General Specifications

Model SC4A
Conductivity Sensors and Fittings
for 2-electrode Systems

GS 12D07J04-01EN-P

■ Overview.

The measurement of specific conductivity in aqueous solutions is becoming increasingly important for the determination of impurities in water. The accuracy of the measurement is strongly influenced by temperature variations, polarization effects at the surface of the contacting electrodes, cable capacitances, etc. Yokogawa has designed a full range of precision sensors and instruments to cope with these measurements, even under extreme conditions.

The SC4A sensors are intended for the low conductivity applications found in the semi-conductor, power, water and pharmaceutical industries; these sensors are in a convenient compact style. There are several mounting possibilities one of which is mounting by 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 and the like, for this kind of application, sanitary clamp mountings are used.

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. The Variopin connector can also be used without the SA11-C1 adapter. Not using the SA11 will not give you the benefits of digital sensor use. 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.

- 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-1 or 0.10 cm-1
- Sensor with 8 pin Variopin with ID chip for SENCOM SA11-C1 use
- Certified for hazardous area
- 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

GS 12D07J04-01EN-P

3rd Edition

■ 1. General Specifications

1.1 Measuring method

Contact conductivity	: 2 electrodes

1.2 Measuring element

Temperature sensor	: Pt1000

1.3 Wetted parts

Sensor Body and electrodes	: SC4A-T-AD : Titanium grade 2 or 3 SC4A-S-AD Stainless Steel AISI 316L SC4A-E-SA (SB, SC) Stainless Steel AISI 316L SC4A-T-PR Titanium grade 2 or 3 SC4A-S-PR Stainless Steel AISI 316L
O-ring	: SC4A-*-AD : Viton SC4A-E-SA (SB, SC) EPDM FDA approved SC4A-*-PR Viton
Insulation	: All models : PEEK 450G, FDA migration tested
Connector Variopin	: Contacts : gold plated
Material	: Nickel-plated brass
Insulation	: PEEK, UL94-V0
Wetted parts adapters/fitting	: /PS, /FF for SC4A-*-AD : Stainless Steel AISI 316L /PF for SC4A-*-AD PVDF /SA1(2), /SB1(2), /SC1 for SC4A-E-SA (SB, SC) Stainless Steel AISI 316L
Cable[1]	: Conductors : tinned copper 0.6 mm2 Outside shield braid, tinned copper, 85% coverage Insulator Polyester for conductor*

* for colors see Section 5.1, TPE-O for outer jacket, color black
Note 1 : Cable is not considered as wetted part

1.4 Functional specifications (at 25 °C)

Temperature element[2] : Pt1000 to IEC 751
Nominal Cell Constant : 0.02 cm-1 or 0.01 cm-1
Note 2: The temperature sensor included in the sensor is designed for process compensation and for indication.
It is NOT designed for process temperature control.

1.5 Dynamic specifications

Response time temperature (t_{90})	: < 1 min.

1.6 Operating range

Conductivity range* at actual process temperature	: 1 µS x C.C. – 200 mS x C.C. (See Fig. 1)

* measurement range dependent on input range analyzer.

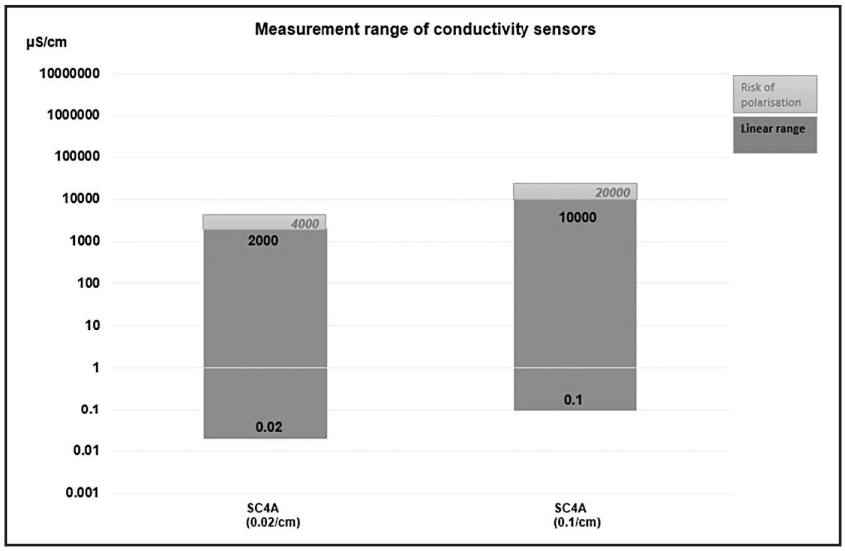


Figure 1: Measuring range of conductivity sensors section

Temperature @ 100 KPa : 0 °C ... 125 °C (32 °F to 257 °F) - For VarioPin type sensors (1 Bar, 14.5 PSI) 0 °C ... 100 °C (32 °F to 212 °F) - For fixed cable type sensors

Remark:
For all types 135°C (275 °F) max. for a short period of time during sterilization.
In combination with a fitting or option, the specification of the most critical part is leading.

Pressure @ 25 °C : Stainless Steel & Titanium type
Over pressure :0 to 10 barg (7 to 142 PSIG)*
Under pressure : 0 to 0.5 barng (0 to 7 PSIG)*
* Unit definition: barg = bar gauge, over pressure against atmosphere.
barng = under pressure against atmosphere
Process Pressure in combination with PVDF fitting : See Figure 2

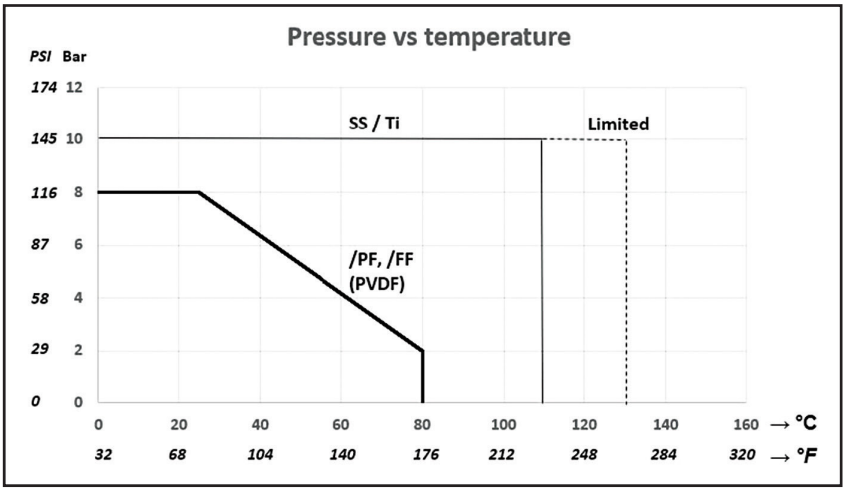


Figure 2: Process pressure in combination with fitting

1.7 Shipping details

Package size (LxWxH) : 220 x 220 x 90 mm (8.7 x 8.7 x 3.6 inch) - Fixed cable version 300 x 100 x 75 mm (11.8 x 3.9 x 3.0 inch) - VarioPin type version

Package weight (max.) SC4A-*** connection type :

-0.3/VS	-0.5	-10	-15	-20	
0.63	0.78	1.13	1.48	1.83	kg
1.4	1.7	2.5	3.0	4.0	lbs

1.8 Environmental conditions

Storage temperature : -30 ºC to +50 ºC (-22 ºF to +122 ºF)
Ingress Protection fixed cable type : IP65 (conform IEC 60529)
Ingress Protection VarioPin type : IP67 (conform IEC 60529)

1.9 Mechanical specifications

Surface roughness :
SC4A-*-AD : max. 0.8 µm
SC4A-E-SA/SB/SC : max. 0.5 µm
SC4A-*-PR : max. 0.8 µm

1.10 Regulatory compliances:

Table 1:. Regulatory compliances

Item	Description, Approval, Certification
ATEX (EU, UK)	ATEX approval: DEKRA 14ATEX0074 X CE 0344 Ex II 1 G Ex ia IIC T4…T6 Ga Applied standards: • EN IEC 60079-0 • EN 60079-11
IECEx	IECEx approval: IECEx DEK 14.0032X Ex ia IIC T4…T6 Ga Applied standards: • IEC 60079-0 • IEC 60079-11
FM (Canada)	FM approval Canada: FM20CA0062X IS SI CL I, DIV 1, GP ABCD, T4…T6 CL I, ZN 0, Ex ia IIC, T4…T6 Ga Control Drawing: D&E 2020-024-A51 Applied standards: • CAN/CSA-C22.2 No. 60079-0 • CAN/CSA-C22.2 No. 60079-11 • CAN/CSA-C22.2 No. 61010-1

Item	Description, Approval, Certification
FM (United States)	FM approval United States: FM20US0123X IS CL I, DIV 1, GP ABCD, T4…T6 CL I, ZN 0, AEx ia IIC, T4…T6 Ga Control Drawing: D&E 2020-024-A50 Applied standards: • FM Class 3600 • FM Class 3610 • FM Class 3810 • ANSI/ISA 60079-0 • ANSI/ISA 60079-11 • ANSI/ISA 61010-1
NEPSI (China)	NEPSI approval: GYJ21.2892X Ex ia IIC T4…T6 Ga Applied standards: • GB 3836.1 • GB 3836.4 • GB 3836.20
PESO (India)	PESO approval: PESO approval is based on ATEX approval DEKRA 14ATEX0074 X, issue 2 – 29.11.2019 Equipment reference numbers: P512759/1 Applied standards: • 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: • IEC 60079-0 • IEC 60079-11
EACEx (Russia)	EAC Ex certificate: RU C-NL.AA87.B.00754 0Ex ia IIC T6…T4 Ga X Applied standards: • GOST 31610.0 (IEC 60079-0) • GOST 31610.11 (IEC 60079-11) • GOST IEC 60079-14

■ 2. Specifications SC4A-AD

2. 1 Materials Wetted Parts

Body & electrodes :	Stainless steel AISI 316L or Titanium grade 2 or 3
O-ring :	Viton
Mounting adapter :	PVDF or Stainless steel AISI 316L
Insulation :	PEEK (Polyether Ether Ketone) FDA migration tested CFR 177 .2415 FDA migration tested 21 CFR 177.2415 +, PIM and USP class VI
Surface Roughness :	0.8µm (R432)

2.2 Operating Specifications

See Section 1.6

2.3 Model and Suffix Codes

Table 2:. Model and suffix codes SC4A-AD

Model	Suffix Code	Option Code	Description		
SC4A-AD			19 mm conductivity sensor		
Material	-T		Titanium Grade 2 or 3		
	-S		Stainless steel AISI 316L (SS)		
Fitting-type	-AD		For adapter mounting		
Sensor-length	-09		9 cm [11]		
	-15		15 cm		
Cell constant	-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		
Temperature element	-T1		Pt1000, IS for ATEX/IECEx/FM-US/FM-CAN		
Options			Material	Process conn.	Part No.
		/PS	Stainless Steel	3/4” NPT adapter	K1542DF
		/PF	PVDF	3/4” NPT adapter	K1542CW
		/FF	Stainless Steel	Flow fitting	K1598AC

Notes

1)Suffix -AD-09 not available with -VS.

2) With option /FF: option /PS is mandatory.

■ 3. Specifications SC4A-SA/SB/SC

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

3.1 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 + FDA, PIM European Directive 10/2011/EC 1935/2004 and USP class VI
Surface Roughness :	0.5µm

3.2 Operating Specifications

See Section 1.6

3.3 Model and Suffix Codes

Table 3:. Model and suffix codes SC4A-SA/SB/SC

Model	Suffix Code	Option Code	Description		
SC4A-SA/SB/SC			19 mm conductivity sensor		
Material	-E		Stainless steel AISI 316L (SS) with EPDM FDA sealing		
Fitting-type	-SA		25 mm port, for sanitary purposes		
	-SB		1-1½” tri-clamp		
	-SC		2” tri-clamp		
Sensor length	-NN		Fixed length		
Cell constant	-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		
Temperature element	-T1		Pt1000, IS for ATEX/IECEx/FM-US/FM-CAN		
Options			Material	Process conn.	Part No.
		/PS	Stainless Steel	3/4” NPT adapter	K1542DF
		/PF	PVDF	3/4” NPT adapter	K1542CW
		/FF	Stainless Steel	Flow fitting	K1598AC

■ 4. Specifications SC4A-PR

4.1 Materials Wetted Parts

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

4.2 Operating Specifications

See Section 1.6

4.3 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.

4.4 Model and Suffix Codes

Table 4:. Model and suffix codes SC4A-PR

Model	Suffix Code	Description
SC4A-PR		19 mm conductivity sensor
Material	-T	Titanium Grade 2 or 3
	-S	Stainless steel AISI 316L (SS)
Fitting-type	-PR	For retractable mounting
Sensor length	-NN	Fixed length
Cell constant	-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 0
Temperature element	-T1	Pt1000, IS for ATEX/IECEx/FM-US/FM-CAN

■ 5. Dimensional Drawings

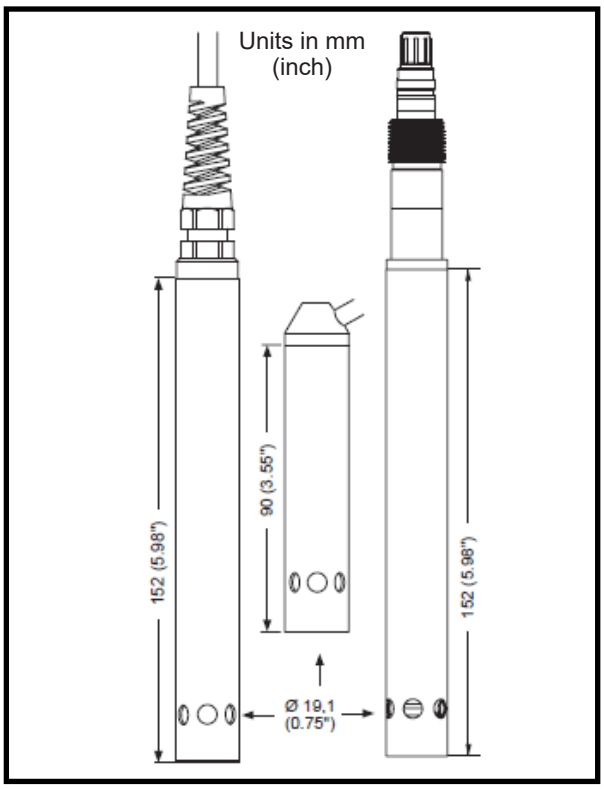


Figure 3: Dimensions SC4A-AD-15 / SC4A-AD-09

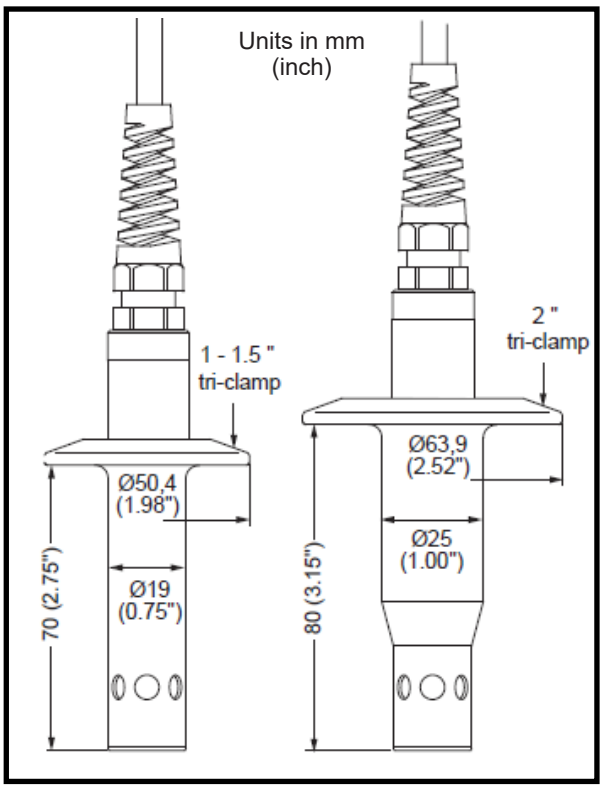


Figure 4: SC4A-SB/SC Cable type

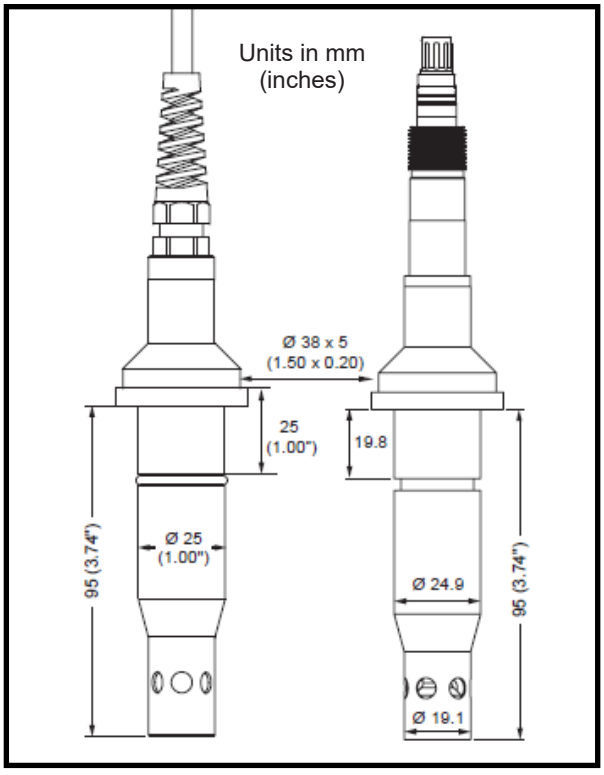


Figure 5: Dimensions SC4A-SA

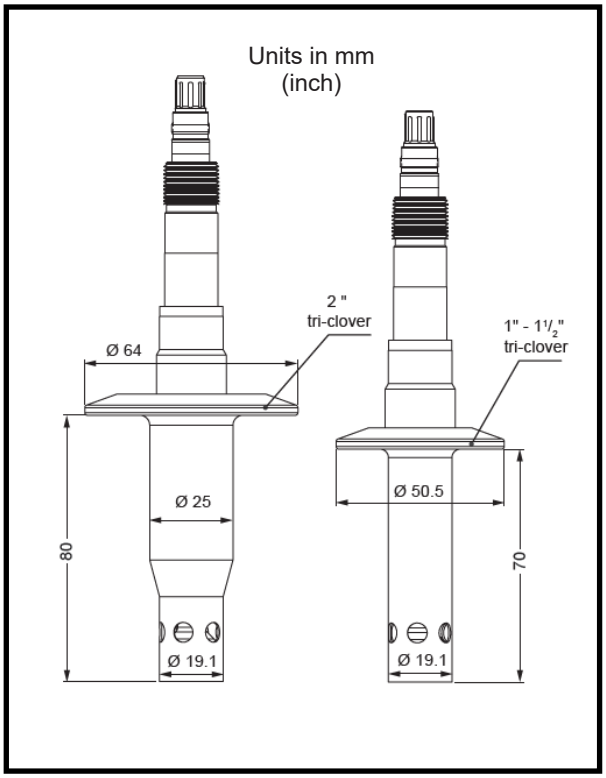


Figure 6: Dimensions SC4A-SB/SC Variopin type

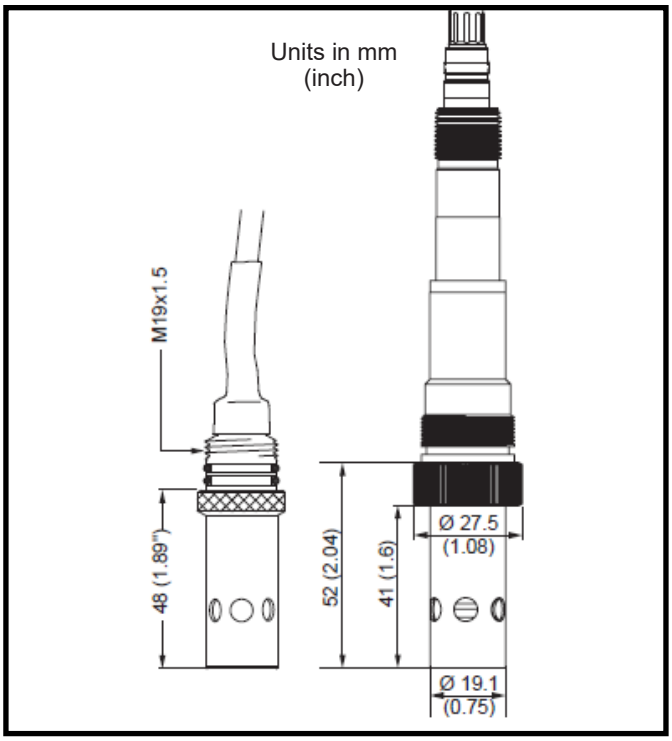


Figure 7: Dimensions SC4A-PR

■ Addendum 1: Typical Installations

For optimum measurement results, the SC4A sensor should be installed in a location that offers an acceptable representation of the process composition and DOES NOT exceed the specifications of the sensor.

Typical installation SC4A-*-AD with standard options

The SC4A-*-AD sensor can be installed in the process using optional ¾" NPT adapters. These adapters are available in Stainless Steel (/PS) and in PVDF (/PF); see Figure 8 for the mounting sequence. The sensor can also be installed in an optional Stainless-Steel flow fitting (/FF) using option /PS, see Figure 9 for details.

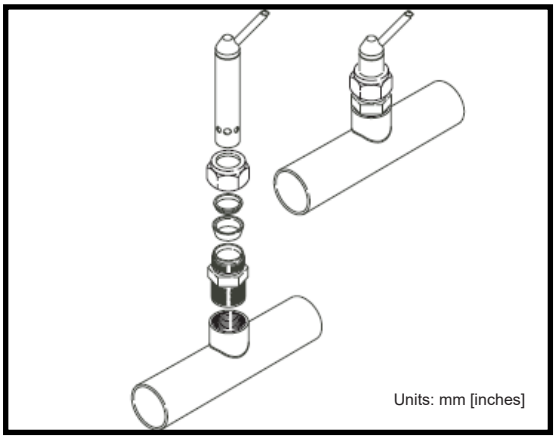


Figure 8: Mounted sensor with option /PF and /PS

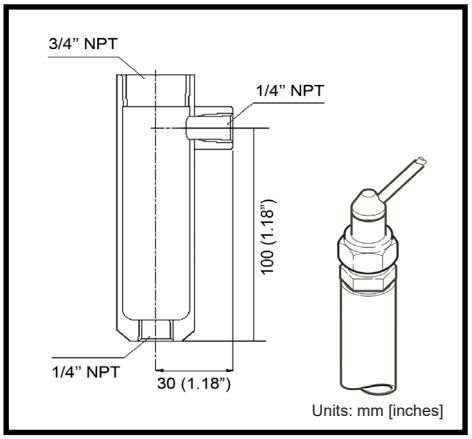


Figure 9: Dimensional drawing /FF with option /PS

Typical installation SC4A-E-SA (SB, SC) with standard options / spare parts

The typical installation of the SC4A-E-SA sensor is done by using a standardized 25 mm port. Stainless Steel welding sockets are available as straight version (spare part /SA1) or 15° angled version (spare part /SA2). Both versions are delivered with mounting nut.

In Figure 10 an example is shown how to install the sensor using spare part /SA1. Sensors SC4A-E-SB and SC4A-E-SC are installed by tri-clamp method, see Figure 11. For the SB version two Stainless Steel tri-clamps are available, in a 1" size (spare part /SB1) or in a 1½" size (spare part /SB2). The SC version has just one Stainless Steel tri-clamp in a 2" size (spare part /SC1).

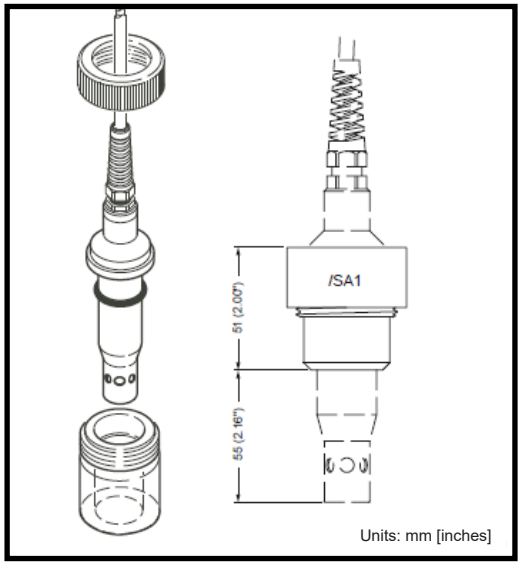


Figure 10: Mounted SC4A-E-SA sensor with spare part/SA1

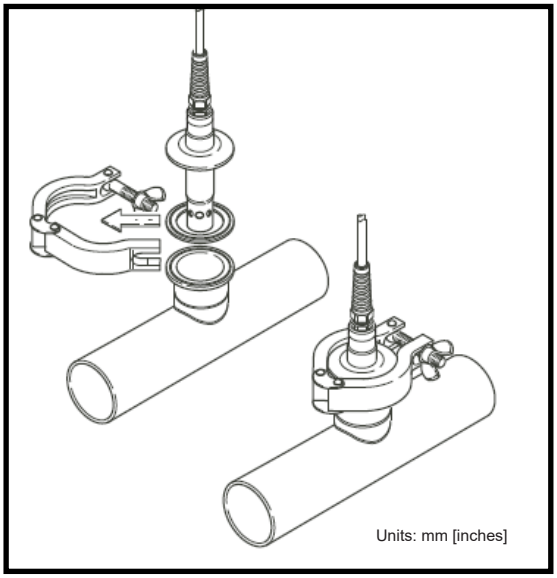
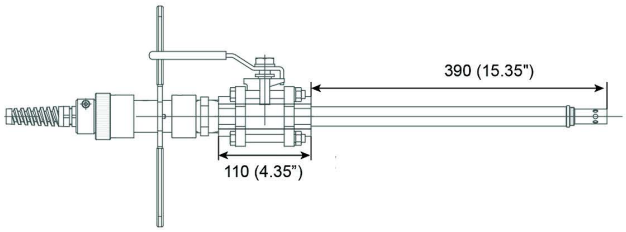


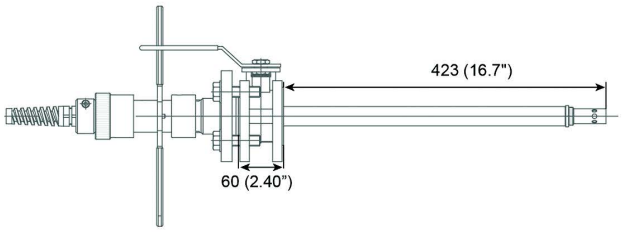
Figure 11: Mounted SC4A-E-SB(-SC) sensor

Typical installation SC4A-*-PR

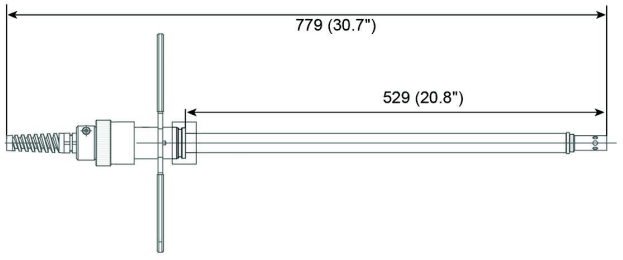
The installation of the SC4A-*-PR sensor is done using the Model PR10 retractable fitting.



PR10-..-..-....-D32-SC4A/SA125/BS125



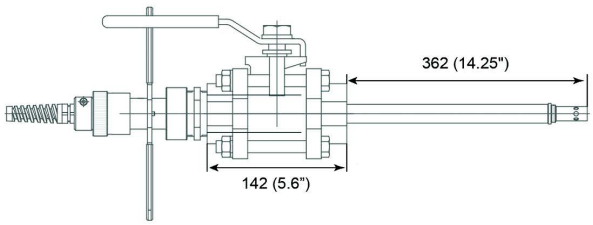
PR10-..-..-....-D32-SC4A/F..125/BF125
PR10-..-..-....-D32-SC4A/F..D32/BFD32



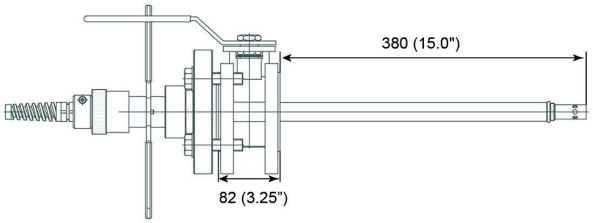
PR10- .. -V-L5-D32-SC4A

Units in mm
(inch)

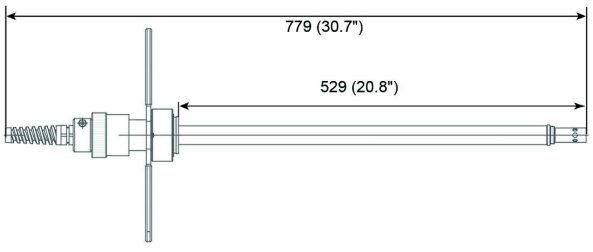
Figure 12: Dimensional drawing PR10...-D32 with mounted SC4A sensor



PR10-..-..-....-D50-SC4A/SA200/BS200



PR10-..-..-....-D50-SC4A/F..200/BF200
PR10-..-..-....-D50-SC4A/F..D50/BFD50



PR10- .. -V-L5-D50-SC4A

Units in mm
(inch)

Figure 13: Dimensional drawing PR10...-D50 with mounted SC4A sensor

■ Addendum 2: Available Model Codes

SC4A-S-AD-09-002-03-T1	SC4A-T-AD-09-002-03-T1	SC4A-E-SB-NN-002-03-T1	SC4A-T-AD-15-002-VS-T1
SC4A-S-AD-09-002-05-T1	SC4A-T-AD-09-002-05-T1	SC4A-E-SB-NN-002-05-T1	SC4A-T-AD-15-010-VS-T1
SC4A-S-AD-09-002-10-T1	SC4A-T-AD-09-002-10-T1	SC4A-E-SB-NN-002-10-T1	
SC4A-S-AD-09-002-15-T1	SC4A-T-AD-09-002-15-T1	SC4A-E-SB-NN-002-15-T1	SC4A-S-AD-15-002-VS-T1
SC4A-S-AD-09-002-20-T1	SC4A-T-AD-09-002-20-T1	SC4A-E-SB-NN-002-20-T1	SC4A-S-AD-15-010-VS-T1
SC4A-S-AD-09-010-03-T1	SC4A-T-AD-09-010-03-T1	SC4A-E-SB-NN-010-03-T1	
SC4A-S-AD-09-010-05-T1	SC4A-T-AD-09-010-05-T1	SC4A-E-SB-NN-010-05-T1	SC4A-E-SC-NN-002-VS-T1
SC4A-S-AD-09-010-10-T1	SC4A-T-AD-09-010-10-T1	SC4A-E-SB-NN-010-10-T1	SC4A-E-SC-NN-010-VS-T1
SC4A-S-AD-09-010-15-T1	SC4A-T-AD-09-010-15-T1	SC4A-E-SB-NN-010-15-T1	
SC4A-S-AD-09-010-20-T1	SC4A-T-AD-09-010-20-T1	SC4A-E-SB-NN-010-20-T1	SC4A-E-SB-NN-002-VS-T1
			SC4A-E-SB-NN-010-VS-T1
SC4A-S-AD-15-002-03-T1	SC4A-S-PR-NN-002-03-T1	SC4A-E-SC-NN-002-03-T1	
SC4A-S-AD-15-002-05-T1	SC4A-S-PR-NN-002-05-T1	SC4A-E-SC-NN-002-05-T1	SC4A-E-SA-NN-002-VS-T1
SC4A-S-AD-15-002-10-T1	SC4A-S-PR-NN-002-10-T1	SC4A-E-SC-NN-002-10-T1	SC4A-E-SA-NN-010-VS-T1
SC4A-S-AD-15-002-15-T1	SC4A-S-PR-NN-002-15-T1	SC4A-E-SC-NN-002-15-T1	
SC4A-S-AD-15-002-20-T1	SC4A-S-PR-NN-002-20-T1	SC4A-E-SC-NN-002-20-T1	SC4A-T-PR-NN-002-VS-T1
SC4A-S-AD-15-010-03-T1	SC4A-S-PR-NN-010-03-T1	SC4A-E-SC-NN-010-03-T1	SC4A-T-PR-NN-010-VS-T1
SC4A-S-AD-15-010-05-T1	SC4A-S-PR-NN-010-05-T1	SC4A-E-SC-NN-010-05-T1	
SC4A-S-AD-15-010-10-T1	SC4A-S-PR-NN-010-10-T1	SC4A-E-SC-NN-010-10-T1	SC4A-S-PR-NN-002-VS-T1
SC4A-S-AD-15-010-15-T1	SC4A-S-PR-NN-010-15-T1	SC4A-E-SC-NN-010-15-T1	SC4A-S-PR-NN-010-VS-T1
SC4A-S-AD-15-010-20-T1	SC4A-S-PR-NN-010-20-T1	SC4A-E-SC-NN-010-20-T1	
SC4A-T-AD-15-002-03-T1	SC4A-E-SA-NN-002-03-T1	SC4A-T-PR-NN-002-03-T1	
SC4A-T-AD-15-002-05-T1	SC4A-E-SA-NN-002-05-T1	SC4A-T-PR-NN-002-05-T1	
SC4A-T-AD-15-002-10-T1	SC4A-E-SA-NN-002-10-T1	SC4A-T-PR-NN-002-10-T1	
SC4A-T-AD-15-002-15-T1	SC4A-E-SA-NN-002-15-T1	SC4A-T-PR-NN-002-15-T1	
SC4A-T-AD-15-002-20-T1	SC4A-E-SA-NN-002-20-T1	SC4A-T-PR-NN-002-20-T1	
SC4A-T-AD-15-010-03-T1	SC4A-E-SA-NN-010-03-T1	SC4A-T-PR-NN-010-03-T1	
SC4A-T-AD-15-010-05-T1	SC4A-E-SA-NN-010-05-T1	SC4A-T-PR-NN-010-05-T1	
SC4A-T-AD-15-010-10-T1	SC4A-E-SA-NN-010-10-T1	SC4A-T-PR-NN-010-10-T1	
SC4A-T-AD-15-010-15-T1	SC4A-E-SA-NN-010-15-T1	SC4A-T-PR-NN-010-15-T1	
SC4A-T-AD-15-010-20-T1	SC4A-E-SA-NN-010-20-T1	SC4A-T-PR-NN-010-20-T1	

■ Addendum 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, T4…T6 CL I, ZN 0, AEx ia IIC, T4…T6 Ga Control Drawing: D&E 2020-024-A50
Electrical data :	(See Note)
Specific conditions of use :	See Control Drawing D&E 2020-024-A50. Temperature classes for SC4A models are defined T4…T6 (See Note).

Note: 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:

Ui= 14.4 V; Ii= 116.5 mA; Pi= 0.3424 W

Li= 0.1 mH (models with fixed cable) or Li= 0 mH (VS type)

Ci= 150 nF (models with fixed cable) or Ci= 0.4 nF (VS type)

Ambient temperature:

-30°C to +40°C for temperature class T6,

-30°C to +95°C for temperature class T5,

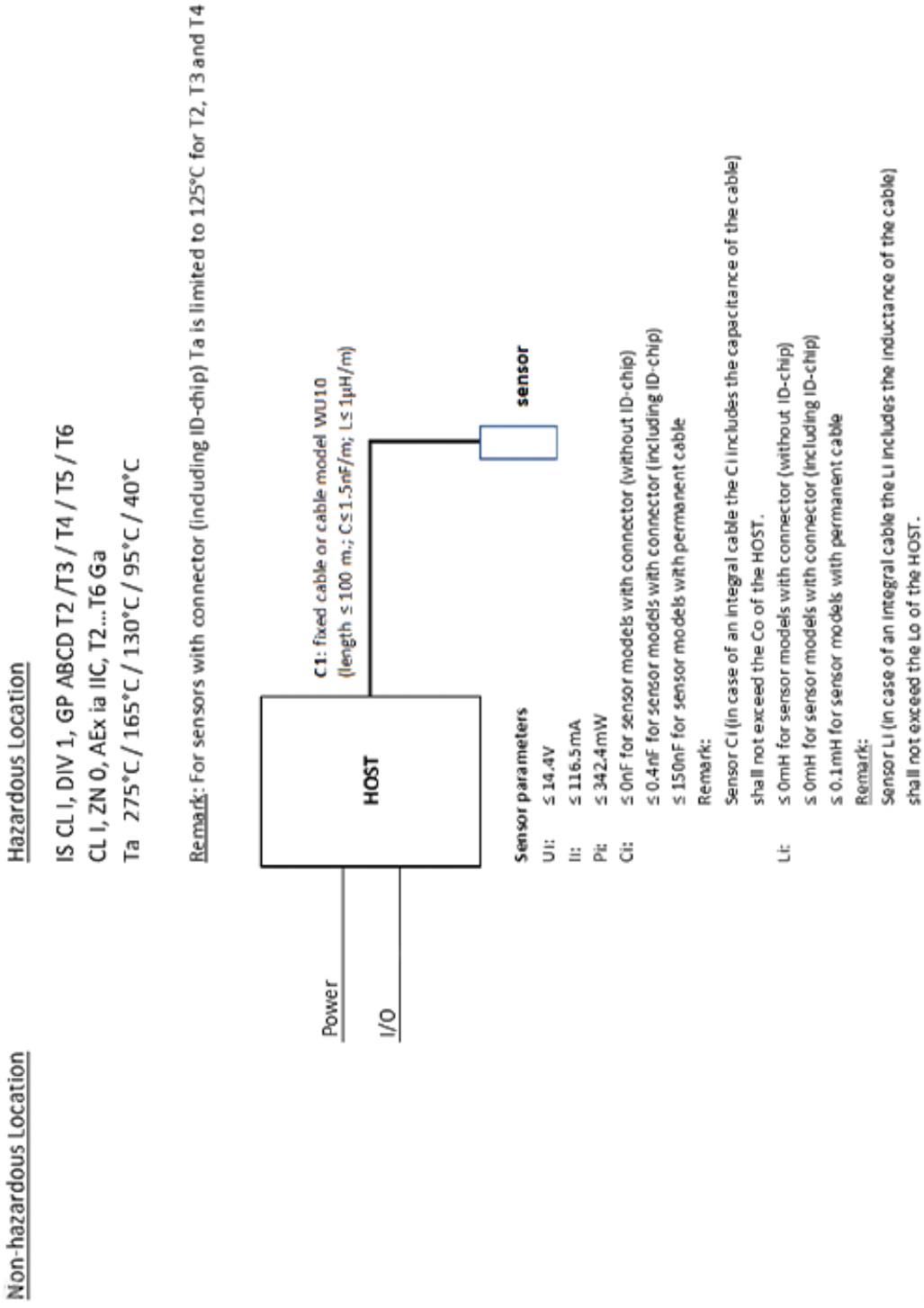
-30°C to +125°C for temperature class T4 (VS type),

-30°C to +130°C for temperature class T4 (models with fixed cable).

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 the certificate is released under the same number 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/ISA-RP12.06.01, and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe HOST with the following maximum values: Uo= 14.4 V, Io = 116.5 mA, Po = 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-tooutput and input-to-earth isolation up to 500 V rms.
5. Sensor Model code:

Model	Suffix Code	Option Code
SC4A	-a-bc-de-fgh-ij-kl	/m
a	Material	T - Titanium
		S - Stainless Steel, Viton sealing
		E - Stainless Steel, EPDM sealing
bc	Fitting type	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
de	Sensor length	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
egh	Cell Constant	Three alphanumeric characters (A to Z, 0 to 9 or a hyphen)
ij	Connection type	VS - Connector with ID-chip. Two alphanumeric characters identifying the length of the permanent cable, each character from 0 to 9
kl	Temp. sensor + Region	T1 Pt1000, IS for ATEX/IECEx, FM-US, FM-CAN
m	Option code	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

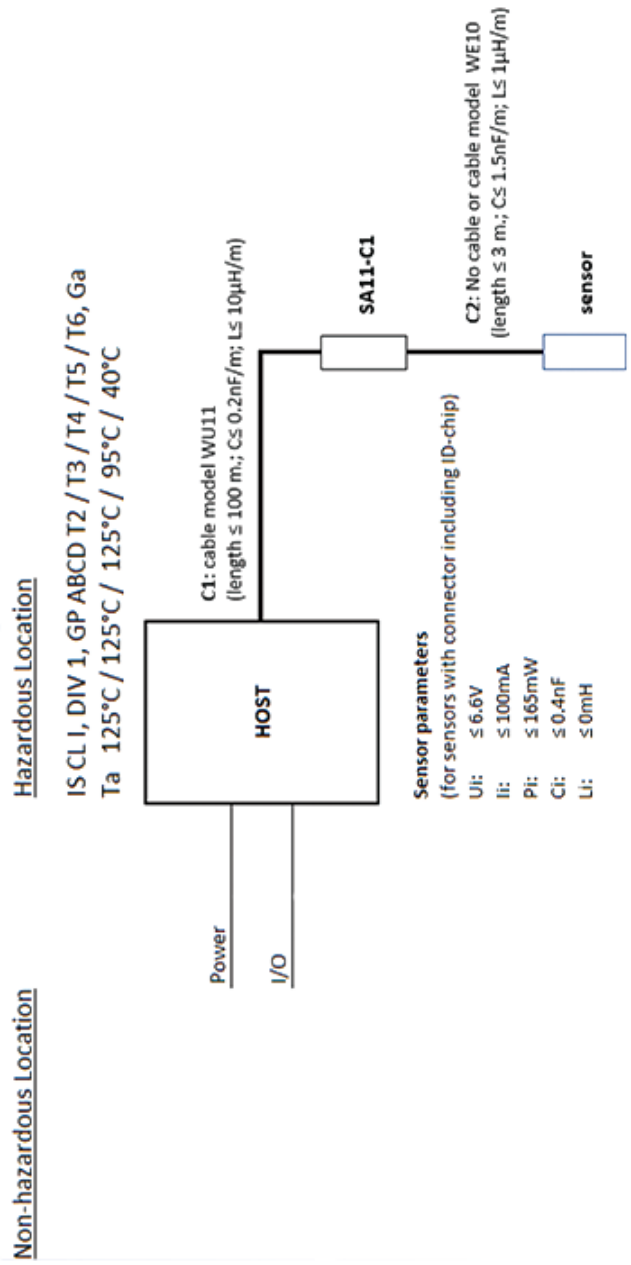
WARNING - POTENTIONAL ELECTROSTATIC CHARGING HAZARD (see instructions)

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 - POTENTIONAL 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)



7.7 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/ISA-RP12.06.01, 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: Uo= 6.6 V, Io = 100 mA, Po= 165 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 e arth, the interconnecting equipment Model SA11-C1 Smart Adapter however provides this required isolation.
5. Sensor Model code:

Model	Suffix Code	Option Code
SC4A	-a-bc-de-fgh-ij-kl	/m
a	Material	T - Titanium
		S - Stainless Steel, Viton sealing
		E - Stainless Steel, EPDM sealing
bc	Fitting type	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
de	Sensor length	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
egh	Cell Constant	Three alphanumeric characters (A to Z, 0 to 9 or a hyphen)
ij	Connection type	VS - Connector with ID-chip.
kl	Temp. sensor + Region	T1 Pt1000, IS for ATEX/IECEx, FM-US, FM-CAN
m	Option code	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

WARNING - POTENTIONAL 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 - POTENTIONAL 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
	S CL I, DIV 1, GP ABCD, T4…T6 CL I, ZN 0, Ex ia IIC, T4…T6 Ga
	Control Drawing: D&E 2020-024-A51
Electrical data :	(See Note 1)
Specific conditions of use :	See Control Drawing D&E 2020-024-A51.
	Temperature classes for SC4A models are defined T4…T6 (See Note 1).

Note 1 : 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; Ii= 116.5 mA; Pi= 0.3424 W;

Li= 0.1 mH (models with fixed cable) or Li= 0 mH (VS type);

Ci= 150 nF (models with fixed cable) or Ci= 0.4 nF (VS type

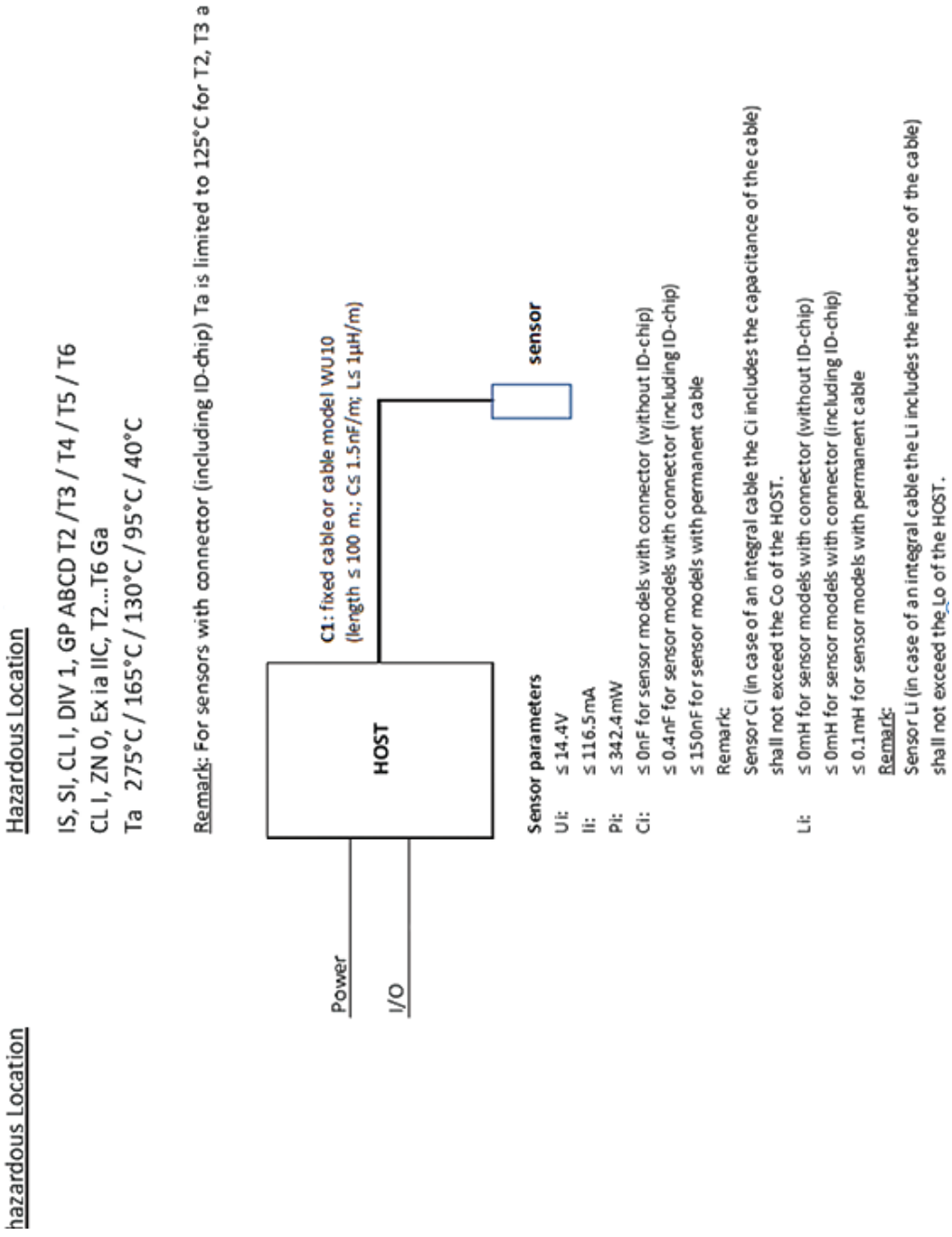
Ambient temperature:

- 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 (VS type),
- 30°C to +130°C for temperature class T4 (models with fixed cable).

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 the certificate is released under the same number with a new date. - FM-Canada: FM20CA0062X (effective from 03-2021)

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



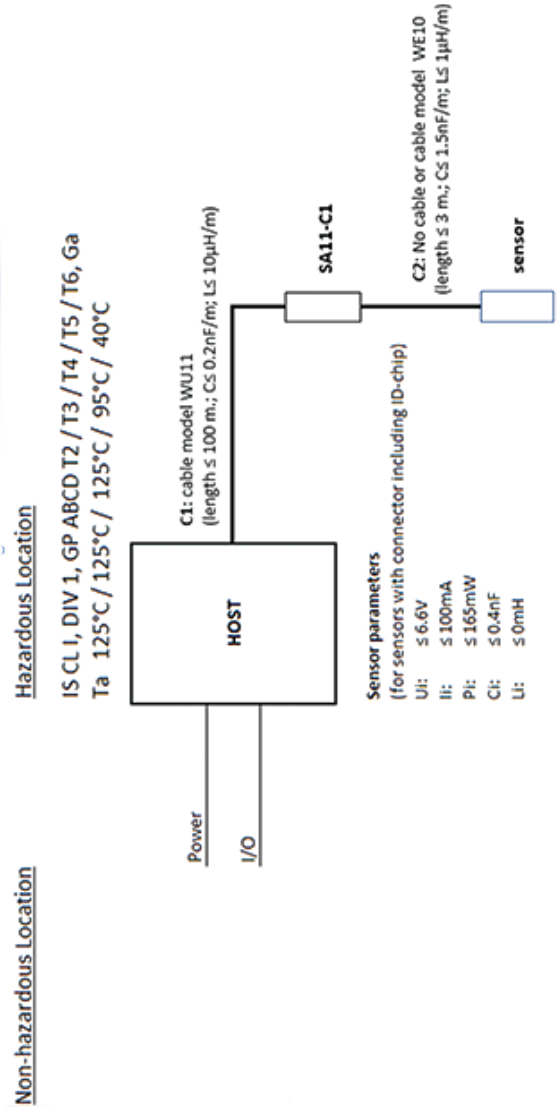
7.12 Remarks:
1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (CEC) CSA22.1 and relevant local codes.
3. The sensor shall be installed to a certified intrinsically safe HOST with the following maximum values: Uo= 14.4 V, Io = 116.5 mA, Po = 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-tooutput and input-to-earth isolation up to 500 V rms.
5. Sensor Model code:

Model	Suffix Code	Option Code
SC4A	-a-bc-de-fgh-ij-kl	/m
a	Material	T - Titanium
		S - Stainless Steel, Viton sealing
		E - Stainless Steel, EPDM sealing
bc	Fitting type	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
de	Sensor length	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
egh	Cell Constant	Three alphanumeric characters (A to Z, 0 to 9 or a hyphen)
ij	Connection type	VS - Connector with ID-chip Two alphanumeric characters identifying the length of the permanent cable, each character from 0 to 9.
kl	Temp. sensor + Region	T1 Pt1000, IS for ATEX/IECEx, FM-US, FM-CAN
m	Option code	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

WARNING - POTENTIONAL 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 - POTENTIONAL 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-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: Uo= 6.6 V, Io = 100 mA, Po = 165mW.
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:

Model	Suffix Code	Option Code
SC4A	-a-bc-de-fgh-ij-kl	/m
a	Material	T - Titanium
		S - Stainless Steel, Viton sealing
		E - Stainless Steel, EPDM sealing
bc	Fitting type	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
de	Sensor length	Two alphanumeric characters (A to Z, 0 to 9 or a hyphen)
egh	Cell Constant	Three alphanumeric characters (A to Z, 0 to 9 or a hyphen)
ij	Connection type	VS - Connector with ID-chip
kl	Temp. sensor + Region	T1 Pt1000, IS for ATEX/IECEx, FM-US, FM-CAN
m	Option code	Up to ten alphanumeric characters (A to Z, 0 to 9 or hyphen)

WARNING - POTENTIONAL 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 - POTENTIONAL 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.

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