Knick

User Manual

SensoGate WA133

Retractable Fitting

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:

Icon	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.	
Without	**NOTICE!**	Designates a situation that can lead to property or environmental damage.	

Symbols Used in this Document

Icon	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

Table of Contents

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.

1.1 Intended Use

The SensoGate WA133 (hereafter also called "product") is a retractable fitting for installation on boilers, containers, and pipes. The product holds a sensor for measuring process parameters. The SensoGate WA133 moves the sensor into the process medium.

SensoGate WA133 has a pneumatic drive.

Cleaning, calibration, or sensor replacement under process conditions by the customer (hereinafter sometimes referred to as the "operating company") may be conducted, subject to the requirements set forth herein, by placing the product into the service position (SERVICE limit position).

If the product is used with any product or part not authorized by Knick, the operating company assumes all risks and liabilities related thereto.

The SensoGate WA133 is suitable for the following sensor types:

Solid-electrolyte sensors	Body diameter 12 mm, body length 225 mm, sensor head thread PG 13.5
Liquid-electrolyte sensors	Body diameter 12 mm, body length 250 mm

For further information, refer to the applicable documentation of the sensor manufacturer.

The defined rated operating conditions must be observed when using this product.
→ *Specifications, p. 55*

With the modular structure, customers can easily adapt the SensoGate WA133 to changed conditions.
→ *Permissible Changes, p. 18*

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.

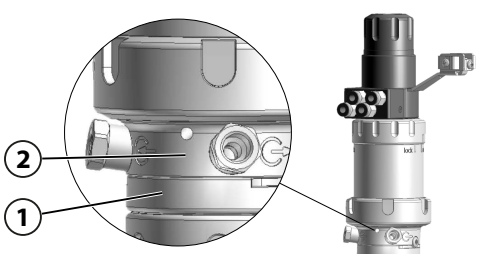
The SensoGate WA133-X version is certified for operation in potentially explosive atmospheres.
→ *Operation in Explosive Atmospheres, p. 8*

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.

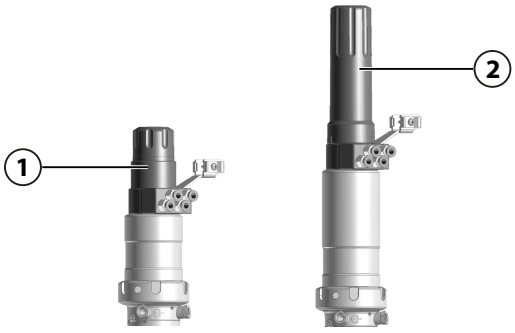
1.3 Safeguards



Leakage Bores

The calibration chamber **(1)** is provided with three radial leakage bores **(2)**.

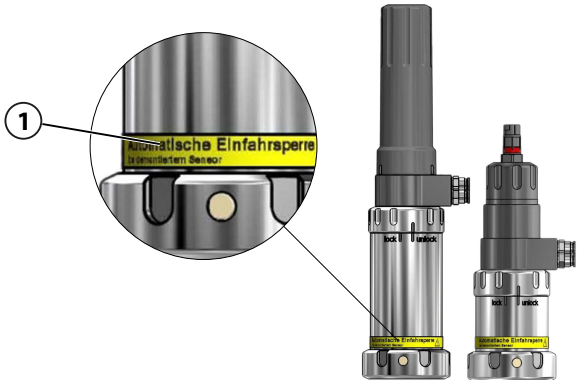
Process medium escaping from the leakage bores **(2)** is indicative of damage to the calibration chamber's O-rings. This damage can be detected and repaired.



Solid Electrolyte Sensor Dismount Guard

For versions of SensoGate WA133 for solid electrolyte sensors, sensors can only be dismounted in the service position (SERVICE limit position).
→ *Moving into the Service Position (SERVICE Limit Position), p. 25*

In the process position (PROCESS limit position), the sensor is in the protection sleeve **(1)** or the extension **(2)** and is not accessible.
→ *Moving into the Process Position (PROCESS Limit Position), p. 25*

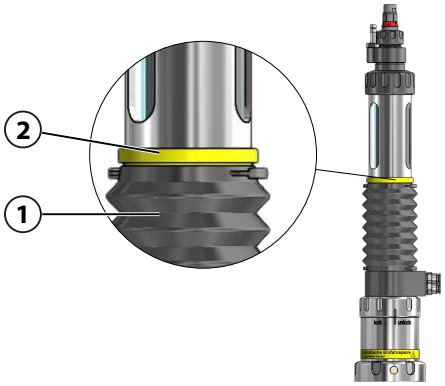


Immersion Lock Without a Mounted Solid Electrolyte Sensor

The safeguard is only available with special version W.
→ *Product Code, p. 12*

The immersion lock can be seen at the yellow indicator ring **(1)** on the drive unit of the SensoGate WA133. If the yellow indicator ring **(1)** is missing, the safeguard function is not available.

A mechanical lock prevents the SensoGate WA133 without a mounted solid electrolyte sensor from being moved into the process position (PROCESS limit position).

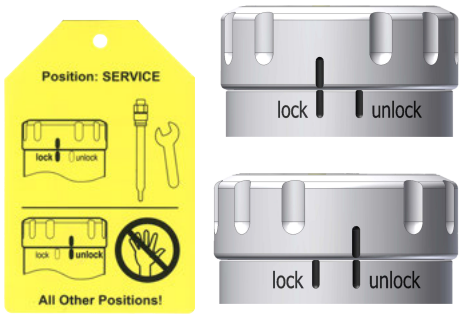


Immersion Lock Without a Mounted Liquid Electrolyte Sensor

The safeguard is only available with special version V.
→ *Product Code, p. 12*

The immersion lock can be seen at the yellow indicator ring **(2)** above the bellows **(1)**. If the yellow indicator ring **(2)** is missing, the safeguard function is not available.

A mechanical lock prevents the SensoGate WA133 without a mounted liquid-electrolyte sensor from being moved into the process position (PROCESS limit position).



SensoLock Locking

The SensoLock immersion lock prevents the SensoGate WA133 from accidentally moving into the process position (PROCESS limit position).

In the service position (SERVICE limit position), manually setting the SensoLock ring to "lock" locks the SensoGate WA133 and prevents it from moving into the process position (PROCESS limit position).

Ambient influences can have a negative effect on the functionality of safeguards (e.g., from components sticking together). → *Residual Risks, p. 7*

The availability of safeguards is in part dependent on the version of the SensoGate WA133.
→ *Product Code, p. 12*

1.4 Residual Risks

The product has been developed and manufactured in accordance with generally accepted safety rules and regulations, as well as an internal risk assessment. Despite the foregoing, the product may among others bear the following risks:

Environmental Influences

The impact of moisture, corrosion and chemicals, as well as the ambient temperature, could influence the safe operation of the product. Observe the following instructions:

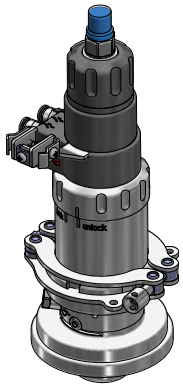
- SensoGate WA133 may only be operated in compliance with the specified operating conditions. → *Specifications, p. 55*
- If possible, install the product inside a protected area of the plant. Alternatively, take appropriate measures to protect the SensoGate WA133 (e.g., install ZU0759 protective cap[1)]). → *Accessories, p. 48*
- If using aggressive chemical process media, adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance Intervals, p. 34*
- Adhering and sticky process media can impact the functionality of the SensoGate WA133 (e.g., by causing components to stick together). Adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance Intervals, p. 34*

1) The ZU0759 protective cap protects against the effects of weather exposure and prevents the ingress of external liquids or particles into the area of the sensor connections.

1.5 Safety Accessories

To increase safety, specially developed accessories are available. → *Accessories, p. 48*

Note: We urgently recommend using the safety accessories.



ZU1138 Retainer Clamp for SensoGate Retractable Fitting

The accessory prevents the screw joint between the retractable fitting's drive unit and the process connection from accidentally coming loose.

The retainer clamp wires connect the SensoGate WA133's drive unit with the coupling nut. The locking lugs on the retainer clamp engage in the grooves of the coupling nut (form-fit) and secure the screw joint.

1.6 Hazardous Substances

IN THE EVENT OF ANY CONTACT WITH HAZARDOUS SUBSTANCES OR OTHER INJURY HEREUNDER, 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 or corrective maintenance), personnel may come into contact with the following hazardous substances:

- Process medium
- Calibration or cleaning medium
- Lubricant

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.

1.7 Operation in Explosive Atmospheres

SensoGate WA133-X is certified for operation in hazardous locations.

- EU Type Examination Certificate KEMA 04ATEX4035X
- IECEx Certificate of Conformity IECEx DEK 23.0051X

The conditions for installation and operation in hazardous locations can be found on the corresponding certificates.

Exceeding the standardized atmospheric conditions within the manufacturer's specifications, e.g., with regard to the ambient temperature and pressure, does not endanger the retractable fitting's durability. → *Specifications, p. 55*

Related certificates are included in the product's scope of delivery and are available at www.knick-international.com in the current version.

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)

1.7.1 Possible Ignition Hazards During Installation and Maintenance

To avoid mechanically generated sparks, handle the SensoGate WA133-X with care and take suitable protective action, e.g., use covers and pads.

The metallic parts of the SensoGate WA133-X must be connected to the plant's equipotential bonding system using the metallic process connection and the grounding connection provided for that purpose.

When components are replaced with genuine Knick spare parts made of other materials (e.g., O-rings), the information on the nameplate may then deviate from the actual version of the SensoGate WA133-X. The operating company must assess and document the changes.
→ *Nameplates, p. 13*

Electrostatic Charging

The drive unit of specific versions of the SensoGate WA133-X contains housing components made of non-conductive plastic. Due to their surface, the housing components may build up an electrostatic charge. To prevent this charge from becoming an effective ignition source in Zone 0, ensure that the following conditions are met:

- There is no risk of highly efficient charge-generating mechanisms.
- Non-metallic parts are only cleaned with a moist cloth.

Mechanically Generated Sparks

Single impacts on metal parts or collisions between metal parts of the SensoGate WA133-X are not a potential ignition source if the following conditions are met:

- Possible impact velocity is less than 1 m/s.
- Possible impact energy is less than 500 J.

If these conditions cannot be ensured, the operating company must reassess single impacts on metal parts or collisions between metal parts as potential sources of ignition. The operating company must implement suitable risk minimization measures, e.g., by ensuring a non-explosive atmosphere.

1.7.2 Possible Ignition Hazards During Operation

When using non-water-based cleaning, rinsing, or calibration media with a low conductivity of less than 1 nS/m, electrostatic charging of internal, conductive components may occur. The operating company must assess the associated risks and take appropriate action.

The sensors that are used must be approved for operation in hazardous locations. Further information can be found in the sensor manufacturer's documentation.

Electrostatic Charging

The wetted parts of the process unit of SensoGate WA133-X are made of non-conductive PTFE plastic. The parts can develop an electrostatic charge. This charge is always an effective ignition source unless the following conditions are fulfilled:

- Efficient charge generating mechanisms are excluded
- Process media are grounded and have a minimum conductivity of 10 nS/cm

If these conditions cannot be ensured, operation in Zone 0 and Zone 1 is not permitted.

1.8 Safety Training

Upon request, Knick Elektronische Messgeräte GmbH & Co. KG will provide safety briefings and product training during initial commissioning of the product. More information is available from the relevant local contacts.

1.9 Maintenance and Spare Parts

Preventive Maintenance

Preventive maintenance can keep the product in good condition and minimize downtimes. Knick provides recommended inspection and maintenance intervals. → *Maintenance, p. 34*

Lubricants

Only use lubricants approved by Knick. Special applications or upgrades to special lubricants are available on request. Usage of any other lubricants shall constitute an unintended use of the product. → *Maintenance, p. 34*

Tools and Mounting Aids

Special and accessory tools help maintenance personnel to replace components and wear parts safely and professionally. → *Tools, p. 50*

Spare Parts

For professional corrective maintenance of the product, only use Knick genuine spare parts. Usage of any other spare parts shall constitute an unintended use of the product. → *Spare Parts, p. 48*

Repair Service

The Knick Repair Service offers professional corrective maintenance for the product to the original quality. Upon request, a replacement unit can be obtained for the period of the repair.

Further information can be found at www.knick-international.com.

2 Product

2.1 Package Contents

- SensoGate WA133 in the version ordered
- User Manual
- EU Declaration of Conformity[1)]
- EU Type Examination Certificate[1)]
- Outlet hose
- Inlet hose [2)]

2.2 Product Identification

Note: The operating company is responsible for selecting the material for the seals and the wetted parts, as well as for the suitability of the selection for the process medium.

The different versions of the product SensoGate WA133 are coded in a model designation.

The model designation is stated on the nameplate, the delivery note, and the product packaging.
→ *Nameplates, p. 13*

2.2.1 Model Designation Example

Model designation		WA133	–	X	1	E	R	B	4	A	B	3	1	–	0	0	1
Explosion protection	ATEX Zone 0			X										–			
Sensor	pH sensor Ø12 mm with pressurization				1									–			
Seal material	EPDM - FDA					E								–			
Wetted materials [3)]	PTFE / PTFE / PTFE						R							–			
Process connection	Loose flange, 1.4571, PN 10/16, DN 100							B	4					–			
Immersion depth	Short									A				–			
Pneumatic system connection	With pneumatic limit signal										B			–			
Rinsing media connection	Hose screw connection inlet PFA DN 4/6, hose screw connection outlet PFA DN 6/8, outlet hose PTFE (3 m)											3		–			
SensoLock	With												1	–			
Special version	Equipment with special grease (provided by customer)													–	0	0	1

1) Only for versions certified for operation in hazardous locations.

2) Supplied depending on the ordered version of the SensoGate WA133. → *Product Code, p. 12*

3) Material combinations: Calibration chamber process-wetted part/calibration chamber rinse-wetted part/immersion tube.

2.2.2 Product Code

Basic unit with pneum. drive unit, stainless steel design		WA133	–	_	_	_	_	_	_	_	_	_	_	–	_	_	_
Explosion protection	ATEX Zone 0			X										–			
	Without			N										–			
Sensor	Sensor Ø12 mm with PG13.5				0									–			
	pH sensor Ø12 mm with pressurization				1									–			
Seal material	FKM					A								–			
	EPDM					B								–			
	EPDM - FDA					E								–			
	FKM - FDA					F								–			
	FFKM - FDA					H								–			
	FFKM					K								–			
Wetted materials [1]	PTFE / PTFE / PTFE						R							–			
Process connection	Loose flange, 1.4571, PN 10/16, DN 40							B	A					–			
	Loose flange, 1.4571, PN 10/16, DN 50							B	1					–			
	Loose flange, 1.4571, PN 10/16, DN 65							B	2					–			
	Loose flange, 1.4571, PN 10/16, DN 80							B	3					–			
	Loose flange, 1.4571, PN 10/16, DN 100							B	4					–			
	Loose flange, ANSI 316, 150 lbs, 2″							D	1					–			
	Loose flange, ANSI 316, 150 lbs, 2.5″							D	2					–			
	Loose flange, ANSI 316, 150 lbs, 3″							D	3					–			
	Loose flange, ANSI 316, 150 lbs, 3.5″							D	4					–			
	Fitting DIN 3237-2, PN 16, DN 40							T	A					–			
	Fitting DIN 3237-2, PN 16, DN 50							T	1					–			
	Loose flange, 1.4571, DN 40, for flat flange made of glass [2]							U	A					–			
	Loose flange, 1.4571, DN 50, for flat flange made of glass [2]							U	1					–			
Immersion depth	Short									A				–			
	Long									B				–			
Pneumatic system connection	Without pneumatic limit signal										A			–			
	With pneumatic limit signal										B			–			
Rinsing media connection	Hose screw connection at inlet PFA DN 4/6, hose screw connection at outlet PFA DN 6/8, outlet hose PTFE (3 m)											3		–			
SensoLock	Without												0	–			
	With												1	–			
Special version	Without													–	0	0	0
	Equipment with special grease (provided by customer)													–		1	
	Customer-specific special datasheet													–		F	
	Immersion lock for fitting with dismounted sensor. For immersion depths A, K, and pH sensor type 1.													–		V	
	Immersion lock for fitting with dismounted sensor. For sensor type 0.													–		W	

1) Material combinations: Calibration chamber process-wetted part/calibration chamber rinse-wetted part/immersion tube.

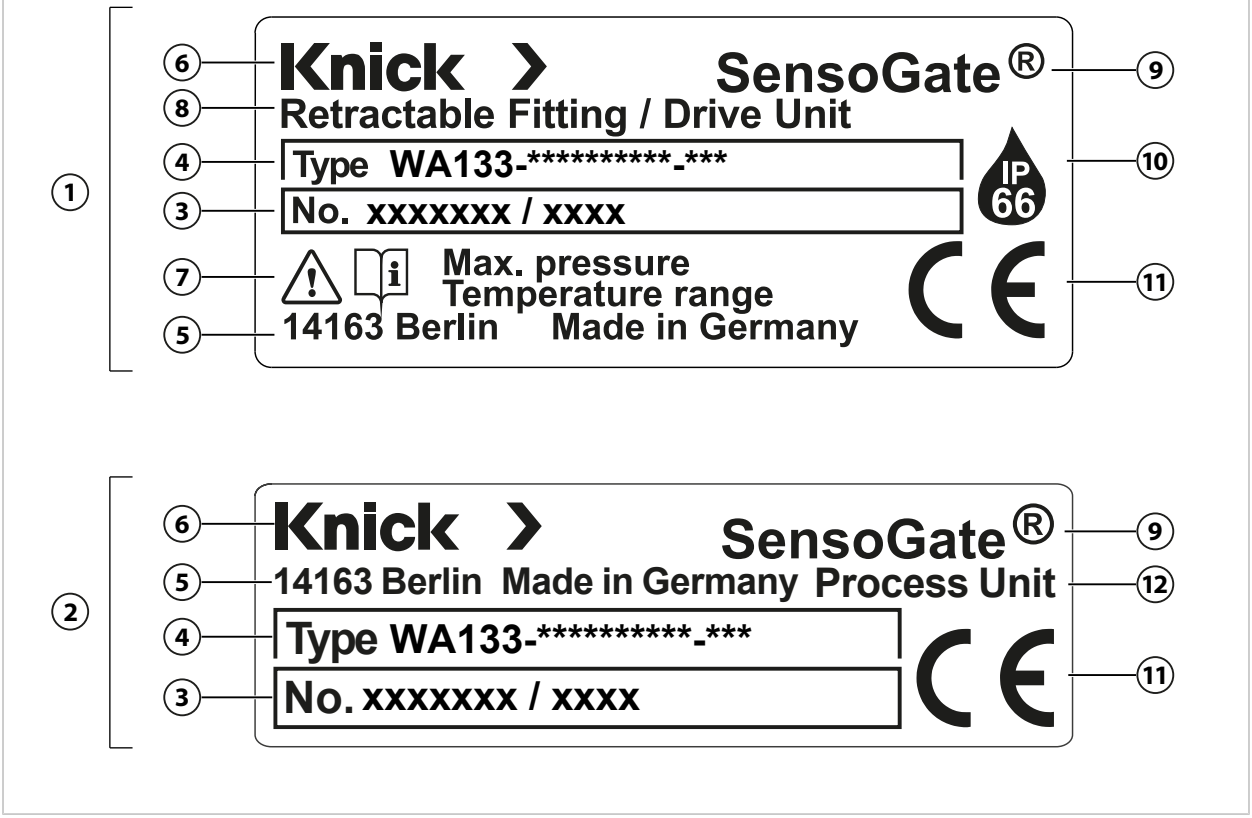
2) Suitable for glass branch with flat flange in the QVF® SUPRA-Line system (De Dietrich Process Systems)

2.3 Nameplates

The SensoGate WA133 is identified by nameplates on the drive unit and the process unit. The information provided on the nameplates varies according to the version of the SensoGate WA133.

Nameplate, Version Without Ex Approval

Note: The figure shows example nameplates in the SensoGate WA133-N version.

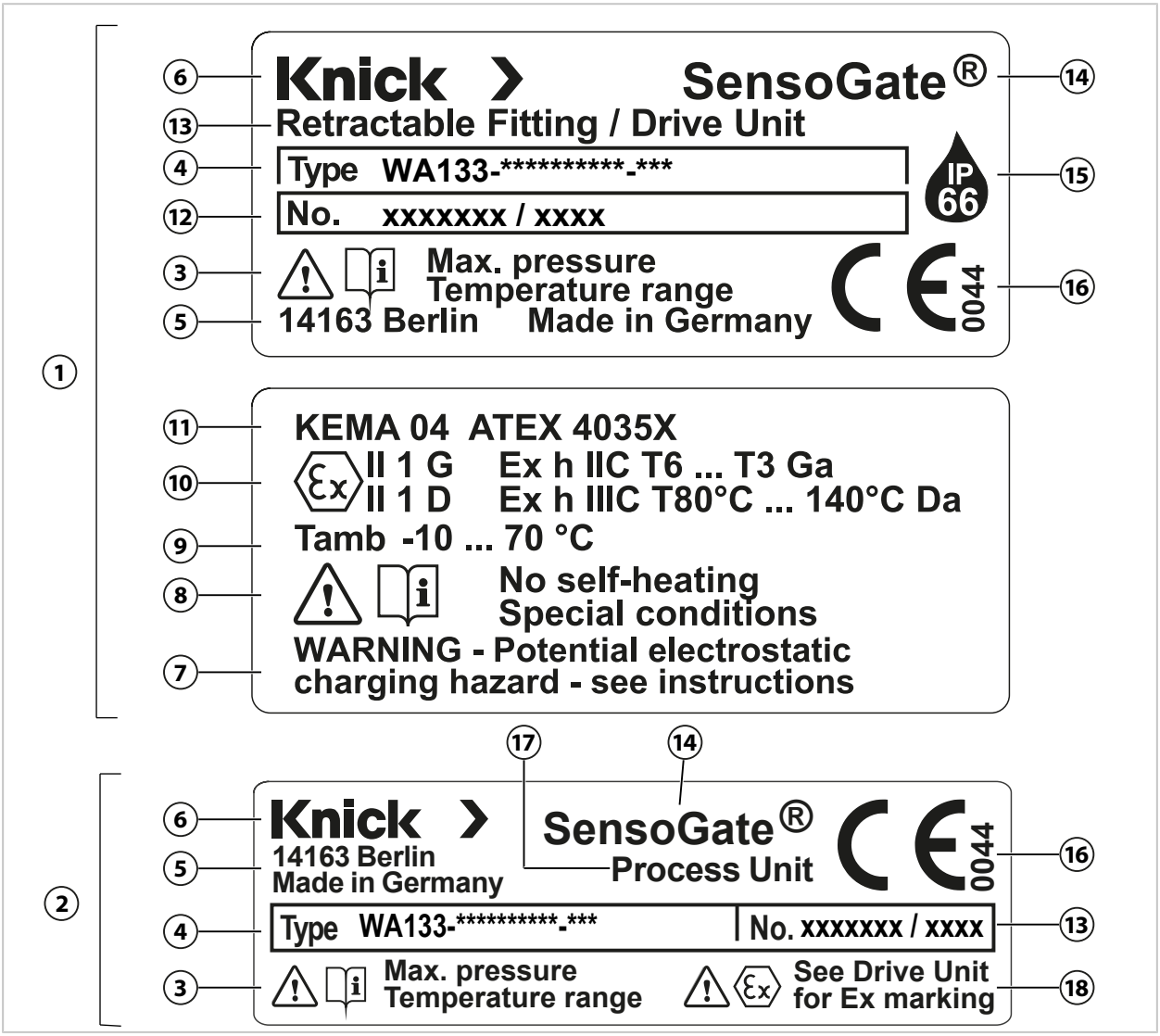


1	Drive unit nameplate	7	Max. operating pressure and temperature range [1]
2	Process unit nameplate	8	Product line: Retractable fitting Assembly group: Drive unit
3	Serial number/production year and week	9	Product family
4	Model designation	10	IP protection
5	Manufacturer address with designation of origin	11	Assembly group: Process unit
6	Manufacturer	12	CE mark

[1] Further information is available in the → *Safety, p. 5* and → *Specifications, p. 55* chapters.

Nameplate, Version with Ex Approval

Note: The figure shows an example nameplate in the SensoGate WA133-X version.



1	Nameplates, drive unit	10	ATEX marking, information on explosion protection
2	Process unit nameplate	11	EU Type Examination Certificate test number
3	Maximum operating pressure and temperature range	12	Serial number/production year and week
4	Model designation	13	Product line: Retractable fitting Assembly group: Drive unit
5	Manufacturer address with designation of origin	14	Product family
6	Manufacturer	15	IP protection
7	Reference to explosion protection information[1)]	16	CE mark with identification number
8	No self heating/special conditions [1)]	17	Assembly group: Process unit
9	Permitted ambient temperature	18	Reference to ATEX information of drive unit

2.4 Symbols and Markings

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

[1)] Additional information can be found in the related EU Type Examination Certificate or in the sections → *Safety, p. 5* and → *Specifications, p. 55*.

	Reminder to read the documentation
	CE mark with identification number[1] of the notified body involved in the production control.
	ATEX marking[1] of the European Union for operation in hazardous locations → *Operation in Explosive Atmospheres, p. 8*
	IP66 protection: The product is dust-tight and offers complete protection against contact as well as protection against strong water jets.
	Outlet symbol marking the outlet port of the SensoGate WA133
	Inlet symbol marking the inlet port of the SensoGate WA133[1]
	Connection of the drive medium for moving to the process position.
	Connection of the drive medium for moving to the service position.
	Connection of the process position (PROCESS limit position) check-back signal[1]
	Connection of the service position (SERVICE limit position) check-back signal[1]
	Symbol to show that the SensoGate WA133 is mechanically locked[1]
	Symbol indicating that the SensoGate WA133 is not mechanically locked[1].

2.5 Design and Function

SensoGate WA133 consists of two main assemblies:

- Drive unit
- Process unit

The drive unit is connected to the process unit with a coupling nut. The drive unit and process unit can be separated. → *Drive Unit: Removal, p. 37*

Various different versions of drive and process unit can be combined. → *Permissible Changes, p. 18*

The process connection is used to fasten the SensoGate WA133 to the process port.

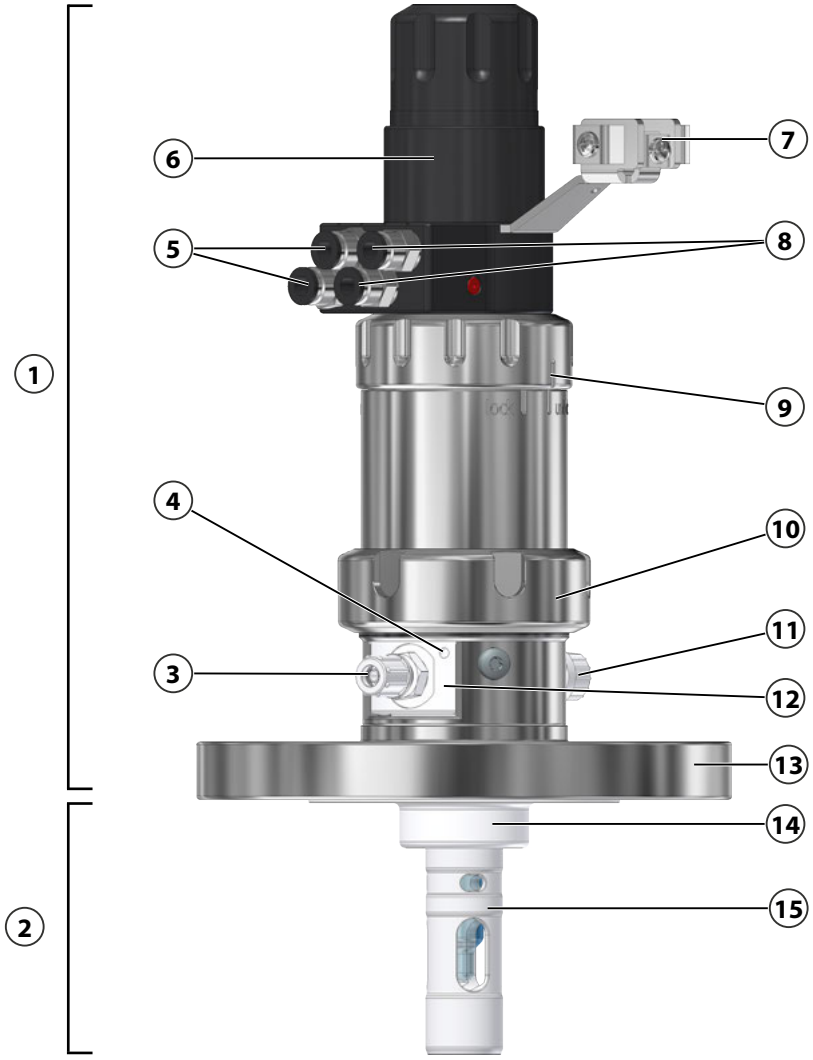
The pneumatically operated drive unit moves the SensoGate WA133 into the service position (SERVICE limit position) or the process position (PROCESS limit position).
→ *Limit Positions, Service and Process Position, p. 19*

See also
→ *Safeguards, p. 5*

2.5.1 Retractable Fitting

Note: The figure shows an example version of the SensoGate. → *Product Code, p. 12*

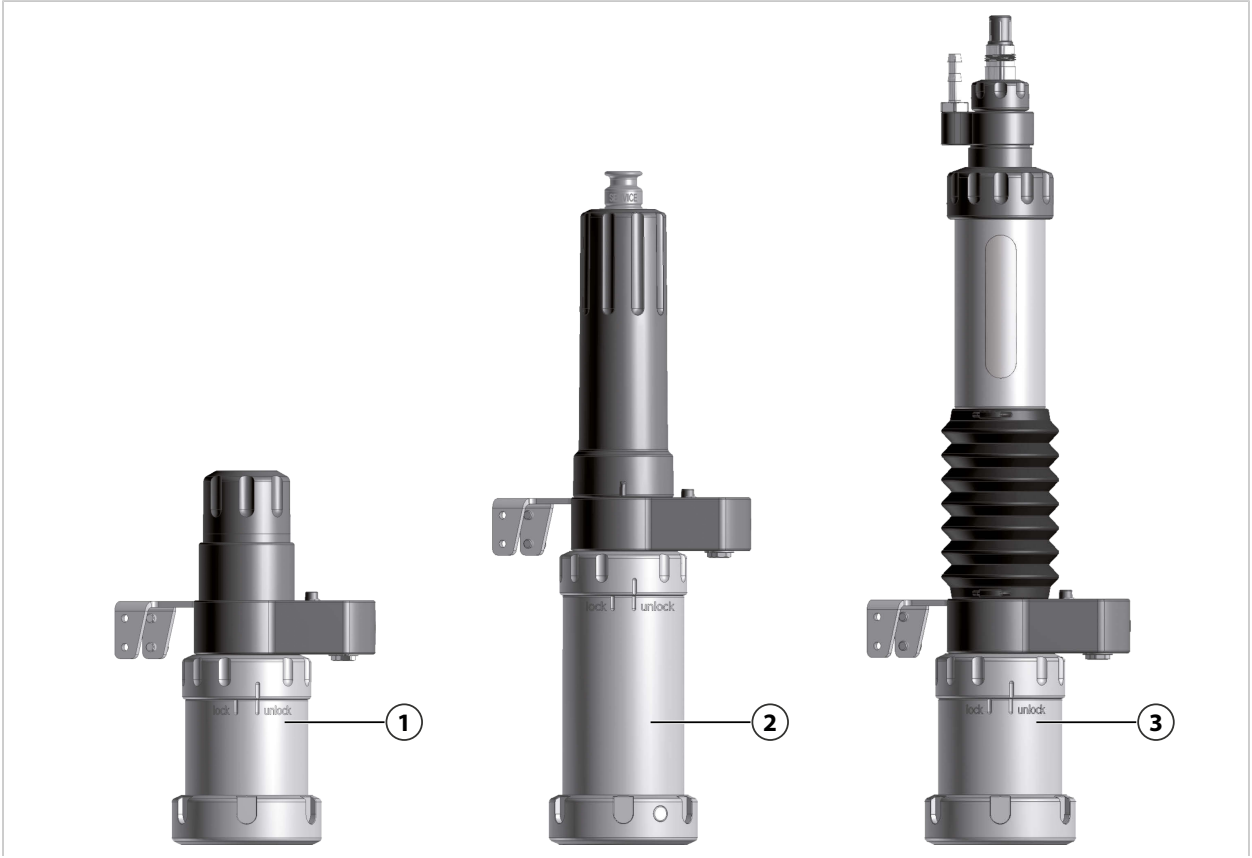
[1] Dependent on the ordered version → *Product Code, p. 12*



1	Drive unit	9	SensoLock
2	Process unit	10	Coupling nut
3	Outlet	11	Inlet
4	Leakage bore	12	Calibration chamber
5	Control air connection	13	Flange
6	Sensor holder	14	Flange bushing
7	Strain relief bracket	15	Immersion tube
8	Connections (2x) pneumatic feedback		

2.5.2 Drive Units and Sensor Holders

Note: The figure shows a selection from the product line. → *Product Code, p. 12*



1	Short immersion depth, sensors with solid electrolyte
2	Long immersion depth, sensors with solid electrolyte
3	Short immersion depth, sensors with liquid electrolyte

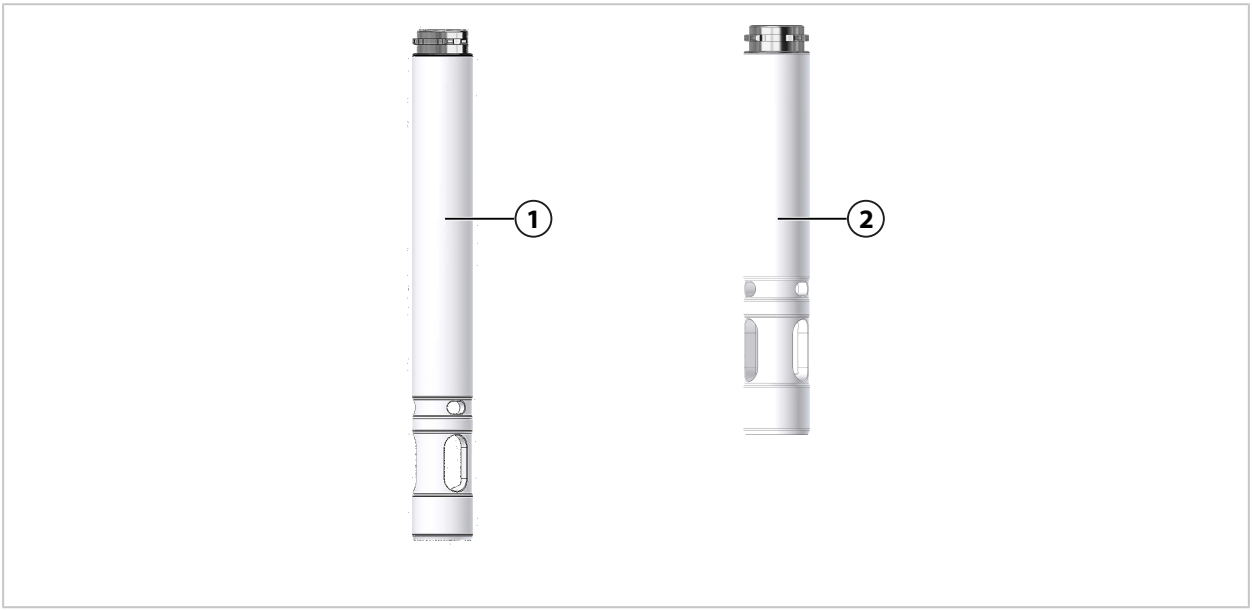
2.5.3 Process Connections

Note: The figure shows a selection from the product line. → *Product Code, p. 12*

1	Flange

2.5.4 Immersion Tubes

Note: The figure shows a selection from the product line. → *Product Code, p. 12*



1 Immersion tube, long (204 mm)
Materials: 1.4571, PTFE

2 Immersion tube, short (149 mm)
Materials: 1.4571, PTFE

See also
→ *Spare Parts, p. 48*

2.6 Permissible Changes

The SensoGate WA133 can be adapted to changed conditions by the customer. Prior to making any changes, contact Knick Elektronische Messgeräte GmbH & Co. KG. The following are examples of possible changes:

- Modification of the sensor holder to fit another sensor type → *Drive Units and Sensor Holders, p. 17*
- Replacing wetted components with other material properties → *Maintenance, p. 34*
- Retrofit of safeguards, e.g., "Immersion Lock Without a Mounted Liquid-Electrolyte Sensor" → *Safeguards, p. 5*

Any changes may result in deviations between the information on the nameplate and the actual version of the SensoGate WA133. The operating company must assess and document the changes. In the event of a change to the version, the product must be identified accordingly.

It is recommended that changes to the SensoGate WA133 be carried out by the Knick Repair Service. After making the necessary changes, a functional and pressure test is carried out and, if necessary, a modified nameplate is attached. → *Knick Repair Service, p. 42*

More information on changes can be found in the related supplementary datasheet. Maintenance instructions with detailed instructions for action are available on request.

2.7 Limit Positions, Service and Process Position

The SensoGate WA133 can have one of two limit positions (service or process position).

Note: The SensoGate WA133 is only separated from the process in the service position (SERVICE limit position).

Service Position (SERVICE Limit Position)

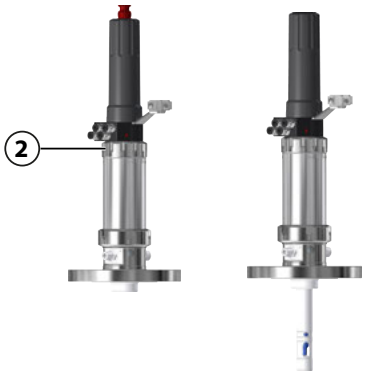
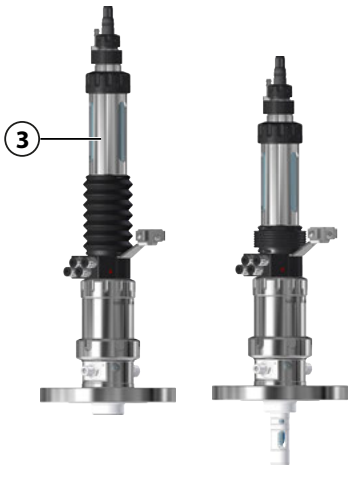
- The sensor is not in contact with the process medium.
- During an ongoing process, the sensor can be installed or removed and cleaned if required.
- The sensor can be cleaned or calibrated by introducing a rinsing or calibration solution into the rinsing chamber during an ongoing process.
- The limit position can be monitored pneumatically.[1)]
- The limit position can be monitored electrically.[1)]

Process Position (PROCESS Limit Position)

- The sensor is in contact with the process medium.
- The required process parameters can be measured.
- The limit position can be monitored pneumatically.[1)]
- The limit position can be monitored electrically.[1)]

For SensoGate WA133 versions with pneumatic limit signal, a pneumatic signal is present at the corresponding push-in connection when the respective limit position is reached. This signal can either be processed directly or converted into an electrical signal by using a limit switch (ZU0859).
→ *Accessories, p. 48*

The service position (SERVICE limit position) and process position (PROCESS limit position) are indicated in different ways depending on the version of the SensoGate WA133.

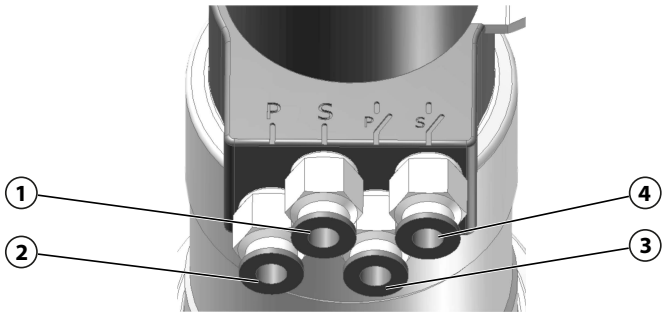
Solid Electrolyte Sensor, Short Immersion Depth	Solid Electrolyte Sensor, Long Immersion Depth	Liquid Electrolyte Sensor, Short Immersion depth
		
SERVICE	**SERVICE**	**SERVICE**
In the service position, the sensor head **(1)** is visible at the top end of the protection sleeve.	In the service position, the service cap **(2)** is visible at the top end of the extension.	In the service position, the bellows **(3)** are pulled apart.
PROCESS	**PROCESS**	**PROCESS**
In the process position, the sensor head **(1)** is retracted into the protection sleeve.	In the process position, the service cap **(2)** is retracted into the extension.	In the process position, the bellows **(3)** are pressed together.

[1)] Availability of functions depends on the ordered version. → *Product Code, p. 12*

2.7.1 Limit Signals

For SensoGate WA133 versions with pneumatic limit signal, a pneumatic signal is present at the corresponding push-in connection when the respective limit position is reached. This signal can either be processed directly or converted into an electrical signal by using a limit switch (ZU0859).

→ *Accessories, p. 48*

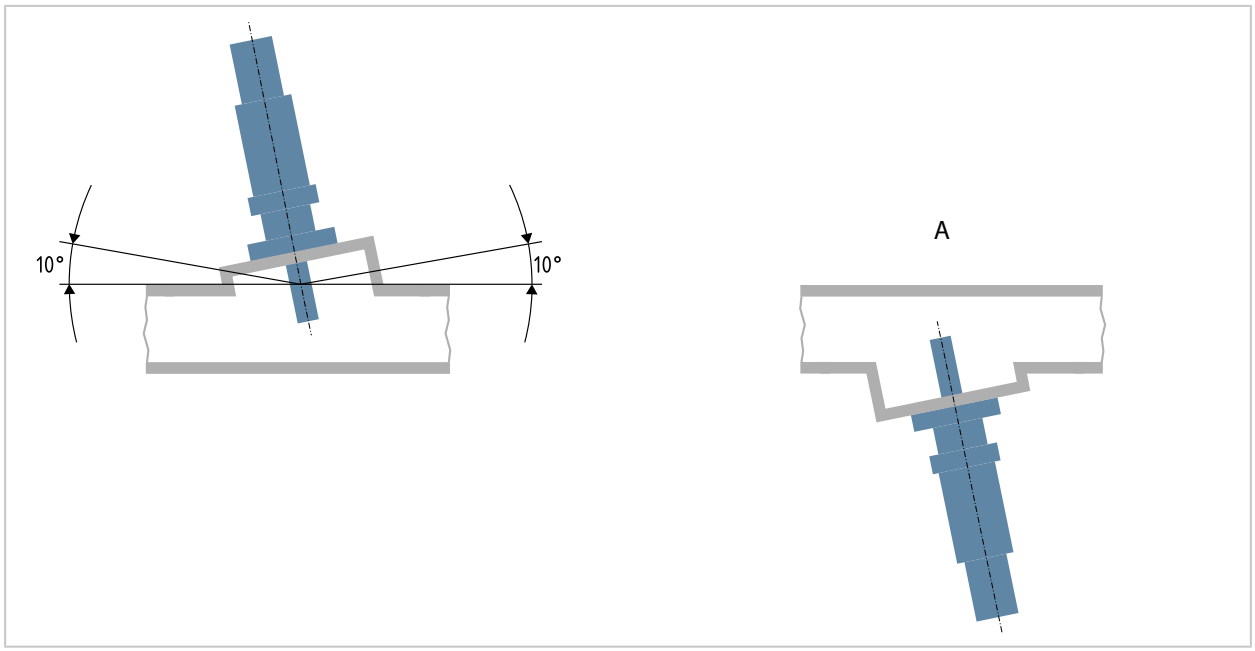


1	SERVICE compressed air connection	3	PROCESS limit position compressed air connection
2	PROCESS compressed air connection	4	SERVICE limit position compressed air connection

3 Installation

3.1 Retractable Fitting: Installation

⚠ WARNING! Risk of explosions from mechanically generated sparks if used in potentially explosive atmospheres. Implement measures for avoiding mechanically generated sparks. Follow the safety instructions. → *Operation in Explosive Atmospheres, p. 8*



01. Check the package contents of the SensoGate WA133 for completeness. → *Package Contents, p. 11*
02. Check the SensoGate WA133 for damage.
03. Ensure the required installation clearances for the sensor installation.
    → *Dimension Drawings, p. 51*
    Note: The installation angle of the SensoGate WA133 depends on the sensor type. An installation angle from 10° above the horizontal is permitted for all sensor types. An upside down installation angle (see View A) is only permitted when using sensors that are approved for upside down operation.
04. Fasten the SensoGate WA133 to the process port with the process connection.
05. Optional: When using in potentially explosive atmospheres, connect the ground connection of the SensoGate WA133 with the equipotential bonding of the system.

See also

→ *Operation in Explosive Atmospheres, p. 8*
→ *Commissioning, p. 24*

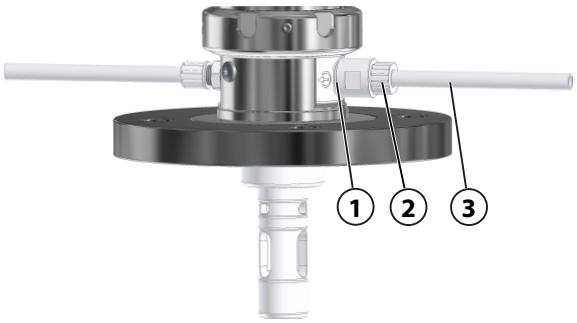
3.2 Safety Accessories: Installation

The installation of the safety accessories is described in the associated accessories manuals.
→ *Safety Accessories, p. 8*

Note: We urgently recommend using the safety accessories.

3.3 Outlet Hose: Installation

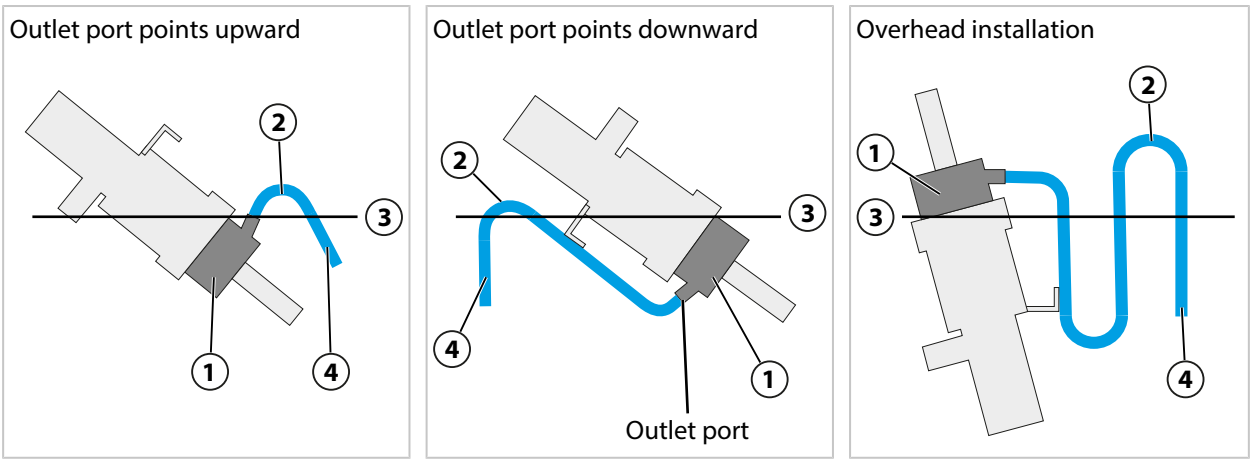
Note: The outlet is used to discharge rinsing medium and trapped process medium and must not be closed. Installation of the supplied outlet hose is also recommended for versions without a rinse connection. By moving the sensor to the SERVICE/PROCESS limit positions, pressurized process medium can enter the calibration chamber and be compressed when the outlet is closed. This process medium may splash out during sensor replacement.



01. Tightly screw the outlet hose **(3)** to the outlet port **(1)** using the hose screw connection **(2)**.

Laying the Outlet Hose

In certain installation orientations of SensoGate WA133, the calibration chamber can leak through the outlet hose. The sensor cannot be calibrated in the service position.

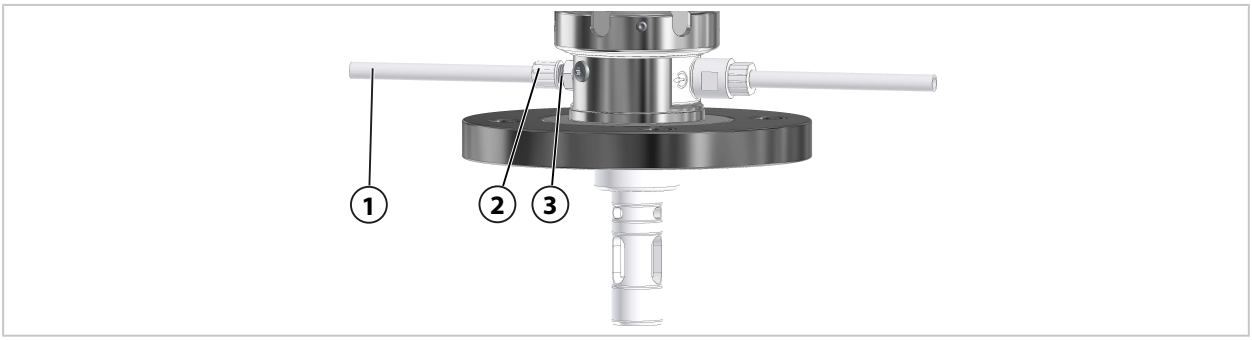


01. Lay the outlet hose **(4)** in an arc **(2)** above the calibration chamber level **(3)**.
    ✓ This prevents the calibration chamber **(1)** from leaking.

3.4 Inlet Hose: Installation

⚠ WARNING! If there is no inlet hose, process medium that may contain hazardous substances will escape during operation. Install the inlet hose. Observe the Safety Instructions. → *Safety, p. 5*

NOTICE! Drinking water may be contaminated by rinsing and process media when connecting to drinking water pipes. Observe the information contained in EN 1717. Install a suitable check valve (e.g., check valve RV01) at the water or rinse connection. → *Accessories, p. 48*



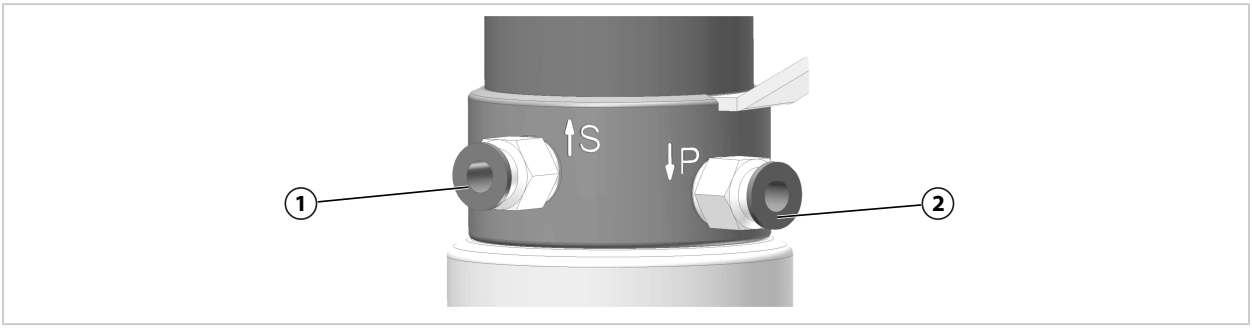
Note: The inlet port is factory-installed and must not be operated when open.

01. Fasten the inlet hose **(1)** to the inlet port **(3)** using a hose screw connection **(2)**.

3.5 Pneumatic Control: Installation

For the SensoGate WA133 retractable fitting, the motions toward the service position (SERVICE limit position) or process position (PROCESS limit position) are pneumatically controlled.

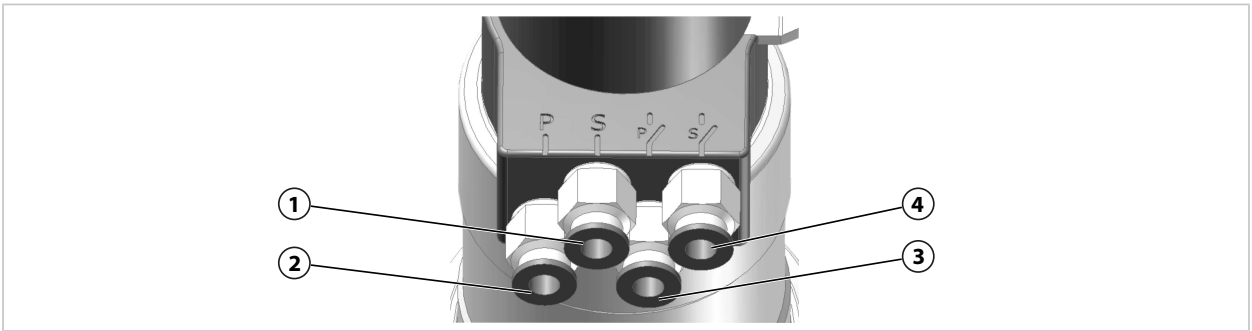
3.5.1 Drive Media: Installation Without Limit Positions



01. Slide two compressed air hoses (outer diameter 6 mm, inner diameter 4 mm) into the SERVICE **(1)** and PROCESS **(2)** plug-in connections up to the stop.

3.5.2 Drive Media: Installation With Limit Positions

Whether limit positions are present depends on the version ordered. → *Product Code, p. 12*



01. Slide four compressed air hoses (outer diameter 6 mm, inner diameter 4 mm) into the SERVICE **(1)**, PROCESS **(2)**, SERVICE feedback **(4)** and PROCESS feedback **(3)** plug-in connections up to the stop.

4 Commissioning

⚠ WARNING! If the SensoGate WA133 fitting is damaged or improperly installed, process medium, potentially containing hazardous substances, may escape. Follow the safety instructions. → *Safety, p. 5*

Note: Upon request, Knick will provide safety briefings and product training during initial commissioning of the product. More information is available from the relevant local contacts.

01. Install SensoGate WA133. → *Retractable Fitting: Installation, p. 21*
02. Install the outlet hose. → *Outlet Hose: Installation, p. 22*
03. Install the inlet hose. → *Inlet Hose: Installation, p. 23*
04. Install the drive media. → *Pneumatic Control: Installation, p. 23*
05. Mount the sensor. → *Installing and Removing Sensors, p. 26*
06. Check that the process connection is mounted securely.
07. Optional: Check that the installed safety accessories (e.g., ZU1138 retainer clamp) are mounted securely. → *Safety Accessories, p. 8*
08. When using the SensoGate WA133-X in potentially explosive atmospheres, check that the connection to the equipotential bonding of the system is correct.
    → *Installing and Removing Sensors, p. 26*
09. Set the SensoLock[1)] to "unlock" by rotating the upper coupling nut.
10. Move SensoGate WA133 into the process position (PROCESS limit position).
    → *Moving into the Process Position (PROCESS Limit Position), p. 25*
    ✓ The sensor head or service cap is not visible.
11. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
    ✓ The sensor head or service cap is visible.
12. Check that SensoGate WA133 is tight under process conditions.
    Note: Pressure and leak tests must be carried out in accordance with the relevant operating regulations or the operating company's instructions.
    ✓ SensoGate WA133 and connections do not leak.

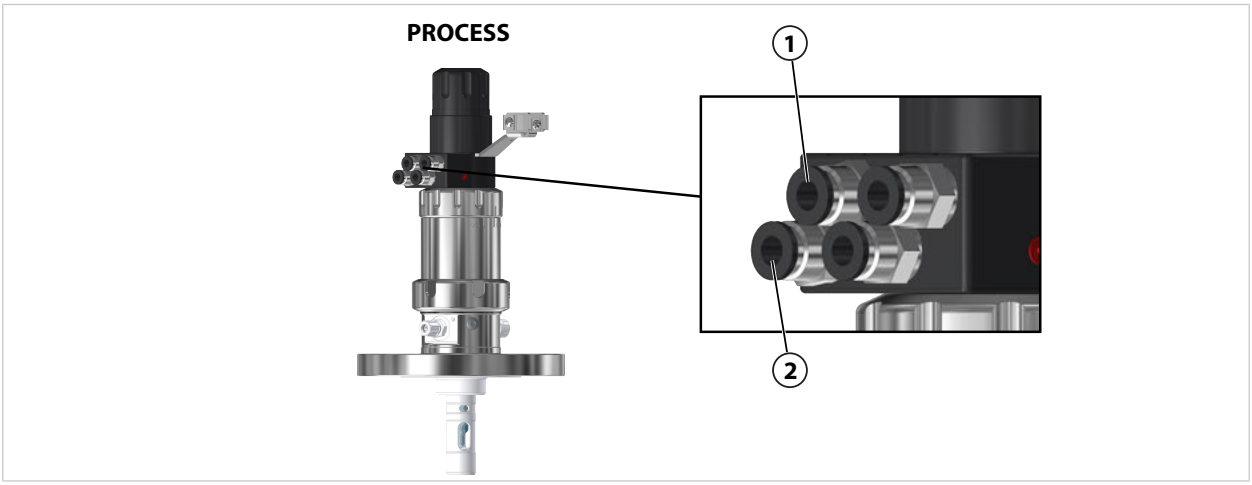
✓ SensoGate WA133 is ready for operation.

1) Availability dependent on the ordered version → *Product Code, p. 12*

5 Operation

5.1 Moving into the Process Position (PROCESS Limit Position)

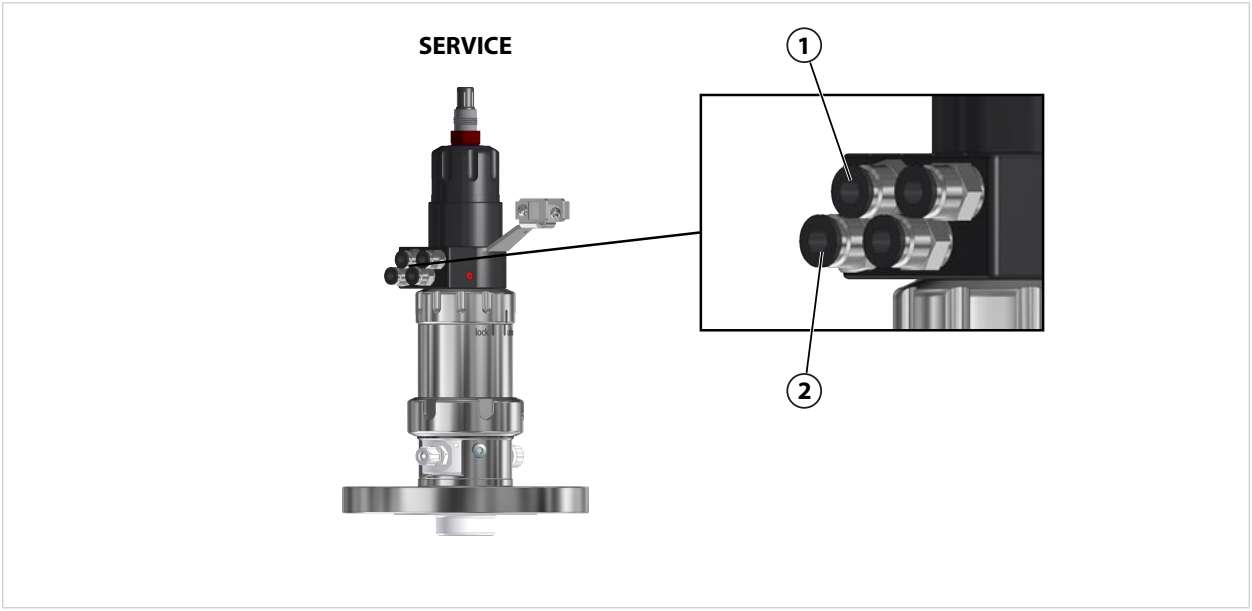
⚠ WARNING! Process, rinse, or additional media, potentially containing hazardous substances, may escape from the SensoGate WA133. Only move the SensoGate WA133 into the process position (PROCESS limit position) if a sensor is installed. → *Installing and Removing Sensors, p. 26*



01. Install the sensor. → *Installing and Removing Sensors, p. 26*
02. Move SensoGate WA133 into the process position (PROCESS limit position).
    Note: When moving to the process position (PROCESS limit position), the control air **(1)** is vented and the process air **(2)** is pressurized.
    ✓ The sensor head or service cap is not visible (see Detail A).

5.2 Moving into the Service Position (SERVICE Limit Position)

Note: The SensoGate WA133 is only separated from the process in the service position (SERVICE limit position).



01. Move SensoGate WA133 into the service position (SERVICE limit position).
    Note: When moving to the service position (SERVICE limit position), the control air **(1)** is pressurized and the process air **(2)** is vented.
    ✓ The sensor head or service cap is visible (see Detail A).

5.3 Installing and Removing Sensors

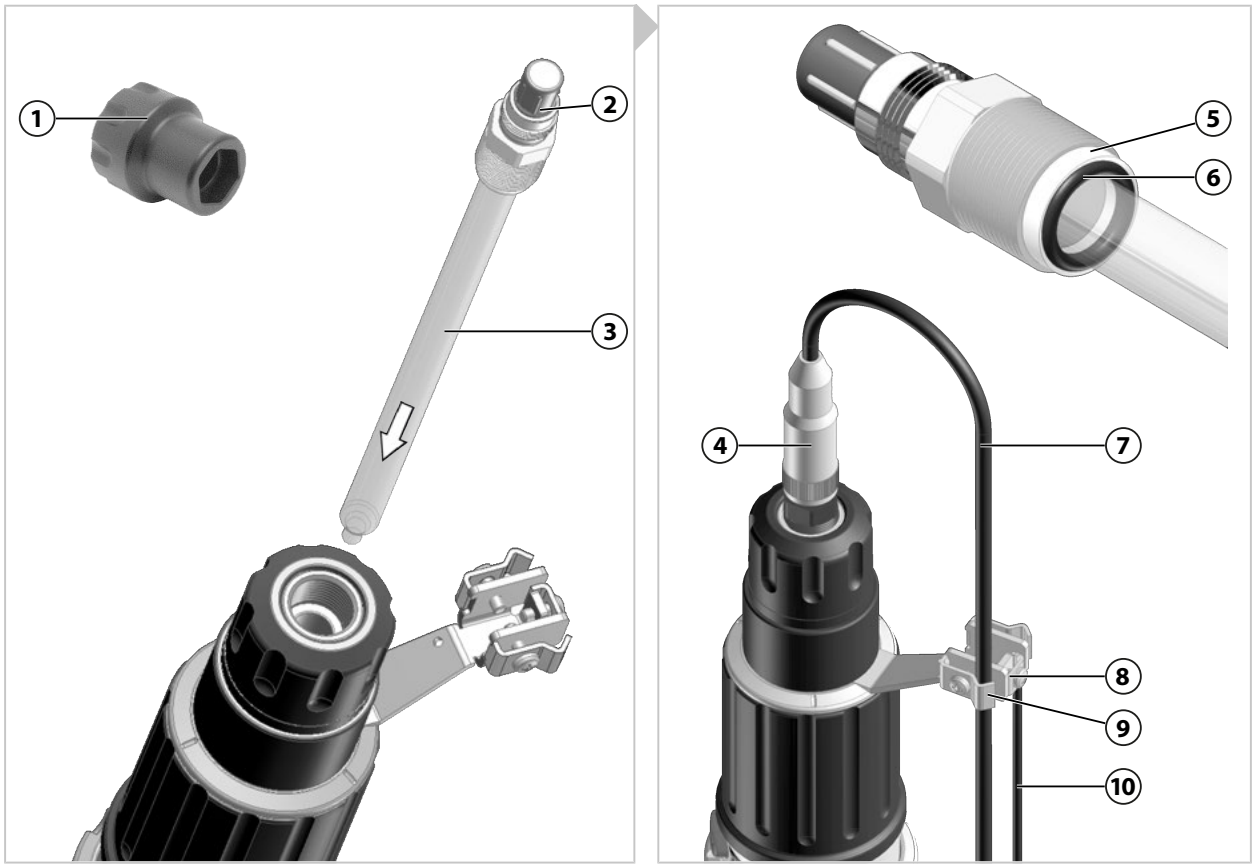
5.3.1 Safety Instructions for Installing and Removing Sensors

⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the SensoGate WA133. Follow the safety instructions. → *Safety, p. 5*

⚠ CAUTION! Risk of cutting injuries from broken sensor glass. Handle the sensor with care. Follow the safety instructions in the sensor manufacturer's documentation.

Note: The outlet is used to discharge trapped rinsing medium and must not be closed. By moving the SensoGate WA133 to the limit positions, pressurized process medium may enter the calibration chamber. When the outlet is closed, this process medium may be compressed and splash out during a sensor replacement. → *Design and Function, p. 15*

5.3.2 Solid Electrolyte Sensor, Short Immersion Depth: Installation



01. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
04. Check that the sensor is permitted. → *Intended Use, p. 5*
    ✓ Length 225 mm
    ✓ Body diameter 11.5 … 12.0 mm
    ✓ Pressure resistance permitted for process → *Specifications, p. 55*
05. Check that the compression ring **(5)** and O-ring **(6)** of the sensor **(3)** are correctly positioned.
06. Check the sensor **(3)**, compression ring **(5)**, and O-ring **(6)** for damage.
    Note: Replace damages sensors, compression rings and O-rings.

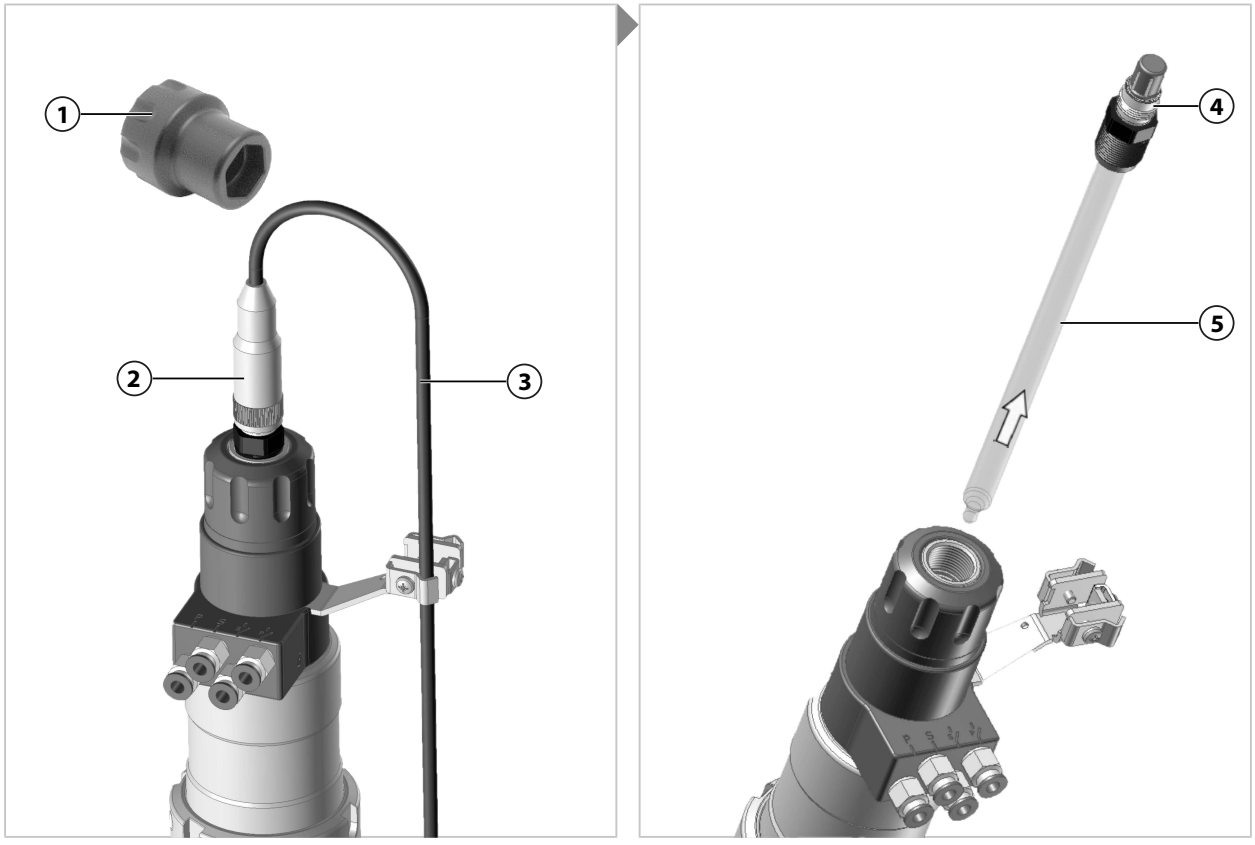
[1] Availability dependent on the ordered version → *Product Code, p. 12*

07. Check the sensor holders for foreign bodies (e.g. compression ring, O-ring) and remove if necessary.
08. Slide the sensor **(3)** into the SensoGate WA133.
09. Tighten the sensor **(3)** using a spanning wrench **(1)** to max. 3 Nm (A/F 19). Recommended tool: ZU0647 sensor spanning wrench → *Tools, p. 50*
    Note: When tightening the sensor, the spring force of the "Immersion Lock Without a Mounted Solid-Electrolyte Sensor" safeguard must be overcome.
10. Connect the socket **(4)** of the sensor cable to the sensor head **(2)**.
11. When installing for the first time: Route the sensor cable **(7)** in an arch and fasten it with the clip **(8)**. While doing so, ensure that the sensor cable has sufficient arch length to prevent the SensoGate WA133's lifting movement from being obstructed by the sensor cable.
12. Optional: Install the ZU0759 protective cap. → *Accessories, p. 48*

See also
→ *Tools, p. 50*

5.3.3 Solid Electrolyte Sensor, Short Immersion Depth: Removal

Note: On versions with rinse connection, rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.



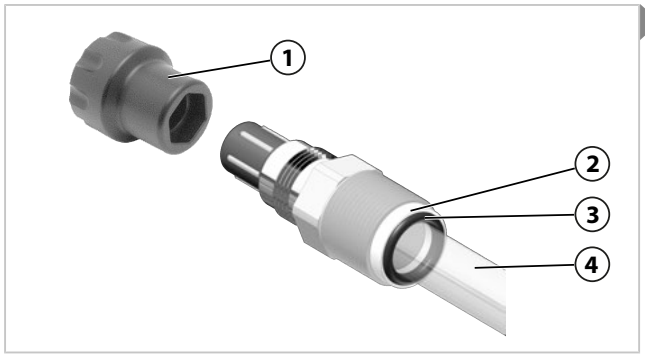
01. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Optional: Remove the ZU0759 protective cap.
04. Disconnect the socket **(2)** of the sensor cable **(3)** from the sensor head **(4)**.
05. Loosen the sensor **(5)** using the spanning wrench **(1)** (A/F 19). Recommended tool: ZU0647 sensor spanning wrench → *Tools, p. 50*

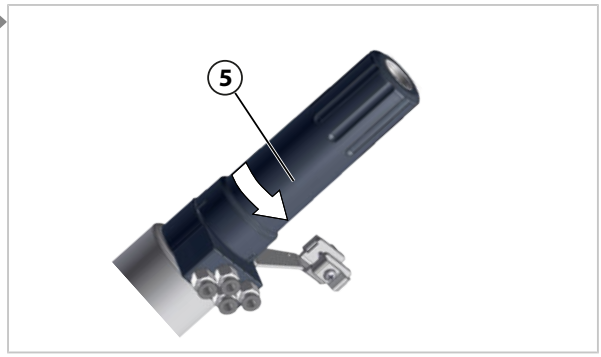
06. Pull the sensor **(5)** out of SensoGate WA133.
07. If the sensor glass is broken, check the seal of the immersion tube for damage and replace if damaged. → *Immersion Tube: Disassembly, p. 39*

See also
→ *Tools, p. 50*

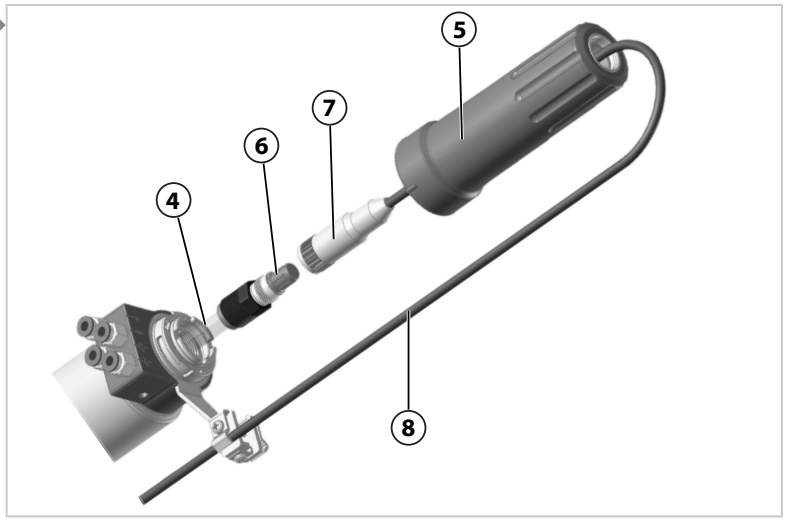
5.3.4 Solid Electrolyte Sensor, Long Immersion Depth: Installation

Note: The extension can only be unlocked in the service position (SERVICE limit position) (safety function).



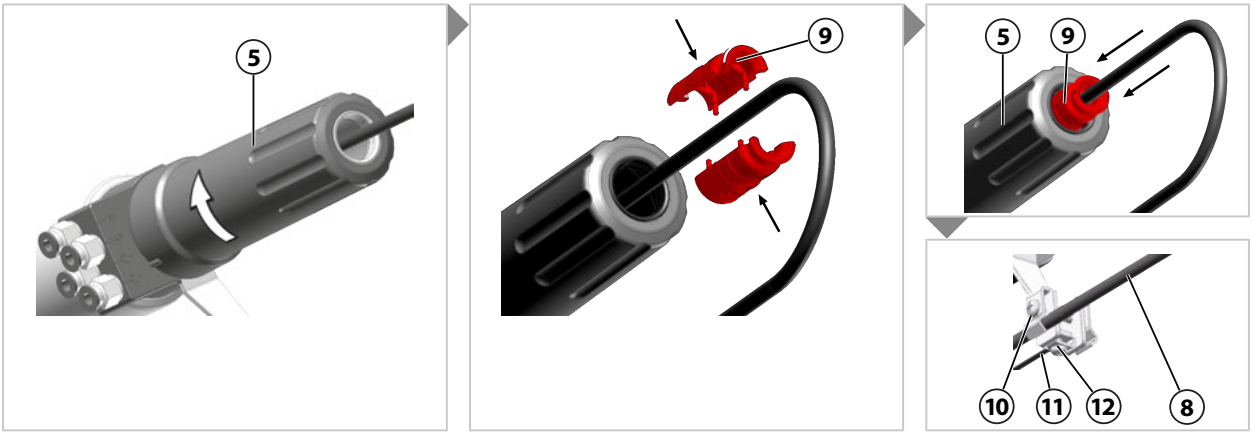


01. Move SensoGate WA133 into the service position (SERVICE limit position).
→ *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
04. Check that the sensor is permitted. → *Intended Use, p. 5*
    ✓ Length 225 mm
    ✓ Body diameter 11.5 ... 12.0 mm
    ✓ Pressure resistance permitted for process → *Specifications, p. 55*
05. Check that the compression ring **(2)** and O-ring **(3)** of the sensor **(4)** are correctly positioned.
06. Check the sensor **(4)**, compression ring **(3)**, and O-ring **(2)** for damage.
    Note: Replace damages sensors, compression rings and O-rings.
07. Turn the extension **(5)** counterclockwise until the bayonet coupling opens.
08. Remove the extension **(5)**.



[1] Availability dependent on the ordered version → *Product Code, p. 12*

09. Check the sensor holders for foreign bodies (e.g. compression ring, O-ring) and remove if necessary.
10. Slide the sensor **(4)** into the SensoGate WA133.
11. Tighten the sensor **(4)** using a spanning wrench **(1)** to max. 3 Nm (A/F 19). Recommended tool: ZU0647 sensor spanning wrench → *Tools, p. 50*
    Note: When tightening the sensor, the spring force of the "Immersion Lock Without a Mounted Solid-Electrolyte Sensor" safeguard must be overcome.
12. When installing for the first time: Remove the two-part red service cap **(9)** from the extension **(5)**. Retain the service cap **(9)** for later use.
13. Connect the socket **(7)** of the sensor cable **(8)** to the sensor head **(6)**.



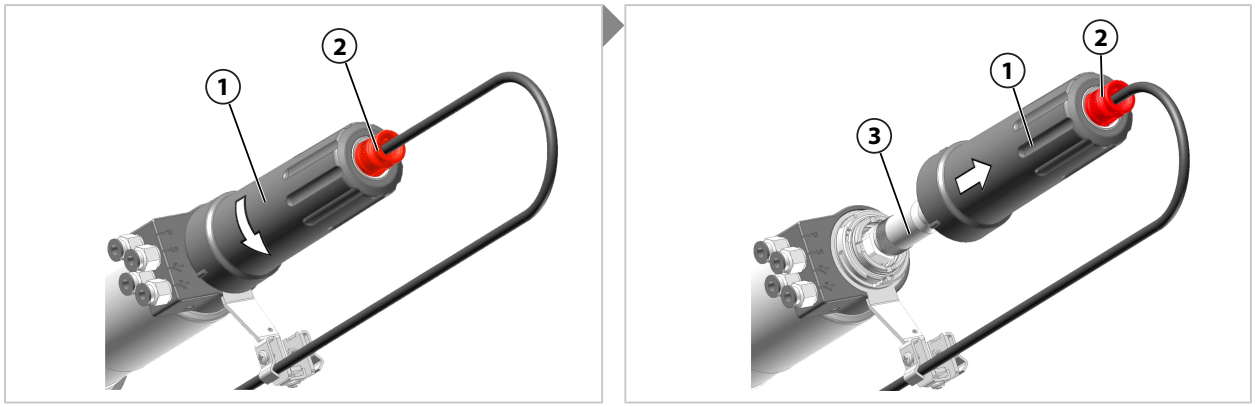
14. Put on the extension **(5)** and turn it clockwise until the bayonet coupling snaps in.
15. When installing for the first time: Mount the two-part red service cap **(9)** on the sensor cable **(8)**.
16. When installing for the first time: Slide the service cap **(9)** above the extension **(5)** into the extension until the service cap **(9)** clearly snaps in.
17. When installing for the first time: Route the sensor cable **(8)** in an arch and fasten it with the clip **(10)**. While doing so, ensure that the sensor cable has sufficient arch length to prevent the SensoGate WA133's lifting movement from being obstructed by the sensor cable.
18. When installing for the first time: Connect the equipotential bonding line **(11)** to the terminal **(12)**.
19. Optional: Install the ZU0759 protective cap. → *Accessories, p. 48*
20. Set the SensoLock[1)] to "unlock" by rotating the upper coupling nut.

See also
→ *Tools, p. 50*

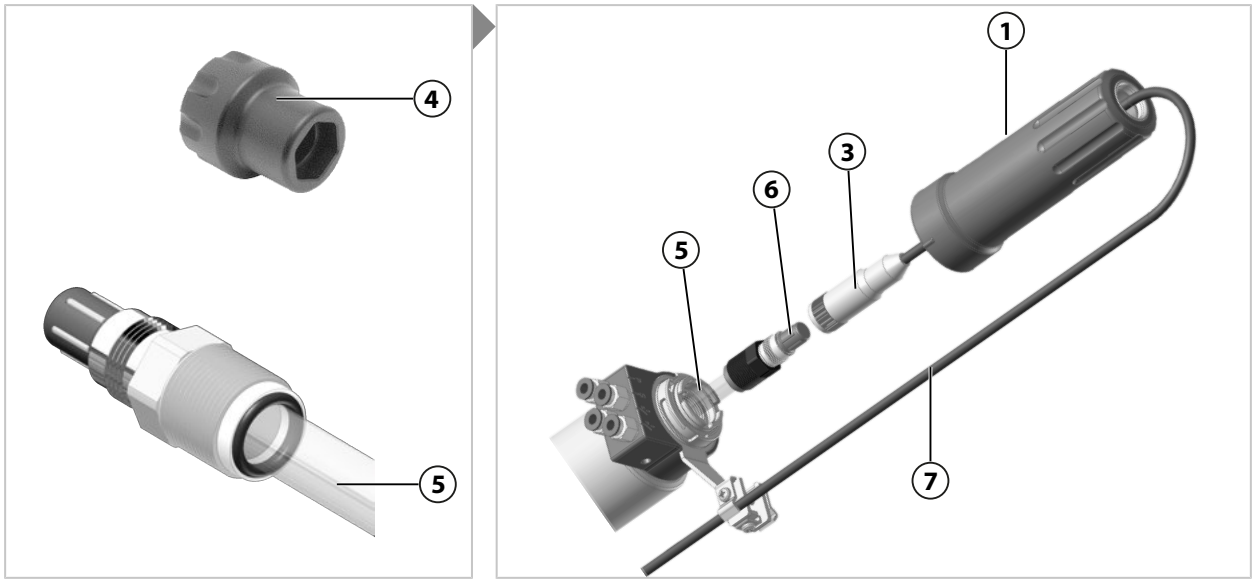
5.3.5 Solid Electrolyte Sensor, Long Immersion Depth: Removal

Note: On versions with rinse connection, rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.

1) Availability dependent on the ordered version → *Product Code, p. 12*



01. Move SensoGate WA133 into the service position (SERVICE limit position).
→ *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Optional: Remove the ZU0759 protective cap.
04. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
05. Turn the extension **(1)** counterclockwise until the bayonet coupling of the extension **(1)** unlocks.
Note: The extension can only be unlocked in the service position (SERVICE limit position). The red service cap **(2)** must be visible in order to unlock.
→ *Limit Positions, Service and Process Position, p. 19*
06. Move the extension **(1)** in the direction of the arrow until the socket **(4)** is accessible.



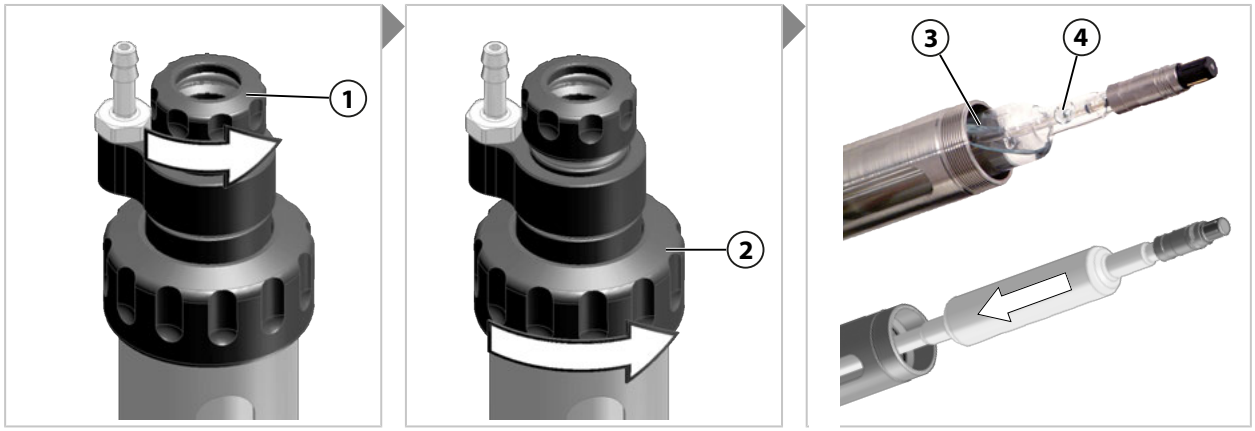
07. Disconnect the socket **(4)** of the sensor cable **(3)** from the sensor head **(5)**.
08. Loosen the sensor **(5)** using the spanning wrench **(4)** (A/F 19). Recommended tool: ZU0647 sensor spanning wrench → *Tools, p. 50*
09. Pull the sensor **(5)** out of SensoGate WA133.
10. If the sensor glass is broken, check the seal of the immersion tube for damage and replace if damaged. → *Immersion Tube: Disassembly, p. 39*

See also
→ *Tools, p. 50*

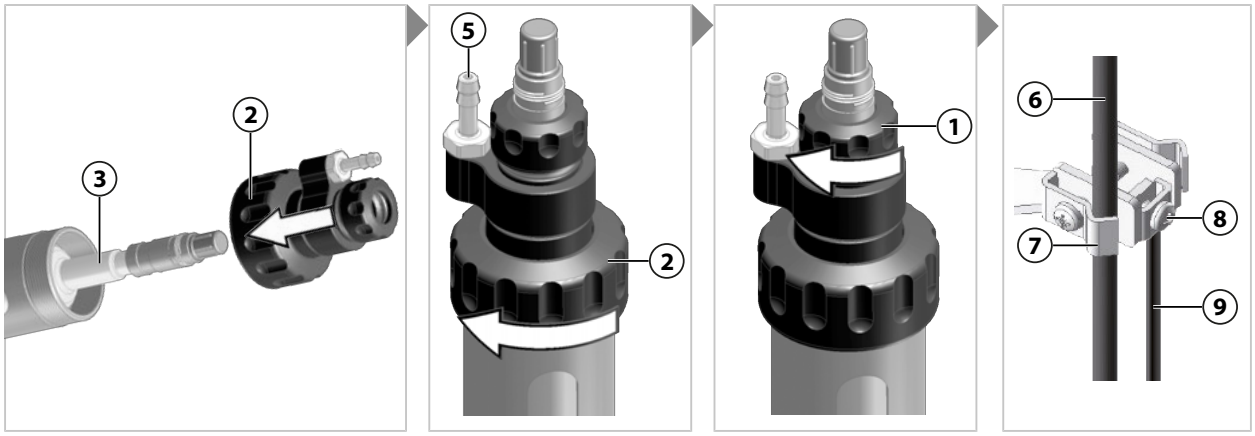
[1] Availability dependent on the ordered version → *Product Code, p. 12*

5.3.6 Liquid Electrolyte Sensor: Installation

Note: To ensure that the electrolyte flows from the reference electrode to the process medium, the air pressure in the pressure chamber must be 0.5 to 1 bar above that of the process medium.



01. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
04. Check that the sensor is permitted. → *Intended Use, p. 5*
    ✓ Length 250 or 450 mm
    ✓ Body diameter 11.5 ... 12.0 mm
    ✓ Pressure resistance permitted for process → *Specifications, p. 55*
05. Loosen the small coupling nut **(1)** by a few rotations, but do not remove it completely.
06. Completely unscrew the large coupling nut **(2)** and pull off the entire unit.
07. Check the sensor for damage. Replace damaged sensors.
08. Remove the clasp of the filling hole **(4)** of the sensor **(3)**.
    Note: In the case of inclined installation, turn the electrolyte filling hole towards the top to prevent electrolyte from flowing out during operation of the SensoGate WA133. Observe any deviating direction of installation specified by the sensor manufacturer.
09. Slide the sensor **(3)** into the SensoGate WA133.



10. Place the large coupling nut **(2)** on and tighten it by hand.
11. Tighten the small coupling nut **(1)** by hand.
12. Connect the socket of the sensor cable **(6)** to the sensor head.

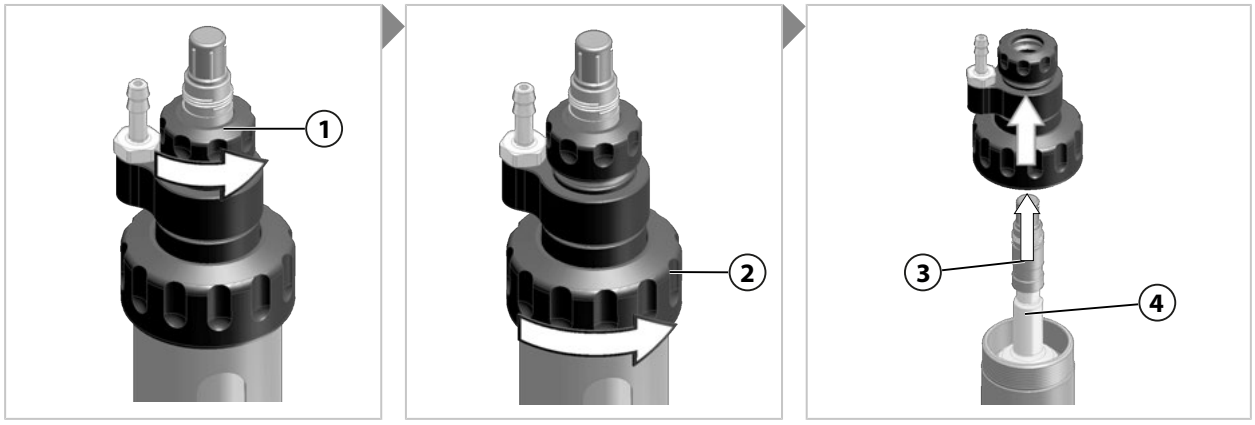
[1] Availability dependent on the ordered version → *Product Code, p. 12*

13. When installing for the first time: Route the sensor cable **(6)** in an arch and fasten it with the clip **(7)**. While doing so, ensure that the sensor cable has sufficient arch length to prevent the SensoGate WA133's lifting movement from being obstructed by the sensor cable.
14. During first-time installation: Connect the air pressure intake for the sensor pressure chamber to the hose insert **(5)**. → *Specifications, p. 55*
15. When installing for the first time: Connect the equipotential bonding line **(9)** to the terminal **(8)**.
16. Set the SensoLock[1)] to "unlock" by rotating the upper coupling nut.

[1)] Availability dependent on the ordered version → *Product Code, p. 12*

5.3.7 Liquid Electrolyte Sensor: Removal

Note: On versions with rinse connection, rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.



01. Move SensoGate WA133 into the service position (SERVICE limit position).
→ *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Check outlet and leakage bores for escaping process medium. If process medium escapes: Stop the process (depressurize if necessary) and perform troubleshooting. → *Troubleshooting, p. 43*
03. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
04. Disconnect the socket of the sensor cable from the sensor head.
05. Loosen the small coupling nut **(1)** by a few rotations, but do not remove it completely.
06. Completely unscrew the large coupling nut **(2)** and pull off the entire unit.
07. Pull the sensor **(3)** out of SensoGate WA133.
Note: Hold the sensor's filling hole **(4)** upward at an inclined angle during removal to prevent electrolyte from escaping. Follow the instructions in the sensor manufacturer's documentation. During transport and storage, close the sensor's filling hole with the cap.
08. If the sensor glass is broken, check the seal of the immersion tube for damage and replace if damaged. → *Immersion Tube: Disassembly, p. 39*

[1] Availability dependent on the ordered version → *Product Code, p. 12*

6 Maintenance

6.1 Inspection

6.1.1 Inspection and Maintenance Intervals

NOTICE! Different process conditions (e.g., pressure, temperature, chemically aggressive media) impact the inspection and maintenance intervals. Analyze the specific application and its process conditions. Determine qualified experiences from comparable applications and derive suitable intervals.

Interval[1)]	To Do
Initial inspection after a few days/weeks	Move SensoGate WA133 into the service position (SERVICE limit position). In case of leakage, process medium will escape from the outlet hose. → *Moving into the Service Position (SERVICE Limit Position), p. 25* Replace damaged process-wetted (subject to dynamic load) O-rings. → *Seal Kits, p. 46*
	Check leakage bores for process deposits. → *Safeguards, p. 5* Replace damaged process-wetted (subject to dynamic load) O-rings. → *Seal Kits, p. 46*
After 6 ... 12 months[2)]	Repeat the initial inspection measures.
After 10,000 ... 20,000 strokes	Replace damaged process-wetted (subject to dynamic load) O-rings. → *Seal Kits, p. 46*
After approx. 2 years	For chemically aggressive cleaners in particular, check the rinse-wetted seals and replace if damaged. → *Seal Kits, p. 46*
After approx. 5 years	Maintain drive unit, replace O-rings and grease again. → *Repair, p. 36*

6.1.2 Immersion Lock without Mounted Solid Electrolyte Sensor: Functional Test

To check the function of the immersion lock, the situation of a missing sensor is simulated.

Note: The functional test is possible only on a SensoGate WA133 with the corresponding safeguard.
→ *Safeguards, p. 5*

01. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Set the SensoLock[3)] to "unlock" by rotating the upper coupling nut.
03. Loosen the sensor with max. 1.5 turns.

⚠ WARNING! In the event of a malfunction, the pressurized process medium may leak from the SensoGate WA133 and contain hazardous substances. Only loosen the sensor by a maximum of 1.5 rotations to ensure pressure resistance in the event of a malfunction.

04. Move SensoGate WA133 into the process position (PROCESS limit position).
    → *Moving into the Process Position (PROCESS Limit Position), p. 25*
    ✓ SensoGate WA133 does not move to the process position (PROCESS limit position).
05. Screw in the sensor completely and tighten with max. 3 Nm.
06. Move SensoGate WA133 into the process position (PROCESS limit position).
    → *Moving into the Process Position (PROCESS Limit Position), p. 25*
07. Repeat the functional test every 12 months. As applicable, adjust the interval to match the specific application for which the SensoGate WA133 is used.

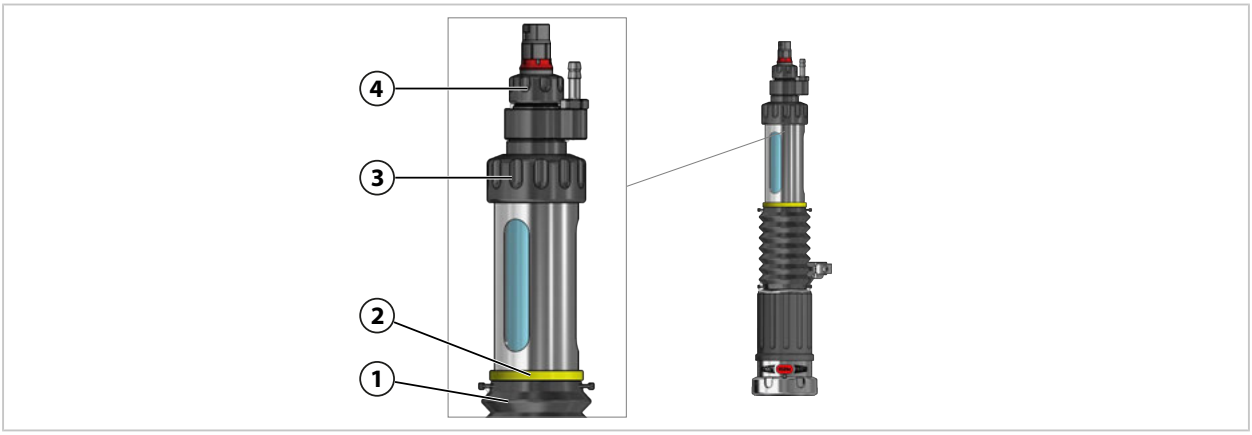
---

1) The intervals listed are approximate recommendations based on the experience of Knick. The actual intervals depend on the specific application.
2) Following successful first inspection and confirmation of the suitability of all materials used, the interval may be lengthened.
3) Availability dependent on the ordered version → *Product Code, p. 12*

6.1.3 Immersion Lock without Mounted Liquid Electrolyte Sensor: Functional Test

To check the function of the immersion lock, the situation of a missing sensor is simulated.

Note: The safeguard "Immersion Lock Without a Mounted Liquid-Electrolyte Sensor" can be seen at the yellow indicator ring **(2)** above the bellows **(1)**. → *Safeguards, p. 5*



01. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Set the SensoLock[1)] to "unlock" by rotating the upper coupling nut.
03. Loosen the small coupling nut **(4)** a bit but do not loosen completely.

⚠ WARNING! In the event of a malfunction, pressurized process medium may escape from the SensoGate WA133. Do not completely loosen the large coupling nut **(3)** to ensure that pressure resistance is still available in the event of a malfunction.

04. Loosen the large coupling nut **(3)** approx. 1.5 turns but do not loosen completely.
05. Move SensoGate WA133 into the process position (PROCESS limit position).
    → *Moving into the Process Position (PROCESS Limit Position), p. 25*
    ✓ SensoGate WA133 does not move to the process position (PROCESS limit position).
06. Tighten the large coupling nut **(3)** by hand.
07. Tighten the small coupling nut **(4)** by hand.
08. Repeat the functional test every 12 months. As applicable, adjust the interval to match the specific application for which the SensoGate WA133 is used.

1) Availability dependent on the ordered version → *Product Code, p. 12*

6.2 Preventive Maintenance

6.2.1 Approved Lubricants

Application	Pharma and Food		Chemicals and Wastewater
Lubricant	Beruglide L[1] (silicone-free)	Paraliq GTE 703[2] (containing silicone)	Syntheso Glep 1 (silicone-free)
Elastomer seal materials			
FKM	-	-	+
FFKM	-	-	+
EPDM	-	-	+
FKM – FDA	+	+	-
FFKM – FDA	+	+	-
EPDM – FDA	+	+	-

Note: Lubricant Paraliq GTE 703 contains silicone and has good lubricating properties even at elevated temperatures and with numerous travel movements. Paraliq GTE 703 is used as a special version at the customer's express request.

6.3 Repair

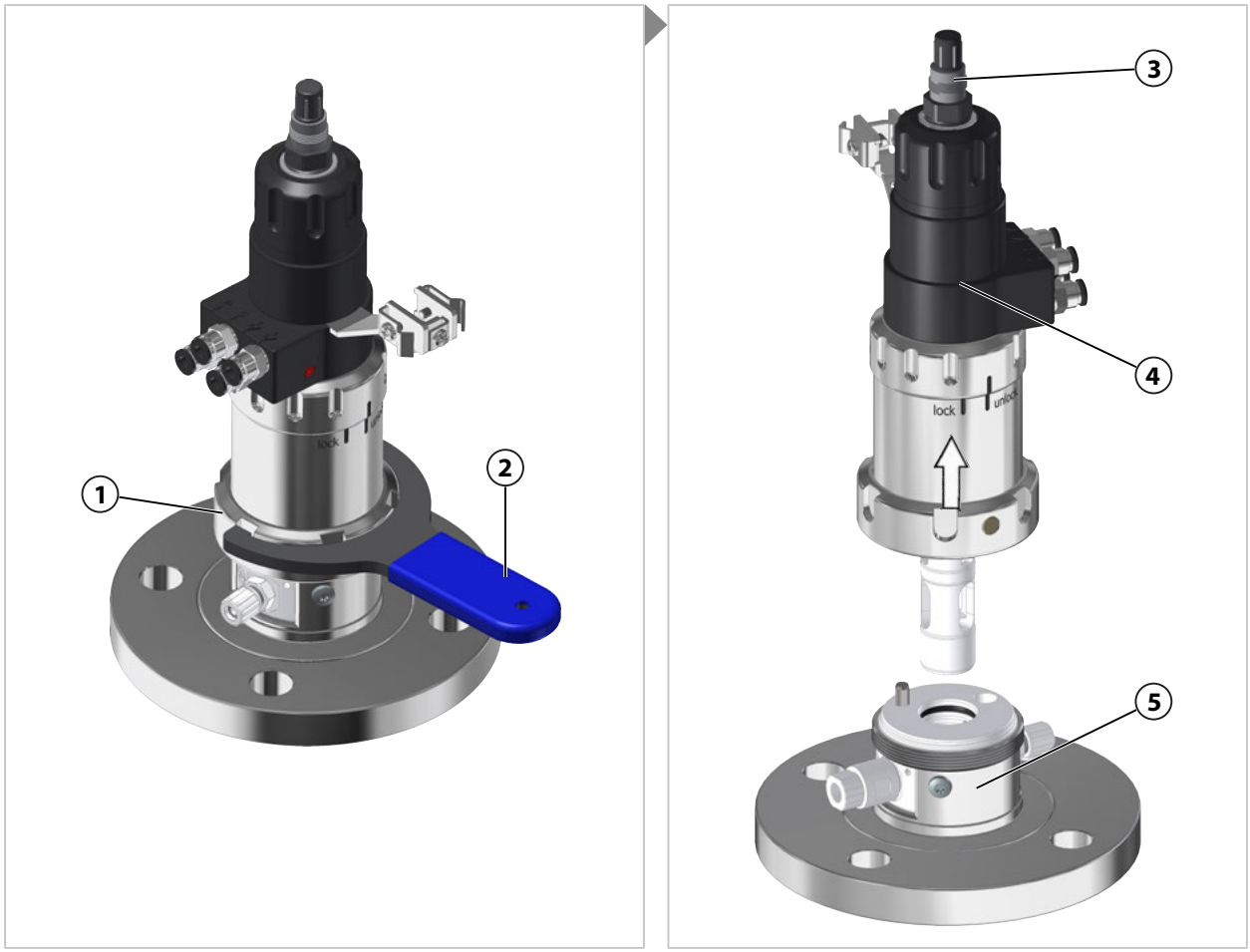
⚠ **WARNING! Process medium, potentially containing hazardous substances, may escape from the SensoGate WA133.** Follow the safety instructions. → *Safety, p. 5*

⚠ **CAUTION! Risk of cutting injuries from broken sensor glass.** Handle the sensor with care. Follow the safety instructions in the sensor manufacturer's documentation.

1) FDA-compliant, registered in accordance with NSF-H1.

2) FDA-compliant, registered in accordance with USDA-H1.

6.3.1 Drive Unit: Removal

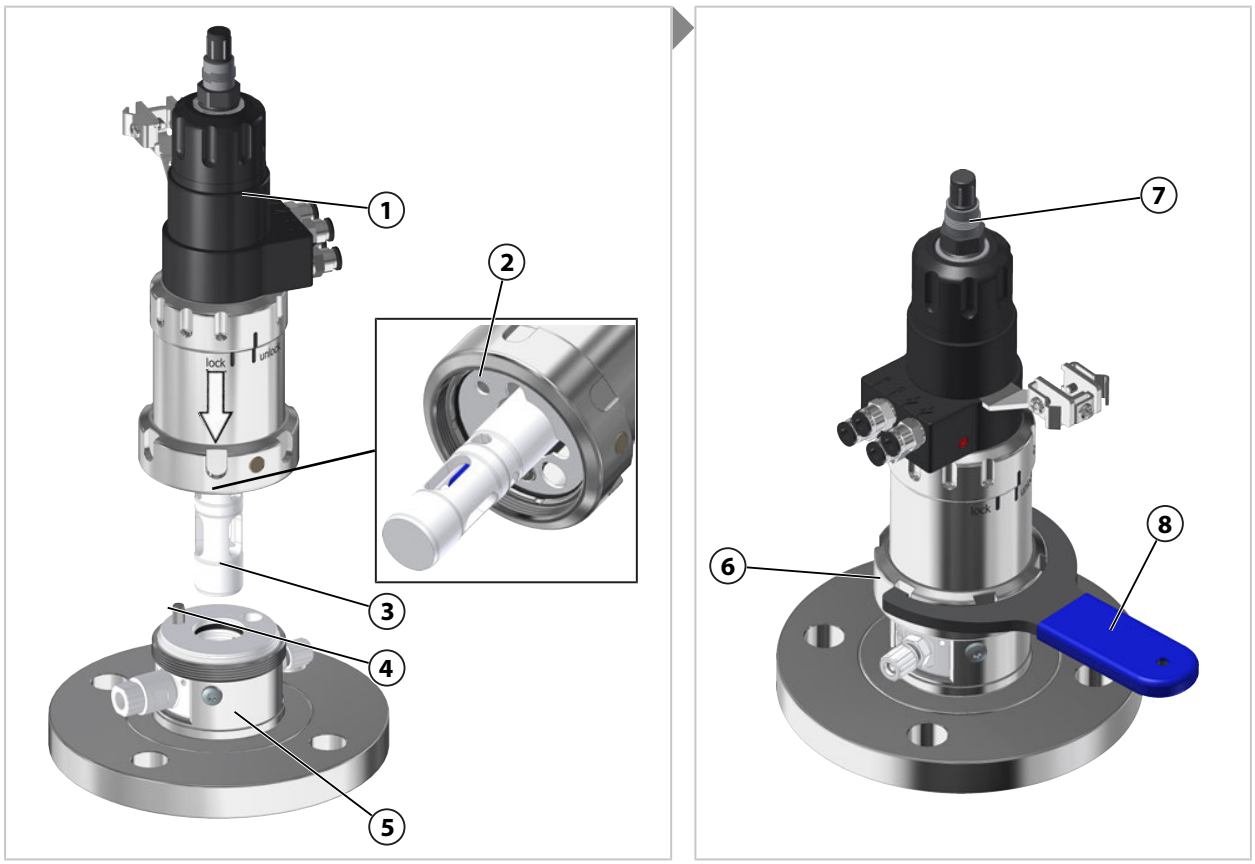


01. Safely disconnect SensoGate WA133 from the process. → *Retractable Fitting: Removal, p. 45*
02. Disconnect the inlet hose and outlet hose.
03. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
04. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
05. Disconnect the sensor cable from the sensor head and, if necessary, remove the sensor **(3)**.
    → *Installing and Removing Sensors, p. 26*
06. Loosen the coupling nut **(2)** by turning the spanning wrench **(1)** counterclockwise.
    Note: Do not tilt the coupling nut. Use a suitable spanning wrench (e.g., the one contained in ZU0680 service set or ZU0740 service set). → *Tools, p. 50*
07. Pull the drive unit **(4)** out of the process unit **(5)**.

[1] Availability dependent on the ordered version → *Product Code, p. 12*

6.3.2 Drive Unit: Installation

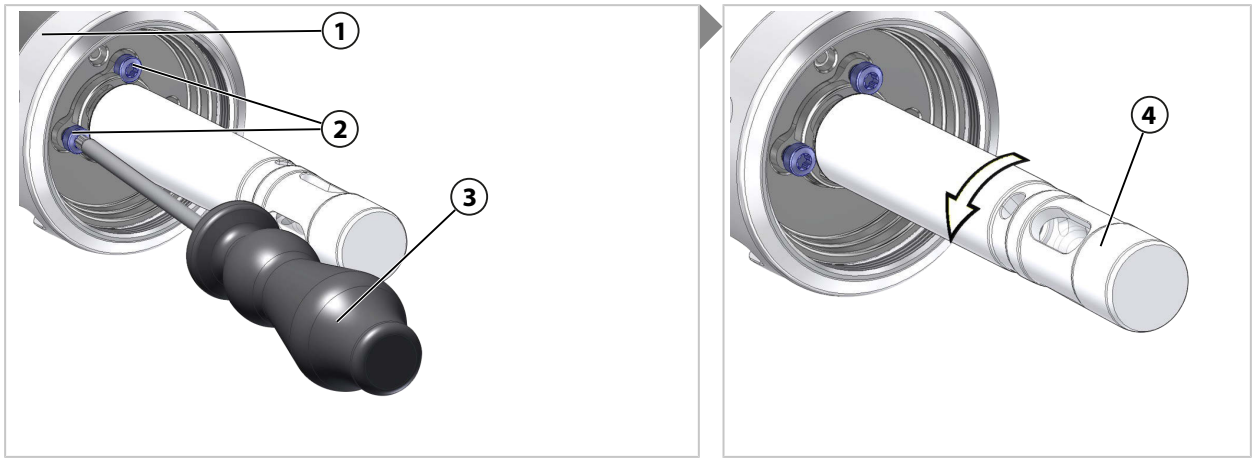
Note: The radial installation position of the drive unit is determined by a coding pin in the calibration chamber and a hole in the drive unit. The coupling nut can be tightened only if the drive unit is correctly inserted into the process unit.



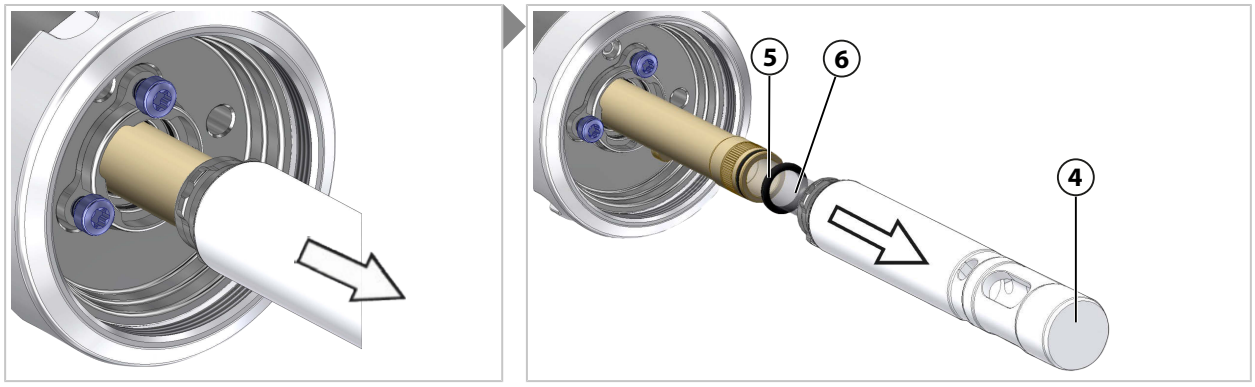
01. Move the drive unit into the service position (SERVICE limit position).
→ *Moving into the Service Position (SERVICE Limit Position), p. 25*
02. Set the SensoLock[1] to "unlock" by rotating the upper coupling nut.
03. Slide the drive unit **(1)** with immersion tube **(3)** into the process unit **(5)**. While doing so, position the coding pin **(4)** in the hole **(2)**.
04. Put on the coupling nut **(6)** and use a spanning wrench **(8)** to tighten it clockwise by hand or with a force of approx. 10 Nm.
Note: Do not tilt the coupling nut. Use a suitable spanning wrench (e.g., the one contained in ZU0680 service set or ZU0740 service set). → *Tools, p. 50*
05. Install the inlet hose and outlet hose.
→ *Outlet Hose: Installation, p. 22* → *Inlet Hose: Installation, p. 23*
06. Optional: Install the limit switch[2].
07. If the sensor has been dismounted: Install the sensor **(7)** and connect the sensor cable to the sensor head. → *Installing and Removing Sensors, p. 26*

1) Availability dependent on the ordered version → *Product Code, p. 12*
2) Dependent on the ordered version → *Product Code, p. 12*

6.3.3 Immersion Tube: Disassembly



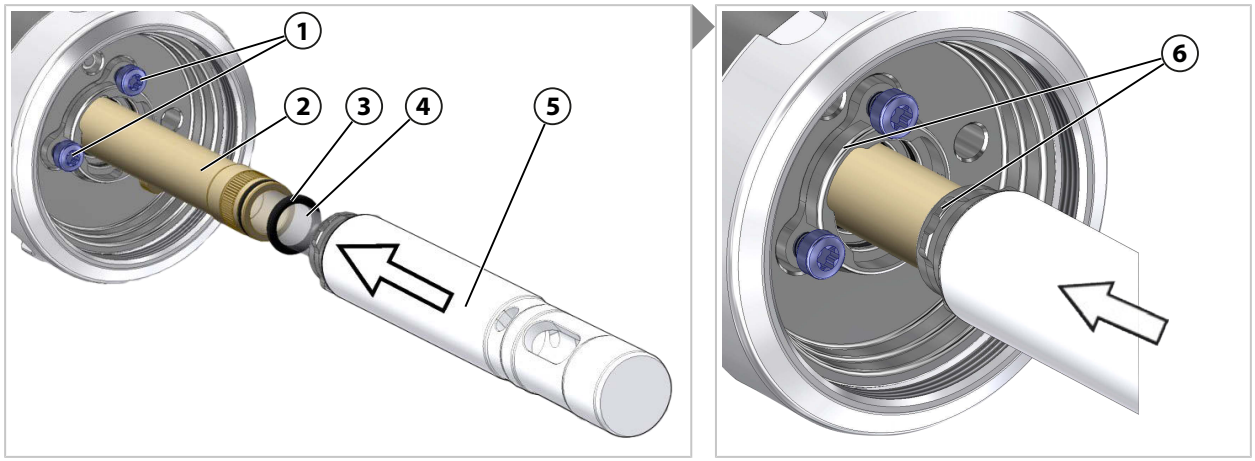
01. Disconnect the drive unit **(1)** from the process unit. → *Drive Unit: Removal, p. 37*
02. Set the SensoLock[1)] to "unlock" by rotating the upper coupling nut.
03. Pull the immersion tube **(4)** until it reaches the process position (PROCESS limit position).
04. Use the type TX25 screw driver **(3)** to loosen the screws **(2)** by approximately 4 rotations (do not completely unscrew them).
05. Rotate the immersion tube **(4)** counterclockwise by about 60° until the bayonet coupling of the immersion tube **(4)** is opened.



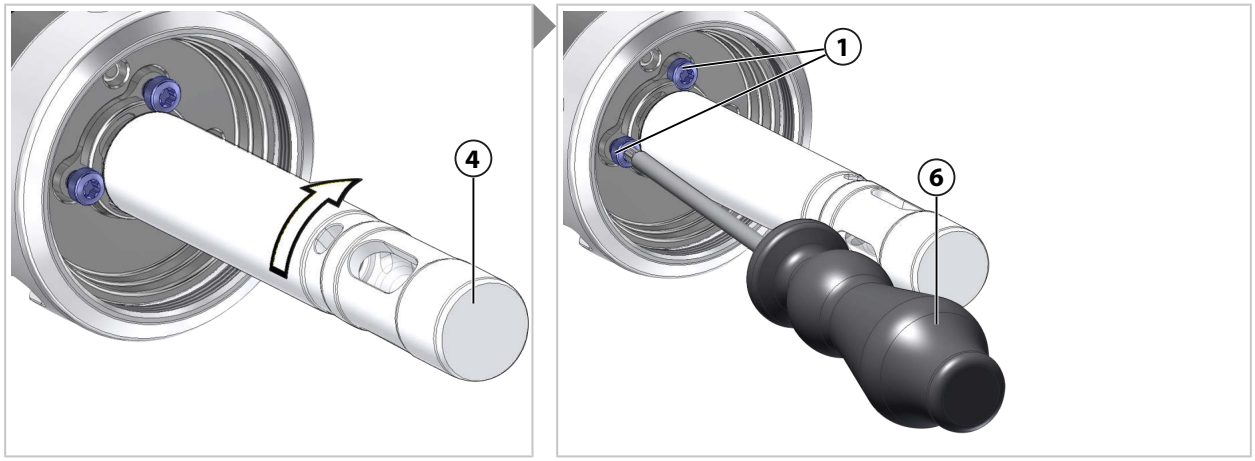
06. Pull the immersion tube **(4)** off the sensor **(6)**.
    ✓ The O-ring **(5)** will become visible or the O-ring **(5)** may be in the dismounted immersion tube **(4)**.
07. Check the O-ring **(5)** for damage; replace the O-ring **(5)** if damaged. → *Seal Kits, p. 46*

1) Availability dependent on the ordered version → *Product Code, p. 12*

6.3.4 Immersion Tube: Assembly

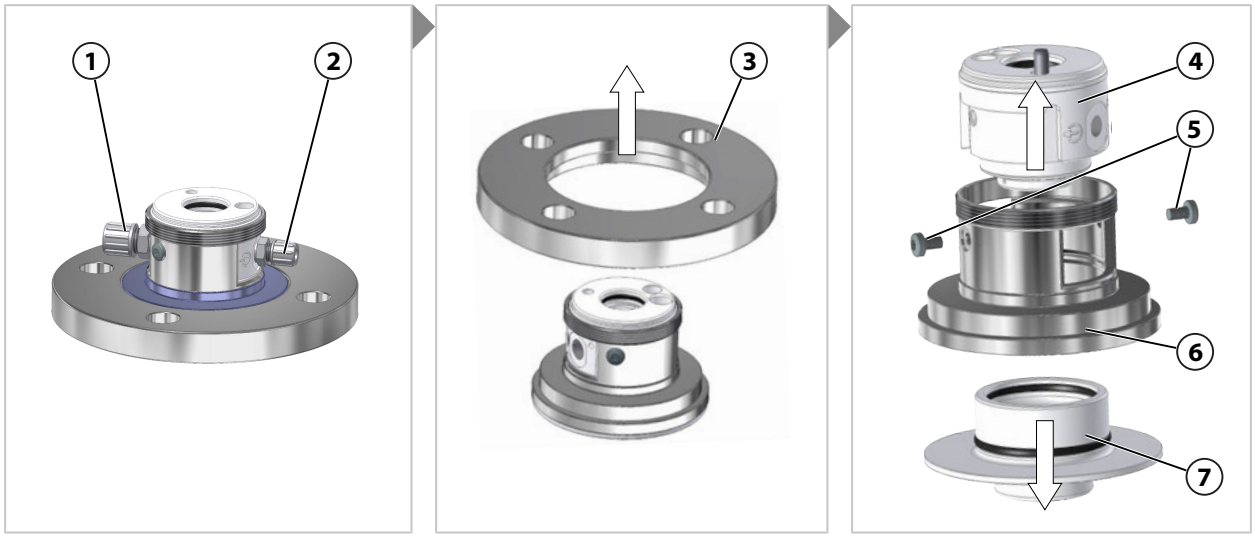


01. Install the sensor. → *Installing and Removing Sensors, p. 26*
02. If the drive unit is not in the process position (PROCESS limit position): Slide the immersion tube **(5)** onto the sensor protection tube. Firmly press into the bayonet coupling **(6)** and turn approx. 60° clockwise until it firmly stops.
    Pull immersion tube **(5)** until reaching the process position (PROCESS limit position).
03. Check the O-ring **(3)** for damage; replace the O-ring **(3)** if damaged. → *Seal Kits, p. 46*
04. Completely slide the O-ring **(3)** onto the sensor **(4)**.
05. If the screws **(1)** have not already been loosened during the disassembly, loosen them by approx. 4 rotations using a type TX25 screwdriver **(7)** (do not completely unscrew them).
06. Carefully slide the immersion tube **(5)** onto the sensor **(4)** and insert it into the bayonet coupling **(6)**.
    Note: An O-ring may have accidentally been left in the immersion tube during disassembly. Remove this O-ring from the immersion tube before assembly.



07. Firmly press the immersion tube **(5)** into the bayonet coupling **(6)** while rotating it approx. 60° clockwise until it firmly stops.
08. Tighten the screws **(1)** using a type TX25 screwdriver **(7)**.
    Note: The bayonet coupling is locked by the form-fit screw heads. The immersion tube, however, remains movable to compensate for tolerances.

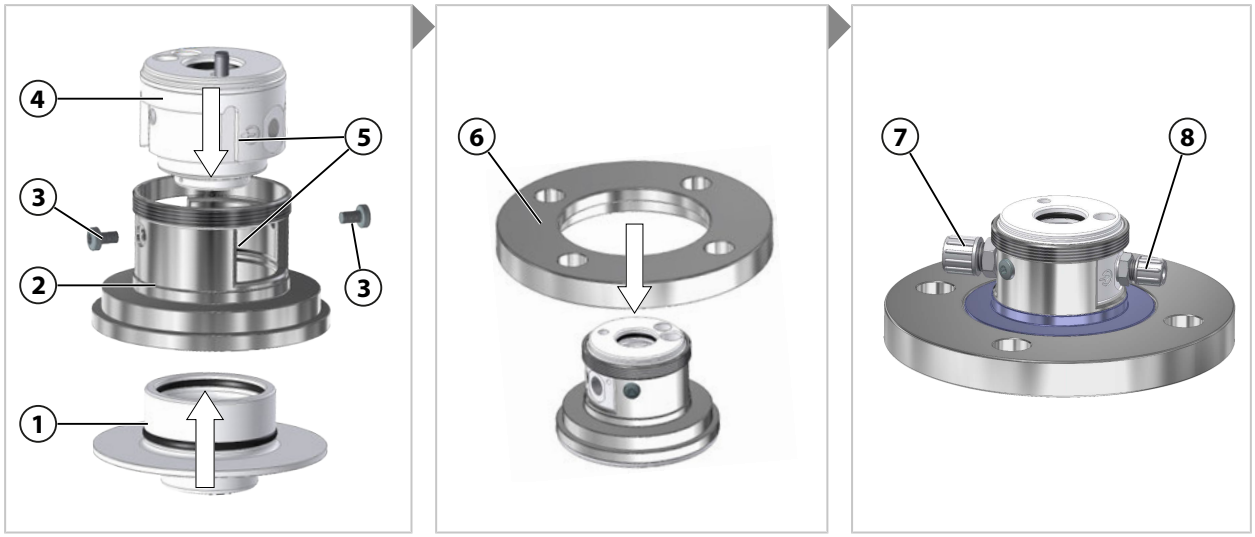
6.3.5 Calibration Chamber: Disassembly



01. Remove the process unit from the drive unit. → *Drive Unit: Removal, p. 37*
02. Remove the outlet screw connection **(1)** and inlet screw connection **(2)**. Remove the loose flange **(3)**.
03. Unscrew the screws **(5)** using a type TX25 screwdriver. Retain the screws **(5)** for later assembly.
04. Pull the calibration chamber **(4)** vertically out of the process connection **(6)**.
05. Press the flange bushing **(7)** downward to push it out of the process connection **(6)**.

6.3.6 Calibration Chamber: Assembly

Note: To ensure correct assembly of the O-rings and the scraper ring, use the accessory tools ZU0746 and ZU0747. The procedure for handling the accessory tools is described in the relevant documentation. → *Tools, p. 50*



01. Check O-rings for damage. Replace damaged O-rings. → *Seal Kits, p. 46*
02. Insert the calibration chamber **(4)** in alignment with the guiding edges **(5)** in the process connection **(2)**.
03. Secure the calibration chamber **(4)** with screws **(3)**.
04. Insert the flange bushing **(1)** into the process connection **(2)** and press in until the seal noticeably snaps in.
05. Mount the loose flange **(6)**.
06. Tightly screw in the outlet screw connection **(7)** and inlet screw connection **(8)**.

6.3.7 Knick Repair Service

The Knick Repair Service offers professional corrective maintenance for the product to the original quality. Upon request, a replacement unit can be obtained for the period of the repair.

Further information can be found at www.knick-international.com.

7 Troubleshooting

Fault status	Possible cause	Remedy
Process medium escaping from leakage bore.	Leakage due to damaged O-rings.	Replace damaged O-rings.[1] → *Seal Kits, p. 46*
Sensor glass shattered.	Mechanical impact on the sensor glass (e.g., by process medium).	Replace faulty sensor. → *Installing and Removing Sensors, p. 26*
		Remove any glass splinters from the SensoGate WA133. Check immersion tube seal and replace if necessary. → *Seal Kits, p. 46*
SensoGate WA133 is not moving.	Sensor installed incorrectly.	Install the sensor correctly. → *Installing and Removing Sensors, p. 26*
	Compression ring or O-ring of the sensor damaged or missing.	Check the compression ring and O-ring of the sensor for correct position and damage; replace if necessary.
	Foreign body in the sensor holder.	Remove any foreign bodies (e.g., old compression ring or old O-ring).
	Seals or O-rings of the drive unit damaged.	Replace the seals or O-rings of the drive unit and the calibration chamber.
	Drive unit defective.	Send SensoGate WA133 to the responsible local representative for repair. → *knick-international.com*
	Compressed air supply interrupted.	Check the compressed air system for proper functioning.
		Check the industrial transmitter for error messages.
No or wrong measured value displayed.	Faulty sensor.	Replace the sensor. → *Installing and Removing Sensors, p. 26*
	Defective plug connection or damaged sensor cable.	Fasten plug connection or replace damaged sensor cable. → *Installing and Removing Sensors, p. 26*
Safeguard "Immersion Lock Without a Mounted Sensor" not working.	Corrosion or clogging by penetrated process medium.[2]	Send the SensoGate WA133 to your local contact for repair. → *knick.de*

See also

→ *Repair, p. 36*
→ *Knick Repair Service, p. 42*
→ *Return, p. 45*

[1] After replacing the damaged O-rings, clean the leakage bores so that any further escape of process medium can be detected.

[2] To protect against the penetration of media from outside into the sensor holder, we recommend using the ZU0759 protective cap. We recommend rinsing the sensor before removing it in order to prevent entrainment of the process medium in the area of the sensor holders.

7.1 Malfunction State: Retractable Fitting Does Not Fully Move to the SERVICE or PROCESS Limit Position

⚠ **CAUTION! Risk of injury to hands and fingers from the drive unit's rotary movement.** Do not manually turn the drive any further or reach inside the SensoGate WA133.

01. Increase the drive control pressure up to the maximum permissible value to move fully to the service position (SERVICE limit position) or the process position (PROCESS limit position).
    → *Specifications, p. 55*
    ✓ Sensor head or service cap is visible in service position (SERVICE limit position). In process position (PROCESS limit position), the sensor head or service cap is not visible.
02. Troubleshooting successful: Check the cause of the malfunction. If necessary, remove the drive unit. Perform maintenance on the drive unit or check the functionality of the process unit using a substitute drive.
03. Troubleshooting unsuccessful: Stop process, depressurize or discharge process medium if necessary. Remove SensoGate WA133 and send to the local representative responsible for repairs.
    → *knick-international.com*

See also

→ *Drive Unit: Removal, p. 37*
→ *Retractable Fitting: Removal, p. 45*

8 Decommissioning

8.1 Retractable Fitting: Removal

⚠ WARNING! Risk of explosions from mechanically generated sparks if used in potentially explosive atmospheres. Implement measures for avoiding mechanically generated sparks. Follow the safety instructions. → *Operation in Explosive Atmospheres, p. 8*

⚠ WARNING! Process or rinsing medium, potentially containing hazardous substances, may escape from the SensoGate WA133 or the process port. Follow the safety instructions. → *Safety, p. 5*

01. Stop the process; depressurize or drain off the process medium if necessary.
02. Move SensoGate WA133 into the service position (SERVICE limit position).
    → *Moving into the Service Position (SERVICE Limit Position), p. 25*
03. Set the SensoLock [1] to "lock" by rotating the upper coupling nut.
04. Switch off the compressed air supply and vent the compressed air system.
05. Remove the compressed air for the process and service positions.
06. Remove the inlet hose[2].
07. Remove the sensor. → *Installing and Removing Sensors, p. 26*
08. Remove the outlet hose.
09. Optional: Disconnect the equipotential bonding cable from the grounding connection and remove it.
10. Optional: Remove installed safety accessories (e.g. ZU1138 retainer clamp).
11. Release the process connection.
12. Remove SensoGate WA133 from the process port of the customer.
13. Seal the process port suitably.

8.2 Return

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

8.3 Disposal

To dispose of the product properly, follow the local regulations and laws.

The SensoGate WA133 can contain various materials, depending on the version concerned.
→ *Product Code, p. 12*

[1] Availability dependent on the ordered version → *Product Code, p. 12*

[2] Dependent on the ordered version → *Product Code, p. 12*

9 Spare Parts, Accessories, and Tools

9.1 Seal Kits

Different seal kits with different materials are needed for repair, depending on the version ordered. The ordered version of the SensoGate WA133 is coded in the product code. → *Product Code, p. 12*

The smaller seal kits (designated Set X/1) only contain O-rings with direct contact to the process medium.

The expanded seal kits (designated Set X/2) contain additional O-rings with contact to the rinsing medium.

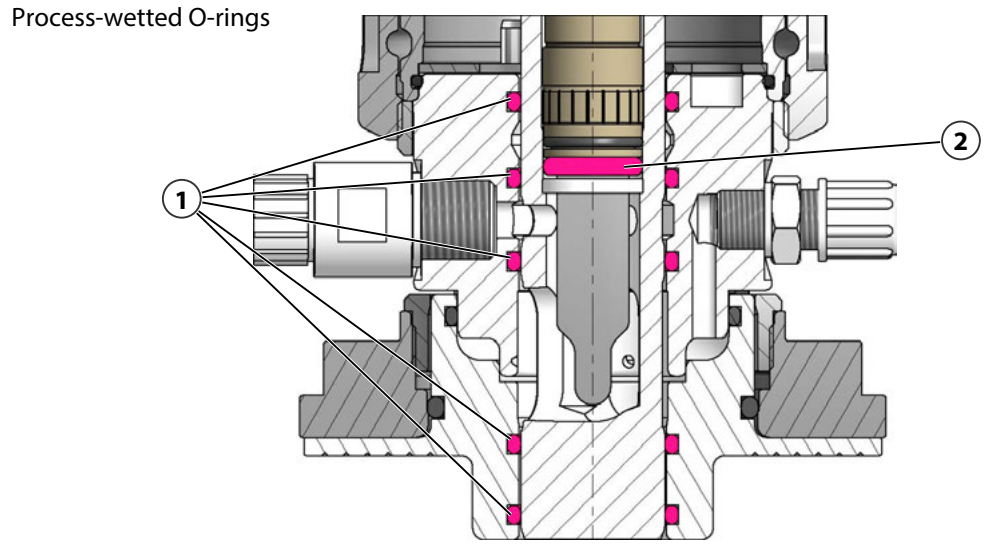
Each seal kit contains documentation. The documentation presents information on the package contents, installation location of the O-rings included, and the lubrication points. The replaced O-rings must be lubricated with the accompanying grease.

Accessory tools ZU0746 and ZU0747 are recommended for mounting the O-rings and the scraper ring properly. The associated product documentation describes how to handle the accessory tools.
→ *Tools, p. 50*

Seal Kits			Order No.
Flange process connection	Set A/1	Process-wetted seal material: FKM	ZU1022/1
	Set A/2	Process-wetted seal material: FKM, Wetted by rinsing medium: FKM	ZU1022/2
	Set B/1	Process-wetted seal material: EPDM	ZU1023/1
	Set B/2	Process-wetted seal material: EPDM, Wetted by rinsing medium: EPDM	ZU1023/2
	Set E/1	Process-wetted seal material: EPDM FDA	ZU1024/1
	Set E/2	Process-wetted seal material: EPDM FDA, Wetted by rinsing medium: EPDM FDA	ZU1024/2
	Set F/1	Process-wetted seal material: FKM FDA	ZU1025/1
	Set F/2	Process-wetted seal material: FKM FDA Wetted by rinsing medium: FKM FDA	ZU1025/2
	Set H/1	Process-wetted seal material: FFKM FDA	ZU1026/1
	Set H/2	Process-wetted seal material: FFKM FDA Wetted by rinsing medium: FFKM FDA	ZU1026/2
	Set K/1	Process-wetted seal material: FFKM	ZU1027/1
	Set K/2	Process-wetted seal material: FFKM, Wetted by rinsing medium: FFKM	ZU1027/2

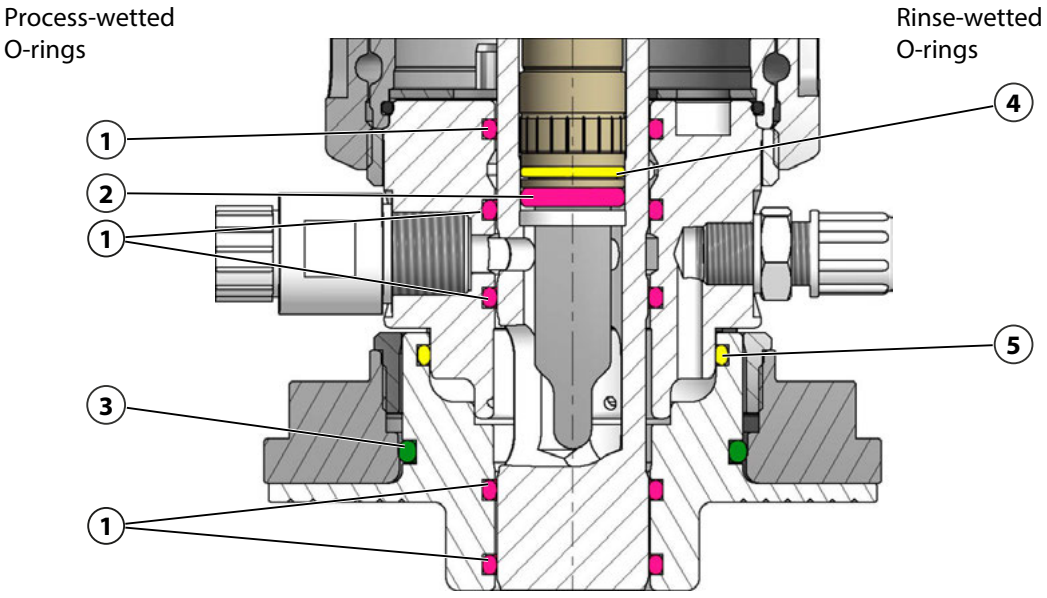
Note: Further seal kits are available on request.

Seal Kits for Flange Process Connection, Process-Wetted



1 O-ring 24 × 2.5 mm	2 O-ring 11.9 × 2.6 mm

Seal Kits for Flange Process Connection, Process- and Rinse-Wetted



1 O-ring 24 × 2.5 mm	4 O-ring 13 × 1.5 mm
2 O-ring 11.9 × 2.6 mm	5 O-ring 45 × 2.5 mm
3 O-ring 48 × 3 mm	

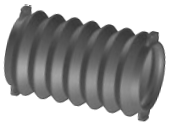
9.2 Spare Parts

ZU1032 Immersion Tube, Short

Material: PTFE

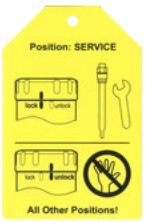
ZU1033 Immersion Tube, Long

Material: PTFE



ZU0739 Bellows

The bellows (only used on versions with liquid-electrolyte sensors) protect the fitting beneath the pressure chamber against external contamination and wear.

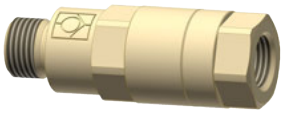


Safety Label

The safety label provides information on the safeguard "Immersion Lock Without a Mounted Solid-Electrolyte Sensor". → *Safeguards, p. 5*

Damaged or lost safety labels will be replaced on request.

9.3 Accessories



RV01 Check Valve

The RV01 check valve prevents the return flow of the process medium, calibration medium, cleaning medium, or rinsing medium into the inlet. The check valve is selected via a product code.

Check Valve		**RV01**	**-**	**_**	**_**	**_**	**_**
Material of housing, valve body	Stainless steel 1.4404			**H**			
	PEEK			**E**			
Material of seals	FKM				**A**		
	EPDM				**B**		
	FFKM				**C**		
	FKM-FDA				**F**		
	EPDM-FDA				**E**		
	FFKM-FDA				**H**		
Inlet connection, female thread	G¼"					**4**	
	G⅛"					**8**	
Outlet connection, male thread	G¼"						**4**
	G⅛"						**8**

ZU0887 Inlet Hose

The inlet hose is used to feed calibration, cleaning, or rinsing media into the calibration chamber of the retractable fitting. → *Inlet Hose: Installation, p. 23*

Thread: G ⅛"
Length: 3 m
Nominal size: DN 8
Hose material: EPDM
Hose insert material: stainless steel
O-ring 8 × 1.5 mm material: EPDM
O-ring 4.5 × 1.5 mm material: EPDM

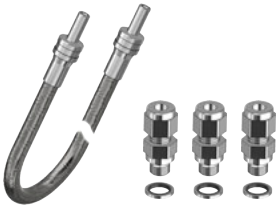
ZU1195 Sealing Plug G⅛″

The ZU1195 is used to close the inlet to the SensoGate WA133. The following materials are available to choose from:

		ZU1195/ _	_
Material	1.4404	**H**	
	Hastelloy 2.4602	**B**	
	PEEK	**C**	
	PVDF	**D**	
	PTFE	**R**	
	Titanium	**T**	
O-ring material	FKM-FDA		**F**
	EPDM-FDA-USP VI		**U**
	FFKM-FDA-USP VI		**W**

ZU0670/1 Air Supply for Pressurized Sensors 0.5 ... 4 bar
ZU0670/2 Air Supply for Pressurized Sensors 1 ... 7 bar
ZU0713 Hose, 20 m (Extension for ZU0670)

This assembly group maintains the defined gauge pressure in the pressure chamber in versions of the SensoGate WA133 for liquid-electrolyte sensors.



ZU0953 Kit for Connecting Compressed Air Supply to the Sensor Pressure Chamber

The connection kit enables installation of accessory ZU0670 "Air supply for pressurized sensors" to customers' permanently installed ¼" pipes.

ZU0953 is an elastic connection between the permanent piping (solid ¼" pipes) and the moving parts of the SensoGate WA133.

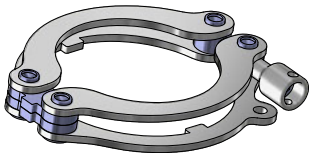
ZU0859 Limit Switch, Electrical

The ZU0859 limit switch converts the pneumatic limit signals from the SensoGate WA133 into electrical output signals. The electrical connections are routed through a cable.

ZU0759 and ZU0759/1 Protective Cover

The protective cover is used to protect against the weather and the ingress of liquids or particulate matter from outside into the area with the sensor plug-in connections.

ZU0759: suitable for versions with solid electrolyte sensors
ZU0759/1: suitable for versions with liquid electrolyte sensors

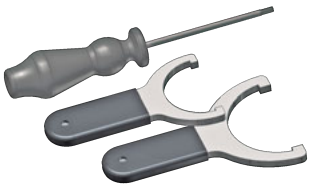


ZU1138 Retainer Clamp for SensoGate Retractable Fitting

The ZU1138 retainer clamp prevents the screw joint between the retractable fitting's drive unit and the process connection from accidentally coming loose.

The retainer clamp wires connect the retractable fitting's drive unit to the coupling nut. The locking lugs on the retainer clamp engage in the grooves of the coupling nut and secure the screw joint.

9.4 Tools



ZU0680 SensoGate Service Set, Basic Equipment

This tool set is suitable for minor maintenance work. It allows easy separation of the drive unit from the process unit, mounting of an Ingold socket, and replacement of the immersion tube, including O-ring maintenance.

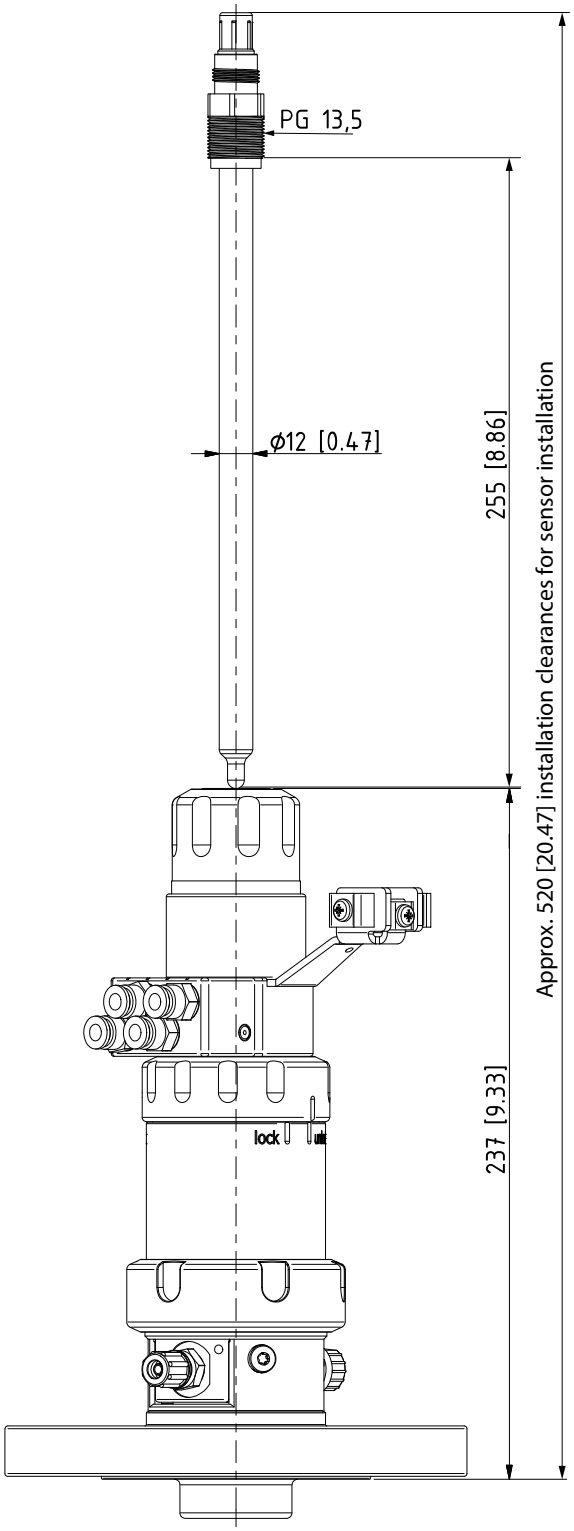
ZU0647 Sensor Spanning Wrench

The ZU0647 sensor spanning wrench is used to properly tighten sensors. It prevents damage to the PG 13.5 plastic thread of the sensor head caused by applying an excessive tightening torque (e.g., when using an open-end wrench).

10 Dimension Drawings

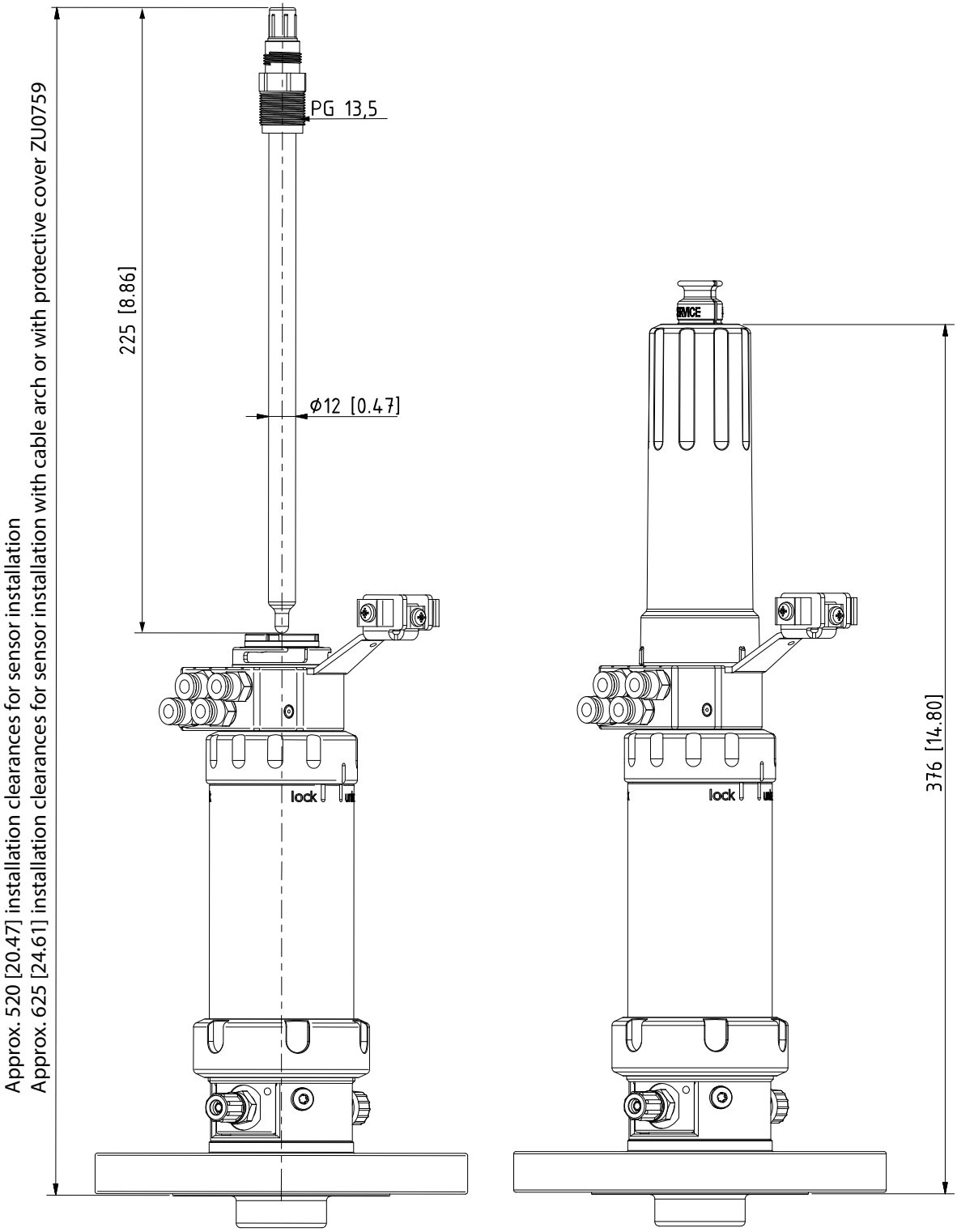
Retractable Fitting for Solid-Electrolyte Sensor, Short Immersion Depth

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



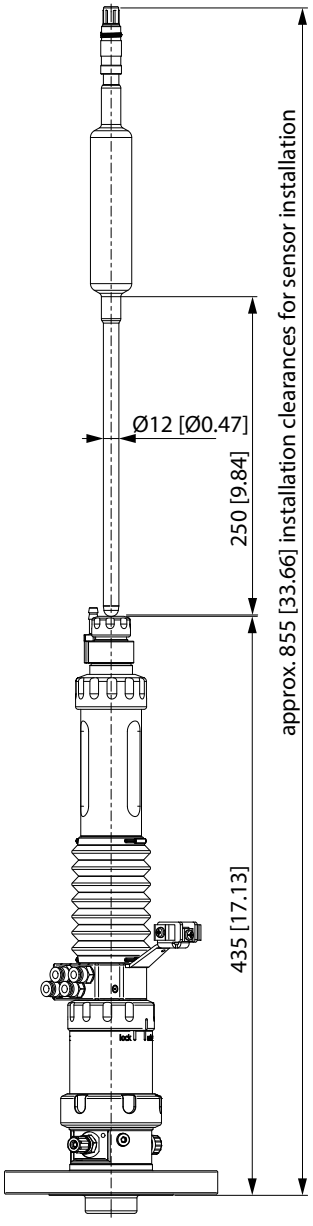
Retractable Fitting for Solid-Electrolyte Sensor, Long Immersion Depth

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

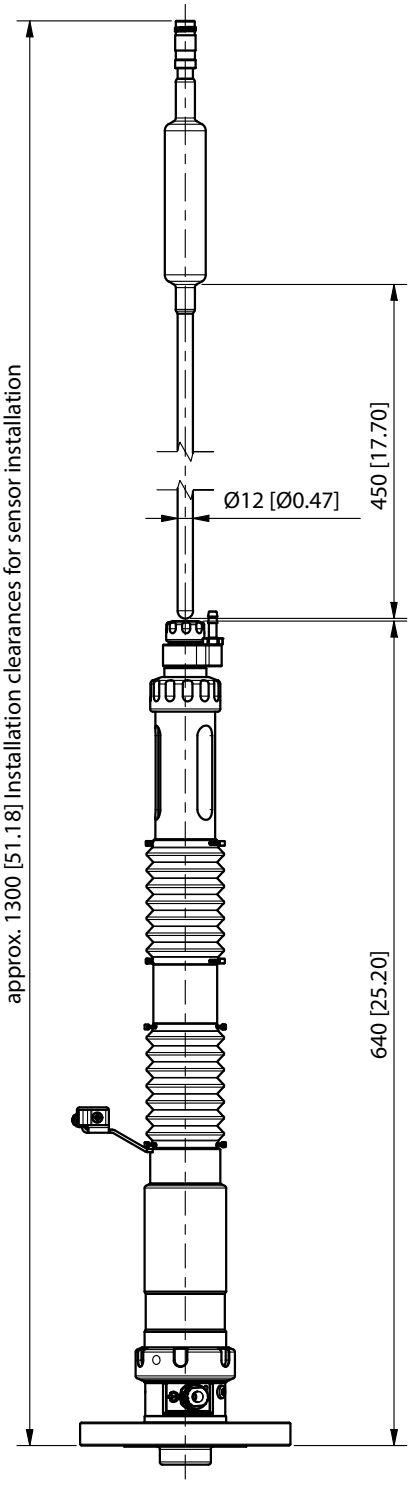


Retractable Fitting for Liquid-Electrolyte Sensor, Short and Long Immersion Depths

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

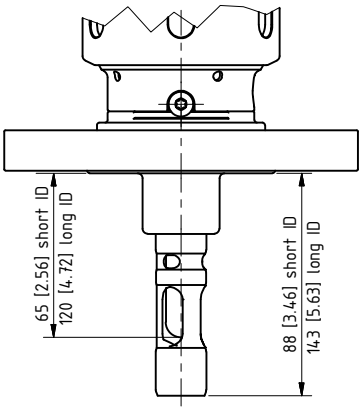


Short immersion depth



Long immersion depth

Process Connections



Loose flange, 1.4571, PN 10/16, DN 40 ... DN 100

Loose flange, ANSI 316, 150 lbs, 2" ... 3.5"

Short and long immersion depth (ID = immersion depth)

11 Specifications

Permitted Process Pressure and Temperature	
0 ... 40 °C (32 ... 104 °F)	6 bar (90 psi)
40 ... 100 °C (104 ... 212 °F)	6 bar (90 psi) decreasing linearly down to 3 bar (43 psi)
135 °C (275 °F)	3 bar (43 psi), max. 1 hour
Permitted pressure for fitting controller	4 ... 7 bar (58…101 psi)
Permitted Rinsing Pressure and Temperature	
5 ... 90 °C (41 ... 194 °F)	6 bar (90 psi)
Ambient temperature	–10 ... 70 °C (14 ... 158 °F)
Degree of protection	IP66
Enclosure material	Stainless steel/PP or PEEK
Compressed Air Quality	
Standard	In accordance with ISO 8573-1:2001
Quality class	3.3.3 or 3.4.3
Solid contaminants	3 (max. 5 µm, max. 5 mg/m^3)
Water content for temperatures > 15 °C (59 °F)	Class 4, pressure dew point 3 °C (37.4 °F) or lower
Water content for temperatures 5 ... 15 °C (41 ... 59 °F)	Class 3, pressure dew point –20 °C (–4 °F) or lower
Oil content	Class 3 (max. 1 mg/m^3)
Sensors	→ *Product Code, p. 12*
Process connection	→ *Product Code, p. 12*
Media Connections	
Inlet	Female thread G⅛" with mounted hose screw connection PFA for hose with outer diameter 6 mm, inner diameter 4 mm
Outlet	Female thread G¼" with mounted hose screw connection PFA for hose with outer diameter 8 mm, inner diameter 6 mm
For pressurized sensors	Hose connection DN 6, Pressure in calibration chamber 0.5 ... 1 bar (7.25 ... 14.5 psi) via process pressure, max. 7 bar (101.5 psi)
For compressed air	Pneumatic tube push-in fitting outer diameter 6 mm (retractable fitting control air)
Immersion depths/installation dimensions	→ *Dimension Drawings, p. 51*
Wetted materials	→ *Product Code, p. 12*
Weight	Depends on material and version

Abbreviations

A/F	Width across flats
ATEX	Atmosphères Explosibles (explosive atmospheres)
CE	Conformité Européenne (European conformity)
DIN	Deutsches Institut für Normung (German Institute for Standardization)
DN	Diamètre Nominal (inside diameter)
EPDM	Ethylene propylene diene monomer rubber
EU	European Union
FDA	U.S. Food and Drug Administration
FFKM	Perfluoro rubber
FKM	Fluoro rubber
ID	Immersion depth
IEC	International Electrotechnical Commission
IP	International Protection/Ingress Protection
ISO	International Organization for Standardization
KEMA	Keuring van Elektrotechnische Materialen te Arnhem (certification body for electrotechnical equipment)
PEEK	Polyether ether ketone
PP	Polypropylene
PVDF	Polyvinylidene fluoride
TX	Torx screw head profile

Glossary

CE mark

Manufacturer's declaration in accordance with EU Regulation 765/2008 that the product meets the applicable requirements set out in the European Union harmonization legislation relating to its attachment.

Corrective Maintenance

Measures taken to return an item under review to an operational condition, with the exception of improvements.

Hazard

A hazard is defined as a potential source of damage. The term "hazard" can be specified to indicate the origin or nature of the expected damage. (Source: EN ISO 12100)

Highly Efficient Charge Generating Mechanism

A highly efficient charge generating mechanism is [...] any charging mechanism stronger than manual rubbing of surfaces. (Source: EN ISO 80079-36)

Inspection

Measure undertaken to determine the actual condition of an item in order to assess its state. (Source: EN 13306 – Maintenance – Terms)

Maintenance

Combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or restore it to, a state in which it can perform the required function. (Source: EN 13306 Maintenance - Terms)

Preventive Maintenance

Combination of planned measures to delay the deterioration of the functional state of an item. (Source: EN 13306 – Maintenance – Terms)

Risk

Combination of the probability of occurrence of harm and the severity of that harm (source: EN ISO 12100)

Risk Assessment

Overall process of risk analysis and risk evaluation (source: EN ISO 12100)

Zone 0

Area in which an explosive gas atmosphere is present continuously or for long periods or frequently. (Source: IEC 60079-10-1)

Zone 1

A place in which an explosive atmosphere consisting of a mixture with air or flammable substances in the form of gas, vapor, or mist is likely to occur in normal operation occasionally. (Source: EC Directive 1999/92/EC, Annex I)

Knick
Elektronische Messgeräte
GmbH & Co. KG

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

Translation of the original instructions

Version 4 • This document was published on December 01, 2025.
The latest documents are available for download on our
website under the corresponding product description.

TA-215.501-KNEN04

105244