Instructions for Use of SE 680 (N/X) Digital Toroidal Conductivity Sensor

WARNING – Failure to observe this warning may result in serious injury.
The safety alert symbol on the nameplate means:
Read these instructions for use, observe the Specifications, and follow the Safety Instructions.

1 Safety Instructions

1.1 All Applications

Hazards due to pressure, temperature, aggressive media or explosive atmosphere are possible, depending on the location of use. Therefore, the installation, operation, and servicing of the sensor shall only be carried out by suitably trained personnel authorized by the operating company.

1.2 Hazardous Areas

Observe all applicable local codes and standards for the installation of electrical equipment in hazardous locations. For orientation, please refer to IEC 60079-14, EU directives 2014/34/EU and 1999/92/EC (ATEX), NFPA 70 (NEC), ANSI/ISA-RP12.06.01. The electrical and thermal parameters of the sensors must be adhered to.

2 Applications

The SE 680 conductivity sensor has a measuring range of 0 to 2000 mS/cm with a resolution of 2 µS/cm.
The joint- and gap-free, sealless design and stain-resistant surface made of Virgin PEEK make the SE 680 a heavy-duty sensor. Inductive conductivity measurement prevents measurement errors due to polarization. Updated recommendations for use can be found at www.knick-international.com.

3 Calibration / Adjustment

Sensor in immersion fitting

Clean, rinse, and dry the sensor, then immerse it in the calibration solution.
Suitable calibration solution: KCl 0.1 mol/l (12.88 mS/cm). Ensure sufficient clearance from walls (> 3 cm). Observe the user manual of the instrument.

Sensor in flow-through fitting

Shut off the flow and remove the sensor. Immerse the sensor in the calibration solution. Ensure sufficient clearance from walls (> 3 cm).

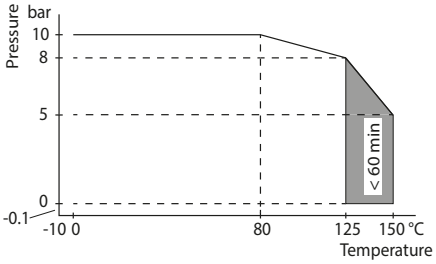
Note: The geometry of the vessel or pipe can be taken into account by using an installation factor. In that case calibrate the cell factor under free field conditions. When you do not use the installation factor (= 1), the geometry of the vessel or pipe is taken into account by the cell factor. For calculating the conductivity, the product of cell factor and installation factor is used.

When using the ARF 210 / 215 flow-through fitting, use the corresponding calibration beaker. Then, the influence of the flow-through fitting will be taken into account by an appropriate cell factor.
If the sensor is not supposed to be removed or cannot be removed, perform a product calibration.
Observe the user manual of the instrument.

4 Specifications

Cell factor Installation factor	c ≈ 5.0/cm 1 (adjustable)
Measuring range Resolution Error	0 ... 2000 mS/cm 2 µS/cm ± 1 % meas. val. ± 0.002 mS/cm, ± 0.02 %/K
Temperature detector Response time	Pt1000 T_{90} approx. 30 s
Materials with process contact	Virgin PEEK, FDA type
Materials without process contact	PP-ESD
Process temperature Sterilizing Ambient temperature P_{rel}	-10 ... 125 °C (see PT diagram) -10 ... 80 °C (KUN4U00M only) ≤ 5 bar / ≤ 150 °C / ≤ 60 min -20 ... 60 °C -0.1 ... 10 bar

Pressure-Temperature Relationship



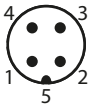
Electrical Connection	M12 plug, 4-pin Cable length max. 100 m
Certificates	FDA CFR 177.2415

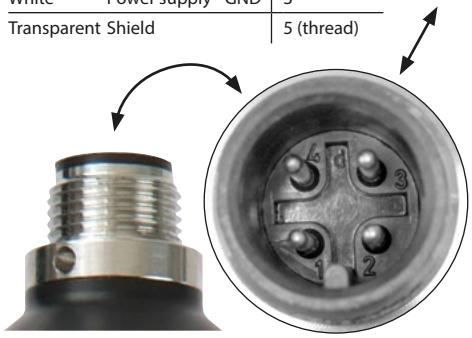
5 Accessories

Cable types	CA/M12-005NA	5 m
	CA/M12-010NA	10 m
	CA/M12-020NA	20 m

Cable with 4 wires and shield;
M12 socket acc. to IEC 61076-2-101

Wire assignment (Type CA/M12-xxxNA cable):		**Contact assignment** M12 connector (plug-in):
Wire color	**Connection**	**Number**
Brown	Power supply +3 V	1
Green	RS-485 A	4
Yellow	RS-485 B	2
White	Power supply - GND	3
Transparent	Shield	5 (thread)



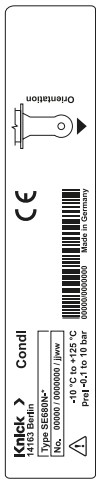


6 Disposal

Observe the applicable local or national regulations concerning the disposal of "waste electrical and electronic equipment".

Knick

Manual SE 680 (N/X)



The orientation symbol shows the position of the sensor bore.

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7 Hazardous Areas: Electrical and Thermal Parameters

Certificate Number:	Marking
TÜV 15 ATEX 154534 X	Ex II 1 G
IECEx TUN 15.0026 X	Ex ia IIC T6/T4/T3 Ga

Electrical Parameters

Sensor circuit in type of protection "Intrinsic Safety" Ex ia IIC, with the following maximum values:

V_i	5.1 V
I_i	130 mA
P_i	166 mW
Effective internal capacitance C_i	≤ 55 µF
Effective internal inductance L_i	negligibly small

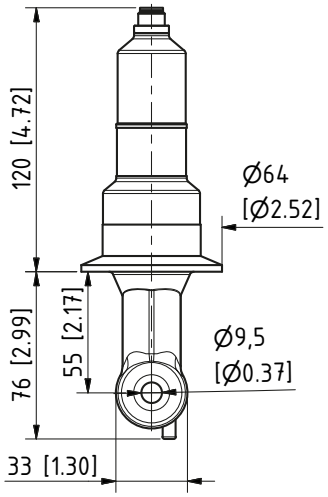
Thermal Parameters

Temperature class	Ambient temperature range	Permissible process temperature
T6	-20 °C ≤ Ta ≤ +75 °C	75 °C
T4	-20 °C ≤ Ta ≤ +125 °C	125 °C
T3	-20 °C ≤ Ta ≤ +150 °C	150 °C

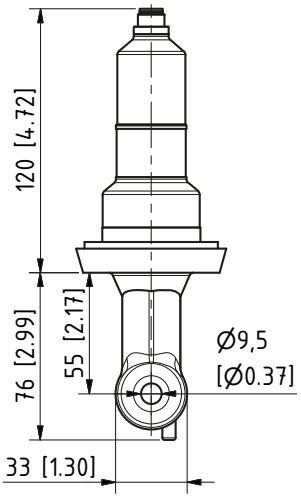
Special conditions:

The cable and the sensor shall only be used within their specified ambient temperature range.
They have to be protected from electrostatic charging if installed in a hazardous area.
The sensor shall only be used in liquid media with a conductivity ≥ 10 nS/cm.

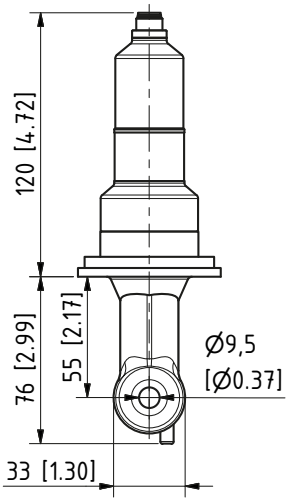
8 Dimension Drawings / Process Connections / Order References



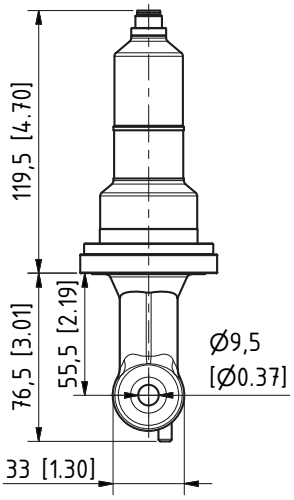
Clamp 2" (ISO 2852)
DN 50 (DIN 32676)
SE680(N/X)-J2N4U00M



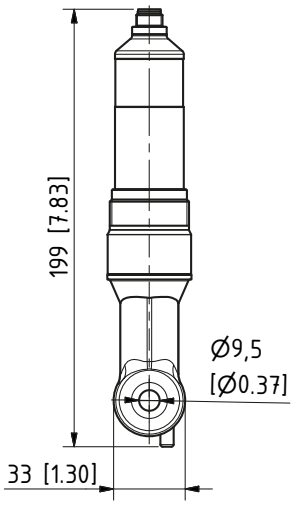
Dairy pipe DN 50
SE680(N/X)-C1N4U00M



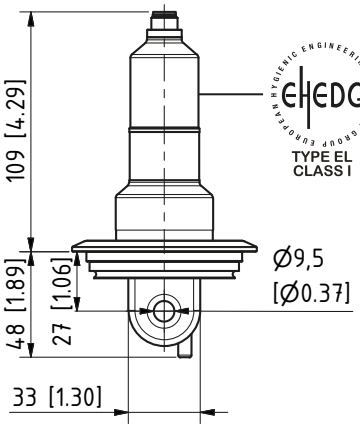
SMS 2"
SE680(N/X)-M2N4U00M



for ARF 210/215
SE680(N/X)-K8N4U00M



for ARD 75
SE680(N/X)-KUN4U00M



Varivent DN 50 or larger
SE680(N/X)-V1N4U00M

095709

All dimensions in mm [inches]