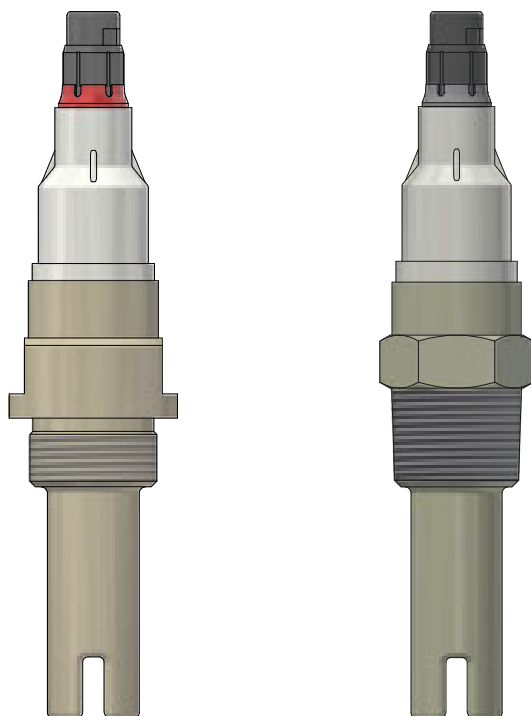


User Manual

SE630
Conductivity Sensor



Read before installation.
Keep for future use.



www.knick-international.com

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>Without</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
	Item number in a figure
(1)	Item number in text

Table of Contents

1 Safety	5
1.1 Intended Use	5
1.2 Personnel Requirements.....	5
1.3 Residual Risks.....	6
1.4 Hazardous Substances.....	6
1.5 Operation in Hazardous Locations.....	6
1.5.1 Electrical and Thermal Parameters in Hazardous Locations	7
2 Product	8
2.1 Package Contents.....	8
2.2 Product Identification	8
2.2.1 Product Code	8
2.3 Nameplates.....	9
2.4 Symbols and Markings	10
2.5 Design.....	11
2.6 Measuring Principle.....	11
3 Installation.....	12
3.1 General Installation Instructions.....	12
3.1.1 Sensor Installation Orientation	12
3.2 Installation ARF210/215 Flow-Through Fitting	13
3.3 Installation in Piping.....	14
3.4 Installation in an ARD75 Immersion Fitting	15
3.5 Electrical Installation	16
3.5.1 General Information on Electrical Installation	16
3.5.2 Sensor Cable (Memosens).....	16
4 Operation, Cleaning, and Calibration	17
4.1 Operation	17
4.2 Cleaning.....	17
4.3 Calibration.....	18
5 Troubleshooting.....	19

6 Decommissioning 20

6.1 Removing the Sensor..... 20

6.2 Return..... 20

6.3 Disposal..... 20

7 Dimension Drawings 21

8 Specifications 22

9 Abbreviations..... 24

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 (hereinafter sometimes referred to as “Knick”) using the information provided on the back page of this document.

Hazards due to pressure, temperature, aggressive media, or explosive atmospheres are possible, depending on the location of use.

SE630 is hereafter also called product.

1.1 Intended Use

The SE630 sensor is used for continuous contacting conductivity measurement in aqueous process media.

The defined rated operating conditions must be observed when using this product.

→ *Specifications, p. 22*

USE CAUTION AT ALL TIMES WHEN INSTALLING, USING, MAINTAINING OR OTHERWISE INTERACTING WITH THE PRODUCT. ANY USE OF THE PRODUCT EXCEPT AS SET FORTH HEREIN IS PROHIBITED, AND MAY RESULT IN SERIOUS INJURY OR DEATH, AS WELL AS DAMAGE TO PROPERTY. THE OPERATING COMPANY SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGES RESULTING FROM OR ARISING OUT OF AN UNINTENDED USE OF THE PRODUCT.

1.2 Personnel Requirements

The operating company 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 the 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 SE630 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 SE630 sensor in compliance with the stated operating conditions.
→ *Specifications, p. 22*
- If using chemically aggressive process media, regularly check the SE630 sensor for damage.
- Clinging and sticky process media could negatively influence the measuring results. Remove clinging substances at regular intervals. In case of heavy soiling, calibrate the SE630 sensor. → *Cleaning, p. 17, → Calibration, p. 18*

1.4 Hazardous Substances

IN THE EVENT OF ANY CONTACT WITH HAZARDOUS SUBSTANCES OR OTHER INJURY HERE-UNDER, SEEK IMMEDIATE MEDICAL ATTENTION OR FOLLOW APPLICABLE PROCEDURES TO ADDRESS HEALTH AND SAFETY OF PERSONNEL. FAILURE TO SEEK IMMEDIATE MEDICAL ATTENTION MAY RESULT IN SERIOUS INJURY OR DEATH.

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

- Process medium
- Cleaning medium

The operating company is responsible for conducting a job hazard analysis.

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

1.5 Operation in Hazardous Locations

The SE630X sensor is certified for operation in hazardous locations.

Ex-protected digital sensor with Memosens technology are marked with an orange-red ring on the connection head.

The permitted SE630X-type digital conductivity sensors may only be connected to a Memosens cable or a compact transmitter with an intrinsically safe output with the following parameter set:

$$P_o \leq 180 \text{ mW}$$

Observe all applicable local and national codes and standards for the installation of equipment in explosive atmospheres. For further guidance, consult the following:

- 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.

1.5.1 Electrical and Thermal Parameters in Hazardous Locations

Certificate Number	Marking
TÜV 26 ATEX 9437 X	 II 1G
IECEx TUR 26.0037 X	Ex ia IIC T6...T3 Ga

Electrical Parameters

The sensor has the following connection values:

Output P_i	180 mW
--------------	--------

Thermal Parameters

Temperature Class	Process Temperature T_p		Ambient Temperature T_a
	Min.	Max.	Max.
T3	-20 °C (-4 °F)	135 °C (275 °F)	60 °C (140 °F)
T4	-20 °C (-4 °F)	115 °C (239 °F)	60 °C (140 °F)
T6	-20 °C (-4 °F)	65 °C (149 °F)	60 °C (140 °F)

Special Conditions

- The SE630X with non-metallic process connection may only be used in liquid media with a conductivity of at least 10 nS/cm.
- The sensor may not be operated in electrostatically critical processing conditions.
- Intense vapor or dust flows directly impacting on the connection system must be avoided.

2 Product

2.1 Package Contents

- SE630 in the ordered version
- User Manual
- Quality Certificate
- Control Drawing¹⁾
- EU Declaration of Conformity¹⁾

2.2 Product Identification

The different versions of the product SE630 are coded in a model designation.

2.2.1 Product Code

Model Designation		SE630	-	-	-	-	-	-	-	-	-
Explosion protection/ Approval	With explosion protection ²⁾	X	-	-	-	-	-	-	-	-	-
	Without explosion protection	N	-	-	-	-	-	-	-	-	-
Process connection	Male thread G1"	-	G1	-	-	-	-	-	-	-	-
	Male thread 1" NPT	-	N1	-	-	-	-	-	-	-	-
Electrical connection	Memosens	-	-	-	MS	-	-	-	-	-	-
Wetted materials	PES	-	-	-	-	Y	-	-	-	-	-
	Graphite	-	-	-	-	-	B	-	-	-	-
Seal	Without	-	-	-	-	-	-	0	-	-	-
Protocol	Memosens protocol	-	-	-	-	-	-	-	M	-	-
Internal marking		-	-	-	-	-	-	-	-	-	A2

¹⁾ Only for versions certified for operation in potentially explosive atmospheres.

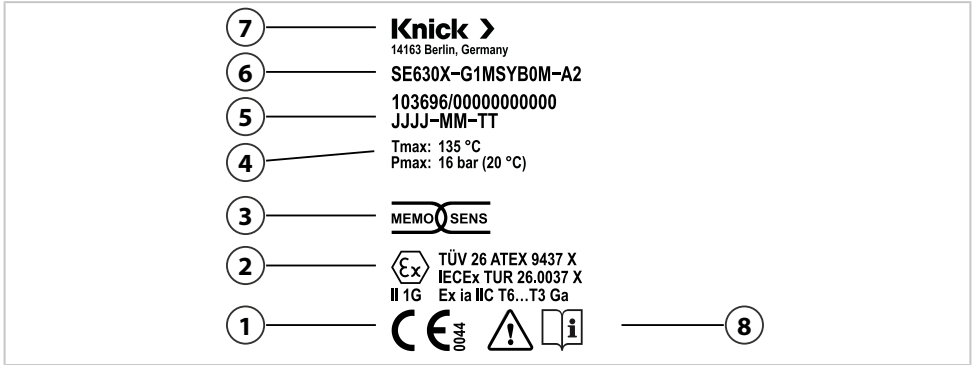
²⁾ Only for process connection G1"

2.3 Nameplates

The body of the SE630 sensor is marked with a nameplate.

Nameplate for Version with Ex Approval

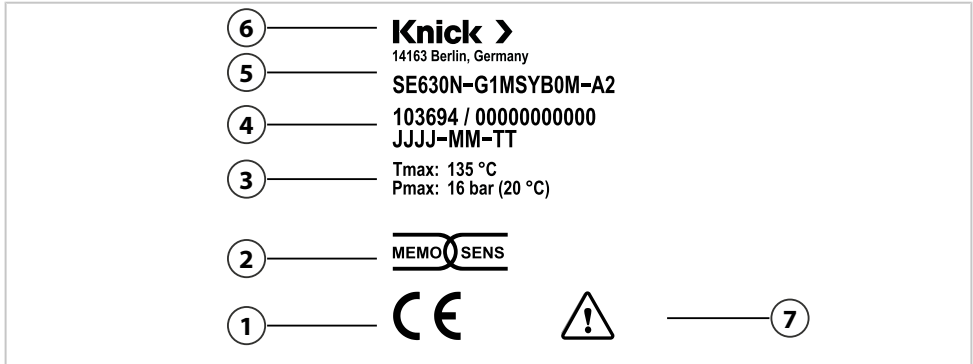
Example:



1	CE mark with identification number	5	Item number/serial number/ year-month-day
2	ATEX marking/information on explosion protection	6	Model designation
3	Memosens logo	7	Manufacturer with postal address and designation of origin
4	Max. temperature and pressure range	8	Special conditions and danger points, reference to product documentation

Nameplate for Version Without Ex Approval

Example:



1 CE mark	5 Model designation
2 Memosens logo	6 Manufacturer with postal address and designation of origin
3 Max. temperature and pressure range	7 Special conditions and danger points
4 Item number/serial number/ year-month-day	

2.4 Symbols and Markings



Refer to the product documentation.



Special conditions and danger points! Observe the safety instructions and instructions on safe use of the product as outlined in the product documentation.



CE mark with identification number¹⁾ of the notified body involved in the production control.



ATEX marking¹⁾ of the European Union for operation in potentially explosive atmospheres. → *Operation in Hazardous Locations, p. 6*



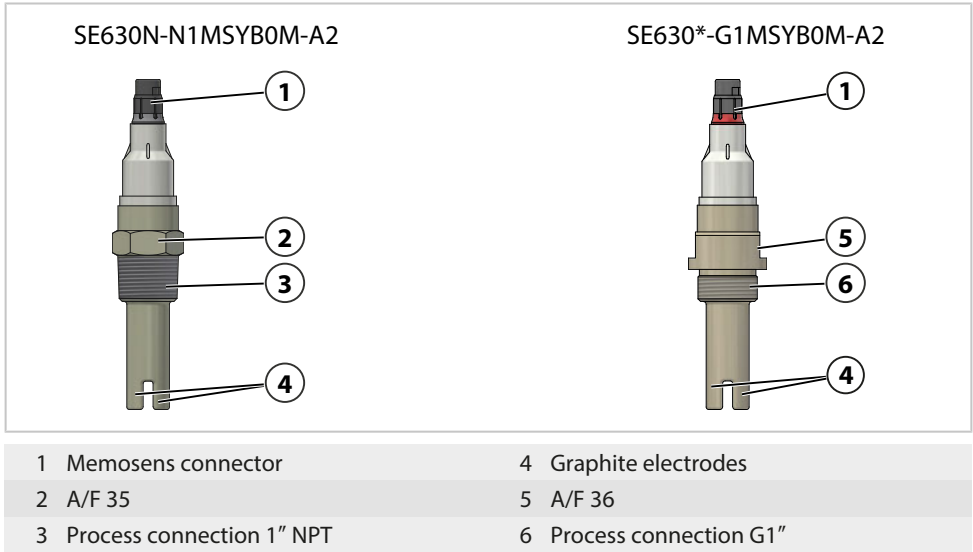
The symbol on Knick products means that waste devices must be disposed of separately from unsorted municipal waste.

¹⁾ Dependent on the ordered version → *Product Code, p. 8*

2.5 Design

Two graphite electrodes in the sensor head record the conductance of the process medium and an integrated temperature detector compensates the temperature-dependent fluctuations. The determined measured values are digitally transmitted to a transmitter using Memosens technology.

The sensor is installed in a suitable socket or a fitting via the process connection. Make sure that the sensors fully immerse in the process medium.



2.6 Measuring Principle

For contacting conductivity measurement, AC voltage is applied to the electrodes of the sensors in the measuring solution. The ions in the process medium move toward the electrode with the respective opposite charge, thereby generating a current flow. In accordance with Ohm's law, this results in the electrical resistance or its inverse, conductance G .

The conductivity of the process medium is determined under consideration of the cell constant determined by the sensor geometry.

3 Installation

3.1 General Installation Instructions

Suitable installation locations:

- Flow-through fittings
- immersion fittings
- Vessels
- Piping
- Bypass systems

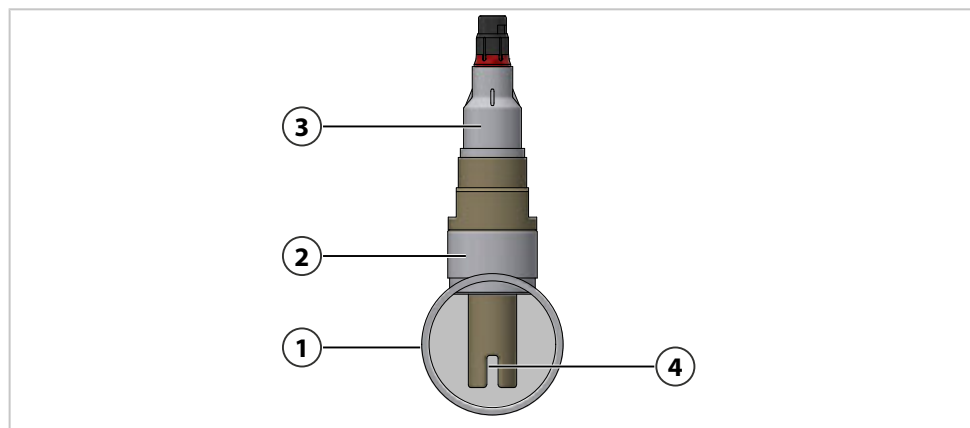
Note: If the SE630 sensor is combined with products, the operating company must check and ensure tightness to the process.

3.1.1 Sensor Installation Orientation

The SE630 sensor can be installed in any position.

For optimal measuring results, install the sensor such that the process medium fully passes through the gap between the graphite electrodes.

Comply with the minimum distance of 5 mm to the inside pipe wall.



1 Pipe

2 Socket

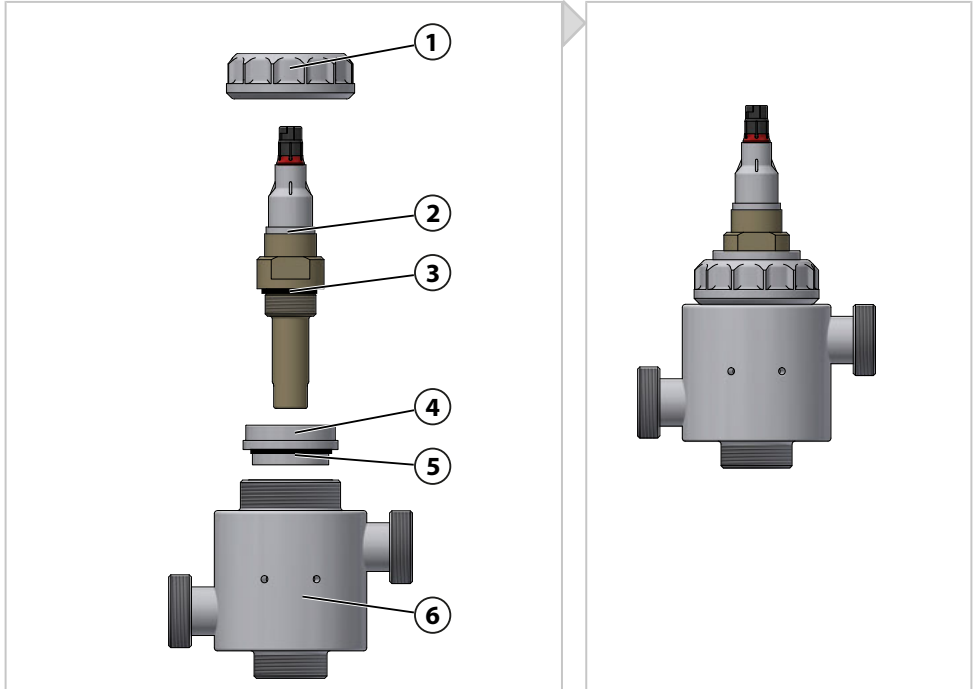
3 Sensor

4 Gap

3.2 Installation ARF210/215 Flow-Through Fitting

Applies to sensors with process connection G1".

⚠ WARNING! Process medium can escape from the fitting or pipe and contain hazardous substances. Depressurize the process before installing, replacing or removing the sensor and, if necessary, discharge the process medium.



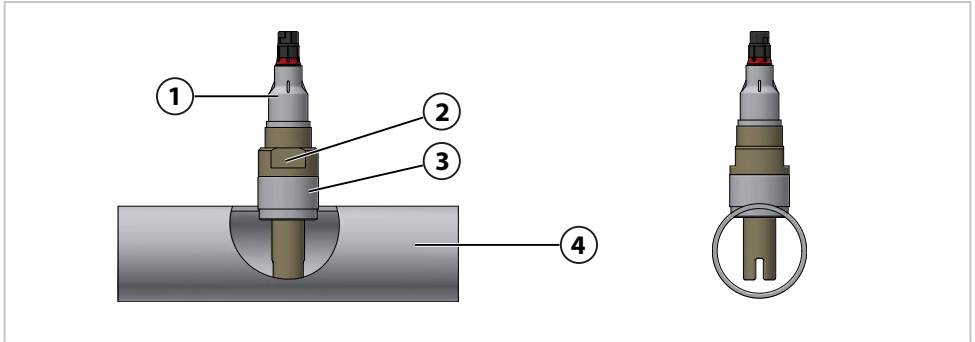
Note: Before installation, check the sensor and O-rings for damage. Do not use damaged components.

01. Slide O-ring 48 × 3 mm **(5)** onto the adapter **(4)**.
02. Slide O-ring 30 × 4 mm **(3)** onto the sensor **(2)**.
03. Screw the sensor **(2)** into the adapter **(4)** and using an A/F 36 open-end wrench, tighten with 1 ... 3 Nm.
04. Insert the assembly group consisting of the adapter **(4)** and the sensor **(2)** into the flow-through fitting **(6)**.
05. Tighten the coupling nut **(1)**.
06. Connect the sensor cable.
07. Check the tightness.

Note: The sensor is removed in reverse order.

3.3 Installation in Piping

⚠ WARNING! Process medium can escape from the fitting or pipe and contain hazardous substances. Depressurize the process before installing, replacing or removing the sensor and, if necessary, discharge the process medium.



Note: Before installation, check the sensor and O-rings for damage. Do not use damaged components.

Installing a sensor with process connection G1"

01. Slide O-ring 30 × 4 mm onto the sensor (1).
02. Screw the sensor (1) into the socket (3) with female thread G1" and using an A/F 36 open-end wrench (2), tighten with 5 ... 20 Nm.
03. Check the tightness.

Note: The sensor is removed in reverse order.

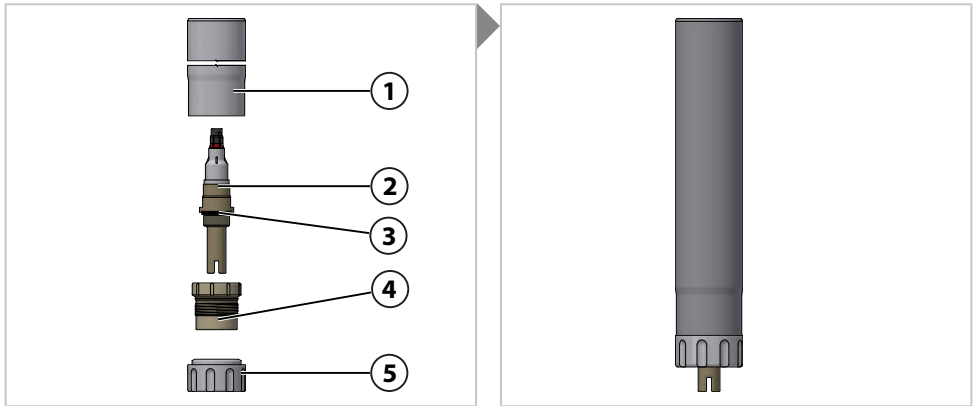
Installing a sensor with process connection 1" NPT

01. Apply PTFE sealing tape to the thread of the sensor (1).
02. Screw the sensor (1) into the socket (3) with female thread 1" NPT and using an A/F 35 open-end wrench (2), tighten with 5 ... 20 Nm.
03. Check the tightness.

Note: The sensor is removed in reverse order.

3.4 Installation in an ARD75 Immersion Fitting

Note: Before installing the SE630 sensor, connect the sensor cable and guide it through the immersion fitting.



Note: Before installation, check the sensor and O-rings for damage. Do not use damaged components.

Installing a sensor with process connection G1"

01. Slide O-ring 30 × 4 mm **(3)** onto the sensor **(2)**.
02. Screw the sensor **(2)** into the sensor adapter **(4)** using an A/F 36 open-end wrench with 1 ... 3 Nm.
03. Insert the sensor adapter **(4)** with sensor **(2)** into the pipe **(1)** of the ARD75 immersion fitting.
04. Hand tighten the coupling nut **(5)**.
05. Check the tightness.

Note: The sensor is removed in reverse order.

Installing a sensor with process connection 1" NPT

01. Apply PTFE sealing tape to the thread of the sensor **(2)**.
02. Screw the sensor into the sensor adapter **(4)** using an open-end wrench A/F 35 with 1 ... 3 Nm.
03. Insert the sensor adapter **(4)** with sensor **(2)** into the pipe **(1)** of the ARD75 immersion fitting.
04. Hand tighten the coupling nut **(5)**.
05. Check the tightness.

Note: The sensor is removed in reverse order.

3.5 Electrical Installation

3.5.1 General Information on Electrical Installation

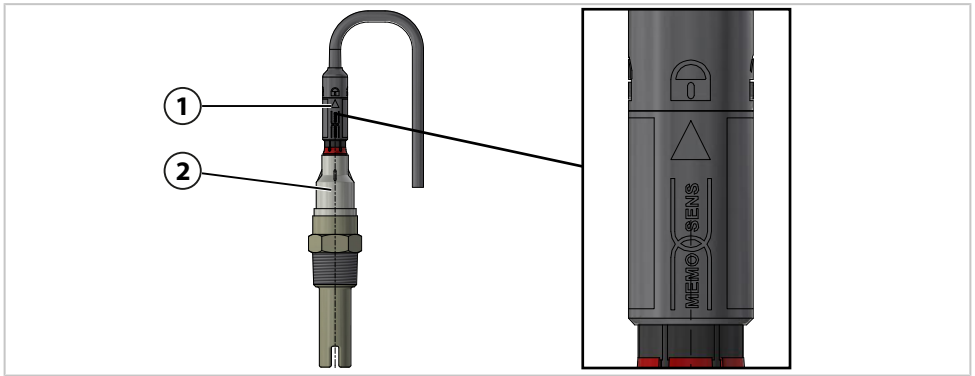
The SE630 sensor is electrically connected to a Memosens-capable transmitter.

Note: More information on Knick transmitters: → www.knick-international.com

3.5.2 Sensor Cable (Memosens)

A type CA-MS-** Memosens cable or similar cable is required for the SE630*-**MS* sensor.

Note: A cable with suitable Ex approval must be used for applications in potentially explosive areas.



01. Put the Memosens cable (1) on the sensor SE630 (2).
02. Close the bayonet coupling using rotational movement.
03. Connect the free cable end (ferrules or M12 plug) to the transmitter.

Note: For information on the terminal assignment, see the user manuals of the relevant cable and transmitter.

4 Operation, Cleaning, and Calibration

4.1 Operation

The sensor is operational immediately after installation.
A transmitter is responsible for signal processing and displaying the measured values.
During operation, regularly carry out the following:

- Check the cables and plug-in connections for damage.
- Check the sensors for deposits.
- Compare the process conditions with the limit values. → *Specifications, p. 22*

Note: The operating company specifies the cleaning and calibration intervals.

4.2 Cleaning

Clean the sensor if there are visible deposits.

⚠ WARNING! When removing the sensor, process medium containing hazardous substances may escape. Depressurize the process and, if necessary, discharge the process medium.

⚠ WARNING! For process media that contain hazardous substances: The sensor has direct contact with the process medium. Remove the sensor from the process, rinse it, and clean it. Follow the information on hazardous substances.
→ *Hazardous Substances, p. 6*

01. Remove and rinse the sensor.
02. Soften and dissolve deposits in the appropriate cleaning medium.
03. Remove deposits using a soft brush.
04. Rinse the sensor with demineralized water.

Recommended Cleaning Media

Contamination	Cleaning Medium
Water-soluble substances	Water
Greases and oils	Warm water and household dishwashing liquid
Lime and hydroxide deposits	Acetic acid (5 %) or hydrochloric acid (1 %)
Protein	Pepsin/HCl solution
Silver sulfide	Thiourea/HCl solution

4.3 Calibration

⚠ WARNING! When removing the sensor, process medium containing hazardous substances may escape. Depressurize the process and, if necessary, discharge the process medium.

⚠ WARNING! For process media that contain hazardous substances: The sensor has direct contact with the process medium. Remove the sensor from the process, rinse it, and clean it. Follow the information on hazardous substances.

→ *Hazardous Substances, p. 6*

01. Remove and clean the sensor. → *Cleaning, p. 17*
02. Immerse the sensor in the conductivity standard (calibration solution).
03. Calibrate the sensor with the transmitter and adjust if necessary.
04. Observe the user manual of the transmitter.

Note: More information on Knick transmitters: → www.knick-international.com

5 Troubleshooting

USE CAUTION WHEN CONDUCTING ANY TROUBLESHOOTING. FAILURE TO ABIDE BY THE REQUIREMENTS SET FORTH HEREIN MAY RESULT IN SERIOUS INJURY OR DEATH, AS WELL AS DAMAGE TO PROPERTY.

Failure Condition	Possible Cause	Remedy
Deviating or highly fluctuating measured values	Visible deposits on the sensor.	Clean and calibrate the sensor. → <i>Cleaning, p. 17</i> → <i>Calibration, p. 18</i>
	Process conditions out of specification.	Check the process conditions and compare them to the specifications. → <i>Specifications, p. 22</i>
Transmitter does not detect sensor.	Faulty cable connection.	Check terminal assignment on transmitter. Check bayonet coupling at sensor.
	Cable breakage or loose connection.	Replace sensor cable.
	Incorrect transmitter parameter settings.	In the parameter setting menu of the transmitter: Select Sensor Selection [I] ▶ Functionality "Conductivity A1.1".

6 Decommissioning

6.1 Removing the Sensor

⚠ WARNING! When removing the sensor, process medium containing hazardous substances may escape. Depressurize the process and, if necessary, discharge the process medium.

⚠ WARNING! For process media that contain hazardous substances: The sensor has direct contact with the process medium. Remove the sensor from the process, rinse it, and clean it. Follow the information on hazardous substances.

→ *Hazardous Substances, p. 6*

01. Remove the sensor cable from the transmitter.
02. Remove the sensor from the fitting or the process connection. → *Installation, p. 12*
03. Clean the sensor thoroughly and remove deposits of the process medium.
→ *Cleaning, p. 17*
04. Properly seal the process connection.

6.2 Return

If a product must be returned, send it to the responsible local representative in a clean condition and securely packaged. → www.knick-international.com

Upon contact with hazardous substances, decontaminate or disinfect the product before shipping. Always include the relevant return form (Declaration of Decontamination) with shipments, in order to avoid hazards to our Service employees.

→ www.knick-international.com

6.3 Disposal

Observe the local regulations and laws around disposal.

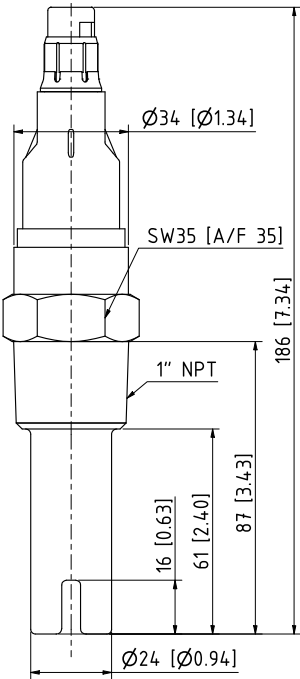
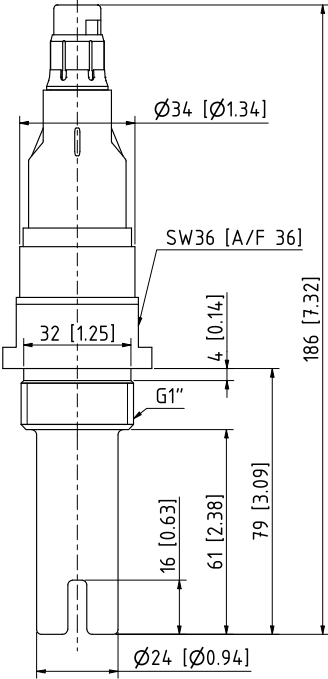
Customers can return their electrical and electronic waste devices.

For details on how to return and dispose of electrical and electronic devices in an environmentally friendly manner, please refer to the manufacturer's declaration on our website. If you have any queries, suggestions, or questions about how Knick recycles electrical and electronic waste devices, please send us an email: → support@knick.de

7 Dimension Drawings

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

SE630*-G1MSYB0M-A2	SE630N-N1MSYB0M-A2
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8 Specifications

Measuring Parameters

Measuring range ¹⁾	10 μ S ... 20 mS/cm
Cell constant	1.0 cm ⁻¹

Response Time

Conductivity	$T_{95} \leq 2 \text{ s}$
Temperature ²⁾	$T_{90} \leq 30 \text{ s}^{3)}$

Measurement Error

Conductivity	$\leq 5 \%$ of measured value in the specified measuring range
Temperature	$\leq 2.5 \text{ K}$, in measuring range $-20 \dots 100 \text{ }^{\circ}\text{C}$ ($-4 \dots 212 \text{ }^{\circ}\text{F}$)
	$\leq 3.5 \text{ K}$, in measuring range $100 \dots 135 \text{ }^{\circ}\text{C}$ ($212 \dots 275 \text{ }^{\circ}\text{F}$)

Repeatability

Conductivity	$\leq 0.2 \%$ of measured value in the specified measuring range
Temperature	$\leq 0.05 \text{ K}$

Process Conditions

Process temperature	$-20 \dots 135 \text{ }^{\circ}\text{C}$ ($-4 \dots 275 \text{ }^{\circ}\text{F}$)
Process pressure, relative	Max. 16 bar (246.5 psi), $20 \text{ }^{\circ}\text{C}$ ($60 \text{ }^{\circ}\text{F}$) linear drop to 2.5 bar (36.26 psi) at $135 \text{ }^{\circ}\text{C}$ ($275 \text{ }^{\circ}\text{F}$) → <i>Pressure/Temperature Diagram, p. 23</i>
Pressure/temperature resistance	→ <i>Pressure/Temperature Diagram, p. 23</i>

Ambient Conditions

Ambient temperature	$-20 \dots 60 \text{ }^{\circ}\text{C}$ ($-4 \dots 140 \text{ }^{\circ}\text{F}$)
Storage temperature	$-25 \dots 80 \text{ }^{\circ}\text{C}$ ($-13 \dots 176 \text{ }^{\circ}\text{F}$)

Temperature Compensation

Temperature detector	Pt1000, Class A in accordance with IEC 60751
----------------------	--

¹⁾ Related to water at $25 \text{ }^{\circ}\text{C}$ ($77 \text{ }^{\circ}\text{F}$)

²⁾ DIN VDI/VDE 3522-2 (0.3 m/s laminar)

³⁾ With activated temperature prediction.

Material, Wetted

Sensor body	Polyethersulfone (PES)
Sensors	Graphite
Protection sleeve temperature detector	Titanium 3.7035

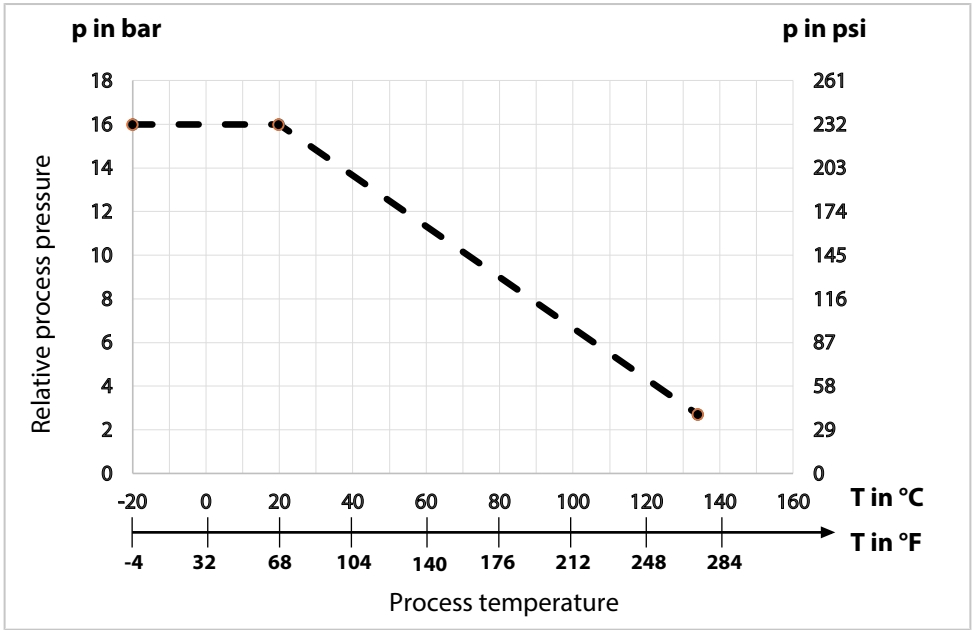
Protection Rating

Protection rating	IP68
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Mechanical Data

Process connection	→ <i>Product Code, p. 8</i>
Seal to process connection	O-ring 30 × 4 mm
Dimensions	→ <i>Dimension Drawings, p. 21</i>
Weight	Approx. 0.3 kg

Pressure/Temperature Diagram



9 Abbreviations

A/F	Width across flats
ANSI	American National Standards Institute
ATEX	Atmosphères Explosibles (explosive atmospheres)
CAS	Chemical Abstracts Service
CE	Conformité Européenne (European conformity)
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EU	European Union
IEC	International Electrotechnical Commission
IP	International Protection/Ingress Protection
NEC	National Electrical Code
NFPA	National Fire Protection Association
NPT	National Pipe Thread
PES	Polyethersulfone
VDE	Association for Electrical, Electronic & Information Technologies
VDI	The Association of German Engineers

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Translation of the original instructions
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Version 7 • This document was published on July 06, 2026.
The latest documents are available for download on our
website under the corresponding product description.

TA-300.118-KNEN07



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