

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 pharmaceutical markets in addition to traditional water quality measurements for standard power plant and chemical applications.



Refer to GS 12A01F01-01EN



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



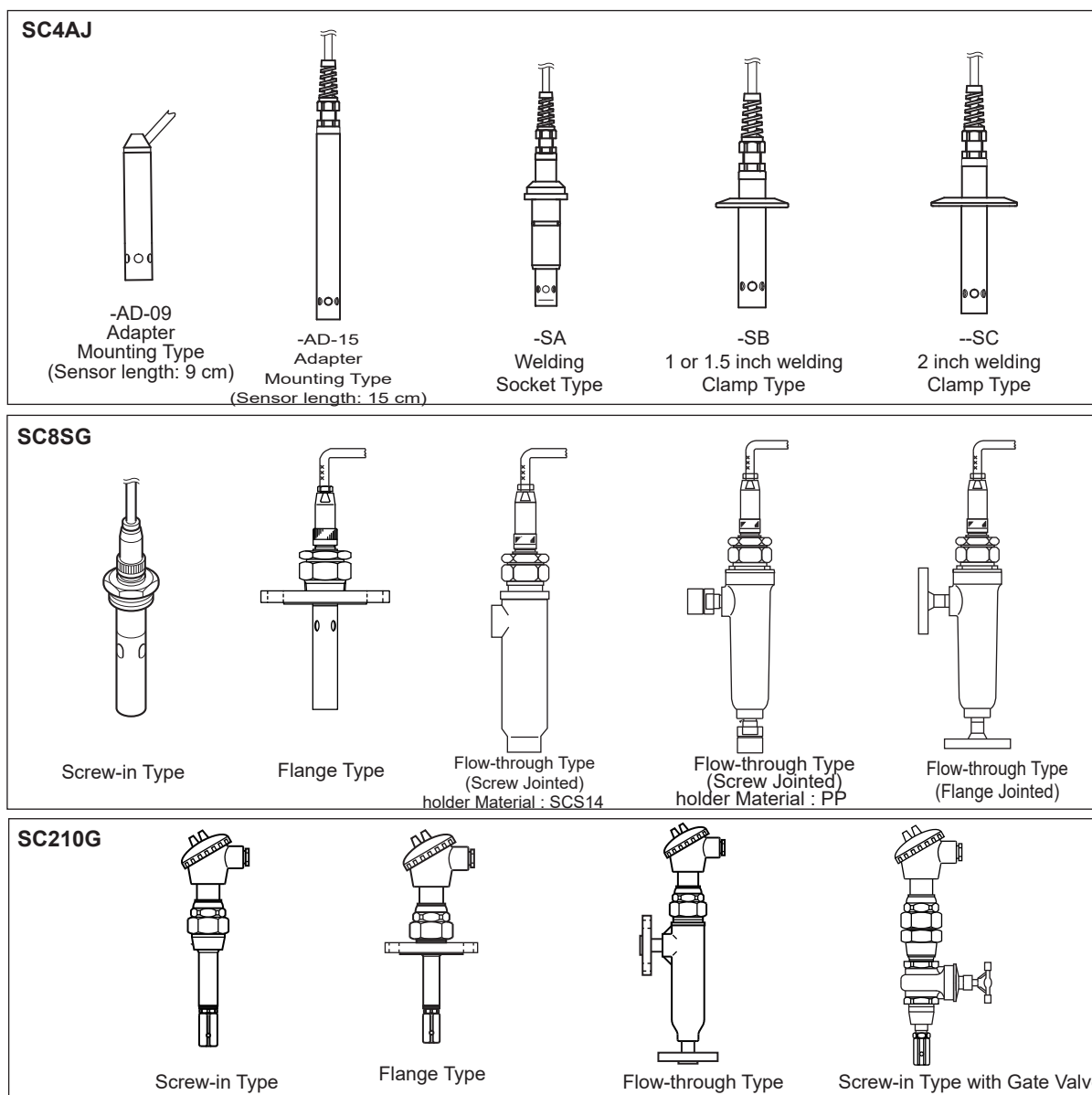
Refer to GS 12A01A02-01E



Refer to GS 12A01A03-01EN

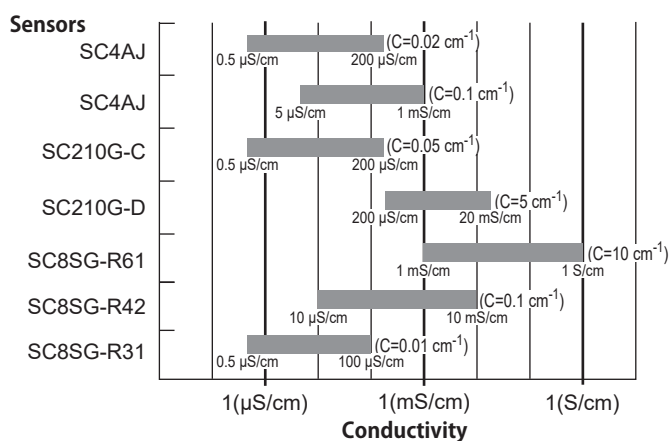
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■ Models of Conductivity Detectors/Sensors



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■ 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.

■ 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

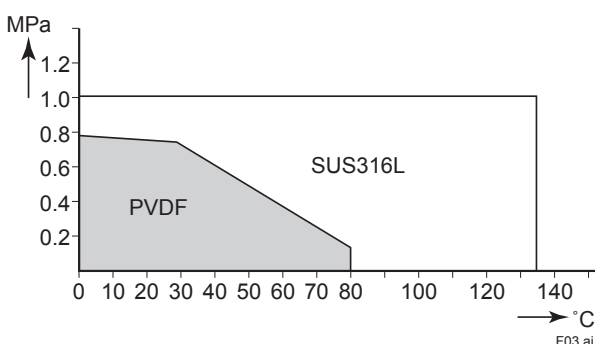


Figure1: The range of tolerance of holders (option: /PS, /PF, /RS, /RF, /SA1, /SA2, /SB1, /SB2, /SC1) for temperature and pressure

- 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 0.1 cm⁻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)

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 $\pm$ 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 μ S/cm to 0-200 μ S/cm
(Cell constant: 0.05 cm⁻¹)
0-200 μ S/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.

■ 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 EA, 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 CD, CH, or CG.

○: 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	40°C	60°C	40°C	60°C
Temperature class				
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	40°C	60°C	40°C	60°C
Temperature class				
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.

Upper limit of process temperature on the SC4AJ

Analyzer used in combination Ambient temperature Ta Temperature class	FLXA202/FLXA21		SC202S	
	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 Type of terminals	SC4AJ			SC8SG			SC210G		
	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)

■ MODEL AND SUFFIX CODES

1. SC4AJ

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

2. SC8SG

Model	Suffix Code	Option Code	Description
SC8SG	.....	.....	Conductivity detector
Measuring range	-R31 -R42 -R61	..... ..... .....	Low range; cell constant: 0.01 cm ⁻¹ Medium range; cell constant: 0.1 cm ⁻¹ High range; cell constant: 10 cm ⁻¹
Electrode configuration	-T -F	..... .....	2-electrode system (for both 0.01 cm ⁻¹ , 0.1 cm ⁻¹ , 10cm ⁻¹ cell constants) - for general measurements 4-electrode system (for 10 cm ⁻¹ cell constant only) - for countermeasures against polarization due to contamination (*1)
Construction	Screw-in type	-100 -101 -102	..... ..... .....
	Flange type	-206 -207 -208	..... ..... .....
	Flow-through type (*3)	-302 -312 -303 -313 -304 -314 -305 -315	..... ..... ..... ..... ..... ..... ..... .....
			with welding socket (*2)
			without welding socket (a welding socket [K9208BK] should be ordered separately)
			R1-1/2 material: SCS14
			JIS 10 K 50 RF Flange
			ANSI Class 150 2 RF flange (with serration)
			JPI Class 150 2 RF flange
			Rc1/2 female threaded; holder material: SCS14
			Rc1/2 female threaded; holder material: PP
			1/2NPT female threaded; holder material: SCS14
			1/2NPT female threaded; holder material: PP
			JIS 10K 15 RF flange; holder material: SCS14
			JIS 10K 15 FF flange; holder material: PP
			ANSI Class150 1/2 RF flange with serration; holder material: SCS14
			ANSI Class150 1/2 FF flange; holder material: PP
Cable length	-P1 -P2 -P3 -F1 -F2 -F3 -X1 -X2 -X3 -Y1 -Y2 -Y3 -VS	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	5.5 m (special cable supplied with detector) (pin terminals) (*4) 10 m (special cable supplied with detector) (pin terminals) (*4) 20 m (special cable supplied with detector) (pin terminals) (*4) 5.5 m (special cable supplied with detector) (fork terminal) 10 m (special cable supplied with detector) (fork terminal) 20 m (special cable supplied with detector) (fork terminal) 5.5 m (special cable supplied with detector) (M4 ring terminal) (*5) 10 m (special cable supplied with detector) (M4 ring terminal) (*5) 20 m (special cable supplied with detector) (M4 ring terminal) (*5) 5.5 m (special cable supplied with detector) (M3 ring terminal) (*6) 10 m (special cable supplied with detector) (M3 ring terminal) (*6) 20 m (special cable supplied with detector) (M3 ring terminal) (*6) Variopin connector (*7)
Style code	*A	.....	Style A
Option	/PS /SS /DG1	..... ..... .....	Stainless Steel Mounting hardware (for PP holder) Stainless Steel Mounting hardware (for SCS14 holder) 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.

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	-F	.....	fork terminals
	-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

3. SC210G

Model	Suffix Code	Option Code	Description
SC210G	.....	.....	Conductivity detector
Measuring range	-C -D	..... .....	Low range; cell constant: 0.05 cm ⁻¹ , Pt1000 Medium range; cell constant: 5 cm ⁻¹ , Pt1000
Construction	Screw-in type	-100	 R1-1/2 male
	Flange type	-103	 1-1/2NPT male
		-206	 JIS 10K 50 RF flange
	Flow-through type (*1)	-207	 ANSI Class150 2 RF flange (with serration)
		-208	 JPI Class150 2 RF flange
		-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
	With gate valve	-306	 JPI Class150 1/2 RF flange, holder material: SCS14
		-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-ELperflow (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.

Spare Parts for SC210G

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

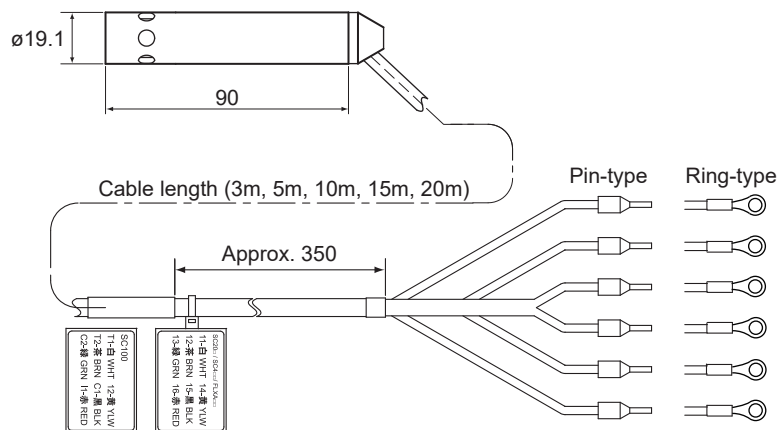
■ DIMENSIONS

1. SC4AJ

<Adapter mounting type>

SC4AJ-□-AD-09

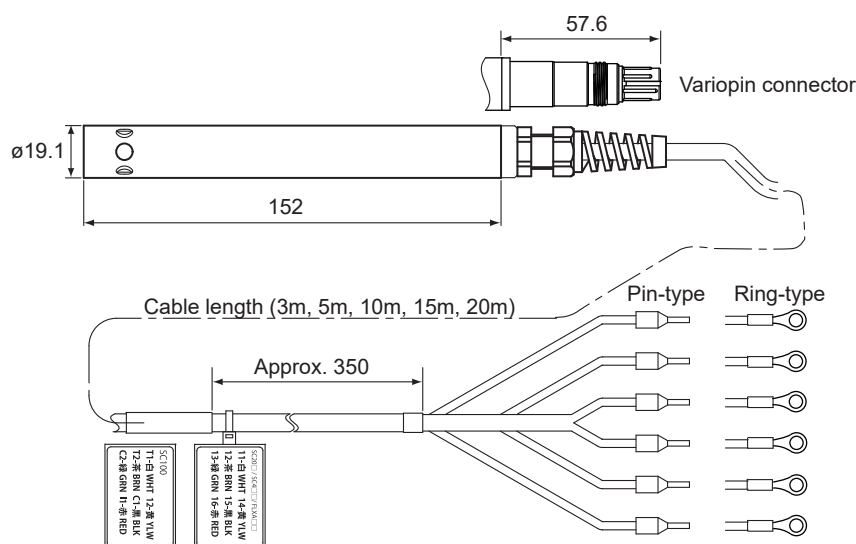
Sensor length: 09 (9 cm)



Unit: mm

SC4AJ-□-AD-15

Sensor length: 15 (15 cm)



Unit: mm

● Option: Adapter mounting type (-AD)

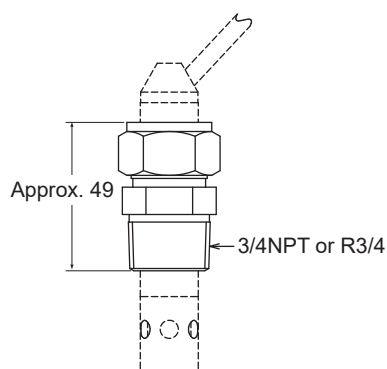
/PS (Stainless Steel)

/RS (Stainless Steel)

/PF (PVDF)

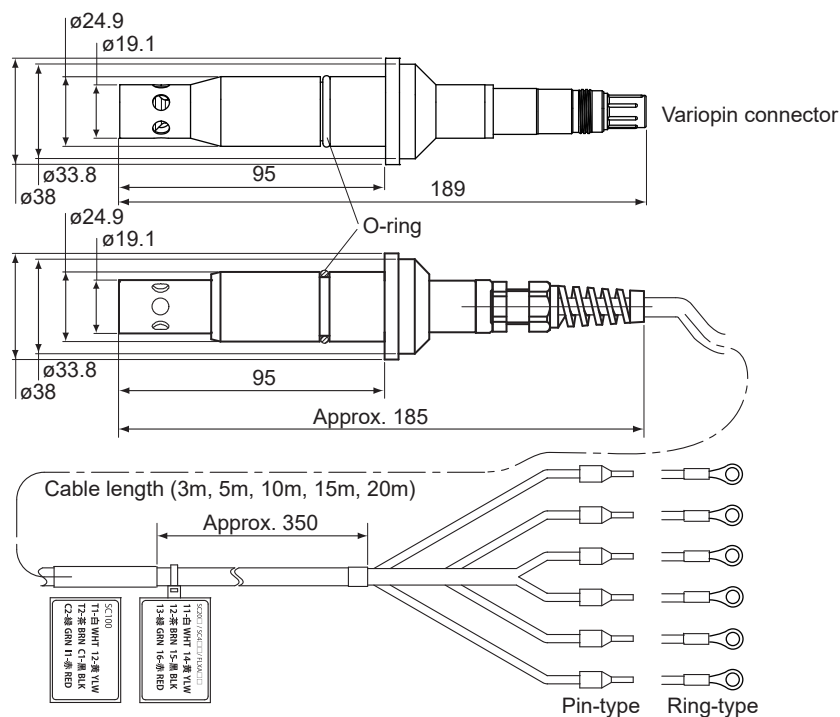
/RF (PVDF)

Unit: mm



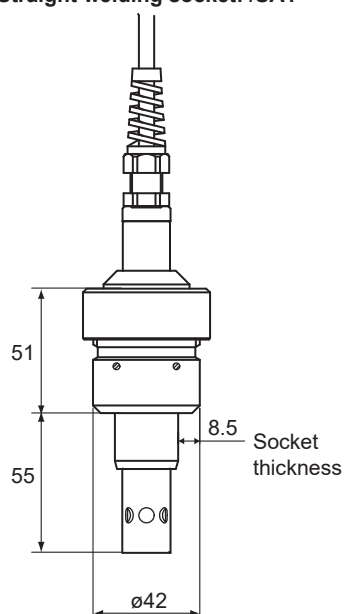
<Welding socket type>
SC4AJ-□-SA-NN

Unit: mm



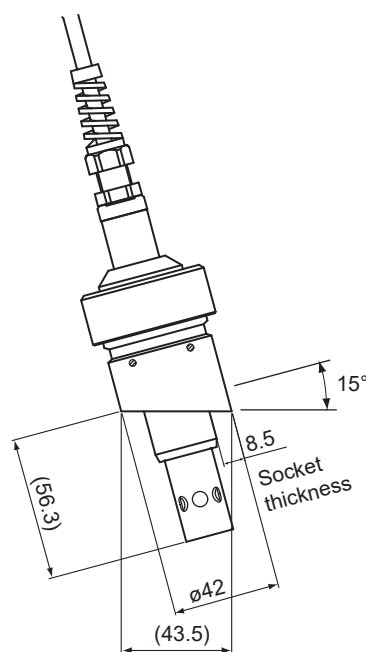
● Option: Welding socket type (-SA)

Straight welding socket: /SA1

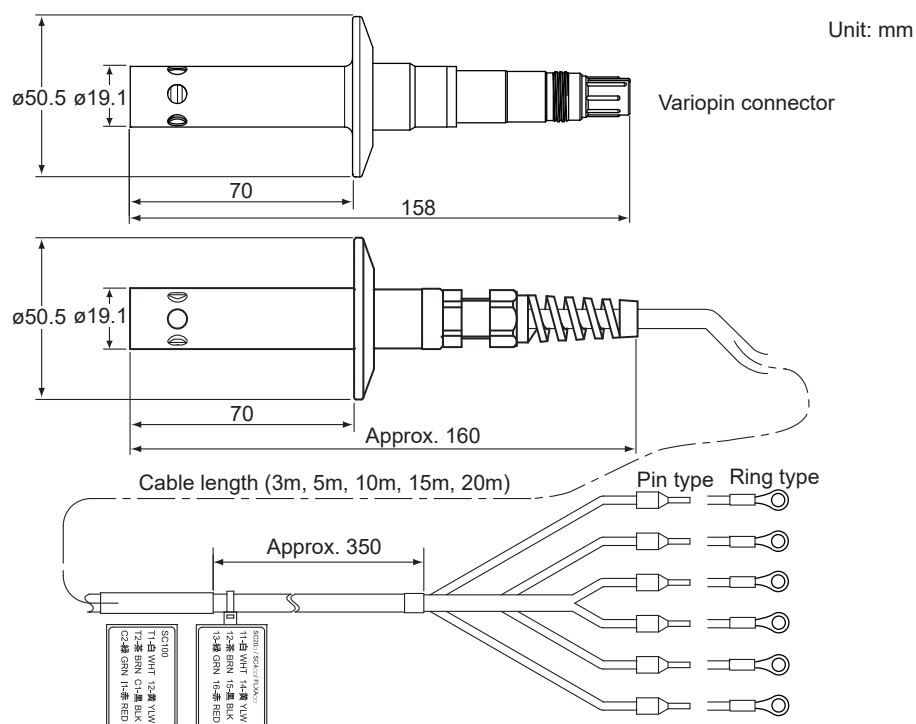


Angled welding socket: /SA2

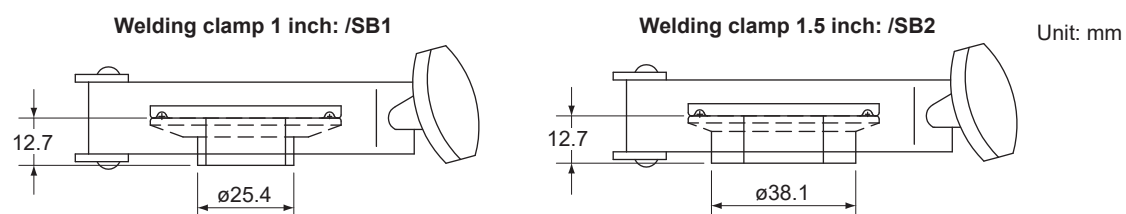
Unit: mm



<Welding clamp type>
SC4AJ-□-SB-NN

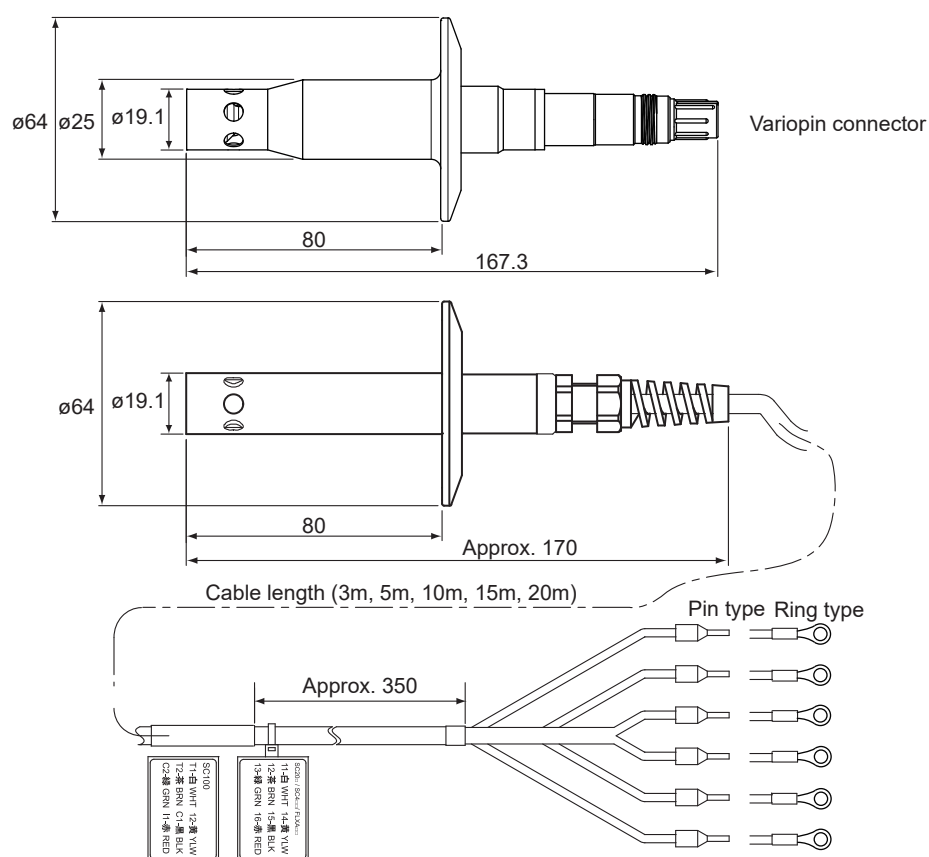


• Option: Welding clamp type (-SB)



Sensor SC4AJ-□-SC-NN

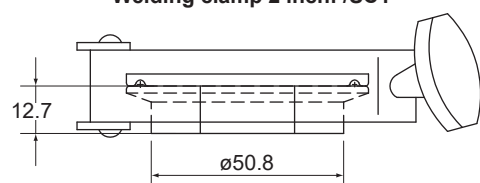
Unit: mm



- Option: Welding clamp type (-SC)

Welding clamp 2 inch: /SC1

Unit: mm

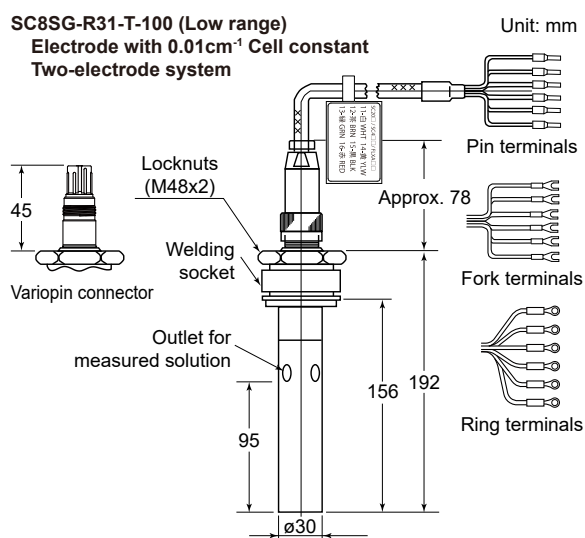


2. SC8SG

<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.

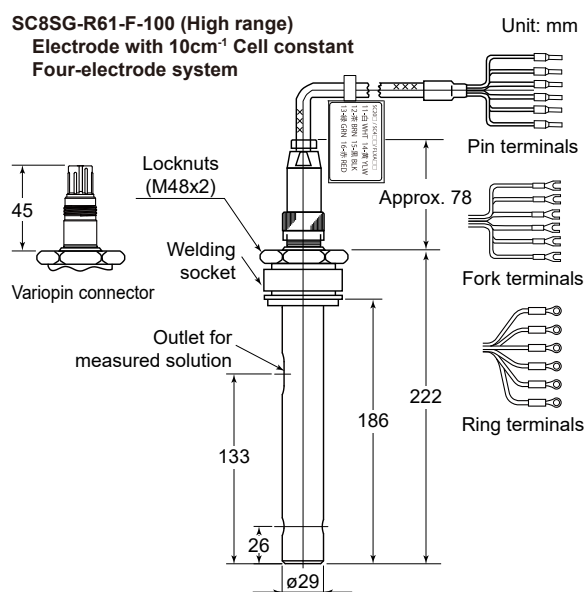
SC8SG-R31-T-100 (Low range)

Electrode with 0.01cm^{-1} Cell constant
Two-electrode system



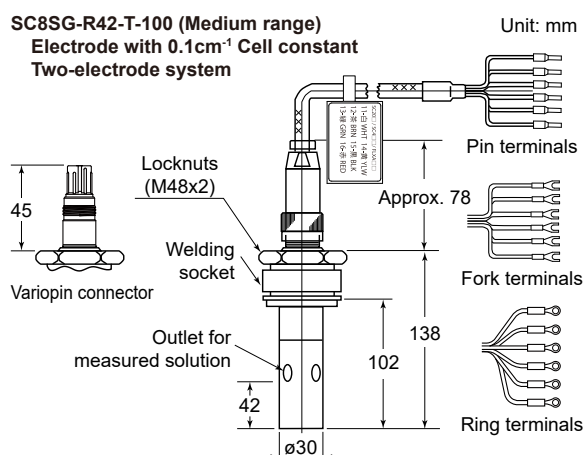
SC8SG-R61-F-100 (High range)

Electrode with 10cm^{-1} Cell constant
Four-electrode system



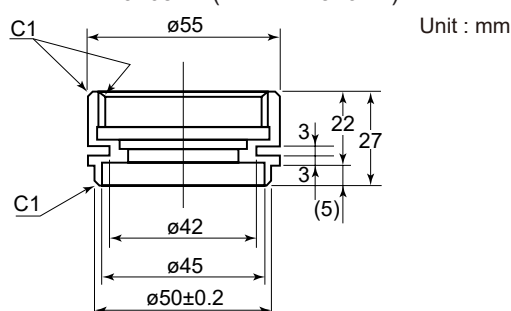
SC8SG-R42-T-100 (Medium range)

Electrode with 0.1cm^{-1} Cell constant
Two-electrode system



Welding socket

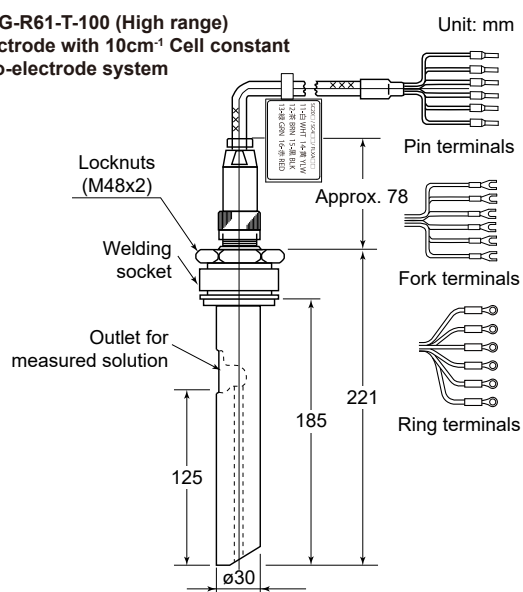
Parts No: K9208BK (Material: 316SS)



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

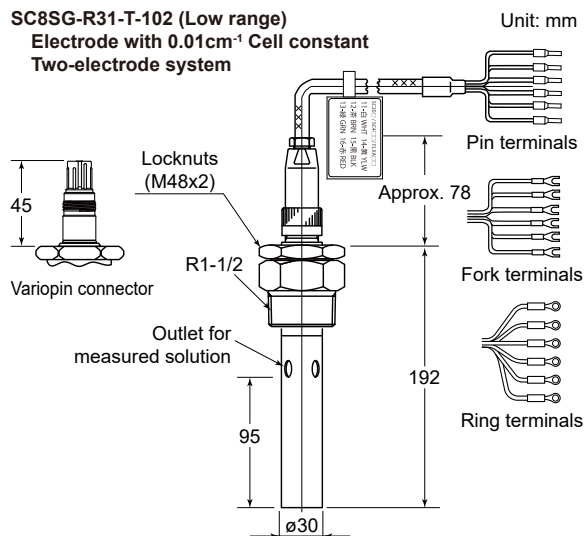
SC8SG-R61-T-100 (High range)

Electrode with 10cm^{-1} Cell constant
Two-electrode system

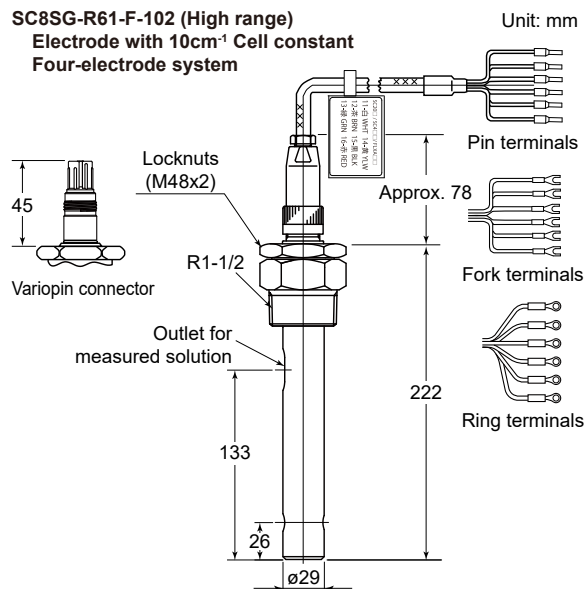


SC8SG-R31-T-102 (Low range)

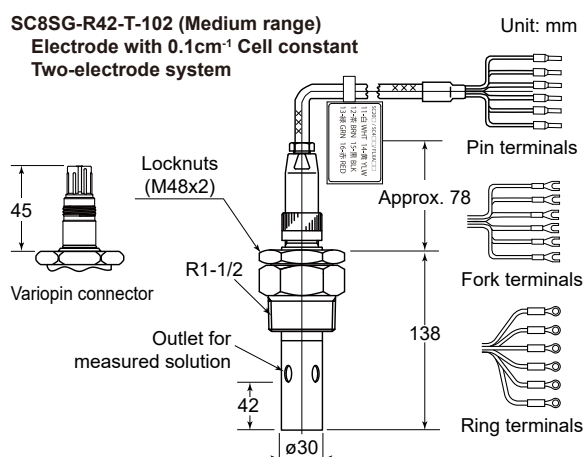
Electrode with 0.01cm^{-1} Cell constant
Two-electrode system

**SC8SG-R61-F-102 (High range)**

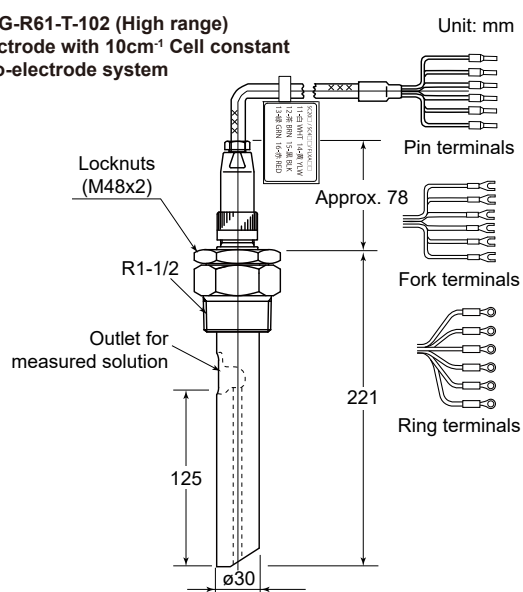
Electrode with 10cm^{-1} Cell constant
Four-electrode system

**SC8SG-R42-T-102 (Medium range)**

Electrode with 0.1cm^{-1} Cell constant
Two-electrode system

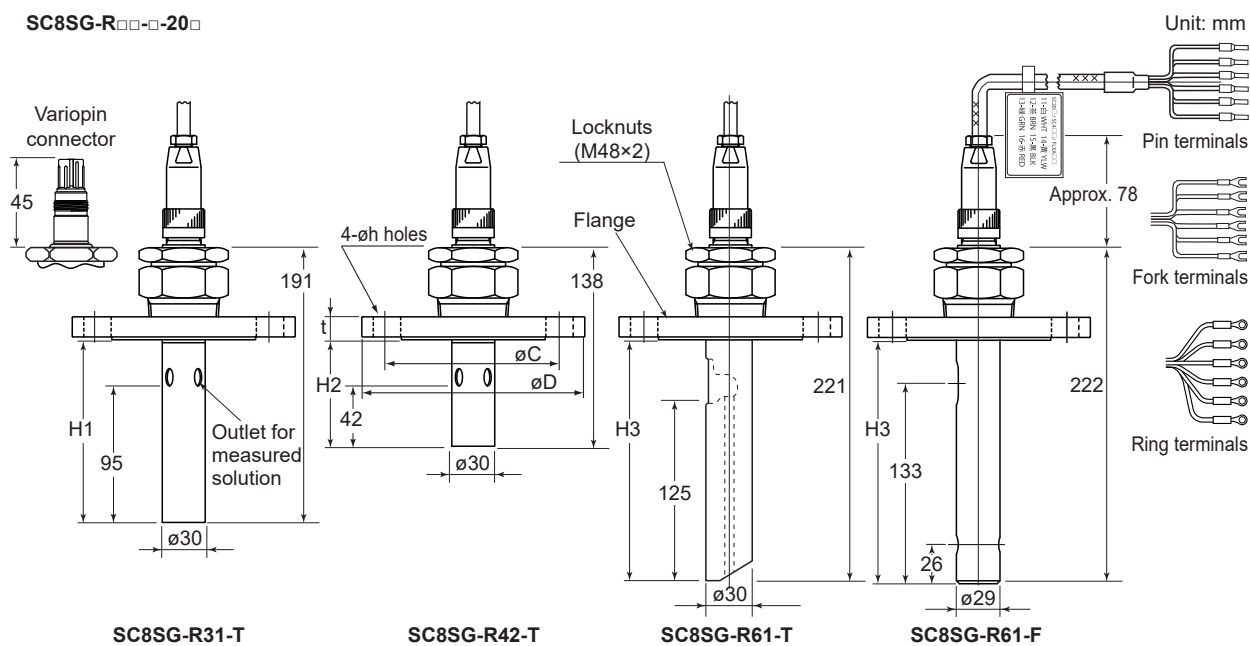
**SC8SG-R61-T-102 (High range)**

Electrode with 10cm^{-1} Cell constant
Two-electrode system



<Flange type>

SC8SG-R□□-□-20□



<Flange>

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

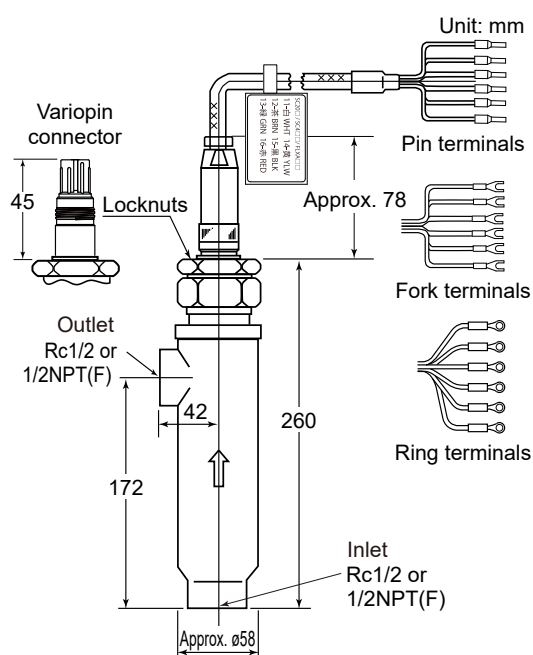
<Insertion length>

<Flow-through type>

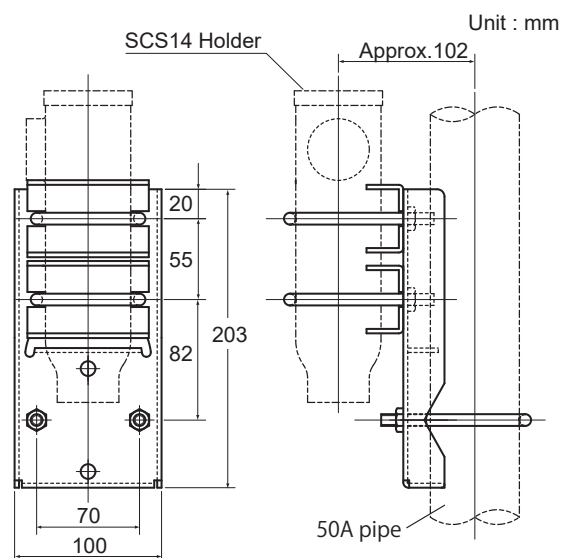
SC8SG-R□□-□-302,

SC8SG-R□□-□-303,

Screw connection (Holder Material: SCS14)



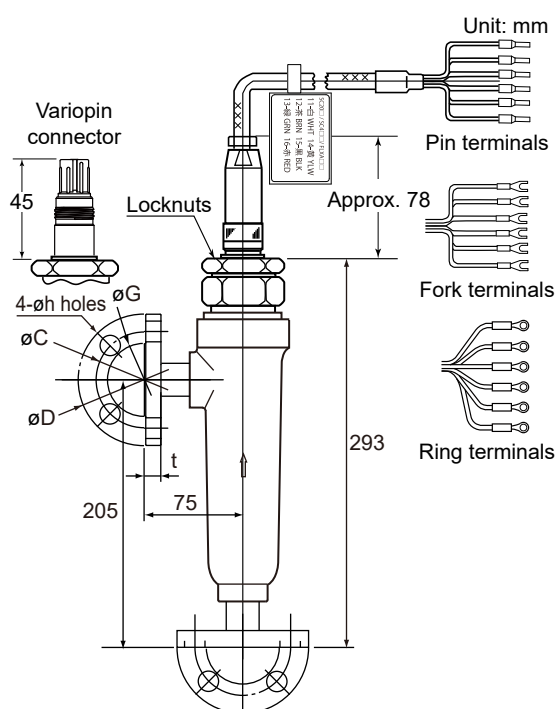
• Option: Mounting hardware (/SS)



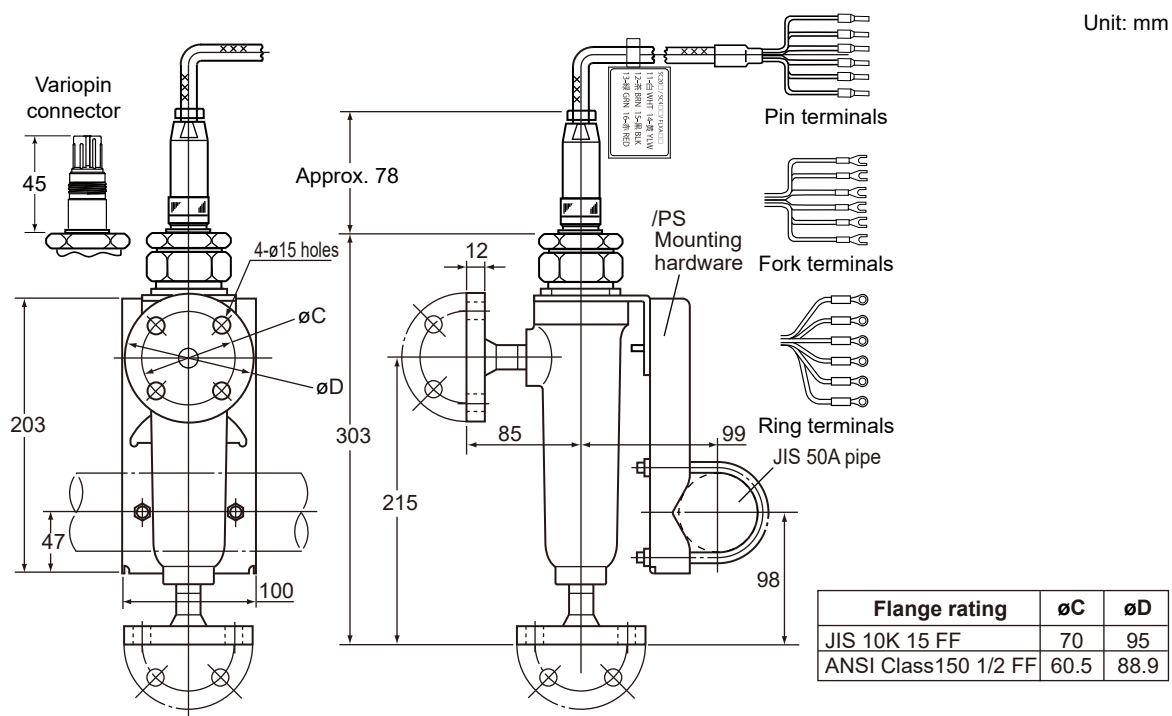
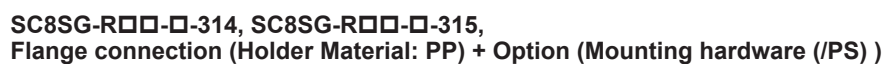
SC8SG-R□□-□-304,

SC8SG-R□□-□-305,

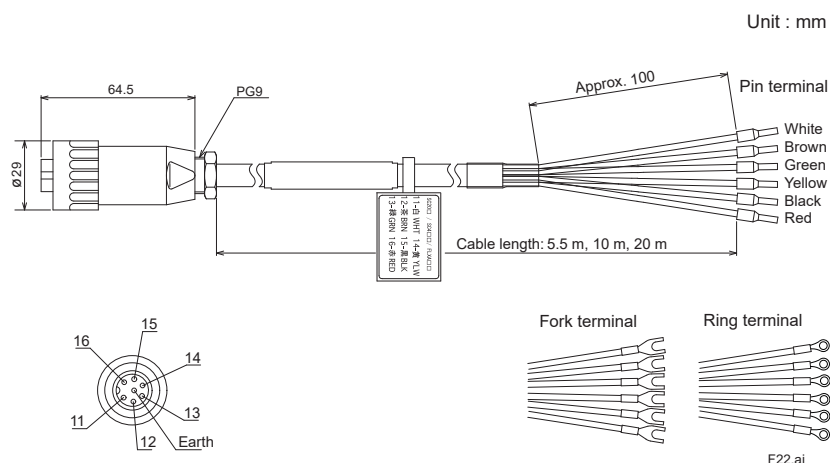
Flange connection (Holder Material: SCS14)



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

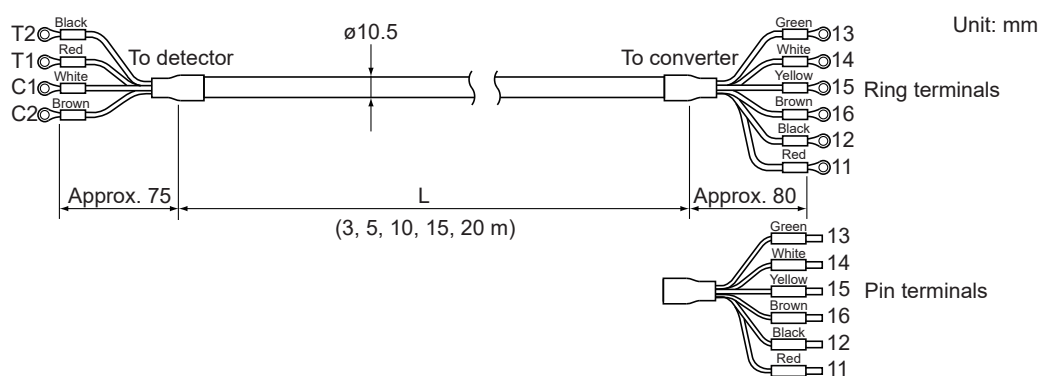


- WU41 for SC8SG

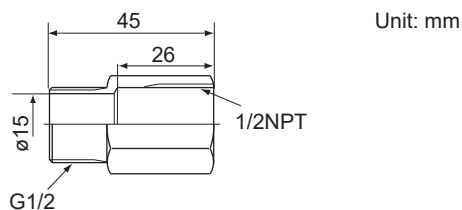


3. SC210G

- SC210G Detector - converter connection cable (accessory)

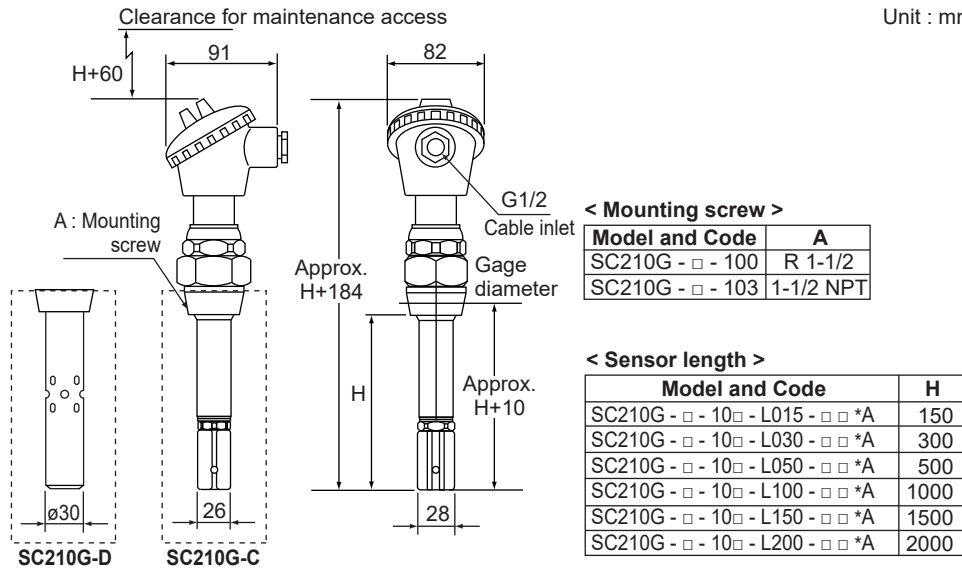


- Option: With ANSI connection adaptor (/ANSI)



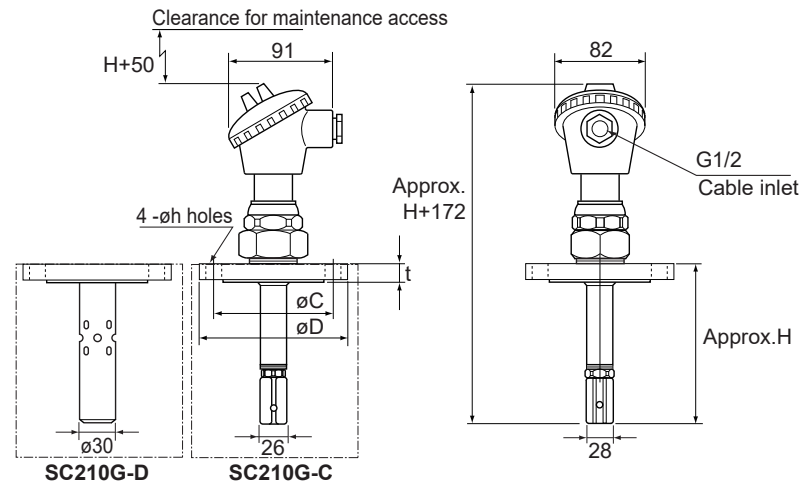
<Screw-in type>
SC210G-□-100, SC210G-□-103

Unit : mm



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

Unit: mm

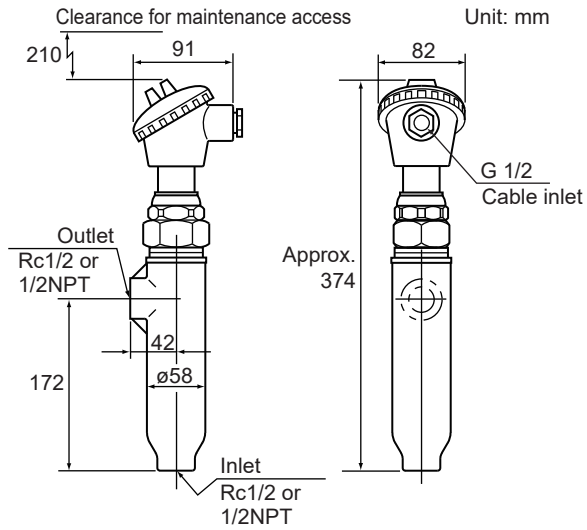


Note : ANSI flange with serrations.

<Flow-through type>

SC210G-□-302, SC210G-□-303 *1

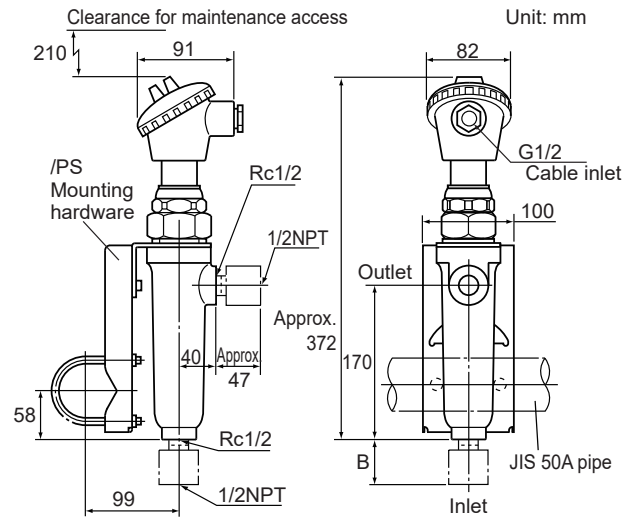
Screw connection (Holder Material: SCS14)



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

SC210G-□-312, SC210G-□-313

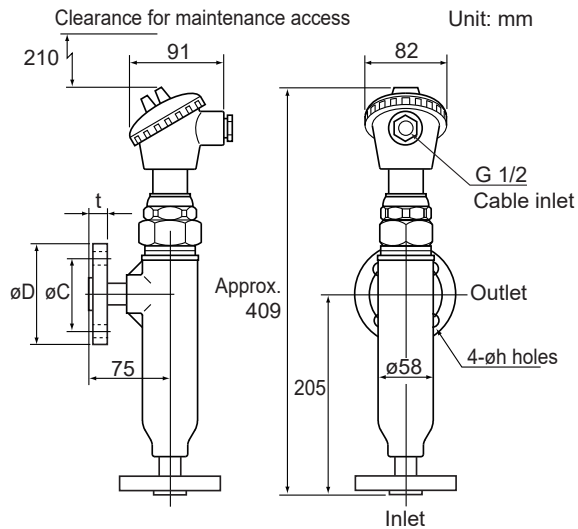
Screw connection (Holder Material: PP)



SC210G-□-304, SC210G-□-305

SC210G-□-306 *1

Flange connection (Holder Material: SCS14)



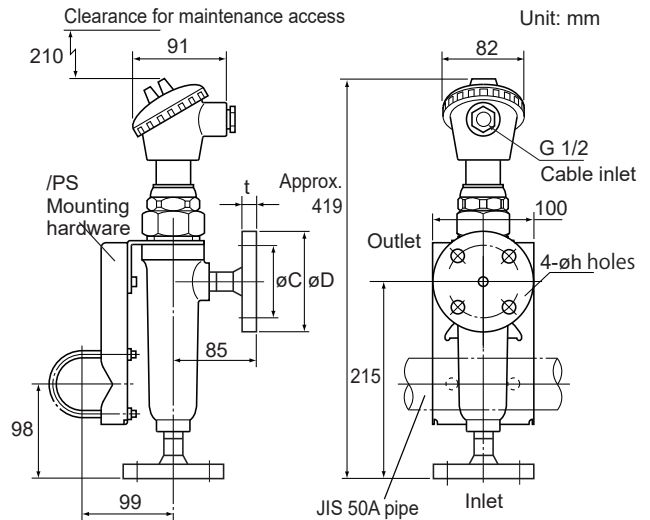
Flange rating	ϕC	ϕD	t	ϕh
JIS 10K 15 RF	70	95	12	15
ANSI Class150 1/2 RF	60.5	88.9	11.2	15.7
JPI Class150 1/2 RF	60.3	89	10.9	16

Note: ANSI flange is serration.

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

SC210G-□-314, SC210G-□-315

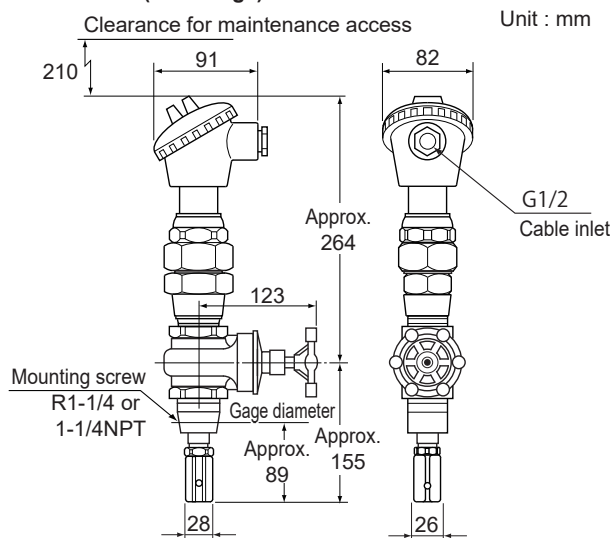
Flange connection (Holder Material: PP)



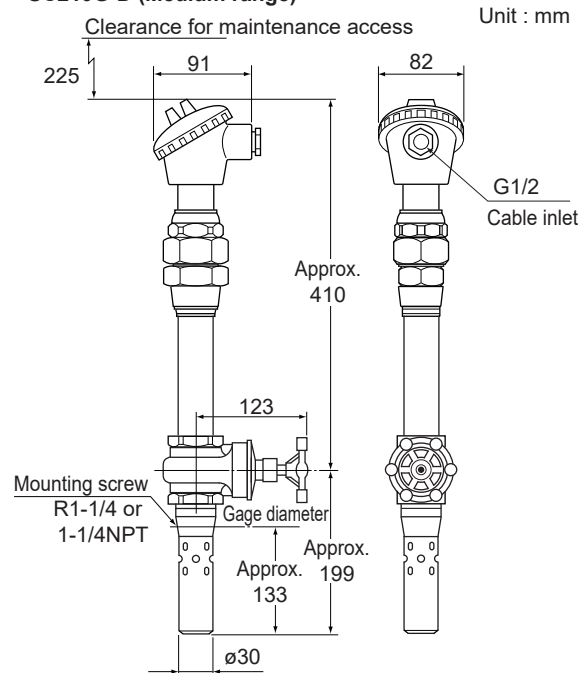
Flange rating	ϕC	ϕD	t	ϕh
JIS 10K 15 FF	70	95	12	15
ANSI Class150 1/2 FF	60.5	88.9	12	15

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

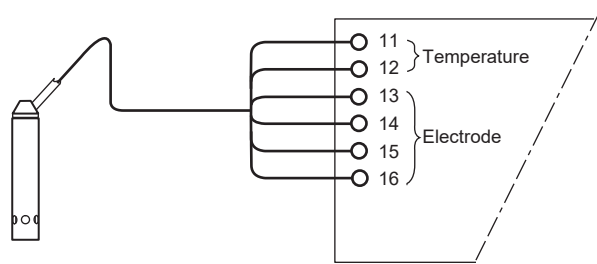
SC210G-C (Low range)



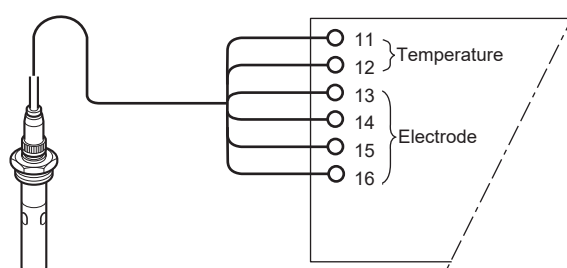
SC210G-D (Medium range)



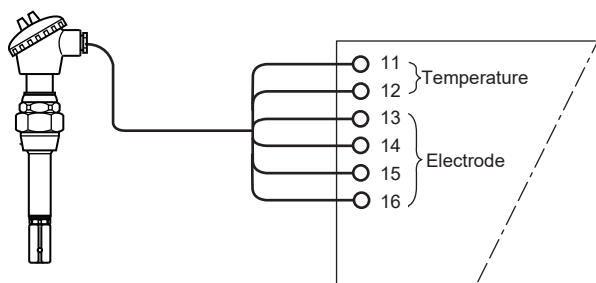
■ WIRING DIAGRAM



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

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

