

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

1.8 Operating range

Conductivity range³ at actual process temperature : 1 μ S x C.C. – 200 mS x C.C.
See figure 2

Note 3: measurement range dependent on input range analyzer.

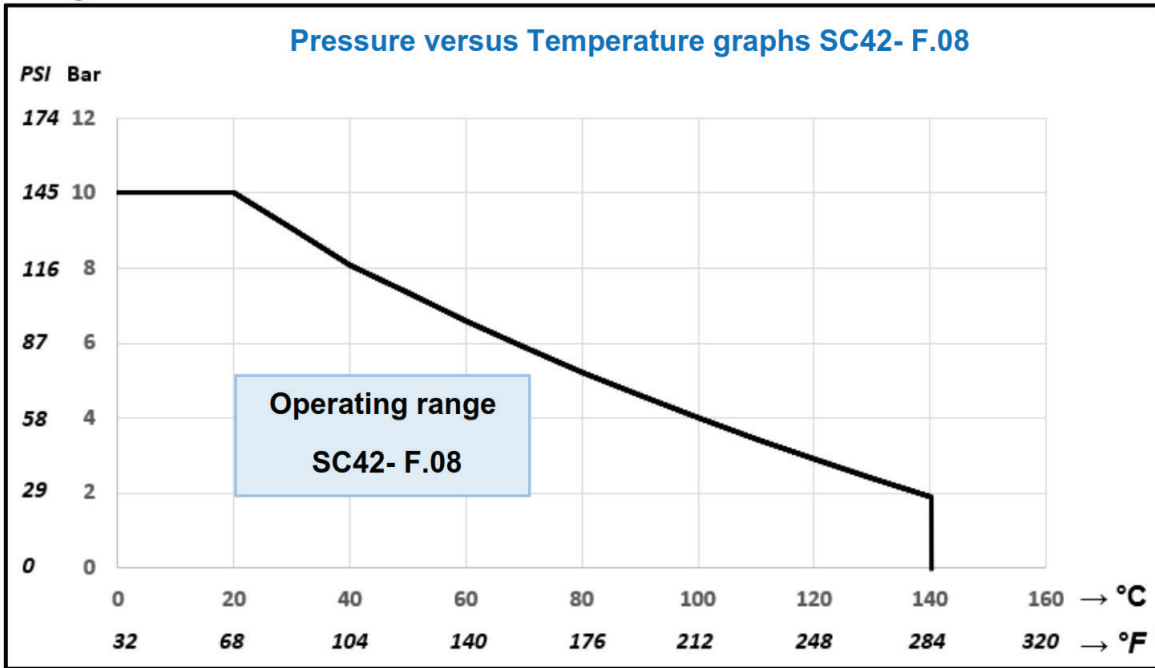


Figure 1: Pressure versus temperature for SC42-F.08

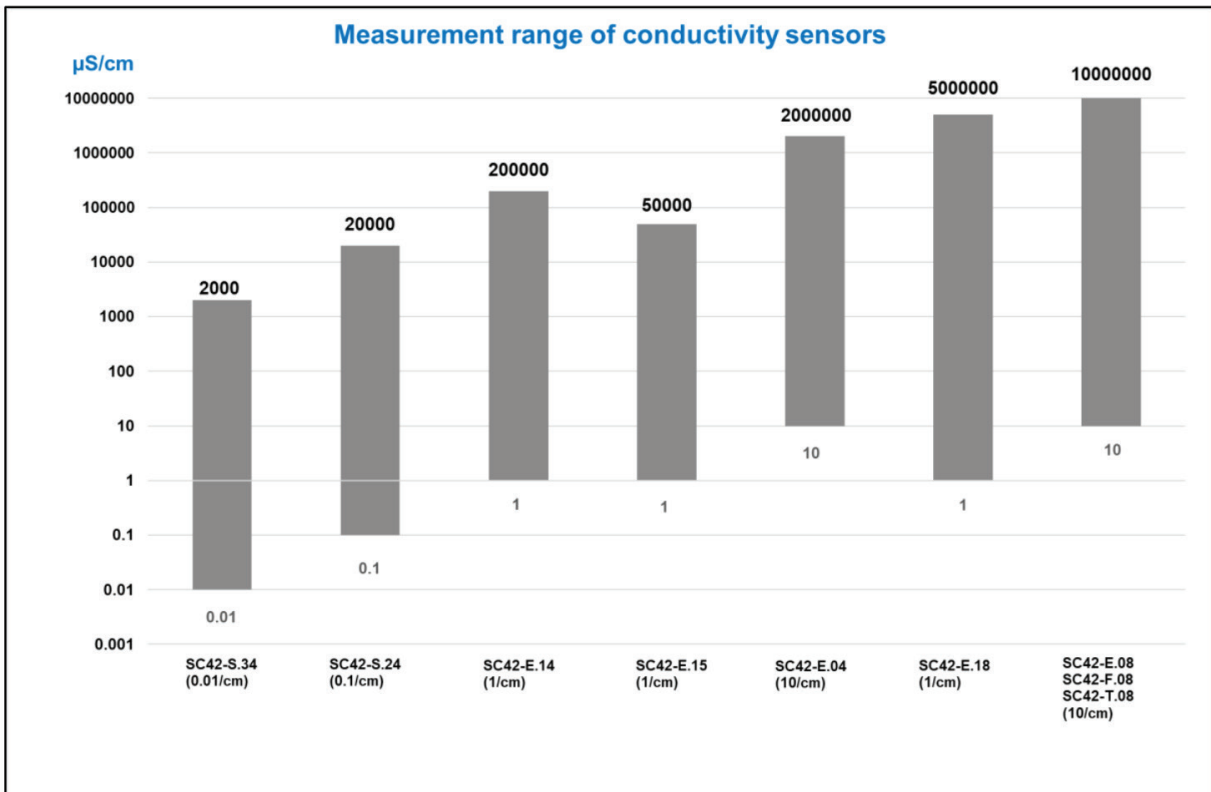


Figure 2: Measuring range of conductivity sensors

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)

1.12 Regulatory compliance



Table 1: Equipment rating

Item	Description	Values
Electrical parameters	Max. input voltage	U _i = 14.4 VDC
	Max. input current	I _i = 116.5 mA
	Max. input power	P _i = 342.4 mW
	Max. internal capacitance	C _i = 0.0 nF for connector types without ID-chip = 0.4 nF for connector types with ID-chip
	Max. internal inductance	L _i = 0.0 mH for connector types L _i = 0.1 mH for permanent cable types
Temperature class	T6	-30°C ≤ T _a ≤ +40°C
	T5	-30°C ≤ T _a ≤ +95°C
	T4	-30°C ≤ T _a ≤ +130°C ⁴⁾
	T3	-30°C ≤ T _a ≤ +165°C ⁴⁾ Note 4 : Connector types with ID-chip are limited to +125°C
Specific conditions of use	Potential electrostatic charging hazard: Contact Conductivity sensors containing accessible plastic parts and/or external conductive parts must be installed and used in such a way, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive. Use a damp cloth for cleaning the equipment.	
	Potential ignition hazard: Contact Conductivity sensors containing light metals, must be installed and used in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.	
	Electrostatic charges of the sensor enclosure parts and label shall be avoided, especially in the case that the process medium is non-conductive. Use a damp cloth for cleaning the equipment. From the safety point of view the circuits shall be assumed to be connected to earth.	
	When the sensor has been connected to non-intrinsically safe equipment which exceeds the restrictions regarding the sensor input circuits, the sensor is not suitable anymore for intrinsically safe use	

Models without ID-chip (-*P** type or -*K**):
I/O signals are from/to an associated intrinsically safe certified SC transmitter (e.g. Yokogawa transmitter Model FLX21/FLX202 series or Yokogawa transmitter Model SC202S series).

Models with ID-chip (-*V** or -*G** type):
I/O signals are from/to an associated intrinsically safe certified SC transmitter, Yokogawa Smart Adapter Model SA11-C1.

Table 2: Regulatory compliance

Item	Description, Approval, Certification
LVD ^{5,6}	<ul style="list-style-type: none"> ▪ ANSI/ISA 61010-1 ▪ CAN/CSA C22.2 No. 61010-1
RoHS	EU Directive 2011/65/EU and Commission Delegated Directive (EU) 2015/863 amending Annex II, per <ul style="list-style-type: none"> ▪ EN-IEC 63000
PED ⁵	EU Directive 2011/68/EU applying Article 4.3: Sound Engineering Practice.
WEEE	EU directive 2012/19/EU This sensor is intended to be sold and used only as a part of equipment which is excluded from the WEEE directive, such as large-scale stationary industrial tools, a large-scale fixed installation etc., and therefore it is in principle fully compliant with WEEE directive. The sensor should be disposed in accordance with applicable national legislations/regulations respectively.
ATEX (EU)	EU Directive 2014/34/EU ATEX approval: DEKRA 14ATEX0074 X  ₀₃₄₄ SC42:  II 1 G Ex ia IIC T3...T6 Ga Applied standards: <ul style="list-style-type: none"> ▪ EN IEC 60079-0 ▪ EN 60079-11
IECEX	IECEx approval: IECEx DEK 14.0032X SC42: Ex ia IIC T3...T6 Ga Applied standards: <ul style="list-style-type: none"> ▪ IEC 60079-0 ▪ IEC 60079-11

Note 5 : Damaging the screw thread or process connection (e.g. flange) of the sensor might influence the maximum process pressure.

Note 6 : Sensor SC42-F*** and SC42-T*** contains glass parts which if broken can cause cutting injuries.

Item	Description, Approval, Certification
FM (Canada)	FM approval Canada: FM20CA0062X SC42: IS SI CL I, DIV 1, GP ABCD, T3...T6; CL I, ZN 0, Ex ia IIC, T3...T6 Ga Control Drawing: D&E 2020-024-A51 Applied standards: <ul style="list-style-type: none"> ▪ CAN/CSA-C22.2 No. 60079-0 ▪ CAN/CSA-C22.2 No. 60079-11 ▪ CAN/CSA-C22.2 No. 61010-1
FM (United States)	FM approval United States: FM20US0123X SC42: IS CL I, DIV 1, GP ABCD, T3...T6; CL I, ZN 0, AEx ia IIC, T3...T6 Ga Control Drawing: D&E 2020-024-A50 Applied standards: <ul style="list-style-type: none"> ▪ FM Class 3600 ▪ FM Class 3610 ▪ ANSI/ISA 60079-0 ▪ ANSI/ISA 60079-11 ▪ ANSI/ISA 61010-1
NEPSI (China)	NEPSI approval: GYJ21.2892X SC42: Ex ia IIC T3...T6 Ga Applied standards: <ul style="list-style-type: none"> ▪ GB 3836.1 ▪ GB 3836.4 ▪ GB 3836.20
PESO (India)	PESO approval: PESO approval is based on ATEX approval DEKRA 141ATEX0074 X, iss. 2 – 29.11.2019 Equipment reference numbers: P512759/1 Applied standards: <ul style="list-style-type: none"> ▪ EN IEC 60079-0 ▪ EN 60079-11
TS (Taiwan)	TS approval: TS Safety Label is based on IECEx approval IECEx DEK 14.0032X Identification Number: TD04000C Applied standards: <ul style="list-style-type: none"> ▪ IEC 60079-0 ▪ IEC 60079-11

KCs (Korea)	Korea Ex certificates: Korea Ex certificate is based on IECEx approval IECEx DEK 11.0064X, iss. 1 and applicable for the following models: SC42-*G**: 21-KA4BO-0419X SC42-*K**: 21-KA4BO-0420X Applied standards: <ul style="list-style-type: none">• IEC 60079-0• IEC 60079-11• KS C IEC 60079-14 For specific conditions of use see certificate Note: Models with ID-chip, Ta is up to +125°C
EAC Ex (Russia)	EAC Ex certificate: RU C-NL.AA87.B.00754 SC42: 0Ex ia IIC T6...T3 Ga X Applied standards: <ul style="list-style-type: none">▪ GOST 31610.0 (IEC 60079-0)▪ GOST 31610.11 (IEC 60079-11)▪ GOST IEC 60079-14

■ 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		Epoxy / graphite.
	-S		Stainless steel AISI 316L / PEEK.
	-F		PVDF / Glass / Platinum.
	-T		PTFE / Glass / Platinum.
Mounting	G ⁸		Plug-in type, VarioPin connector with SENCOM ID-chip; IS for KCs
	K		Plug-in type, plug-socket connector; IS for KCs
	P		Plug-in type, plug-socket connector; IS for ATEX/IECEX/FM-US/FM-CAN /NEPSI /PESO /TS /EACEX
	V ⁸		Plug-in type, VarioPin connector with SENCOM ID-chip IS for ATEX/IECEX/FM-US/FM-CAN /NEPSI /PESO /TS /EACEX
Cell constant	0		C = 10 cm ⁻¹
	1		C = 1 cm ⁻¹
	2		C = 0,1 cm ⁻¹
	3		C = 0,01 cm ⁻¹
Type	4		2-electrode, flow cell.
	5		2-electrode, insertion cell.
	6		2-electrode, insertion cell with DN25 collar.
	8		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

■ 3. Dimensional drawings

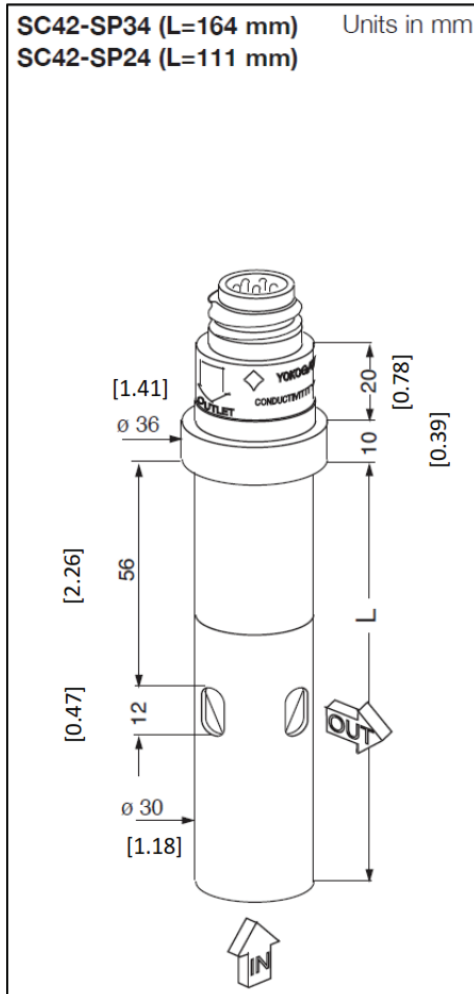


Figure 3: Dimensions SC42-SP, SC42-SK

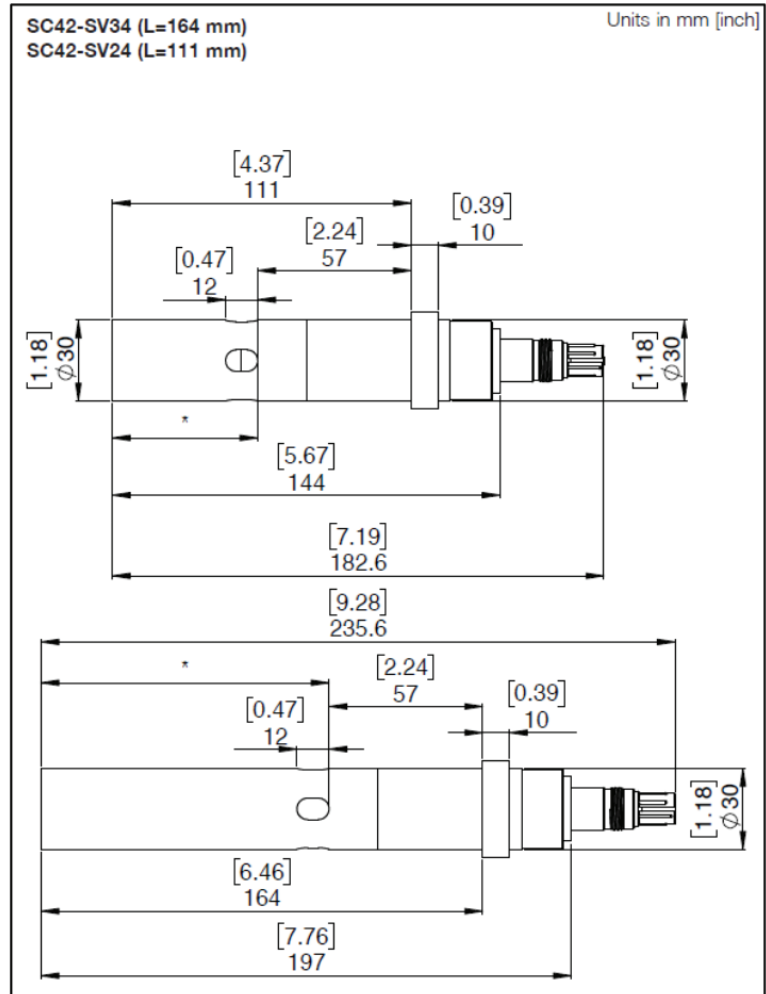


Figure 4: Dimensions SC42-SV, SC42-SG

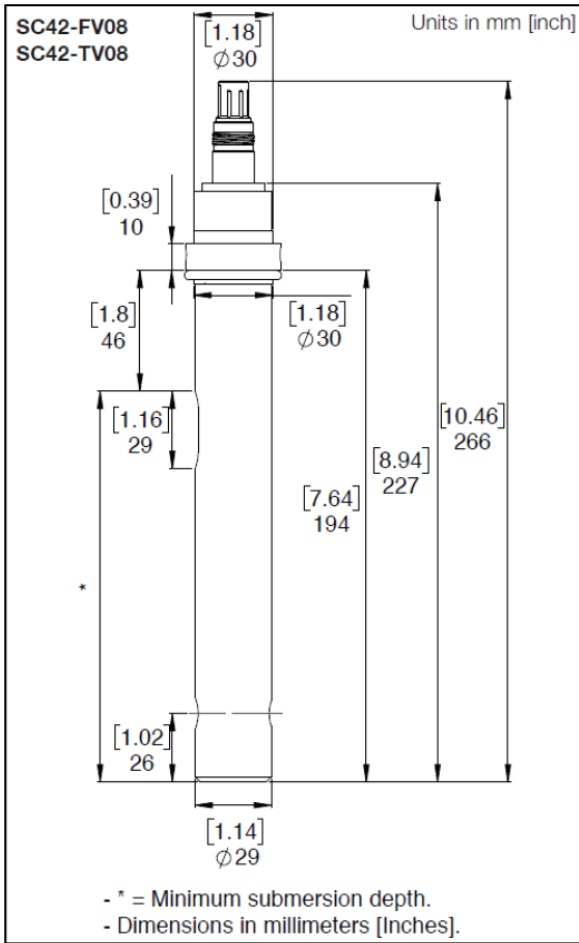


Figure 5: Dimensions SC4*-FV/FG/TV/TG

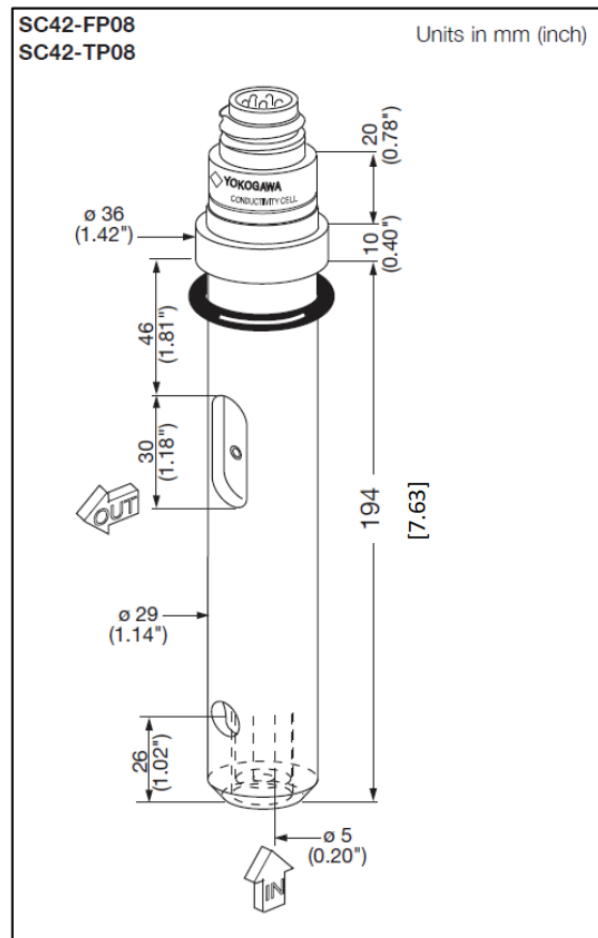


Figure 6: Dimensions SC42-FP/FK/TP/TK

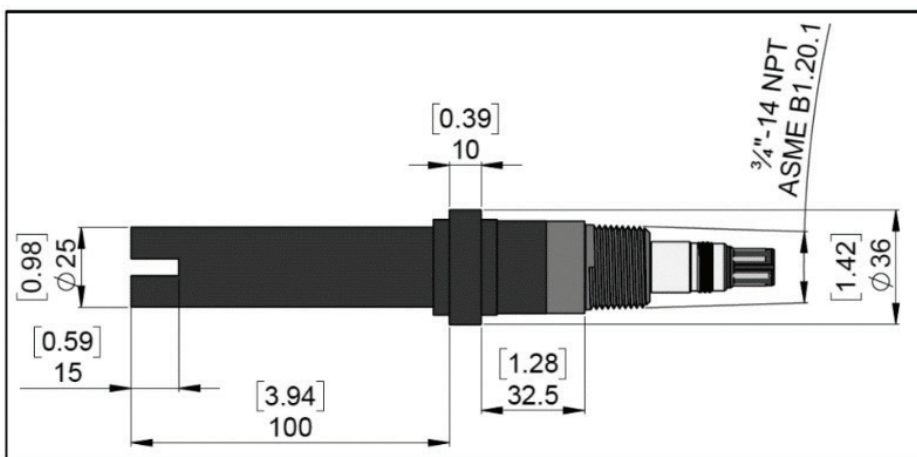


Figure 7: Dimensions SC42-EV15 SC42-EG15

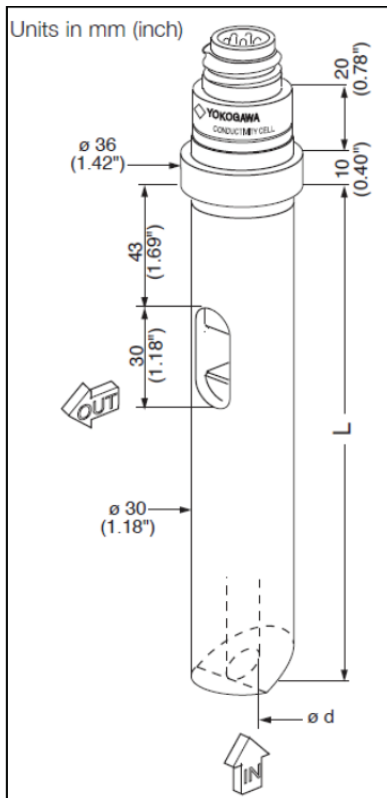


Figure 8: SC42-EP14 (EP18), SC42-EP04 (EP08)

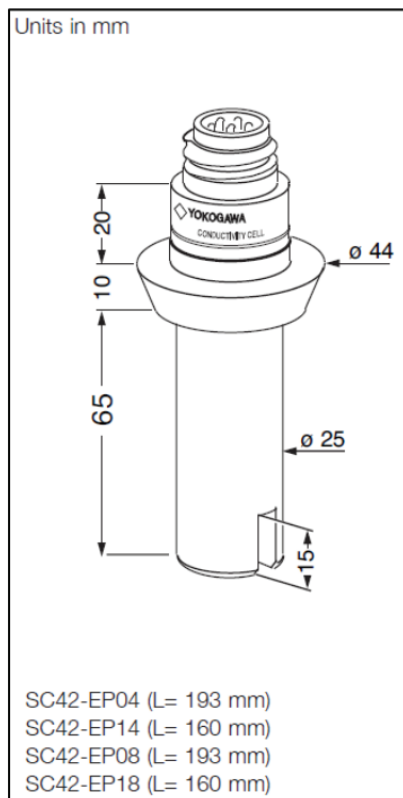


Figure 9: SC42-EP16

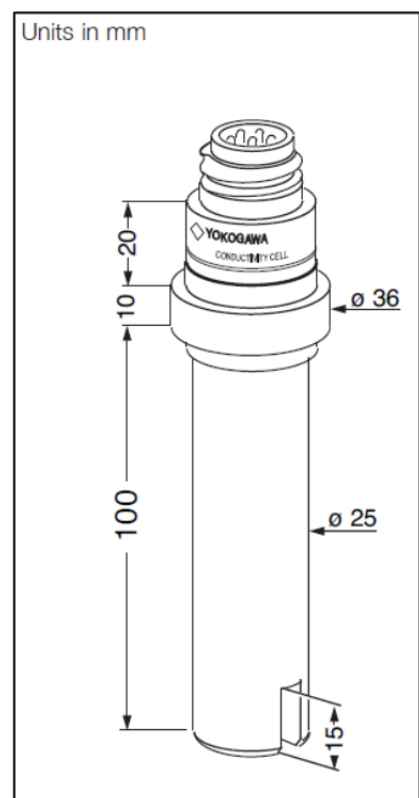


Figure 10: SC42-EP15

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.

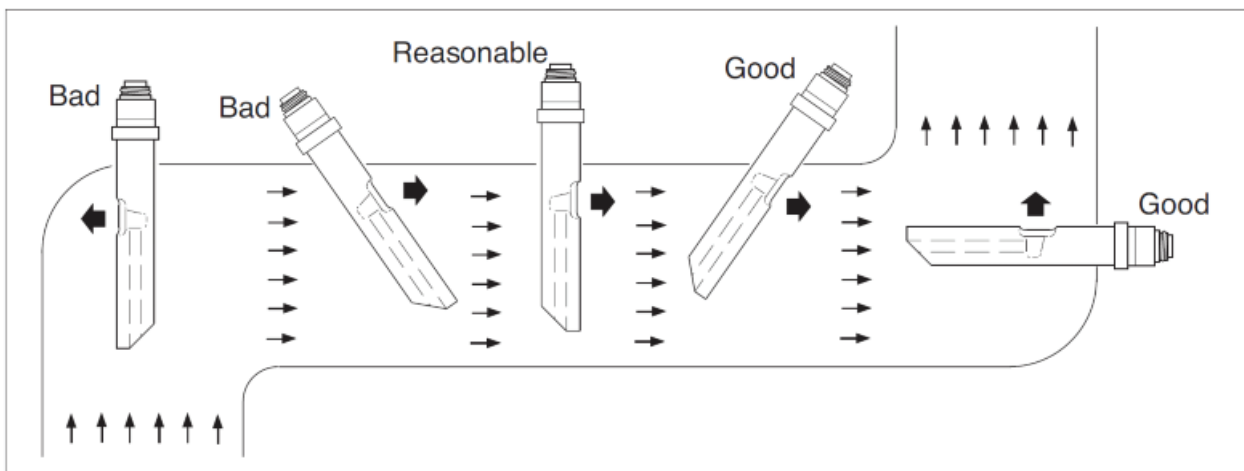


Figure 11: Mounting position SC42 sensor

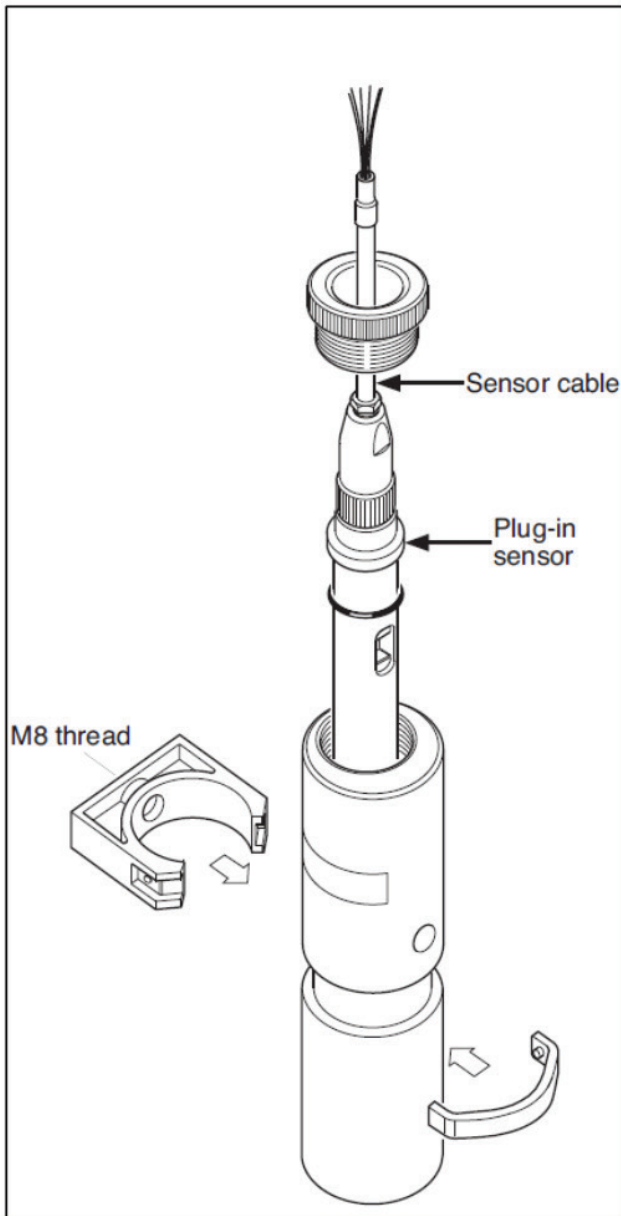


Figure 12: Installation SC42 in FF40-P22/FF40-V22⁹

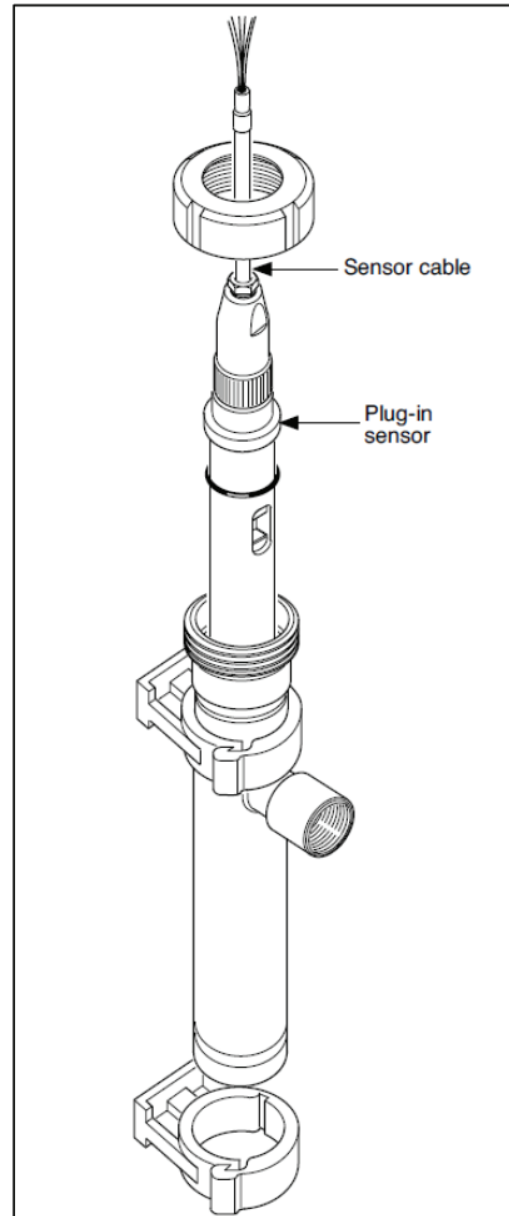


Figure 13: Installation SC42 in FF40⁹

Note 9: Not possible for sensors with suffix code -EP16 – EK16)

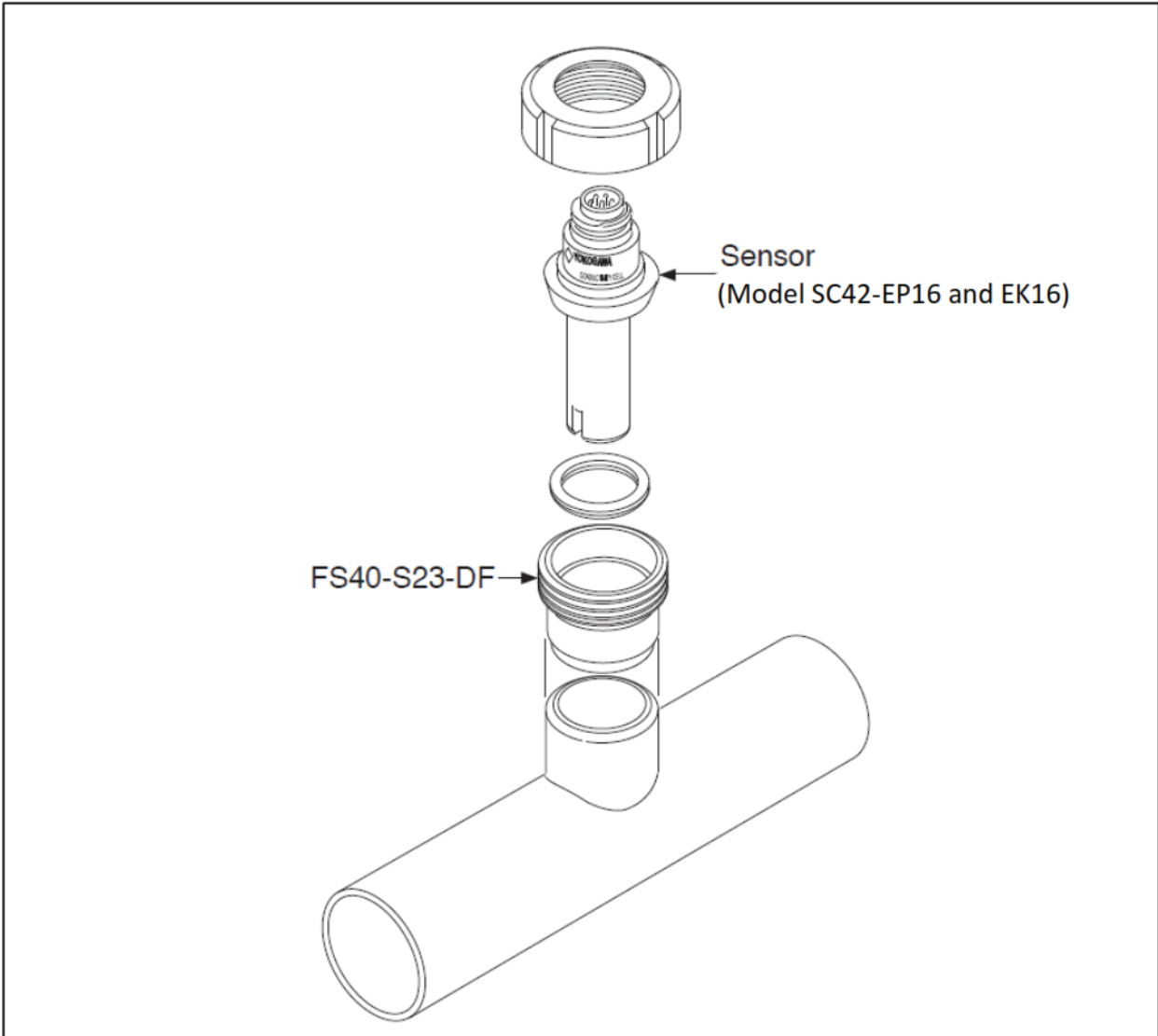


Figure 14: Installation example of the SC42-EP16 sensor with FS40-S23-DF subassembly

Installation examples using the K1522PS protection sleeve

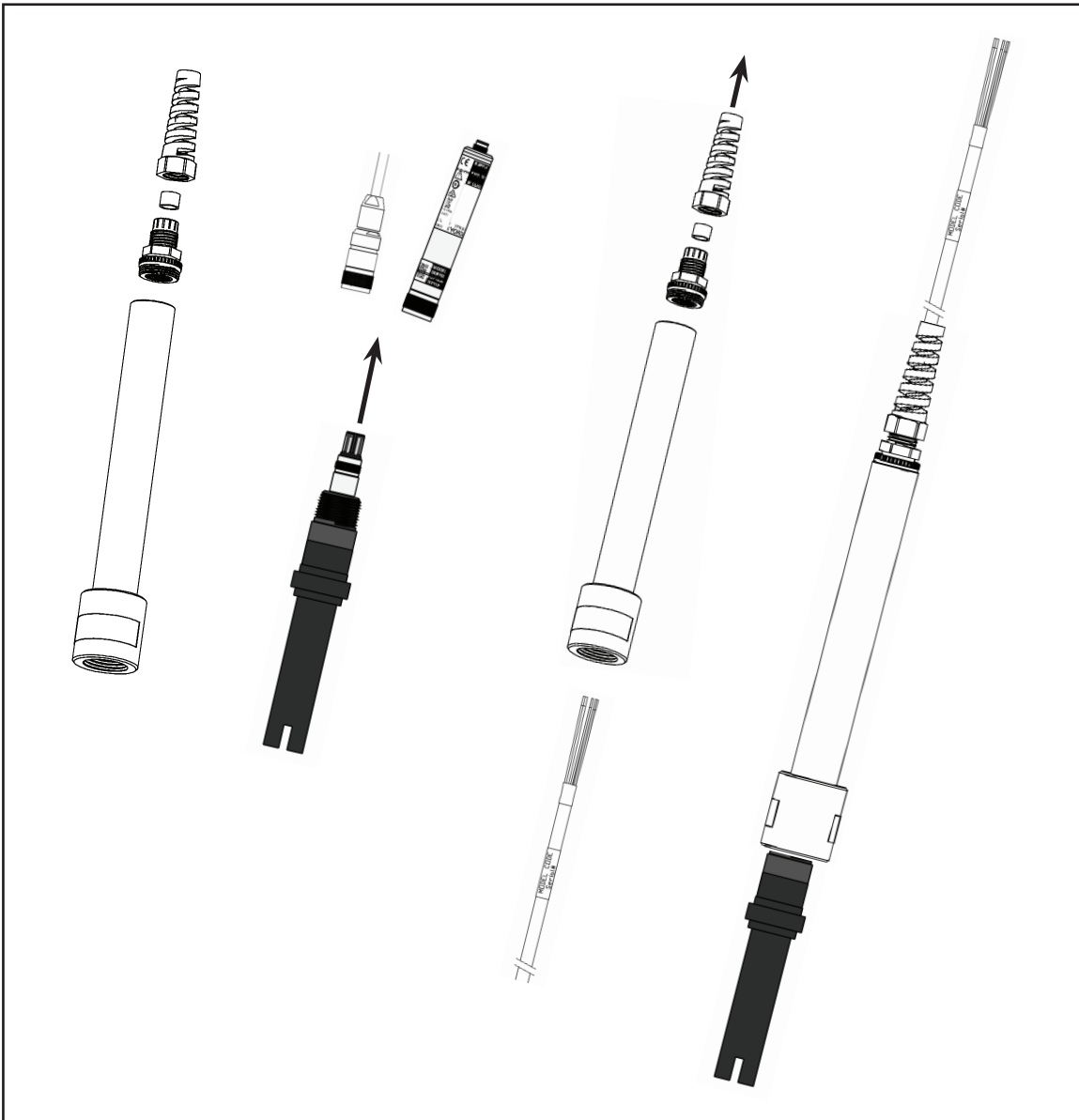


Figure 15: Installation using the protection sleeve K1522PS

Note: For details on installation SC42 sensor using protection sleeve please use instruction from SD 12A06K01-00EN-P

Adendum 2: Available models

Table 5: SC42 available models

SC42-EK04
SC42-EK08
SC42-EK14
SC42-EK15
SC42-EK16
SC42-EK18
SC42-EG15
SC42-EP04
SC42-EP08
SC42-EP14
SC42-EP15
SC42-EP16
SC42-EP18
SC42-EV15
SC42-FK08
SC42-FG08
SC42-FP08
SC42-FV08
SC42-SK24
SC42-SK34
SC42-SG24
SC42-SG34
SC42-SP24
SC42-SP34
SC42-SV24
SC42-SV34
SC42-TK08
SC42-TG08
SC42-TP08
SC42-TV08

Adendum 3: Control Drawings

FM-United States

Applying standards

FM Class 3600
FM Class 3610
FM Class 3810
ANSI/ISA 60079-0
ANSI/ISA 60079-11

Certificate no.*

FM20US0123X
IS CL I, DIV 1, GP ABCD, T3...T6
CL I, ZN 0, AEx ia IIC, T3...T6 Ga
Control Drawing: D&E 2020-024-A50

Electrical data

:See Note 10

Specific conditions
of use

:See Control Drawing D&E 2020-024-A50. (Page 13-16)
Temperature classes for SC42 models are defined
T3...T6, see Note ¹¹

Note 10

:Intrinsically safe, entity, for Class I, Division 1, Groups A, B, C and D;
Class I, Zone 0, AEx ia IIC, Ga (entity) for hazardous (classified) locations
when installed per control drawing D&E 2020-024-A50.
Maximum sensor input parameters:
U_i= 14.4 V; I_i= 116.5 mA; P_i= 0.3424 W; L_i= 0 mH
C_i= 0 nF (P type) or C_i=0.4 nF (V type).

Note 11

: Ambient temperature:
-30°C to +40°C for temperature class T6,
-30°C to +95°C for temperature class T5,
-30°C to +125°C for temperature class T4 (V type),
-30°C to +130°C for temperature class T4 (P type),
-30°C to +125°C for temperature class T3 (V type),
-30°C to +165°C for temperature class T3 (P type).

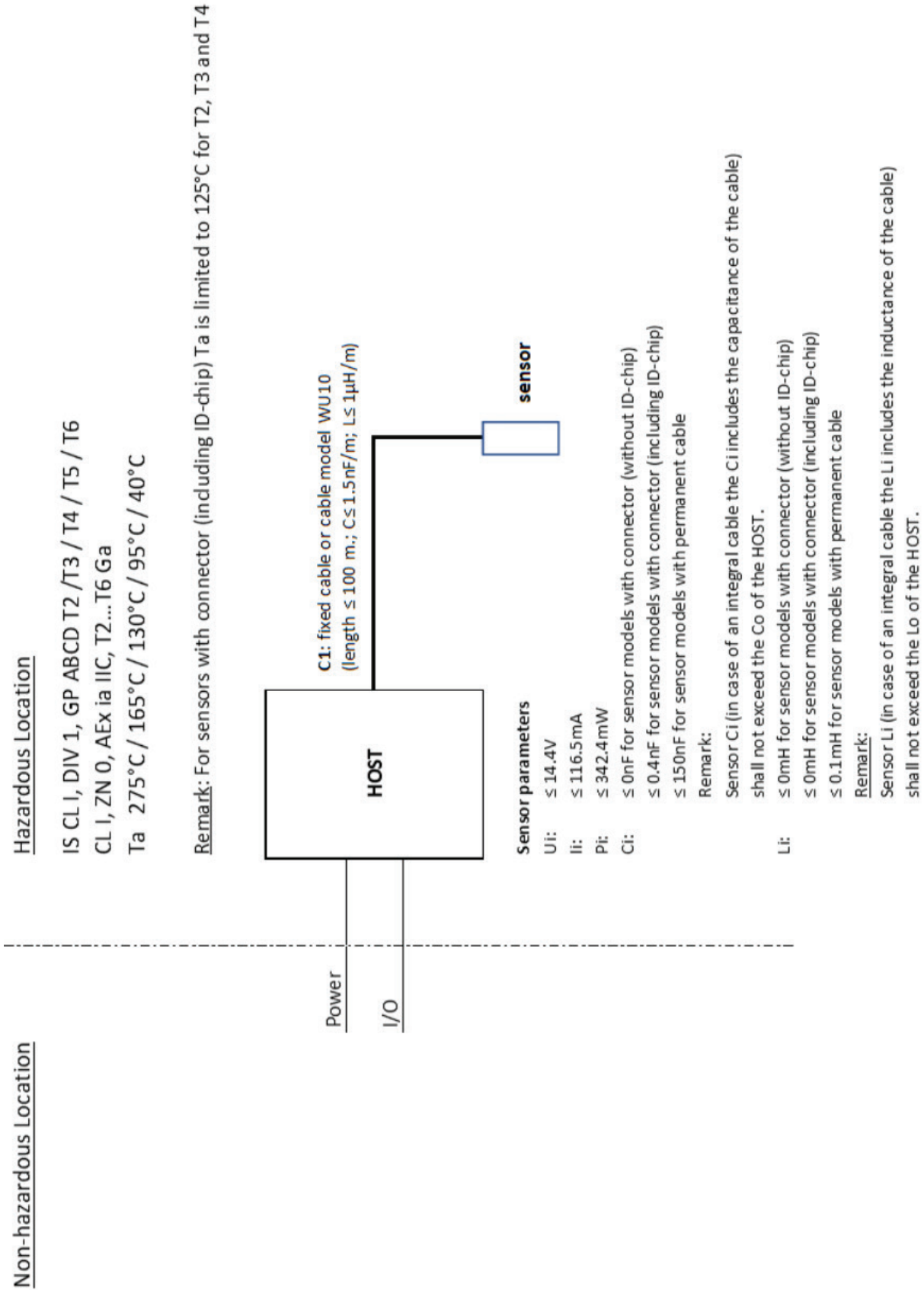


When the sensor has been connected to non-intrinsically safe equipment
which exceeds the restrictions regarding the sensor input circuits, the sensor
is not suitable anymore for intrinsically safe use.

* Certification is subject to change, due to new regulations or changes in the product itself.
When a certificate is updated, a new revision under the same certificate number is created with a new date.

- FM-United States:
FM20US0123X (effective from 03-2021)

Control drawing: D&E 2020-024-A50 (part 1)



Remarks:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (ANSI/NFPA 70), ANSI/ISARP12.06.01, and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe HOST with the following maximum values: $U_o = 14.4$ V, $I_o = 116.5$ mA, $P_o = 342.4$ mW.
4. The sensor does not provide isolation from earth. Installers shall take necessary measures to prevent the possibility of sparking resulting from differing earth potentials between the sensors and interconnecting equipment. This can be realized for example by selecting interconnecting equipment which provides input-to-output and input-to-earth isolation up to 500 V rms.
5. Sensor Model code:

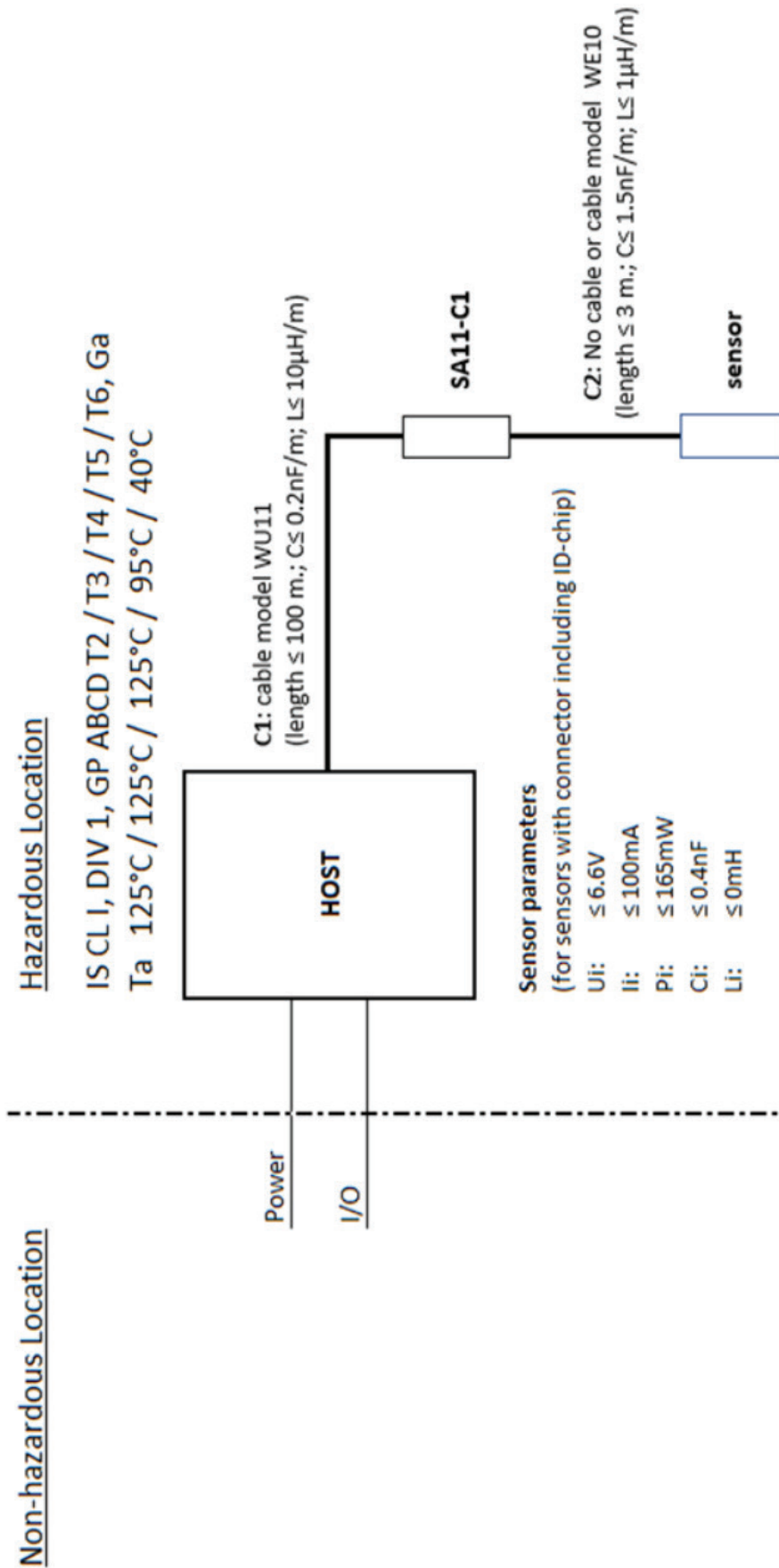
Table 6: Regulatory compliance

Model	Suffix Codes	Option Codes
SC42	-abcd	/e
a	Material:	E Epoxy S Stainless Steel F PVDF T PTFE
b	Connection type + Region:	P Connector without ID-chip, IS for ATEX/IECEX, FM-US, FM-CAN V Connector with ID-chip, IS for ATEX/IECEX, FM-US, FM-CAN
c	Cell Constant:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
d	Measuring type:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
e	Option code:	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

6. **WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS** pH sensors containing accessible plastic parts and/or external conductive parts, must be installed and used in such a way, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive.

WARNING - POTENTIAL IGNITION HAZARD – SEE INSTRUCTIONS Contact Conductivity sensors containing light metals, must be installed and used in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

Control drawing: D&E 2020-024-A50 (part 2)



Remarks:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (ANSI/NFPA 70), ANSI/ISARP12.06.01, and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe Smart Adapter, model SA11-C1, with the following maximum values: $U_o = 6.6\text{ V}$, $I_o = 100\text{ mA}$, $P_o = 165\text{ mW}$.
4. The Installers shall take necessary measures to prevent the possibility of sparking resulting from differing earth potentials between the sensors and interconnecting equipment. The sensor itself does not provide 500 V rms isolation from earth, the interconnecting equipment Model SA11-C1 Smart Adapter however provides this required isolation.
5. 5. Sensor Model code:

Table 7: Regulatory compliance

Model	Suffix Codes	Option Codes
SC42	-abcd	/e
a	Material:	E Epoxy S Stainless Steel F PVDF T PTFE
b	Connection type + Region:	V Connector with ID-chip, IS for ATEX/IECEX, FM-US, FM-CAN
c	Cell Constant:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
d	Measuring type:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
e	Option code:	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

6. WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS pH sensors containing accessible plastic parts and/or external conductive parts, must be installed and used in such a way, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive.

WARNING - POTENTIAL IGNITION HAZARD – SEE INSTRUCTIONS

Contact Conductivity sensors containing light metals, must be installed and used in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

FM-Canada

Applying standards	CAN/CSA-C22.2 No. 60079-0 CAN/CSA-C22.2 No. 60079-11
Certificate no.*	: FM20CA0062X IS CL I, DIV 1, GP ABCD, T3...T6 CL I, ZN 0, Ex ia IIC, T3...T6 Ga Control Drawing: D&E 2020-024-A51
Electrical data	: See Note 12
Specific conditions	: See Control Drawing D&E 2020-024-A51. (Page 18-21) of use Temperature classes for SC42 models are defined T3...T6, see Note 13.

Note 12 : Intrinsically safe, entity, for Class I, Division 1, Groups A, B, C and D;
Class I, Zone 0, Ex ia IIC, Ga (entity) for hazardous (classified) locations
When installed per control drawing D&E 2020-024-A51.
Maximum sensor input parameters:
Ui= 14.4 V; li= 116.5 mA; Pi= 0.3424 W; Li= 0 mH;
Ci= 0 nF (P type) or Ci=0.4 nF (V type).

Note 13 : Ambient temperature:
-30°C to +40°C for temperature class T6,
-30°C to +95°C for temperature class T5,
-30°C to +125°C for temperature class T4 (V type),
-30°C to +130°C for temperature class T4 (P type).
-30°C to +125°C for temperature class T3 (V type),
-30°C to +165°C for temperature class T3 (P type).



When the sensor has been connected to non-intrinsically safe equipment which exceeds the restrictions regarding the sensor input circuits, the sensor is not suitable anymore for intrinsically safe use.

* Certification is subject to change, due to new regulations or changes in the product itself.
When a certificate is updated, a new revision under the same certificate number is created with a new date.
- FM-Canada:
FM20CA0062X (effective from 03-2021)

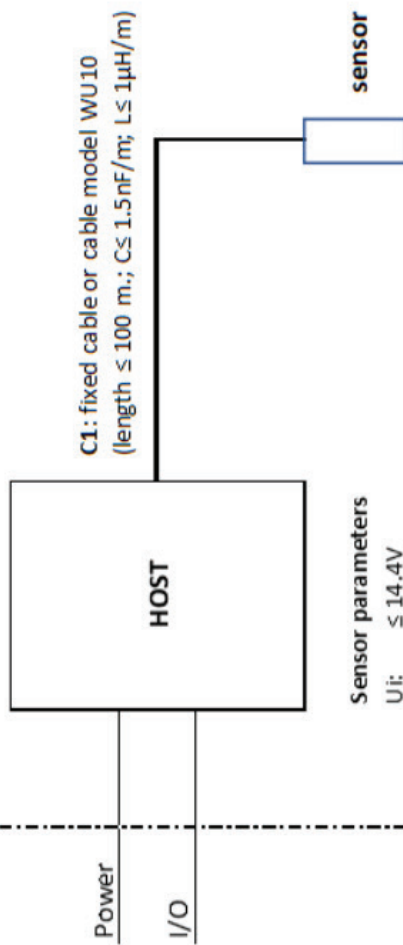
Control drawing: D&E 2020-024-A51 (part 1)

Non-hazardous Location

Hazardous Location

IS, SI, CL I, DIV 1, GP ABCD T2 / T3 / T4 / T5 / T6
 CL I, ZN 0, Ex ia IIC, T2...T6 Ga
 Ta 275°C / 165°C / 130°C / 95°C / 40°C

Remark: For sensors with connector (including ID-chip) Ta is limited to 125°C for T2, T3 and T4



Sensor parameters

Ui: ≤ 14.4V

Ii: ≤ 116.5mA

Pi: ≤ 342.4mW

Ci: ≤ 0nF for sensor models with connector (without ID-chip)
 ≤ 0.4nF for sensor models with connector (including ID-chip)
 ≤ 150nF for sensor models with permanent cable

Remark:

Sensor Ci (in case of an integral cable the Ci includes the capacitance of the cable) shall not exceed the Co of the HOST.

Li: ≤ 0mH for sensor models with connector (without ID-chip)

≤ 0mH for sensor models with connector (including ID-chip)

≤ 0.1mH for sensor models with permanent cable

Remark:

Sensor Li (in case of an integral cable the Li includes the inductance of the cable) shall not exceed the Lo of the HOST.

Remarks:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (CEC) CSA22.1 and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe HOST with the following maximum values: $U_o = 14.4\text{ V}$, $I_o = 116.5\text{ mA}$, $P_o = 342.4\text{ mW}$.
4. The sensor does not provide isolation from earth. Installers shall take necessary measures to prevent the possibility of sparking resulting from differing earth potentials between the sensors and interconnecting equipment. This can be realized for example by selecting interconnecting equipment which provides input-to-output and input-to-earth isolation up to 500 V rms.
5. Sensor Model code:

Table 8: Regulatory compliance

Model	Suffix Codes	Option Codes
SC42	-abcd	/e
a	Material:	E Epoxy S Stainless Steel F PVDF T PTFE
b	Connection type + Region:	V Connector with ID-chip, IS for ATEX/IECEX, FM-US, FM-CAN
c	Cell Constant:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
d	Measuring type:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
e	Option code:	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

6. **WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS** pH sensors containing accessible plastic parts and/or external conductive parts, must be installed and used in such a way, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive.

AVERTISSEMENT – DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES – VOIR LES INSTRUCTIONS

Les sondes de conductivité de contact contenant des pièces en plastique accessibles et / ou des pièces conductrices externes doivent être installées et utilisées de manière à éviter tout risque d'inflammation dû à des charges électrostatiques dangereuses, en particulier dans le cas où le fluide de procédé n'est pas conducteur.

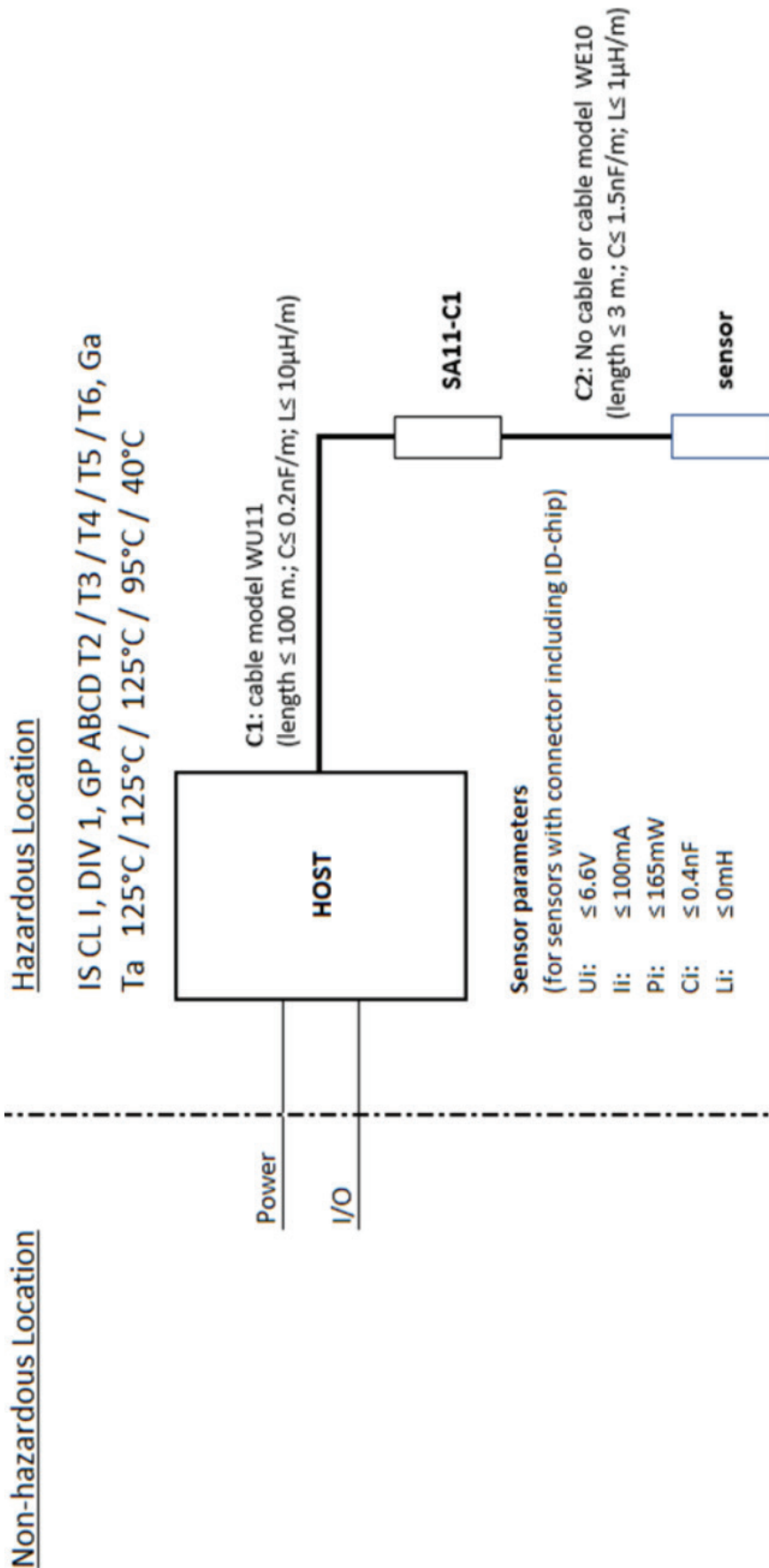
WARNING - POTENTIAL IGNITION HAZARD – SEE INSTRUCTIONS

Contact Conductivity sensors containing light metals, must be installed and used in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

AVERTISSEMENT – RISQUE POTENTIEL D'ALLUMAGE – VOIR LES INSTRUCTIONS

Les capteurs de conductivité de contact contenant des métaux légers doivent être installés et utilisés de telle sorte que, même en cas d'incidents rares, les sources d'allumage dues aux chocs et aux étincelles de friction soient exclues.

Control drawing: D&E 2020-024-A51 (part 2)



Remarks:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (CEC) CSA22.1 and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe Smart Adapter, model SA11-C1, with the following maximum values: $U_o = 6.6 \text{ V}$, $I_o = 100 \text{ mA}$, $P_o = 165 \text{ mW}$.
4. The Installers shall take necessary measures to prevent the possibility of sparking resulting from differing earth potentials between the sensors and interconnecting equipment. The sensor itself does not provide 500 V rms isolation from earth, the interconnecting equipment Model SA11-C1 Smart Adapter however provides this required isolation.
5. Sensor Model code:

Table 9: Regulatory compliance

Model	Suffix Codes	Option Codes
SC42	-abcd	/e
a	Material:	E Epoxy S Stainless Steel F PVDF T PTFE
b	Connection type + Region:	V Connector with ID-chip, IS for ATEX/IECEX, FM-US, FM-CAN
c	Cell Constant:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
d	Measuring type:	One alphanumeric characters (A to Z, 0 to 9 or a hyphen)
e	Option code:	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

6. **WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS**
pH sensors containing accessible plastic parts and/or external conductive parts, must be installed and used in such a way, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive.

AVERTISSEMENT – DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES – VOIR LES INSTRUCTIONS


Les sondes de conductivité de contact contenant des pièces en plastique accessibles et / ou des pièces conductrices externes doivent être installées et utilisées de manière à éviter tout risque d'inflammation dû à des charges électrostatiques dangereuses, en particulier dans le cas où le fluide de procédé n'est pas conducteur.

WARNING - POTENTIAL IGNITION HAZARD – SEE INSTRUCTIONS

Contact Conductivity sensors containing light metals, must be installed and used in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

AVERTISSEMENT – RISQUE POTENTIEL D'ALLUMAGE – VOIR LES INSTRUCTIONS

Les capteurs de conductivité de contact contenant des métaux légers doivent être installés et utilisés de telle sorte que, même en cas d'incidents rares, les sources d'allumage dues aux chocs et aux étincelles de friction soient exclues.

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