

# General Specifications

## Model SC4A Conductivity Sensors and Fittings for 2-electrode Systems



Model SC4A sensors, available in a Stainless Steel or Titanium version with fixed cable or Variopin connector, in combination with WU10/WE10-cable are intended for the low conductivity applications. These sensors are designed in a convenient compact style, and can be inserted directly in process pipework using available fittings or adapters. There are several mounting possibilities, including a compression gland, giving a simple effective method of direct insertion in process pipework. The sensors are made from a combination of wetted materials approved by FDA. This makes them ideally suited for the monitoring of pure water systems used in the preparation of injectable solutions. For this kind of application, sanitary clamp mountings are most often used.

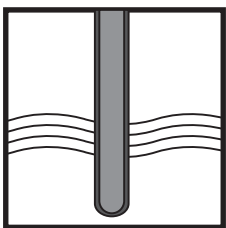
All sensors have a pre-calibrated cell constant and a built-in temperature element for automatic temperature compensation. Sensors with the Variopin connector are equipped with an ID-chip in which calibration information is stored for easy setup when connected to a SENCOM Smart Adapter model SA11-C1. For metal sensors a 3.1 material certificate is included. The sensors, except those equipped with Variopin connector, are ATEX certified for installation in zone 0 environments when connected to a certified intrinsically safe Yokogawa analyser, model SC202S or FLXA21 or a certified intrinsically safe circuit with defined output parameters.

### Features

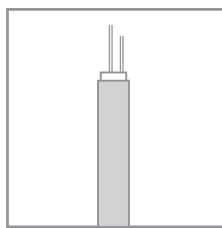
- Compact style sensor
- Built-in temperature resistor: Pt1000
- Fast temperature response
- Plug and cable form a water tight connection to IP67
- Selection of two cell constant 0.02 cm<sup>-1</sup> or 0.10 cm<sup>-1</sup>
- Sensor with 8 pin Variopin with ID chip for SENCOM SA11-C1 use
- ATEX/IECEX certified
- Direct process insertion
- Wide range of mountings
- Compatible with PR10 retractable assembly
- The sensor is polished to meet pharmaceutical requirements
- Standard quality inspection certificate with delivery of sensor
- Peek and O-rings according to FDA standard



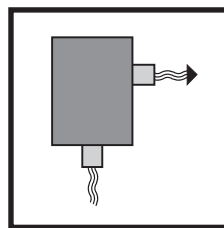
### System Configuration



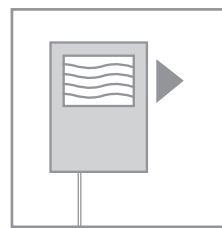
Sensors



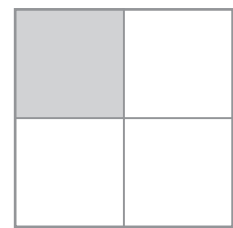
Cables



Fittings



Transmitters



Accessories

**Specifications**

**General Specifications**

**Measuring elements**

2-electrode measuring system  
Pt1000 temperature sensor

**Materials**

Cable:  
Versions with integrated cable only:  
Conductors : tinned copper 0.6 mm<sup>2</sup>  
Outside shield : braid, tinned copper, 85% coverage  
Insulator : Polyester for conductors, for colors see Section 2.4  
TPE-O for outer jacket, color black

Variopin connector:  
Contacts : Gold plated  
Material : Nickel plated brass  
Insulation : Peek, UL94-VO  
IP class : IP67

**Functional specifications (at 25°C)**

Temperature element : Pt1000 to IEC 751  
Nominal Cell Constant (C.C.) : 0.02 cm<sup>-1</sup> or 0.1 cm<sup>-1</sup>

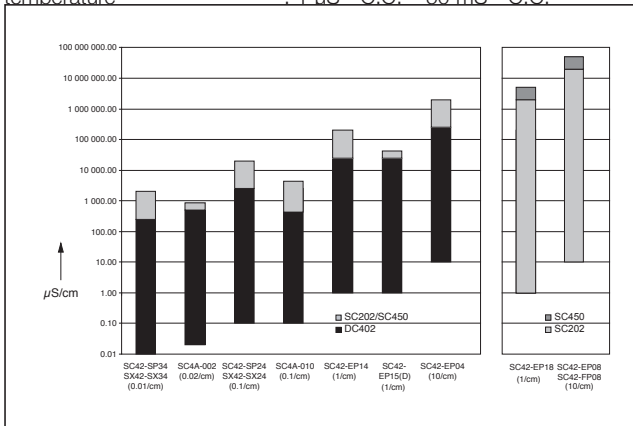
**Note:** The SC4A temperature sensor is designed for measurement compensation and for indication. It is **NOT** designed for process temperature control.

**Dynamic specifications**

Response time temp. t<sub>90</sub> : < 1 min.

**Operating range**

Conductivity at actual process temperature : 1 µS \* C.C. – 50 mS \* C.C.



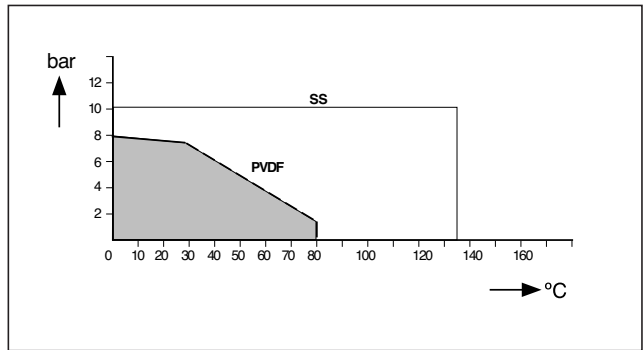
**Fig. 1 Measuring range of conductivity sensors**

Process temperature SS & Titanium type : 0°C to 110°C (32°F to 230°F)  
: 135°C (275°F) for a short period of time during sterilization.

Process temperature in combination with PVDF fitting (option /PF) : 0°C to 80°C (32°F to 176°F)

Process pressure : 0 to 10 bar (0 to 142 PSIG)  
Stainless Steel & Titanium type

Process Pressure in combination with PVDF fitting: See Fig. 2




**Fig. 2 Pressure versus temperature**

**Process/temperature relationship**

Cable length for  
SC4A with fixed cable or  
SC4A with Variopin directly conn. to Flexa analyzer : max. 60 meter with WU10/WE10 (possibly in combination with WF10 cable and BA10 junction box)  
For suffix -VS combined with SA11-C1 : 3 meter WE10 cable (as option) combined with SA11-C1 Smart Adapter  
SA11-C1 Smart Adapter : Directly connected to the analyzer using a WU11 cable up to 100 meters or Connected to a BA11 connection box using WU11 cable upto 100 m. The BA11 connection box is connected to the analyzer using a WU11 cable up to 100m.

**Regulatory standards (only for SC4A with fixed cable)**

- ATEX	: Directive 2014/34/EU by applying: EN 60079-0 EN 60079-11 EN 60079-26
Certificate no.	: DEKRA 14ATEX0074 X  II 1 G Ex ia IIC T4... T6 Ga
- IECEx Applying standards	: IEC 60079-0 : IEC 60079-11 : IEC 60079-26
Certificate no.	: IECEx DEK 14.0032X Ex ia IIC T4...T6 Ga
Conformity	: EAC (Eurasia) TS (Taiwan)

**- Electrical data for ATEX/IECEx**

: For sensor input circuit connected to  
A certified intrinsically safe circuit  
with the following maximum values:  
 $U_i = 14.4 \text{ V}$ ;  $I_i = 116.5 \text{ mA}$ ;  $P_i = 0.342 \text{ W}$   
or  
Certified intrinsically safe Yokogawa  
Contact  
Conductivity transmitter Model  
FLXA21 series or  
Model SC202S series.  
The effective internal capacitance  $C_i$   
and the effective internal inductance  
 $L_i$  of the sensor depends only upon  
the properties and length of the  
integral cable.


**Special conditions (X)**

: T6 for Tamb. -30°C to 40°C  
T5 for Tamb. -30°C to 95°C  
T4 for Tamb. -30°C to 130°C



Impact on the product shall be  
avoided. Electrostatic charges on the  
enclosure shall be avoided.  
From the safety point of view the  
circuits shall be assumed to be  
connected to earth.

**Regulatory standards (all types)**

<b>CE</b>	: Decision 768/2008/EC 
- Pressure Applying article	: Directive 2014/68/EU : 4.3 (Sound Engineering Practice)
- RoHS2 Applying category	: Directive 2011/65/EU : 9 (Industrial monitoring and control instruments)

**Shipping details**

Package size (LxWxH)	: 220 x 220 x 90 mm (8.7 x 8.7 x 3.6 inch)
Package weight	: 0.5 to 1.7 kg (1.1 to 3.8 lbs), depends on sensor type and cable length

**Environmental conditions**

Storage temperature	: -30°C to 50°C (-22°F to 122°F)
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## Specifications SC4A-AD

### General Specifications

#### Materials Wetted Parts

Body & electrodes	: Stainless steel AISI 316L or Titanium grade 2 or 3
O-ring	: EPDM FDA
Mounting adapter	: PVDF or Stainless steel AISI 316L
Insulation	: PEEK (Polyether Ether Ketone)
Surface Roughness	: 0.8µm (R432)

#### Operating Specifications (Sensor)

Measuring system	: 2-electrode (4-wire)
Maximum pressure	: 10 bar (142 PSIG)
Maximum temperature	: 110°C (230 °F)
Sterilize	: At 135°C (275 °F)

### Model and Suffix codes

Model	Suffix	Option	Description
SC4A*			19 mm conductivity sensor
	-T		Titanium
	-S		Stainless steel 316L (Sterilizable acc. EHEDG test)
Fitting-type	-AD		For adapter mounting
Sensor length	-09		9 cm (note 1)
	-15		15 cm
Cellconstant	-002		0.02/cm
	-010		0.1/cm
Cable length	-03		3 mtr
	-05		5 mtr
	-10		10 mtr
	-15		15 mtr
	-20		20 mtr
	-VS		No Cable; Variopin connector with SENCOM ID-chip (note 2)
	-T1		Pt1000
AD only		/PS	3/4"NPT Stainless Steel adapter
		/PF	3/4"NPT PVDF adapter
(option /PS required)		/FF	Stainless Steel flow fitting

\* 3.1 Material certificate according to EN 10024 is standard delivered with this sensor.

Note 1: Suffix -AD-09 not available with VS  
Note 2: Suffix -VS not ATEX/ IECEx certified

### Spare parts SC4A-AD

#### Adapters SC4A-\*-AD sensor

Part no.	Description	Process conn.	Material	Quantity
K1542DF	/PS	3/4" NPT adapter	Stainless Steel	1
K1542CW	/PF	3/4" NPT adapter	PVDF	1
K1598AC	/FF	Flow fitting	Stainless Steel	1

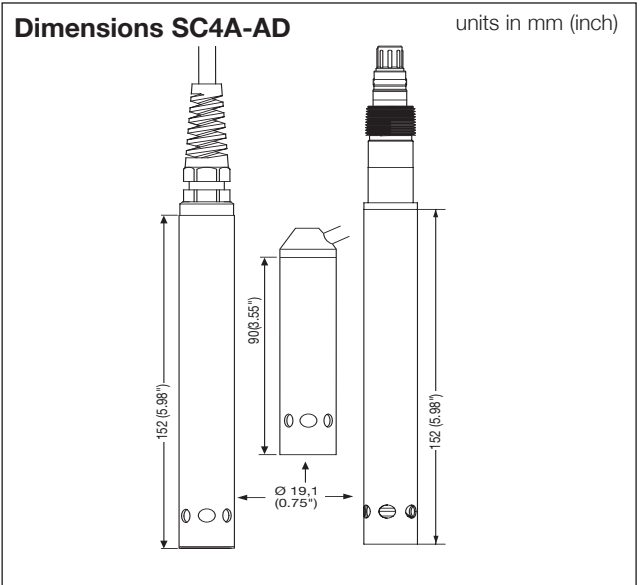


Fig. 3 SC4A-AD-15 / SC4A-AD-09

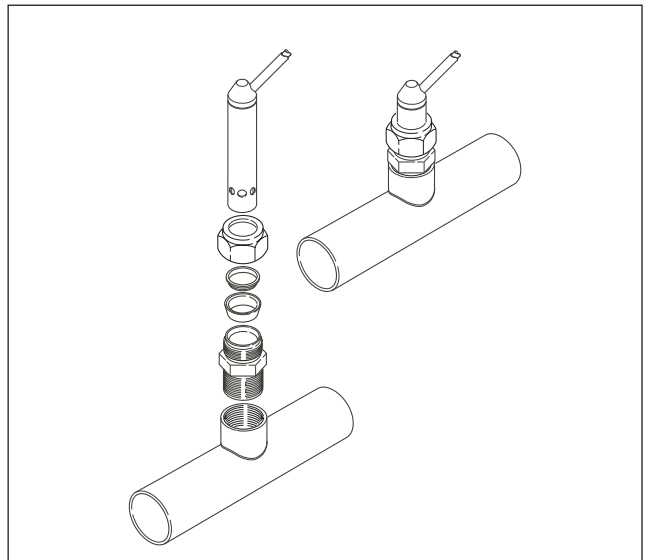


Fig. 4 Mounted sensor with the option /PF and /PS

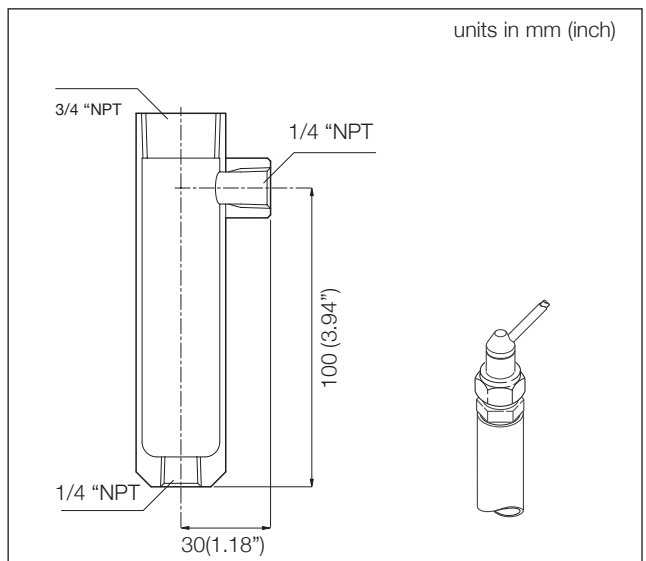


Fig. 5 Dimensional drawing /FF with the option /PS

### Specifications SC4A-SA/SB/SC

#### General Specifications

The SC4A-E is a conductivity sensor made of below materials with full traceability and supporting documents.

- EPDM O-ring (21 CFR 177.2600)
- SS is 1.4435
- Double O-ring construction (EPDM 21 CFR 177.2450)
- Virgin PEEK isolator (21 CFR 177.2415)
- Surface roughness Ra < 0.5µm (R416)
- Tested for sterilizability against EHEDG procedure
- 5% accuracy for the Cell constant

#### Materials Wetted Parts

- Body & electrodes : Stainless steel AISI 316L (1.4435)
- O-ring : EPDM, FDA migration tested 21 CFR 177.2600
- Mounting adapter : Stainless steel AISI 316L Tri-clamp according to ISO 2852-1993
- Insulation : PEEK (Polyether Ether Ketone) FDA migration tested 21 CFR 177.2415
- Surface Roughness : 0.5µm

#### Operating Specifications (Sensor)

- Measuring system : 2-electrode, 4-wire
- Maximum pressure : 10 bar (142 PSIG)
- Maximum temperature : 110°C (230 °F)
- Sterilize : At 135°C (275 °F)

#### Operating Specifications options /SB1, /SB2, /SA1, /SA2, /SC1

- Stainless Steel
- Maximum pressure : 10 bar (142 gpsi)
- Maximum temperature : 135°C (275°F)

#### Model and Suffix codes

Model Code	Suffix Code	Option Code	Description
SC4A			19 mm conductivity sensor
	-E		with EPDM FDA O-ring
fitting-type	-SA		25 mm port
	-SB		1-1½" tri-clamp
	-SC		2" tri-clamp
cellconstant	-002		0.02/cm
	-010		0.1/cm
connection type	-03		Fixed cable with wirepins, 3 m
	-05		Fixed cable with wirepins, 5 m
	-10		Fixed cable with wirepins, 10 m
	-15		Fixed cable with wirepins, 15 m
	-20		Fixed cable with wirepins, 20 m
	-VS		No Cable; Variopin connector with SENCOM ID-chip
	-T1		Pt1000

\* 3.1 Material certificate according to EN 10024 is standard delivered with this sensor.

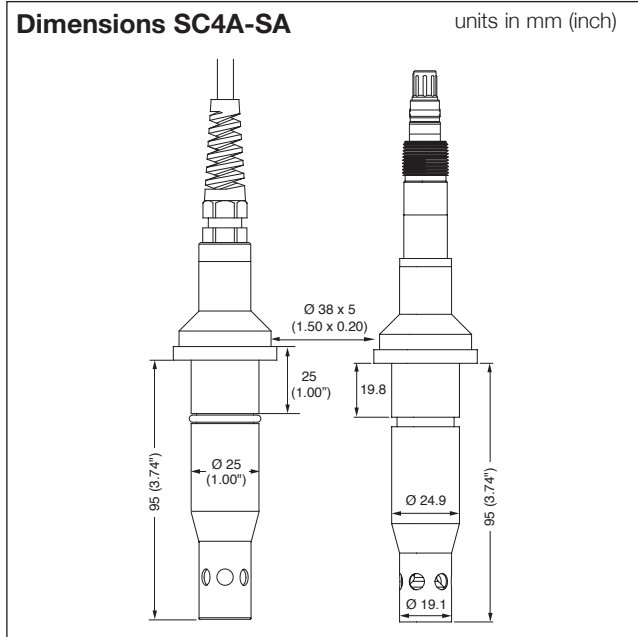


Figure 6. Sensor SC4A-SA

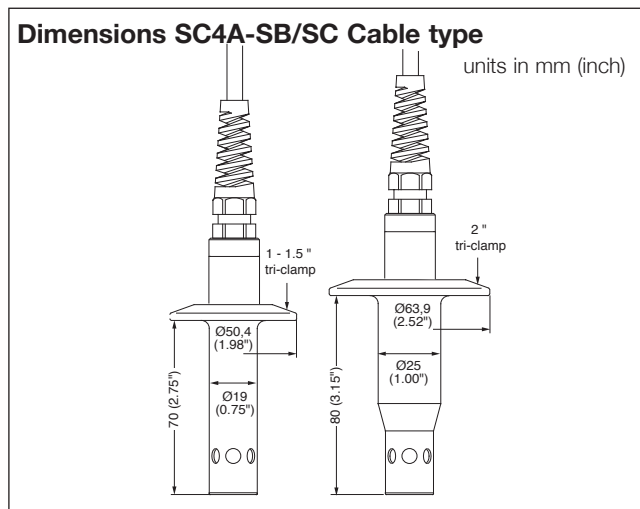


Figure 7. Sensor SC4A-SB/SC

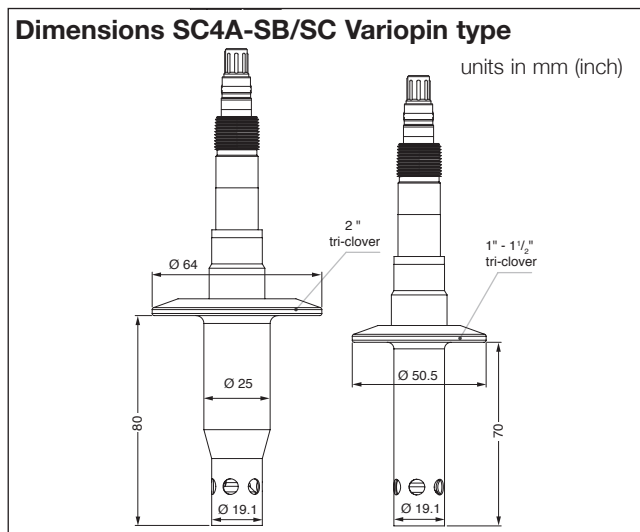


Figure 8. Sensor SC4A-SB/SC -VS type

## Installation SC4A-SA/SB/SC

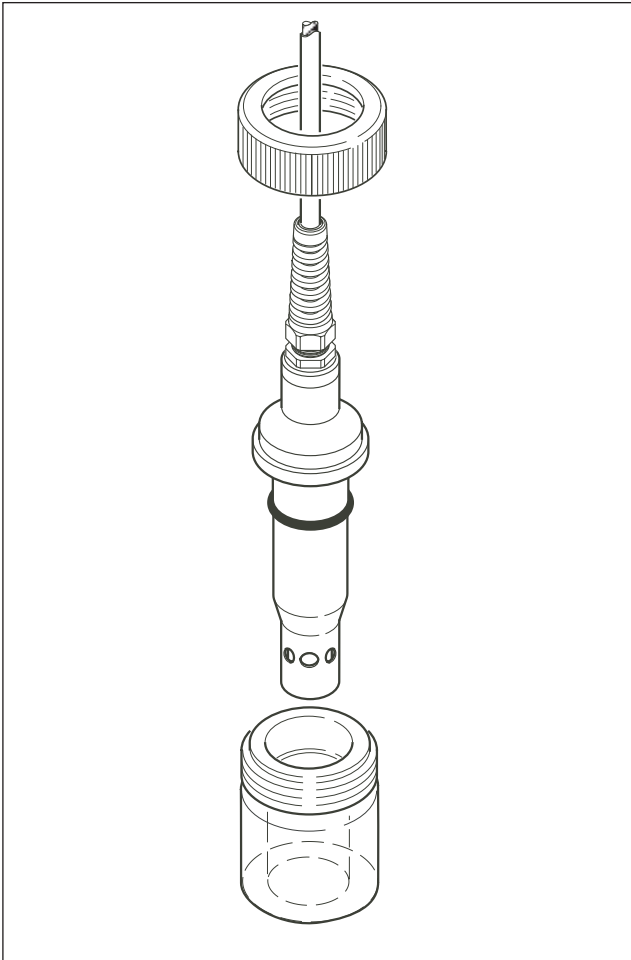


Figure 9. Mounted Sensor SC4A -SA

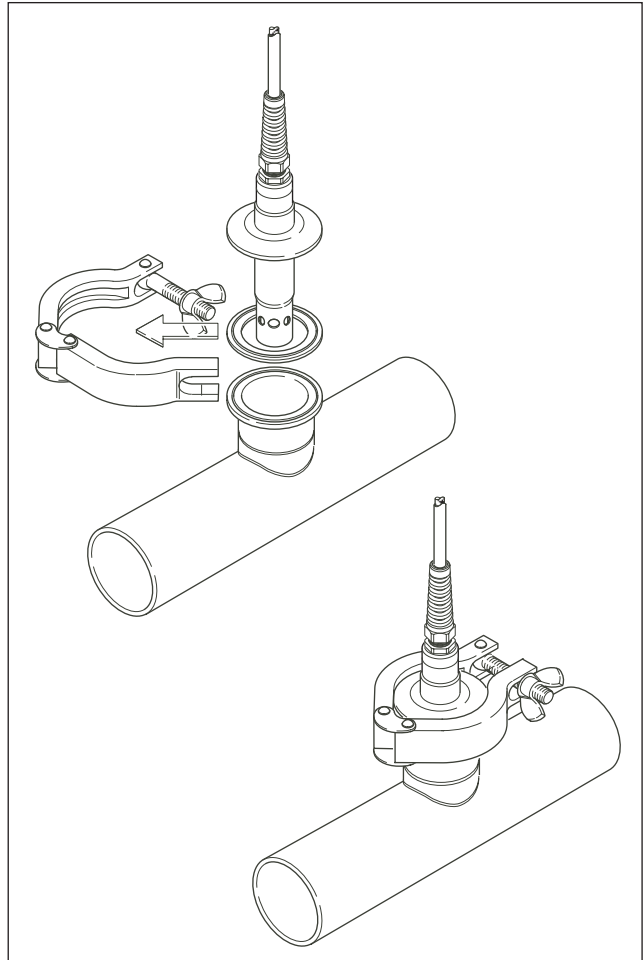


Figure 10. Mounting example

### Adapters SC4A-E-SA sensor

Part number	Description	Process connection	Material	Quantity
K1542FA	/SA1	Straight welding socket	Stainless steel	1
K1542FB	/SA2	Angled welding socket	Stainless steel	1

### Spare parts for adapters SC4A-E-SA sensor

Part number	Description		Quantity
K1520EJ	Straight weld-in adapter without mounting nut, Stainless Steel		1
K1520EK	Angled weld-in adapter without mounting nut, Stainless Steel		1

### Spare parts for SC4A-E-SA sensor

Part number	Description		Quantity
K1542DL	O-ring set, EPDM FDA, 20.3 x 2.62		3
K1542DK	O-ring set, Viton, 20.3 x 2.62		3

### Adapters SC4A-E-SB sensor

Part number	Description	Process connection	Material	Quantity
K1542FC	/SB1	Tri-clamp 1"	Stainless Steel	1
K1542FF	/SB2	Tri-clamp 1½"	Stainless Steel	1

### Spare parts for adapters SC4A-E-SB sensor

Part number	Description		Quantity
K1500BN	Clamp seal ring, EPDM FDA, 1" ~ 1½"		1
K1542DG	Clamp seal ring, Viton, 1"		3
K1542DH	Clamp seal ring, Viton, 1½"		3

### Adapters SC4A-E-SC sensor

Part number	Description	Process connection	Material	Quantity
K1542FE	/SC1	Tri-clamp 2"	Stainless Steel	1

### Spare parts for adapters SC4A-E-SC sensor

Part number	Description		Quantity
K1500BP	Clamp seal ring, EPDM FDA, 2"		1
K1542DJ	Clamp seal ring, Viton, 2"		3

## Specifications SC4A-PR

### General Specifications

#### Materials Wetted Parts

Body & electrodes	: Stainless steel AISI 316L or Titanium grade 2 or 3
O-ring	: Viton
Mounting adapter	: Retractable fitting
Insulations	: PEEK (Polyether Ether Ketone)

#### Operating Specifications (Sensor)

Measuring system	: 2-electrode
Maximum pressure	: 10 bar (142 PSig)
Maximum temperature	: 110°C (230 °F)
Sterilize	: At 135°C (275 °F)
Surface Roughness	: 0.8µm (R432)

### Model and Suffix codes

Model Code	Suffix code	Option	Description
SC4A*			19 mm conductivity sensor
	-T		Titanium
	-S		Stainless steel
Fitting-type	-PR		For retractable mounting
Always	-NN		fixed length
Cellconstant	-002		0.02/cm
	-010		0.1/cm
Cable length	-03		3 meter
	-05		5 meter
	-10		10 meter
	-15		15 meter
	-20		20 meter
	-VS		No cable; Variopin with Sencom ID-chip
	-T1		Pt1000

\* 3.1 Material certificate according to EN 10024 is standard delivered with this sensor.

**Note:** -VS not ATEX /IECEX certified

## Installation SC4A\*-PR

The installation of the SC4A\*-PR sensor is done using the Model PR10 retractable fitting.

The mounting procedure of the sensor is explained in the Instruction Manual of this fitting.

#### Spare parts for SC4A\*-PR sensor

Part number	Description	Quantity
K1500BE	O-ring set, Viton, 15.6 x 1.78	10
K1500ED	O-ring set, Kalrez, 15.6 x 1.78	1

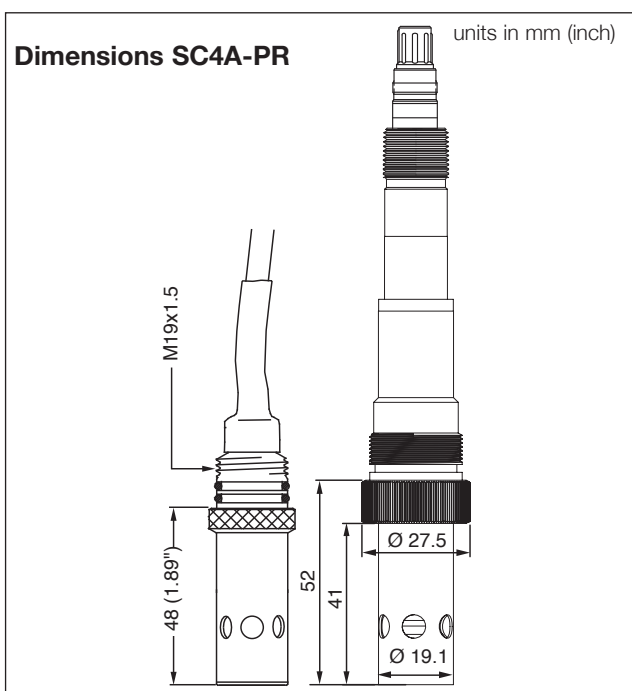


Figure 11. SC4A -PR

**YOKOGAWA HEADQUARTERS**

9-32, Nakacho 2-chome,  
Musashinoshi  
Tokyo 180  
Japan  
Tel. (81)-422-52-5535  
Fax (81)-422-55-1202  
[www.yokogawa.com](http://www.yokogawa.com)

**YOKOGAWA EUROPE B.V.**

Euroweg 2  
3825 HD AMERSFOORT  
The Netherlands  
Tel. +31-88-4641 000  
Fax +31-88-4641 111  
E-mail: [info@nl.yokogawa.com](mailto:info@nl.yokogawa.com)  
[www.yokogawa.com/eu](http://www.yokogawa.com/eu)

**YOKOGAWA CORPORATION OF AMERICA**

2 Dart Road  
Newnan GA 30265  
United States  
Tel. (1)-770-253-7000  
Fax (1)-770-251-2088  
[www.yokogawa.com/us](http://www.yokogawa.com/us)

**YOKOGAWA ELECTRIC ASIA Pte. Ltd.**

5 Bedok South Road  
Singapore 469270  
Singapore  
Tel. (65)-241-9933  
Fax (65)-241-2606  
[www.yokogawa.com/sg](http://www.yokogawa.com/sg)

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