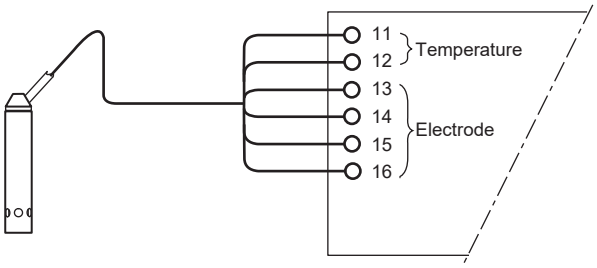
SC210G-C (Low range)



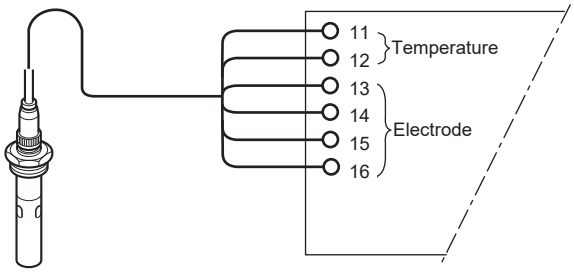
SC210G-D (Medium range)



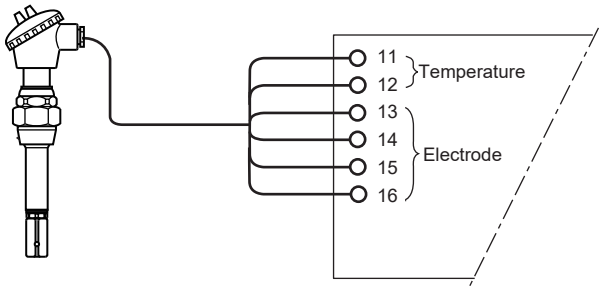
■ WIRING DIAGRAM



SC4AJ Conductivity Sensor
(two-electrode system)
Applicable Analyzer:
FLXA402, FLXA402T, SC450G, FLXA202, FLXA21



SC8SG Conductivity Detector
(two-electrode system, four-electrode system)
Applicable Analyzer:
FLXA402, FLXA402T, SC450G, FLXA202, FLXA21



SC210G Conductivity Detector
(two-electrode system)
Applicable Analyzer:
FLXA402, FLXA402T, SC450G, FLXA202, FLXA21

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■ TABLE OF CORROSION-RESISTANT MATERIALS

Note: This table shows corrosion resistances against each specified chemical only. If two or more kinds of chemical are mixed in a sample, the properties may be different from those shown in this table.

◎ Very suitable
○ Suitable
△ Slightly unsuitable
× Unusable

Example of Description
Concentration % Temperature ˚C Judgement ◎

		Holder material			Electrode material						Seal O-ring material
		Polypropylene			316 SS			Epoxy resin			PVDF			Fluoro-rubber (FKM)
Inorganic acids	Hydrochloric acid	5 20 ◎ 80 ◎			5 30 ×			5 30 ○ 10 60 ×			5 30 ◎ 1 b ×			
	Hypohlorous acid	10 20 ◎ 40 ○			14 30 ×			15 30 ×			20 40 ◎			
	Nitric acid	10 20 ◎ 80 ◎			10 30 ◎			10 30 ◎ 25 60 ×			10 100 ○			Strong acid ◎ Weak acid ◎
	Sulfuric acid	3 20 ◎ 3 100 ◎			5 30 ◎ 5 100 ×			5 20 ○ 10 60 ×			5 30 ◎ 5 100 ×			
	Phosphoric acid	30 60 ◎ 30 100 △			15 30 ◎ 5 b ◎			5 30 ◎ 25 100 ×			5 30 ◎ 5 60 ○			
Alkali	Ammonia water	15 80 ◎ 15 100 ○			10 b ◎ 28 65 ◎			10 b ◎ 28 65 ◎			10 b ◎ 28 65 ◎			
	Caustic potash				10 b ◎ 25 b ◎			10 60 ○ 25 b ×			10 b ◎ 25 b ○			
	Caustic soda	20 80 ◎ 20 100 ◎			20 30 ◎ 20 b ◎			20 60 ◎ 20 b ×			20 30 ◎ 20 b ◎			Strong alkali × Weak alkali △
	Potassium carbonate				5 b ◎ 35 b ◎			5 b ◎ 35 b ◎			5 b ◎ 35 b ○			
	Sodium carbonate	sat. 100 ◎			25 b ◎			25 b ◎			25 b ◎			
Chlorides	Zinc chloride				20 b △			20 60 ○			20 b ◎			
	Aluminum chloride				25 25 × 25 25 ×						10 b ◎ 25 b ×			
	Ammonium chloride	35 40 ◎			25 b △			25 20 ○			25 b ◎			
	Potassium chloride				sat. 60 ◎			sat. 60 ◎			sat. 60 ◎			
	Calcium chloride	sat. 80 ◎ sat. 100 ◎			25 b ○			25 b ◎			25 b ◎			
	Ferric chloride	20 40 ◎ 60 ◎			30 b ×			30 60 ○ 100 ×			30 b ◎			
	Sodium chloride 20% + C12 (saturated) (Electrolyte)	100 ◎			90 ×			90 ×			90 ◎			
	Sea water	24 ◎			24 △			60 ○			24 ◎			
Sulfates	Ammonium sulfate	5 60 ◎			20 b ◎ sat. 30			20 b ◎ sat. 30 ○			20 b ◎ sat. 30 ◎			
	Potassium sulfatc				10 b ◎			10 b ◎			10 b ◎			
	Sodium sulfate	Good corrosion resistance against all salts normally used			20 b ◎			20 b ◎			20 b ◎			
Ni-trates	Ammonium nitrate				20 b ◎			20 b ◎			20 b ◎			
	Sodium nitrate				50 b ◎			50 b ◎			50 b ◎			
Others	Sodium sulfite				20 b ◎						20 b ◎			
	Hydrogen peroxide				10 30 ◎			10 30 ◎			10 30 ◎			
	Sodium hypochlorite	10 90 ◎ 20 80 ◎			2 60 to 90 ×			2 60 to 90 ×			15 30 ◎			
	Potassium bichromate				10 b ◎			10 20 ○			10 b ◎			
	Alcohol	96 70 ◎			100 b ◎			80 60 ○			80 100 ○			
	Acetic acid	100 70 ◎			100 70 ◎			10 60 ○			10 100 ○			
	Phenol	100 20 ◎			95 30 ◎			100 20 ×			100 20 ○			
	Aromatic solvent	100 20 ×			100 25 ◎			100 20 ×			100 ○			

(Note) b: Shows temperatures up to the boiling point. PVDF: Polyvinylidene difluoride

CAUTION

Select the material of wetted parts with careful consideration of process characteristics. Inappropriate selection may cause leakage of process fluids, which greatly affects facilities. Considerable care must be taken particularly in the case of strongly corrosive process fluid such as hydrochloric acid, sulfuric acid, hydrogen sulfide, and sodium hypochlorite. If you have any questions about the wetted part construction of the product, be sure to contact Yokogawa.

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Conductivity Detectors/Sensors Inquiry Specifications

Thank you for inquiry about YOKOGAWA Conductivity Detector/Sensor. Please check (✓) the appropriate box (☐) and write down the relevant information in the underlined blanks.

1. General Items

Name of your company:_____
Person in charge :_____ Belongs to:_____(Phone No.:_____)
Name of plant :_____
Measuring point :_____
Purpose of use : ☐ Indication ☐ Record ☐ Alarm ☐ Control
Power supply :_____V AC,_____Hz

2. Measuring Conditions

(1) Liquid temperature :_____to_____, Normal_____[˚C]
(2) Liquid pressure :_____to_____, Normal_____[kPa]
(3) Flow rate :_____to_____, Normal_____[L/min.]
(4) Flow speed :_____to_____, Normal_____[m/s]
(5) Slurry or fouling components: ☐ No ☐ Yes
(6) Name of measuring liquid :_____
(7) Component of measuring liquid :_____
(8) Others :_____

3. Installing Location

(1) Ambient temperature :_____
(2) Installing location : ☐ Outdoors ☐ Indoors_____
(3) Others :_____

4. Specification Requirements

(1) Measuring Range :_____
(2) Transmission output : ☐ 4 to 20 mA DC ☐ 0 to 20 mA DC
(3) Detector/Sensor : SC4AJ ☐ 2-electrode system (0.02 cm^{-1}) ☐ 2-electrode system (0.1 cm^{-1})
SC8SG ☐ 2-electrode system (0.01 cm^{-1}) ☐ 2-electrode system (0.1 cm^{-1})
☐ 2-electrode system (10 cm^{-1}) ☐ 4-electrode system (10 cm^{-1})
SC210G ☐ 2-electrode system (0.05 cm^{-1}) ☐ 2-electrode system (5 cm^{-1})
(4) Mounting type : SC4AJ ☐ Adapter mounting ☐ Welding socket ☐ Welding clamp
SC8SG ☐ Screw-in ☐ Flange ☐ Flow-through
SC210G ☐ Screw-in ☐ Flange ☐ Flow-through
☐ Screw-in with gate valve
(5) Cable length : SC4AJ ☐ 3 m ☐ 5 m ☐ 10 m ☐ 15 m ☐ 20 m
☐ none (SA11)
SC8SG ☐ 5.5 m ☐ 10 m ☐ 20 m ☐ none (SA11)
SC210G ☐ 3 m ☐ 5 m ☐ 10 m ☐ 15 m ☐ 20 m
(6) Others :_____

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