

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

YOKOGAWA

SC42-EP15

2-ELECTRODE INSERTION CONDUCTIVITY SENSOR

Used with the applicable SC42 conductivity sensors configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Yokogawa official manufacturer documentation

General Specifications

Model SC42
2/4-electrode design for Contacting Conductivity

GS 12D07J01-01EN-P

• General

Model SC42 sensor, available in various materials such as Epoxy, Stainless Steel, PTFE and PVDF, is intended to suit most process conditions. The sensor is provided either with an Amphenol connector to fit the Yokogawa WU40 cable or Variopin connector to fit with Yokogawa WU10/WE10-cable. A wide range of flow and immersion fittings makes it possible to install the sensor in a permanent or semi-permanent location. The fittings of stainless steel might be used in sanitary applications

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 are certified for hazardous area when connected to a certified intrinsically safe Yokogawa analyzer, model SC202S or FLXA-series or a certified intrinsically safe circuit with defined output parameters.

• Features

- Built-in temperature resistor: Pt1000
- Fast temperature response
- Plug and cable watertight IP67 connection
- Selection of cell constant 0.01 cm⁻¹ to 10 cm⁻¹
- Sensor with 8 pin Variopin with ID chip for SENCOM SA11-C1 use
- Certified for hazardous areas
- Wide range of sensors to suit most process conditions including ultra-pure water applications
- Standard quality inspection certificate with delivery of sensor



■ 1. General Specification

1.1 Object of measurement

Conductivity measurements are used for example for the determination of impurities in water or the concentration measurement of chemicals.

1.2 Principle of measurement

Conductivity is the measure of a solution's ability to pass or carry an electric current. Conductivity is defined as the reciprocal of the resistance of a solution between two electrodes.

1.3 Measuring method

- 2-electrode for SC42- E□04, -E□14,E□15, -E□16, -S□24 and -S□34
- 4-electrode for -E□08, -E□18, -F□08 and T□08

1.4 Measuring element

Temperature : P1000

1.5 Wetted parts

Wetted parts sensor:

Body SC42-S : Stainless Steel AISI 316L
 SC42-E : Glass filled epoxy resin
 SC42-F : PVDF, Glass
 SC42-T : Glass filled PTFE, Glass

Electrodes

SC42-S : Stainless Steel AISI 316L
 SC42-E : Graphite impregnated with epoxy resin
 SC42-F : Platinum
 SC42-T : Platinum

O-ring

SC42-S : Viton
 SC42-F : Viton
 SC42-T : FFKM

For the -F and -T the supplied O-ring for sealing in the fitting is Viton.

Insulation -S : PEEK 450G, FDA migration tested

Connector:

Amphenol

Contacts : Gold plated

Plug : Polyamide

Variopin:

Contacts : gold plated

Material : Nickel-plated brass

Insulation : PEEK, UL94-V0

IP class : IP67

1.6 Functional specifications (at 25°C)

Temperature element SC42: Pt1000 to IEC 751

Nominal Cell Constant

- SC42-S□24 : 0.1 cm-1
- SC42-S□34 : 0.01 cm-1
- SC42-E□08 : 10 cm-1
- SC42-E□14 (E□18) : 1 cm-1
- SC42-E□15(E□16) : 1 cm-1
- SC42-F□08 : 10 cm-1
- SC42-T□08 : 10 cm-1

Note: The SC42 temperature sensor is designed for measurement compensation and for indication. It is NOT designed for process temperature control.

1.7 Dynamic Specifications

Response time temperature t90

- SC42-S□24 : < 3 min.
- SC42-S□34 : < 1 min.
- SC42-E□04 (E□08) : < 3 min.
- SC42-E□14 (E□18) : < 2 min.
- SC42-E□15 (E□16) : < 3 min.
- SC42-F□08 : < 1 min.
- SC42-T□08 : < 1 min.

Temperature

- SC42-SP/SK : 0°C to 150°C (32°F to 302°F)
- SC42-SV/SG : 0°C to 125°C (32°F to 257°F)
- SC42-E : 0°C to 110°C (32°F to 230°F)
- SC42-F : 0°C to 110°C (32°F to 230°F)
- SC42-T : 0°C to 110°C (32°F to 230°F)

Pressure

- SC42-S : 0 to 10 barg (0 to 142 PSIG)
- SC42-E : 0 to 10 barg (0 to 142 PSIG)
- SC42-F* : 0 to 10 barg (0 to 142 PSIG)¹
- SC42-T : 0 to 2 barg (0 to 28 PSIG)

All sensors : 0 to 0.5 barg² (0 to 7 PSIG)

See figure 1

Note 1 : 0 to 3 barg (0 to 14 PSIG) @ Tmax.

Note 2 : Unit definition:

barg = bar gauge, over pressure against atmosphere.

barg = under pressure against atmosphere

1.9 Cable length

The maximum cable length for sensors with Amphenol connector or Variopin connector when directly connected to a FLXA analyzer is 60 meters with WU40 or WU10 in combination with WE10/WF10 cable and BA10 junction box.

For sensors with suffix - V or - combined with SA11-C1 there is an optional 3-meter WE10 cable combined with SA11 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 up to 100 m. The BA11 connection box is connected to the analyzer using a WU11 cable up to 100m.

1.10 Shipping details

Package size (LxWxH)

- 300 x 95 x 73 mm (11.8 x 3.7 x 2.9 inch)

Package weight (max.)

-E[]04 -E[]15 -F[]08 -S[]24 -S[]34

-E[]08 -E[]16 -T[]08

0.50 kg 0.30 kg 0.45 kg 0.80 kg 0.65 kg

1.1 lbs 0.66 lbs 1.0 lbs 1.8 lbs 1.43 lbs

1.11 Environmental conditions

Storage temperature

- -30°C to 50°C (-22°F to 122°F)
- Ingress Protection Type Amphenol connector IP65 (conform IEC 60529)
- Ingress Protection Type VarioPin IP67 (conform IEC 60529)

■ 2. Model and Suffix code

Table 3: Model & Suffix code

Model	Suffix Code	Option code	Description
SC42 ⁷			Conductivity Sensor 2- or 4- electrodes + Pt1000
Materials	-E -S -F -T		Epoxy / graphite. Stainless steel AISI 316L / PEEK. PVDF / Glass / Platinum. PTFE / Glass / Platinum.
Mounting	G ⁸ K P V ⁸		Plug-in type, VarioPin connector with SENCOM ID-chip; IS for KCs Plug-in type, plug-socket connector; IS for KCs Plug-in type, plug-socket connector; IS for ATEX/IECEX/FM-US/FM-CAN /NEPSI /PESO /TS /EACEx Plug-in type, VarioPin connector with SENCOM ID-chip IS for ATEX/IECEX/FM-US/FM-CAN /NEPSI /PESO/TS/EACEx
Cell constant	0 1 2 3		C = 10 cm ⁻¹ C = 1 cm ⁻¹ C = 0,1 cm ⁻¹ C = 0,01 cm ⁻¹
Type	4 5 6 8		2-electrode, flow cell. 2-electrode, insertion cell. 2-electrode, insertion cell with DN25 collar. 4-electrode, flow cell.
Options			N/A

Note 7: 3.1 Material certificate according to EN 10024 is standard delivered with the stainless-steel version sensor.

Note 8: Suffix G and V not in combination with suffix -E (Epoxy), except -EG15 and EV15
Not all combinations are possible, please check addendum 2 for all available models

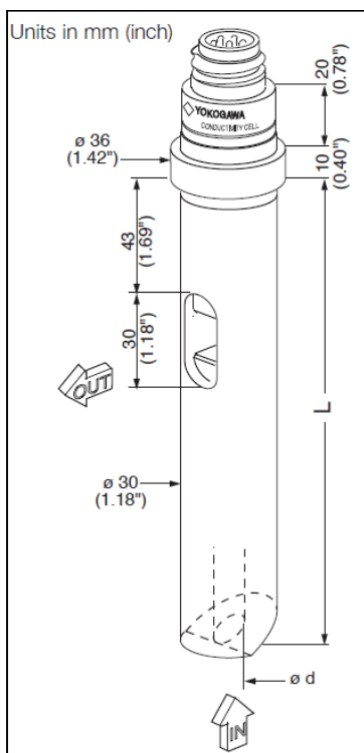


Figure 8: SC42-EP14 (EP18), SC42-EP04 (EP08)

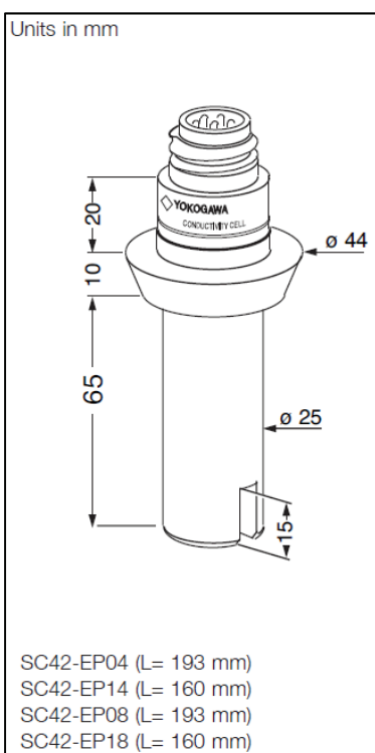


Figure 9: SC42-EP16

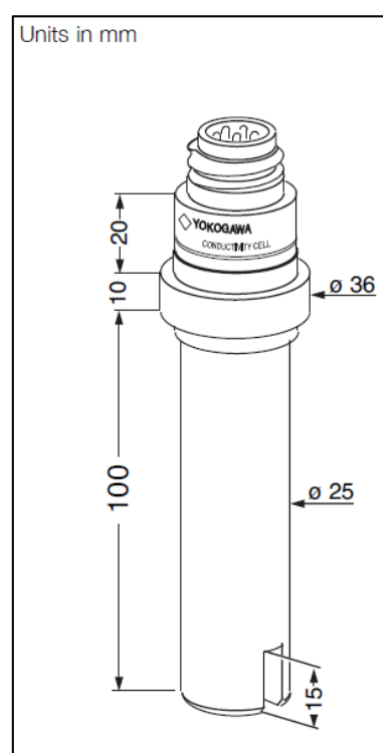


Figure 10: SC42-EP15

■ 4. Spare parts

Table 4: Spare part list

Spare part		Description
K1500AG	O-rings	O-rings viton 29.74x3.53 (5)
K1500AH		O-ring FFKM 29.74x3.53
K1500AK		O-rings EPDM 29.74x3.53 (5)
K1500FX		O-rings Sil 70 sh 29.74x3.53 (5)
K1500HE		O-ring set silicon, FS40-S23
K1522PS	Part K1522PS - Protection sleeve	Protection sleeve for 3/4" NPT sensor

Addendum 1: Typical installations

To install the SC42 conductivity sensors in a permanent or semipermanent location, Yokogawa can supply a range of flow and immersion fittings. These fittings and sub-assemblies are available in different materials to give the best solution for any process considering chemical resistance, pressure and temperature specifications. Flow fittings are available with optional flange adapters. When installing the SC42 sensor in a fitting, an O-ring is necessary. This O-ring is available in different materials to improve chemical resistance. If the SC42 sensor is supplied with an O-ring, the O-ring in the fitting must be removed.

Typical installation of SC42 sensor in FF40 Flow fittings/ FS40 Flow fitting assemblies from a practical point of view, the best mounting place for a conductivity sensor is in a by-pass with a sample valve. For these applications the following Flow fittings/Flow fitting subassemblies are ideal: Model FF40: Flow fitting, Model FS40: Flow fitting subassembly. When using the sensor in combination with a Flow fitting or Flow fitting subassembly, the process flow has to be taken into account when mounting the sensor. For an example see figure 11.

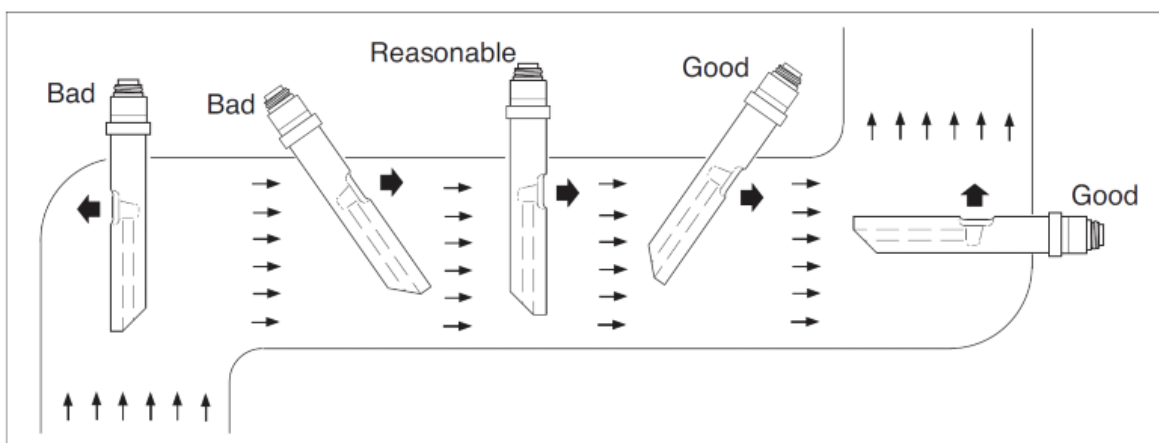


Figure 11: Mounting position SC42 sensor