

SE625
Conductivity Sensor



Read before installation.
Keep for future use.



Supplemental Directives

READ AND SAVE THIS DOCUMENT FOR FUTURE REFERENCE. BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT, PLEASE ENSURE A COMPLETE UNDERSTANDING OF THE INSTRUCTIONS AND RISKS DESCRIBED HEREIN. ALWAYS OBSERVE ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS IN THIS DOCUMENT COULD RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE. THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.

These supplemental directives explain how safety information is laid out in this document and what content it covers.

Safety Chapter

This document's safety chapter is designed to give the reader a basic understanding of safety. It illustrates general hazards and gives strategies on how to avoid them.

Warnings

This document uses the following warnings to indicate hazardous situations:

Symbol	Category	Meaning	Remark
	WARNING	Designates a situation that can lead to death or serious (irreversible) injury.	The warnings contain information on how to avoid the hazard.
	CAUTION	Designates a situation that can lead to slight or moderate (reversible) injury.	
<i>None</i>	NOTICE	Designates a situation that can lead to property or environmental damage.	

Symbols Used in this Document

Symbol Meaning

- Reference to additional information
- ✓ Interim or final result in instructions for action
- ▶ Sequence of figures attached to an instruction for action
- ① Item number in a figure
- (1) Item number in text

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1 Safety

This document contains important instructions for the use of the product. Always follow all instructions and operate the product with caution. If you have any questions, please contact Knick Elektronische Messgeräte GmbH & Co. KG (sometimes hereafter referred to as "Knick") using the information provided on the back page of this document.

1.1 Intended Use

The SE625 conductivity sensor (the "product") is a coaxial 2-electrode sensor with a measuring range of 0 ... 1000 $\mu\text{S}/\text{cm}$. The sensor body is made of stainless steel, the sensing electrodes of titanium. The sensor is ideal for use in measuring and monitoring ultrapure water.

The measurement data is output via a suitable industrial transmitter. The defined operating conditions must be observed when using this product. → *Specifications, p. 22*

1.2 Personnel Requirements

Customer shall ensure that any personnel using or otherwise interacting with the product is adequately trained and has been properly instructed.

The operating company shall comply and cause its personnel to comply with all applicable laws, regulations, codes, ordinances and relevant industry qualification standards related to product. Failure to comply with the foregoing shall constitute a violation of operating company's obligations concerning the product, including but not limited to an unintended use as described in this document.

1.3 Residual Risks

The product has been developed and manufactured in accordance with generally accepted safety rules and regulations. The SE625 sensor was subjected to a risk assessment. Nevertheless, not all risks can be sufficiently reduced; the following residual risks remain:

Environmental Influences

The effects of pressure, moisture, corrosion, chemicals, and ambient temperature can negatively impact on safe operation of the product.

Observe the following instructions:

- Only operate the SE625 sensor in compliance with the stated operating conditions. → *Specifications, p. 22*
- If using chemically aggressive process media, regularly check the SE625 sensor for damage.
- Adhering and sticky process media may interfere with measurements. Regularly remove adherents. As required, recalibrate the SE625 sensor. → *Cleaning, p. 16* → *Calibration, p. 17*

1.4 Hazardous Substances

In certain situations (e.g., sensor replacement), personnel may come into contact with the following hazardous substances:

- Process medium
- Cleaning medium

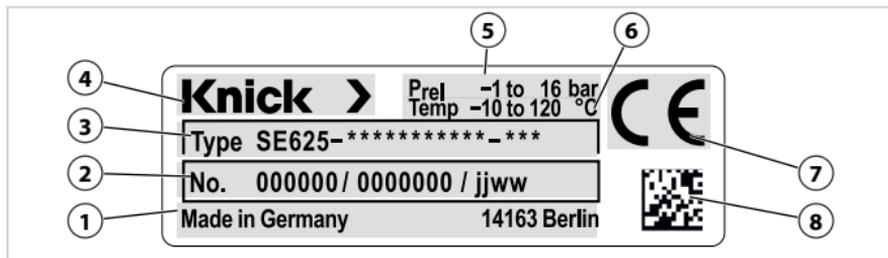
This document specifies the personal protective equipment that needs to be used when carrying out handling instructions.

The operating company is responsible for conducting a hazard assessment.

See the relevant manufacturers' safety data sheets for hazard and safety instructions on handling hazardous substances.

2.3 Nameplates

The SE625 is identified by a nameplate.



- | | | | |
|---|---|---|---|
| 1 | Manufacturer's address with designation of origin | 5 | Permissible pressure range |
| 2 | Item production number / serial number / production year and week | 6 | Permissible temperature range |
| 3 | Type (product code) | 7 | Conformity mark |
| 4 | Manufacturer | 8 | DataMatrix code with item production number / serial number |

2.4 Symbols and Markings

 CE marking

 UK Conformity Assessed: Conformity mark for the United Kingdom of Great Britain and Northern Ireland

 Labeling according to the European WEEE Directive. The product must be separately disposed of with electrical and electronic equipment.

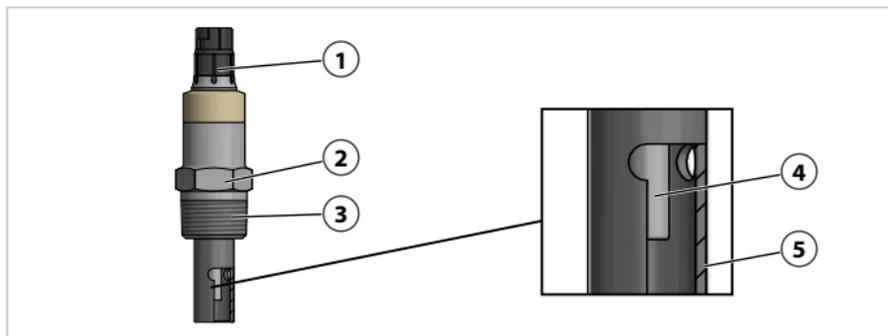
2.5 Design and Function

The SE625 sensor features a temperature detector and outer and inner electrodes made of titanium.

Note: The temperature detector is used for automatic measured value compensation, but not to display the temperature or control the process temperature.

The sensor is attached to piping or a vessel via the process connection.

A Memosens measuring cable is required for connection to an industrial transmitter. This cable is plugged into the Memosens connector.



1 Memosens connector

4 Inner electrode

2 A/F 27

5 Outer electrode

3 NPT 3/4" process connection

2.6 Measuring Principle

Contacting conductivity measurements involve applying an alternating voltage to the electrodes of the sensor, which is located in a measurement solution. The movement of the ions in the process medium toward their oppositely charged electrode generates a current flow. According to Ohm's law, this produces the electrical resistance or its reciprocal, the conductance G .

Taking into account the cell constants determined by the sensor geometry, the conductance is used to determine the conductivity of the process medium.

3 Installation

3.1 General Installation Instructions

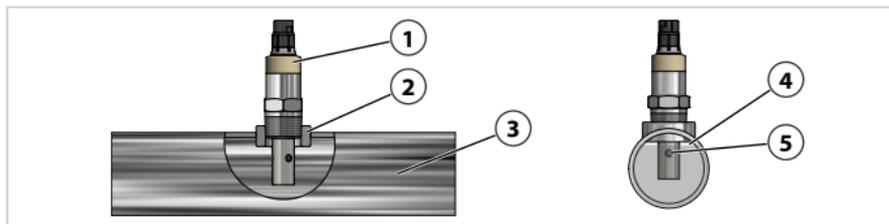
The sensor is designed for use with a Memosens-capable industrial transmitter. The SE625 (optionally with NPT $\frac{3}{4}$ " weld nipple) is used in:

- vessels
- piping
- bypass systems

Note: More information on Knick industrial transmitters can be found at www.knick.de.

The following conditions apply when installing the SE625 sensor:

- The process medium must surround or flow through the vents.



1 SE625 sensor

4 Process medium fill level

2 Weld nipple

5 Vent

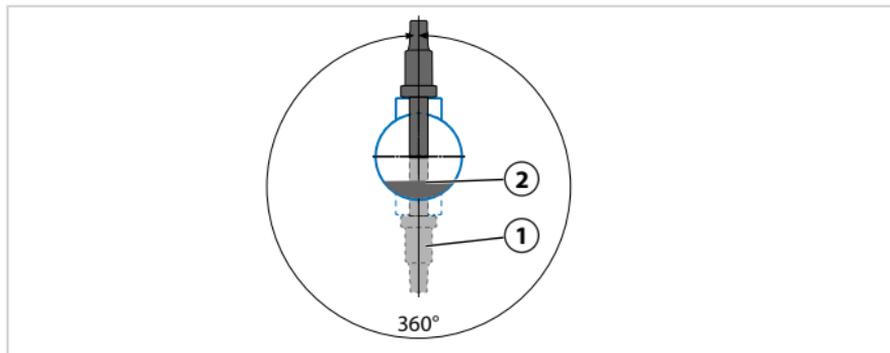
3 Piping

Installation Position

The SE625 sensor can be installed in any position.

NOTICE! Risk of sludge accumulating at the measuring point if the sensor is installed upside down **(1)**. Clean the sensor regularly.

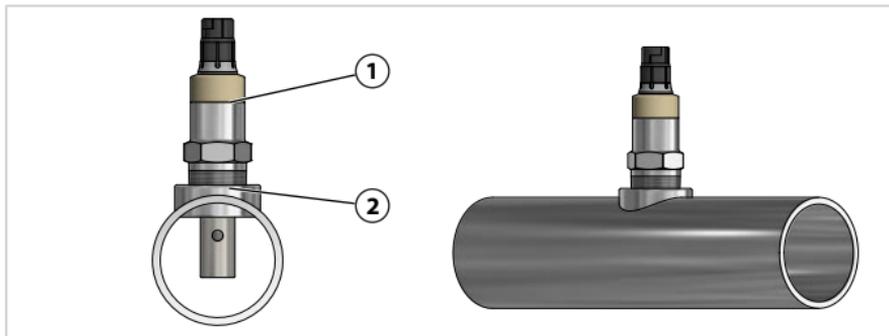
→ *Cleaning, p. 16*



Depending on the process medium, sediments **(2)** may accumulate, potentially affecting the measurement result.

3.2 Sensor: Installation in Piping

⚠ CAUTION! Process medium containing hazardous substances may escape when the sensor is released. Depressurize the process/drain off process medium prior to installing, replacing, or removing the sensor.



01. Check the SE625 sensor **(1)** for damage.
02. Seal the thread with a suitable sealant (e.g., PTFE tape).
03. Tightly screw the sensor **(1)** into the weld nipple **(2)** using an appropriate tool A/F 27. Max. tightening torque 60 Nm.
04. Test for leaks.
 - ✓ The SE625 sensor is mechanically installed.

3.3 Electrical Installation

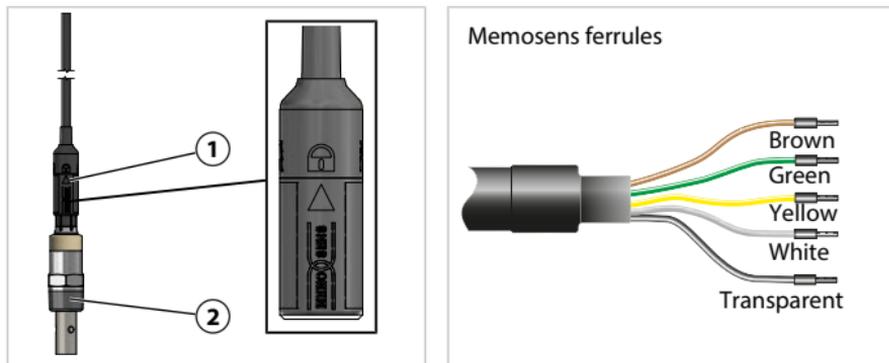
3.3.1 General Information on Electrical Installation

The SE625 sensor is electrically connected to a Memosens-capable industrial transmitter.

Note: More information on Knick industrial transmitters can be found at www.knick.de.

3.3.2 Sensor Cable

A Memosens cable of type CA/MS-***N** is required for the sensor's electrical connection. → *Accessories, p. 20*



01. Plug the Memosens cable **(1)** onto the SE625 sensor **(2)**.
02. Turn to close the bayonet coupling.
03. Connect the Memosens cable's ferrules or M12 plug to the industrial transmitter.

Memosens cable terminal assignments

Wire Color	Terminal
Brown	Power supply +
Green	RS485 (A)
Yellow	RS485 (B)
White	Power supply – (GND)
Transparent	Shield

4 Maintenance, Cleaning, Calibration

4.1 Maintenance

The SE625 sensor does not require any maintenance.

4.2 Cleaning

⚠ CAUTION! Risk of burns from acidic cleaning agents. Handle acidic cleaning agents with care; wear protective equipment if necessary.

If deposits are visible, clean the SE625 sensor.

01. Depending on their type, soak and partially dissolve deposits in an appropriate cleaning agent.
02. Remove deposits using a soft brush.
03. Rinse the sensor in demineralized water and dry it.

Recommended Cleaning Agents

Contamination	Cleaning Agent
Water-soluble substances	Deionized water
Greases and oils	Warm water and household dishwashing liquid
Heavy contamination	Ethanol or isopropanol
Lime and hydroxide deposits	Acetic acid (5 %) or hydrochloric acid (1 %)

4.3 Calibration

▲ CAUTION! Process medium containing hazardous substances may escape when the sensor is released. Depressurize the process/drain off process medium prior to installing, replacing, or removing the sensor.

01. Remove the sensor.
02. Clean, rinse off, and dry the sensor. → *Cleaning, p. 16*
03. Fill the calibration beaker with the appropriate conductivity standard. → *Accessories, p. 20*
04. Immerse the sensor in the conductivity standard.
05. Calibrate the SE625 sensor with the industrial transmitter.

Note: More information on Knick industrial transmitters can be found at www.knick.de.

5 Troubleshooting

Malfunction State	Possible Causes	Remedy
Incorrect measurement display ¹⁾	Visible deposits on sensor	Clean and calibrate sensor → <i>Cleaning, p. 16</i> → <i>Calibration, p. 17</i>
No display of measured value ¹⁾	Faulty cable connection	Check terminal assignments on industrial transmitter Check bayonet coupling on sensor
	Sensor cable defective	Replace the sensor cable
	Sensor defective	Replace the sensor

¹⁾ Measured value on industrial transmitter.

6 Decommissioning

6.1 Removing the Sensor

▲ CAUTION! Process medium containing hazardous substances may escape when the sensor is released. Depressurize the process/drain off process medium prior to installing, replacing, or removing the sensor.

01. Disconnect the sensor cable from the sensor.
02. Unscrew the sensor.
03. Seal off the process port appropriately.

6.2 Disposal

The local codes and regulations must be observed when disposing of the product.

7 Accessories

CS-C147K/500 conductivity standard

Measured value:	147 $\mu\text{S}/\text{cm}$ at 25 °C
Volume size:	500 ml
Order code:	CS-C147K/500

CS-C15K/500 conductivity standard

Measured value:	15 $\mu\text{S}/\text{cm}$ at 25 °C
Volume size:	500 ml
Order code:	CS-C15K/500



Memosens cable CA/MS¹⁾

Cable end	Cable lengths	Order code
Ferrule	3 m	CA/MS-003NAA
	5 m	CA/MS-005NAA
	10 m	CA/MS-010NAA
	20 m	CA/MS-020NAA
M12 plug (8-pin)	3 m	CA/MS-003NCA
	5 m	CA/MS-005NCA
	10 m	CA/MS-010NCA
	20 m	CA/MS-020NCA

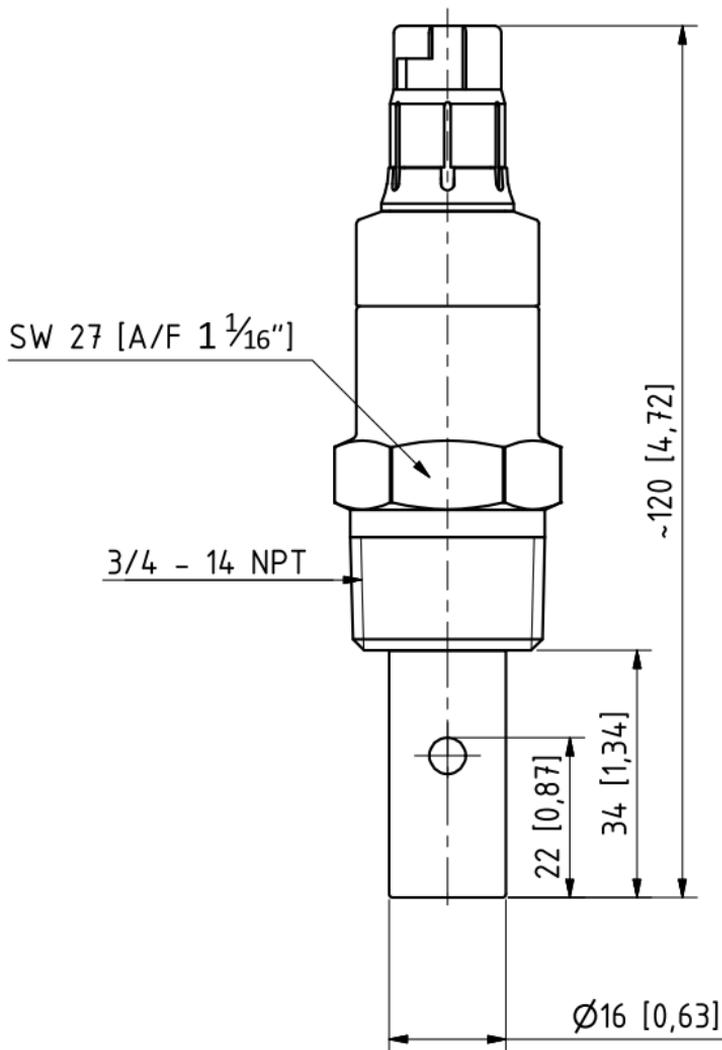
ZU0320 calibration certificate for conductivity sensors

Determination of the individual cell constant with a measurement uncertainty of 1 %.

¹⁾ Other cable lengths and ends on request.

8 Dimension Drawings

Note: All dimensions are given in millimeters [inches].



9 Specifications

Cell constant	0.080 /cm
Measuring range	0 ... 1000 $\mu\text{S/cm}$
Measurement uncertainty	0.05 + 0.02 * measured value ($\mu\text{S/cm}$)
Material	
Sensor body	1.4404 (AISI 316L)
Electrodes	3.7035 (titanium grade 2)
Insulator	PEEK
Seals	→ <i>Product Code, p. 8</i>
Temperature detector	
Response time	$t_{90} < 15 \text{ s}$
Temperature	
Medium	-10 ... 120 °C (14 ... 248 °F)
Environment	-25 ... 70 °C (-13 ... 158 °F)
Permissible process pressure p_{rel}	-1 ... 16 bar (-14.5 ... 232 psi)
Permissible transient pressure at 5 ... 30 °C (41 ... 86 °F), max. 60 min.	24 bar (348 psi)
Process connection	→ <i>Product Code, p. 8</i>
Tightening torque	max. 60 Nm
Protection	IP68 (10 m water column, 24 h)
Electrical connection	Memosens connector
Dimensions	→ <i>Dimension Drawings, p. 21</i>
Weight	approx. 0.15 kg



Knick
Elektronische Messgeräte
GmbH & Co. KG

Headquarters

Beuckestraße 22 • 14163 Berlin
Germany
Phone: +49 30 80191-0
Fax: +49 30 80191-200
info@knick.de
www.knick.de

Local Contacts

www.knick-international.com

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