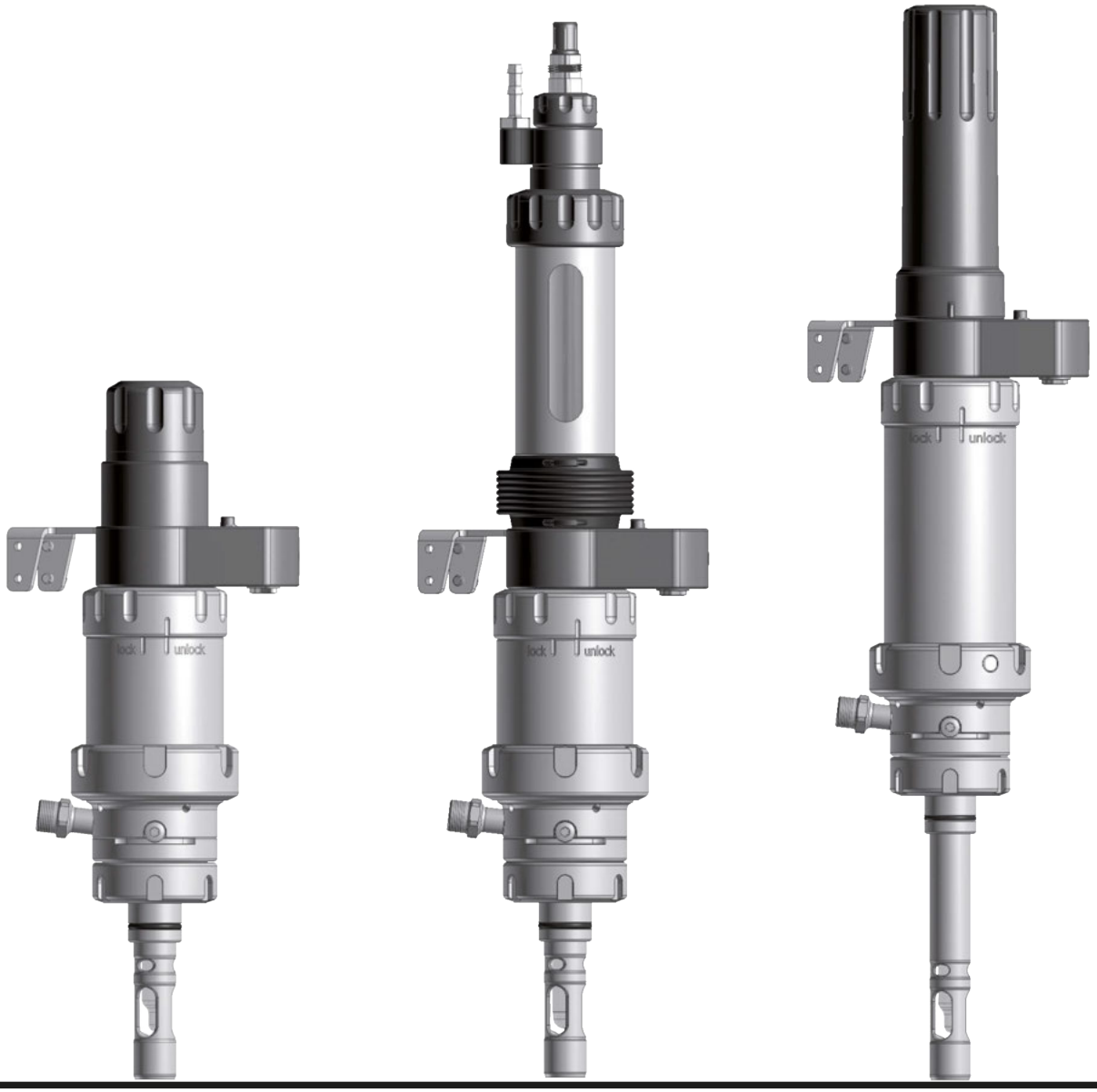
SensoGate® WA 130

User Manual



Sensor Lock-Gate

097306

Knick

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Process-Related Risks

Knick Elektronische Messgeräte GmbH & Co. KG assumes no liability for damages caused by process-related risks known to the operator, which would in fact not permit the use of the WA 130 sensor lock-gate.

Be sure to observe:

Work on the sensor lock-gate must only be performed by personnel authorized by the operating company and specially trained for handling and operating the sensor lock-gate.

Warranty

Defects occurring within 1 year from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).

Exclusions from Warranty

Wear parts (gaskets) and damage caused by improper use are excluded from warranty.

Return of Products

Please contact our Service Team before returning a defective device. Ship the cleaned device to the address you have been given. If the device has been in contact with process fluids, it must be decontaminated/disinfected before shipment. In that case, please attach a corresponding Declaration of Contamination (see page 53), for the health and safety of our service personnel.

Operation in Explosive Atmospheres

The SensoGate WA130-X is certified for operation in explosive atmospheres.

- EU-Type Examination Certificate KEMA 04ATEX4035X

Exceeding the standard atmospheric conditions within the manufacturer's specifications, such as ambient temperature, process pressure and temperature, does not impair the durability of the retractable fittings.

Related certificates are included in the product's scope of delivery and are available at www.knick.de 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)

Possible Ignition Hazards During Installation and Maintenance

To avoid mechanically generated sparks, handle the SensoGate WA130-X with care and apply suitable measures, e.g., use covers and pads.

The metallic parts of the SensoGate WA130-X must be connected to the plant's equipotential bonding 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 given on the nameplate may deviate from the actual version of the SensoGate WA130-X. The operating company must assess and document this deviation.

Electrostatic charging

The drive unit of specific versions of the SensoGate WA130-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:

- Highly efficient charge generating mechanisms are excluded
- Non-metallic components are cleaned with a moist cloth only

Mechanically generated sparks

Single impacts on metal parts or collisions between metal parts of the SensoGate WA130-X are not a potential ignition source only 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.

Possible Ignition Hazards During Operation

When using non-water-based cleaning, rinsing, or calibration media with low conductivities of less than 1 nS/m with a calibration chamber made of polypropylene (PP), electrostatic charging of internal, conductive components may occur. The operating company must assess the associated risks and implement appropriate measures.

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

Intended Use

SensoGate® WA 130 Sensor Lock-Gate

Intended Use

The SensoGate® WA 130 pneumatic sensor lock-gate is used for installing a sensor for measurements in liquids. The sensor can be cleaned, calibrated or replaced under process conditions (pressure and temperature).
The modular concept allows simple installation, operation, and maintenance.
The operator can exchange process adaptations (flange, dairy pipe, Ingold socket) or convert the fitting for the use with gel sensors or liquid-electrolyte sensors.

The sensor lock-gate is suitable for sensors with an outer diameter of 12 mm:

- with gel electrolyte, length 225 mm, sensor head with Pg 13.5
- with liquid electrolyte, length 250 mm

The SensoGate® WA 130 sensor lock-gate allows:

- inserting and retracting the sensor under process pressure (sensor lock-gate)
- calibrating or adjusting the measuring system and cleaning the sensor in the running process (different options available)
- replacing the sensor in the running process (in SERVICE position)
- variable process adaptation by the operator at any time

Take account of the influences of humidity, ambient temperature, chemicals and corrosion.

Safe Use

If you are not sure whether the sensor lock-gate can be safely used for your intended application, please contact the manufacturer.

To ensure safe use of the equipment, you must follow the instructions given in this manual and observe the specified temperature and pressure ranges.

The SensoGate® WA 130 sensor lock-gate has been developed and manufactured in compliance with the applicable European guidelines and standards. Compliance with the European Harmonized Standards for use in hazardous locations is confirmed by the EC-Type-Examination Certificate. Compliance with the European guidelines and standards is confirmed by the EC Declaration of Conformity.

The sensors used must ensure proper separation of the ATEX zones. When the sensor lock-gate is in SERVICE position and the SensoLock® ring has been locked, the sensor may be replaced within a Zone 1 hazardous location.
There is no particular direct hazard caused by the operation of the device in the specified environment.

Intended Use

SensoGate® WA 130 Sensor Lock-Gate

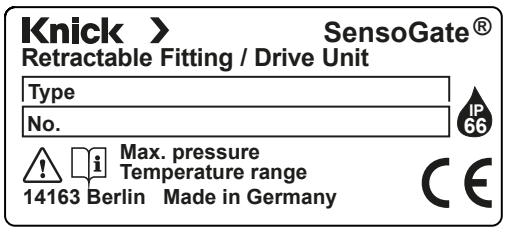
Caution!
Observe the general requirements of protection devices to prevent pollution of potable water (EN 1717) when drawing water from drinking water pipes.
We recommend installing a check valve on the water supply to protect the drinking water from pollution.

We recommend installing a check valve on the water inlet e.g. on the water valve provided by the customer or on the rinse connection of the sensor lock-gate (inlet to calibration chamber) to pre-vent backflow of rinse or process medium or compressed air into the water pipe.
Suitable check valves made from different materials are available from Knick.

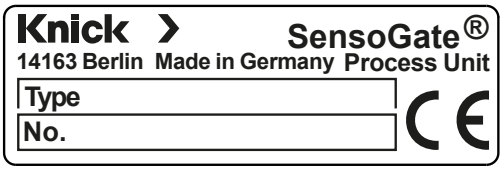
Rating Plates

SensoGate® WA 130-N

Drive

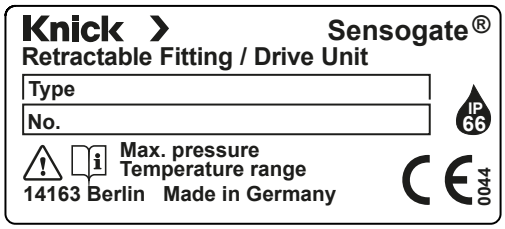


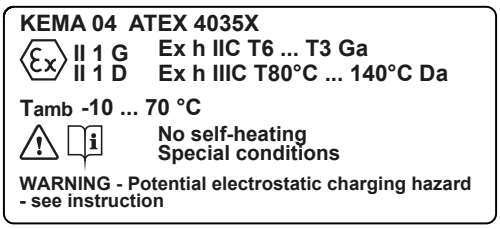
Process



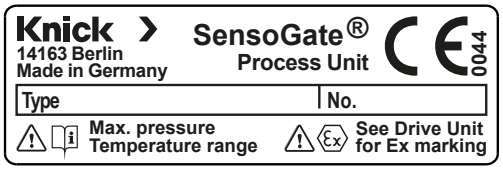
SensoGate® WA 130-X

Drive





Process



Package Contents

SensoGate® WA 130 Sensor Lock-Gate

Check the shipment for transport damage and completeness.

The package should contain:

- Sensor lock-gate
- Documentation
- Test certificates

SensoGate® WA 130 Product Coding

		WA 130-											
Explosion protection	For hazardous area Zone 1	X											
	Without	N											
Sensor	Solid electrolyte		0										
	Liquid electrolyte (pressurization possible)		1				A						
Gasket material	Elastomeric ring set A, FKM (Viton)			A									
	Elastomeric ring set B, EPDM			B									
	Elastomeric ring set C, FFKM (Kalrez)			C									
	Elastomeric ring set E, EPDM FDA			E									
	Elastomeric ring set K, FFKM, compl. (Kalrez)			K									
Process-wetted materials*	1.4571 / 1.4571 / 1.4571				A								
	Hastelloy / Hastelloy / Hastelloy				B								
	PEEK / PEEK / PEEK				C								
	PVDF / PVDF / PVDF				D								
	PEEK HD / PEEK HD / PEEK HD				E								
	PVDF HD / PVDF HD / PVDF HD				F								
	Hastelloy / PEEK / Hastelloy				M								
	Hastelloy / 1.4571 / PEEK				N								
	Titanium / Titanium / Titanium				T								
	1.4571 / 1.4571 / PEEK				Z								
	PP reinforced				P								
Process adaptation	Steel flange, 1.457, DN 32					B	0						
	Steel flange, 1.457, DN 40					B	A						
	Steel flange, 1.457, DN 50					B	1						
	Steel flange, 1.457, DN 65					B	2						
	Steel flange, 1.457, DN 80 1)					B	3						
	Steel flange, 1.457, DN 100 1)					B	4						
	Dairy pipe DN 50					C	1						
	Dairy pipe DN 65					C	2						
	Dairy pipe DN 80					C	3						
	Dairy pipe DN 100					C	4						
	Flange, ANSI 316, 1 1/2"					D	0						
	Flange, ANSI 316, 2"					D	1						
	Flange, ANSI 316, 2 1/2"					D	2						
	Flange, ANSI 316, 3" 1)					D	3						
	G 1 external					G	1						
	G 1 external, one piece[2)]					G	U						
	R 1 external					R	1						
	NPT 1" external					N	1						
	Ingold socket, 25 mm					H	0						
	G 2 1/4 for ARF 210/30xxxxx					K	1	A					
Immersion depth	Short							A					
	Long							B					
	Short, no lock-gate function							K					
Connection	Media connection, PP								A				
	Media connection, PEEK								B				
	Media connection, PEEK, with integr. connector for additional medium								C				
	Free hose connection, PP								E				
Special version	Without									0	0	0	
	Equipped with special grease (provided by customer)									0	0	1	
	With scraper ring, reinforced version, PTFE/PEEK (ZU 0760)									0	0	3	
	With pneumatic limit signal for Unical 79(X)-2									0	0	4	

* Material combinations: Process-wetted part of calibration chamber / rinse-wetted part of calibration chamber / immersion tube

1) With the lower calibration chamber made of plastic, DN 80...DN 100 flange, you require one of the following flange protectors: ZU0755, ZU0756, ZU0757, ZU0758

2) Process adaptation GU (G1, one piece), PP and PVDF only, non-Ex

Function Description

SensoGate® WA 130 Sensor Lock-Gate

The pneumatically operated sensor lock-gate allows calibrating or adjusting the measuring system and cleaning the sensor in the running process. For that purpose, the sensor lock-gate can be moved between two positions using compressed air:

- **PROCESS position**: Sensor located in the process medium.
- **SERVICE position**: Sensor located in the calibration chamber.

In SERVICE position you can clean, maintain, calibrate or adjust the measuring system.

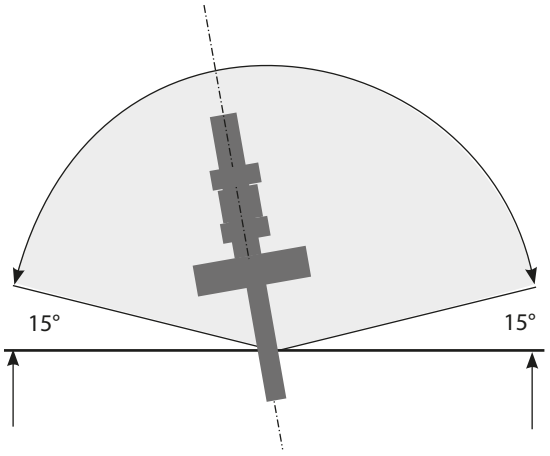
Using compressed air, a control unit such as the Unical® 9000 moves the probe between SERVICE position and PROCESS position and leads different calibration and/or cleaning liquids to the sensor located in the calibration chamber.
For operation of the SensoGate®, you must connect control air, rinsing or calibration media and the electrical check-back signal for indicating the probe position.

There are two basic options for this.
When the SensoGate® is operated with the Unical® or Uniclean® electro-pneumatic controllers and the Protos® measuring system, the cables and tubings for air pressure, rinsing/calibration media and check-back are combined in a single hose with just one plug connection. This hose is referred to as media connection.
This media connection is installed on the SensoGate® together with the outlet hose.
When you do not use a probe controller (Unical® or Uniclean® and the Protos® measuring system), you can connect the supply lines for control air, rinsing/calibration media and electrical check-back to the sensor lock-gate with a free hose connection via a ZU 0742 / ZU 0733 / ZU 0734 adapter (see Accessories, page 46).

These liquids leave the calibration chamber through an outlet hose, i.e. they are displaced from the calibration chamber by following liquids or by compressed air.
To replace the sensor, you must move the sensor lock-gate into SERVICE position.
With the Unical® 9000 probe controller, all media, control air and the check-back cable for position indication of the probe are connected to the sensor lock-gate through a compact connector (multiplug).

Assembly

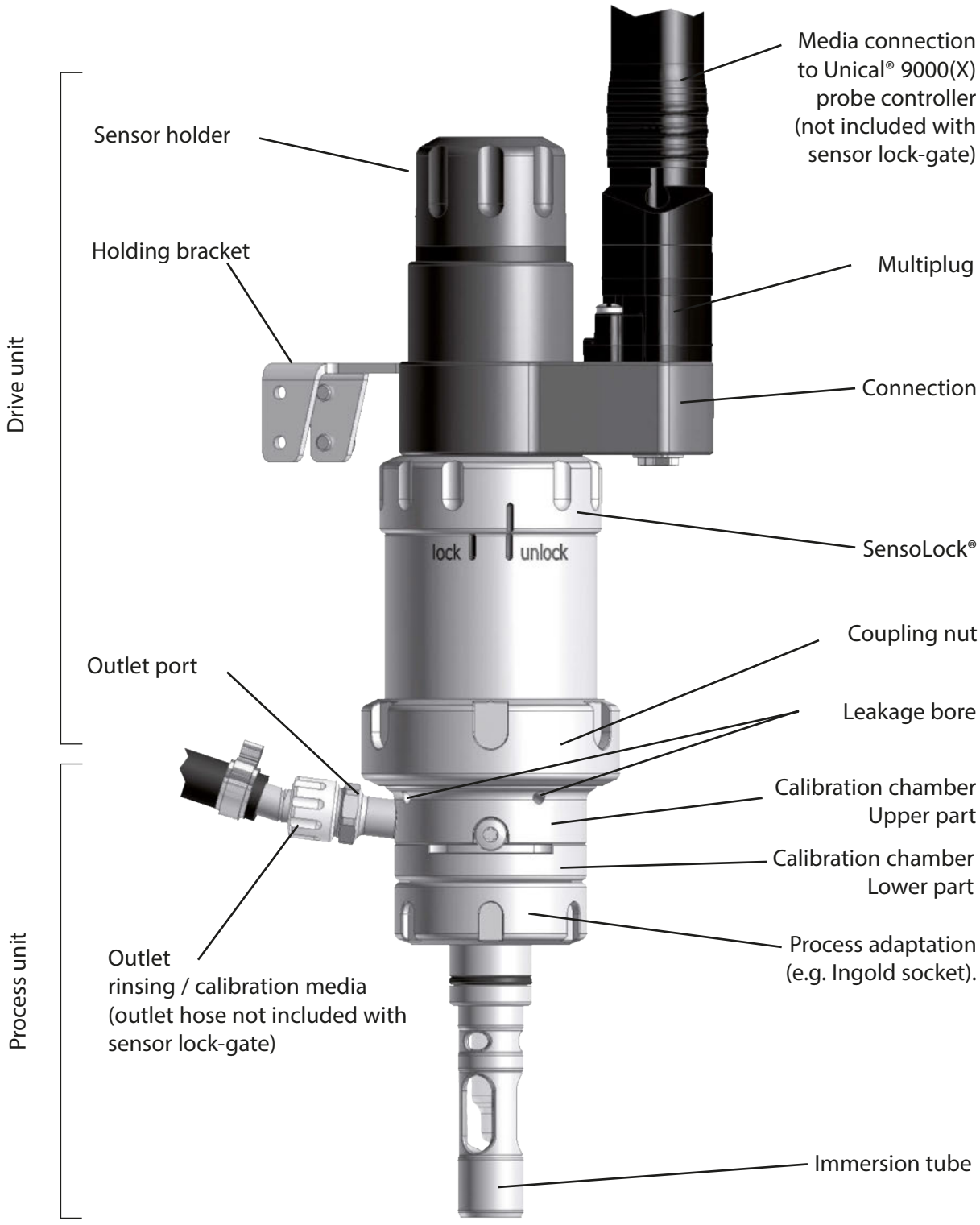
- Possible mounting angle 15° above horizontal:
- Mounting angle 360° (i.e. even upside down) for special sensors only containing thickened electrolytes which thus cannot flow.



Build-up of the Sensor Lock-Gate

SensoGate® WA 130 Sensor Lock-Gate

The SensoGate® sensor lock-gate consists of 2 main units:
drive unit and process unit.
The **drive unit** performs the required movements to move the sensor into and out of the process.
The **process unit** comprises the process-wetted calibration chamber as well as the process adaptation (e.g. flange or dairy-pipe screw joint). Drive unit and process unit can be separated by the operator (see page 28).



Build-up of the Sensor Lock-Gate

Modules available: Rotary drives, immersion tubes, process adaptations

Drives

Short immersion depth
Sensors with
gel electrolyte

Long immersion depth
Sensors with
gel electrolyte

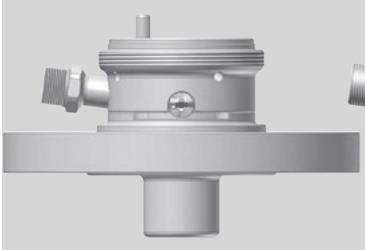
Short immersion depth
Sensors with
liquid electrolyte

Immersion tubes

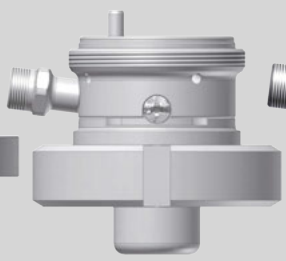
Materials available:

- 1.4571
- Hastelloy
- PP
- PEEK
- PVDF
- Titanium

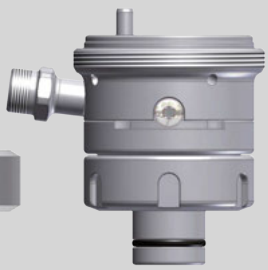
Process adaptations



Flange



Dairy-pipe screw joint



25-mm socket (Ingold)

Process adaptations

- DIN and ANSI flanges
- Dairy-pipe screw joint
- Ingold socket

SensoLock®

The WA 130 is equipped with a SensoLock® ring. SensoLock® securely blocks the sensor lock-gate in SERVICE position. Turning the SensoLock® ring to "LOCK" position mechanically locks the internal lift piston and thus prevents the sensor lock-gate from moving to PROCESS position.
The SensoLock® ring can only be turned in SERVICE position. In PROCESS position and all intermediate positions the SensoLock® ring is blocked.
This prevents operation errors. Before starting maintenance work or replacing a sensor, you must activate SensoLock® (LOCK) to:

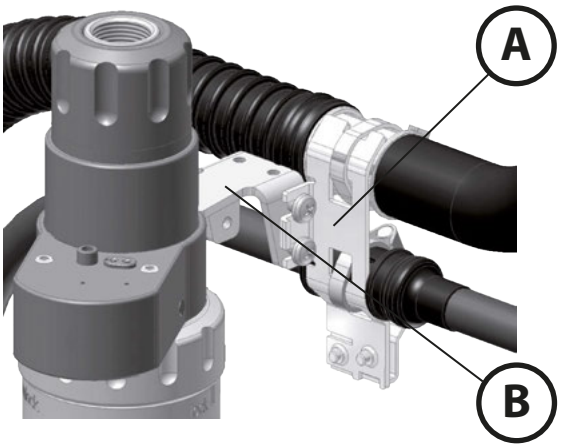
- make sure that the sensor lock-gate is in SERVICE position.
- prevent that the sensor lock-gate is accidentally moved to PROCESS position.

Turning the SensoLock ring to "LOCK" position prevents the immersion in the process when the sensor has been removed. (blocking the travel function, safety function)

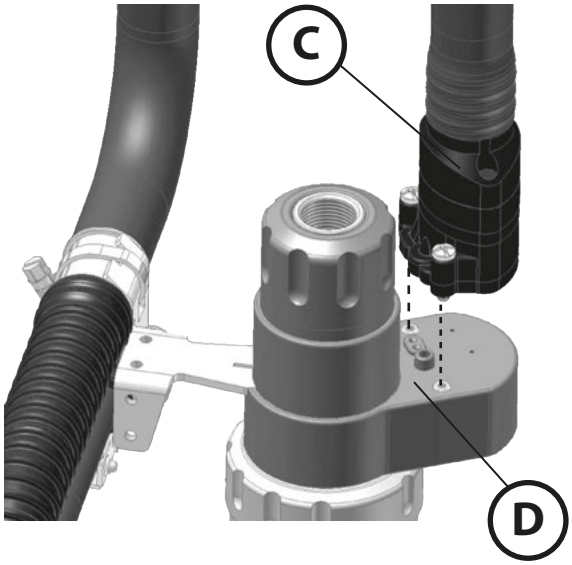
After the sensor has been installed, you can unlock the travel movement by turning the SensoLock® ring to "UNLOCK".

Installing the Media Connection

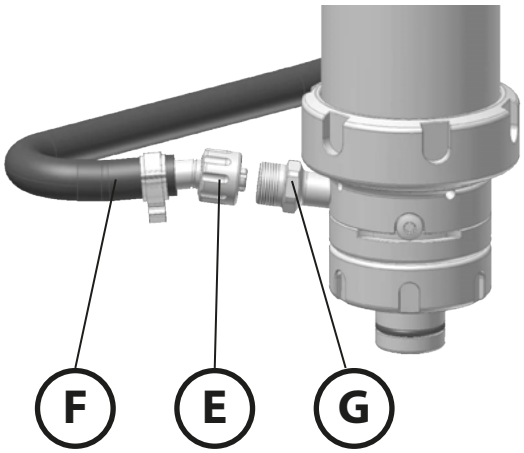
Using the media connection and the Unical® 9000(X) probe controller with multiplug



1) Screw mounting bracket **(A)** of media connection to holding bracket **(B)** of the sensor lock-gate. One possible arrangement is shown here. (3 x 2 threaded holes on the holding bracket **(B)** allow 3 different arrangements of the hose.)



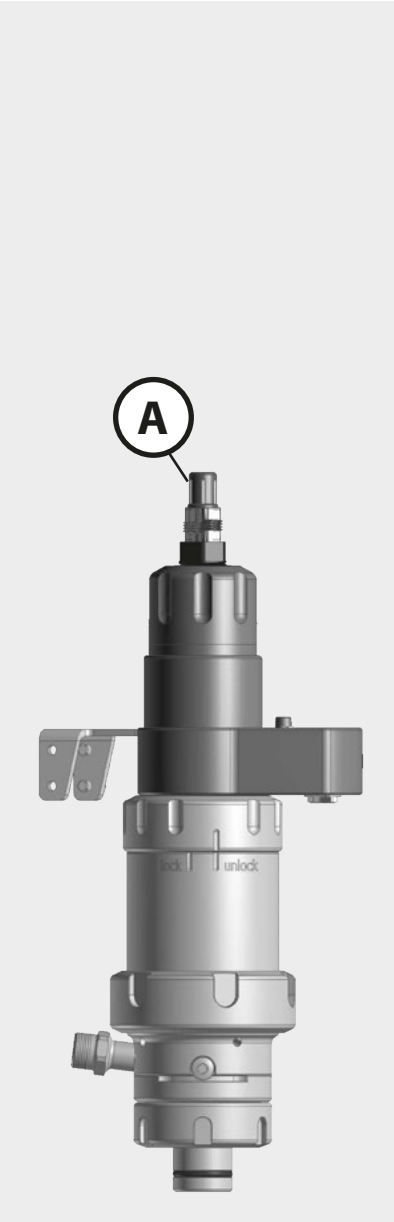
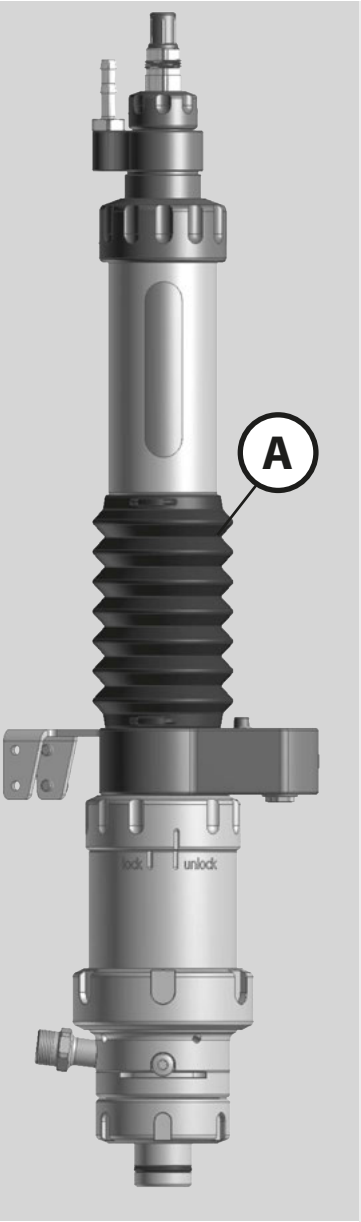
2) Screw multiplug **(C)** of media connection to connector **(D)** of the sensor lock-gate.



3) Screw coupling nut **(E)** of the outlet hose **(F)** to outlet port **(G)** of the sensor lock-gate.

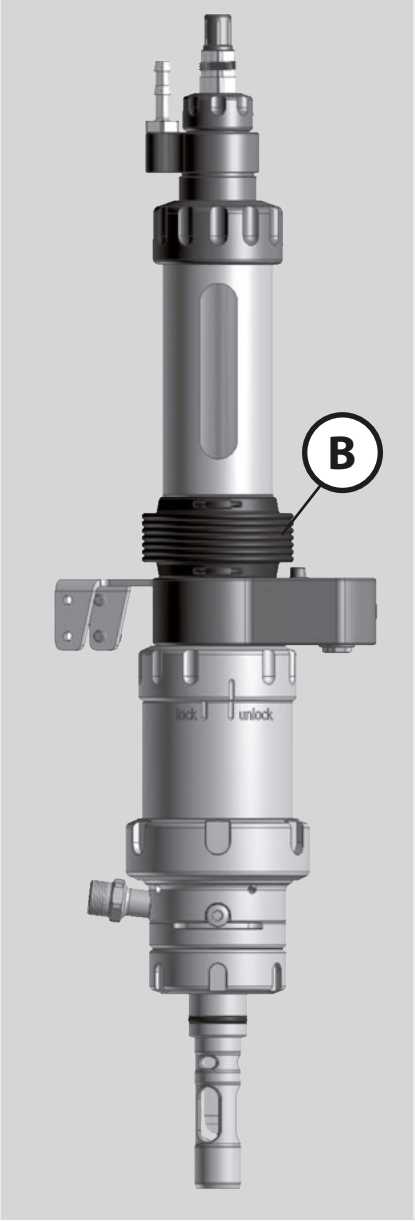
Identifying the SERVICE Position

SensoGate® WA 130 Sensor Lock-Gate

Short immersion depth Solid-electrolyte sensor	Short immersion depth Liquid-electrolyte sensor	Long immersion depth Solid-electrolyte sensor
		
SERVICE position – indicated by the sensor connector **(A)** protruding out of the drive unit.	SERVICE position – indicated by the rubber bellows **(A)** being expanded.	Service position – indicated by the service cap **(A)** protruding out of the extension.

Identifying the PROCESS Position

SensoGate® WA 130 Sensor Lock-Gate

Short immersion depth Solid-electrolyte sensor	Short immersion depth Liquid-electrolyte sensor	Long immersion depth Solid-electrolyte sensor
		
PROCESS position – indicated by the sensor connector not protruding out of the drive unit.	PROCESS position – indicated by the rubber bellows **(B)** being compressed.	PROCESS position – indicated by the service cap not protruding out of the extension.

Installing and Removing a Sensor

Sensors must only be installed or removed by trained personnel authorized by the operating company. **Make sure that the sensor lock-gate is in SERVICE position** (see "Function Description" on page 10).

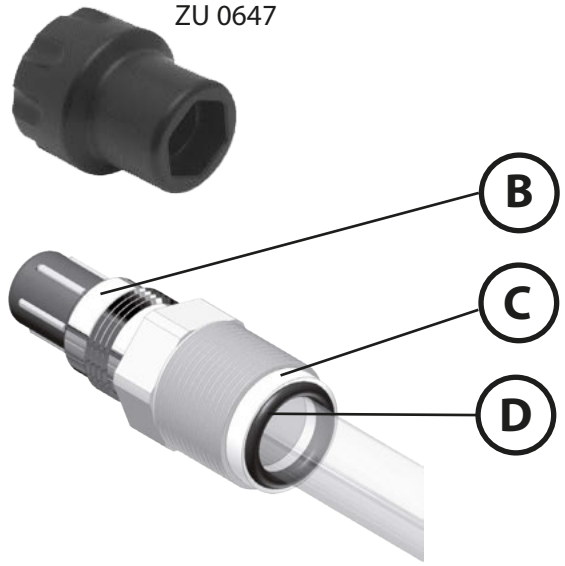
Be sure to follow the assembly instructions step by step.

Preparations:

- Check if the sensor is damaged (glass broken?).
  Never install a damaged sensor.
- Check if slide washer or O-ring on the sensor are damaged and replace if required.
- Remove watering cap from the sensor tip and rinse sensor with water.
- Internally pressurized sensors might have a silicone seal on the diaphragm (as transport protection). Remove this seal using the knife shipped with the sensor.

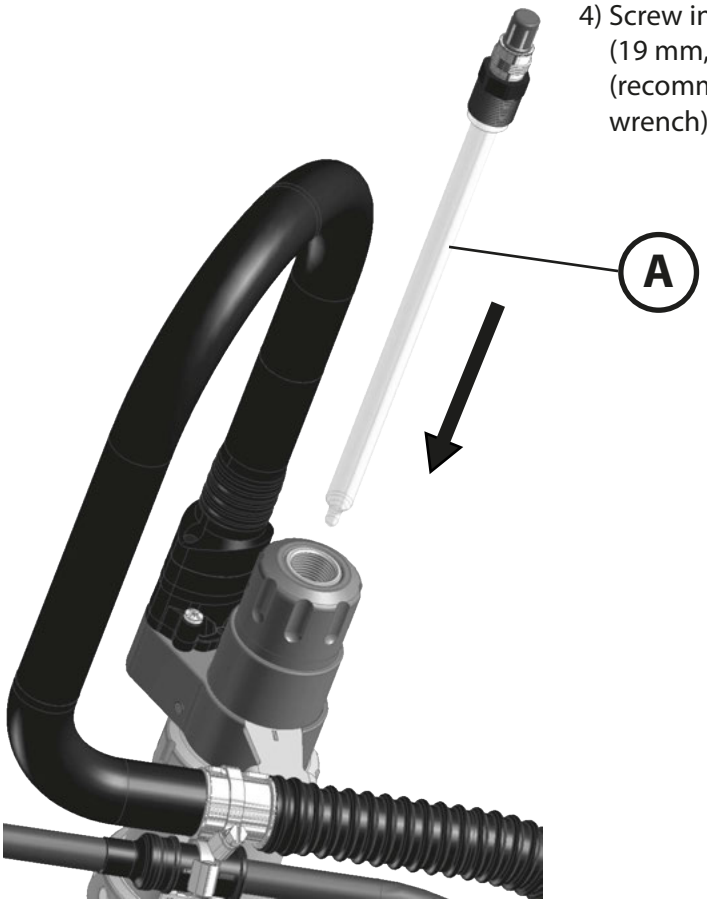
Installing a Gel-Electrolyte Sensor

Short immersion depth



Installing the sensor

1) The sensor must only be installed in **SERVICE position**.
2) Use appropriate sensors **(A)** only:
   Diameter: 12 mm Length: 225 mm
   Observe pressure resistance of the sensor.
3) Check if slide washer **(C)** or O-ring **(D)** on the sensor are damaged.



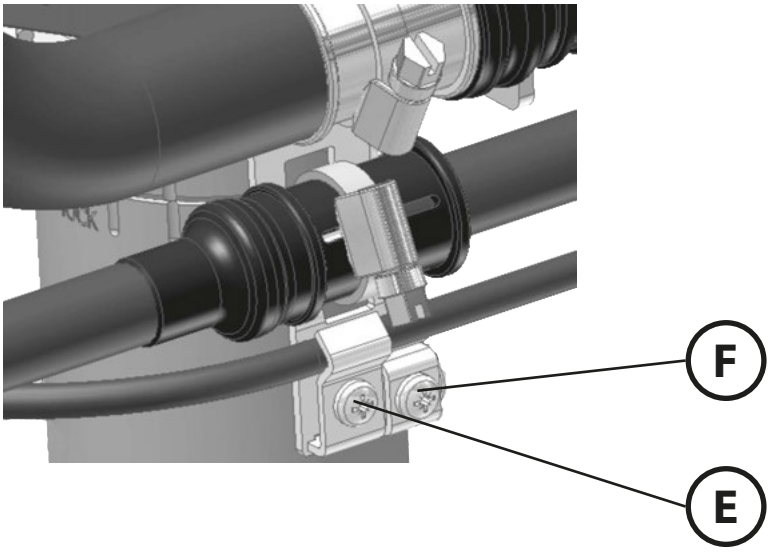
4) Screw in the sensor head **(B)**
   (19 mm, Pg 13.5) with a max. torque of 3 Nm.
   (recommended tool: 19 mm, e.g. Knick ZU0647 wrench).

Installing a Gel-Electrolyte Sensor

Short immersion depth

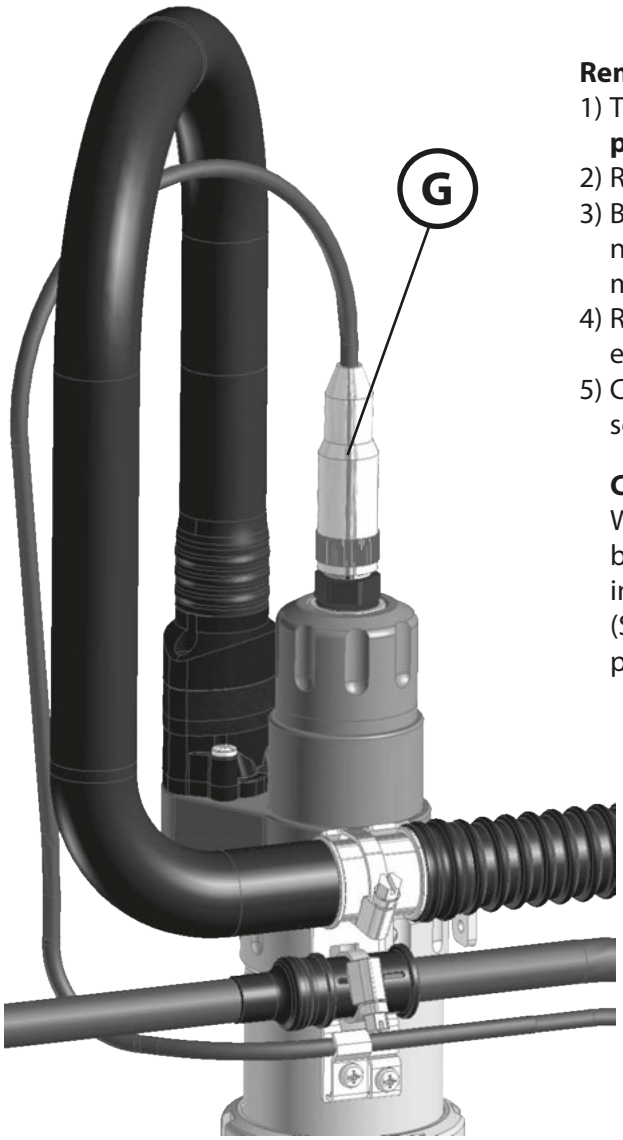
5) Connect cable jack with cable **(G)**.
Hold the cable in a loop and fix it using clamp **(E)**.
Caution! The cable loop must be long enough so that the cable does not impede the stroke movement of the fitting.

6) Connect equipotential bonding cable to terminal **(F)** (if required).



Removing a Gel-Electrolyte Sensor

Short immersion depth



Removing the sensor

1) The sensor must only be removed in **SERVICE position**.
2) Remove cable jack with cable **(G).**
3) Before removing the sensor, check that there is no liquid leaking from the outlet (process sealing might be defective).
4) Remove the sensor (recommended tool: 19 mm, e.g. Knick ZU0647 wrench).
5) Check if slide washer **(C)** or O-ring **(D)** on the sensor are damaged.

Caution!
When replacing damaged sensors (glass breakage), you must check the sensor seal in the immersion tube and replace it if required.
(See section "Replacing the Immersion Tube" on page 30)

ZU 0647

Installing a Gel-Electrolyte Sensor

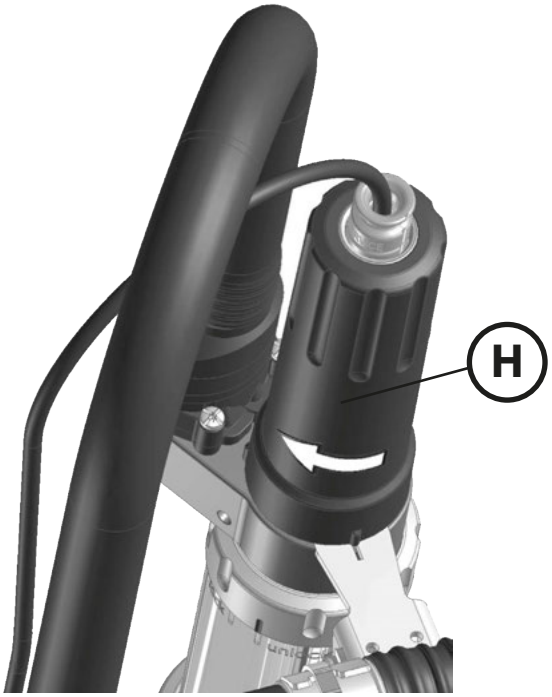
Long immersion depth

Installing the sensor

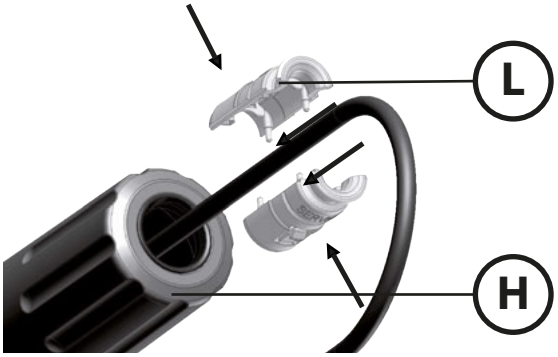
1) The sensor must only be installed in **SERVICE position**. (Red service cap **(L)** is visible.)
2) Use appropriate sensors **(A)** only:
   Diameter: 12 mm Length: 225 mm
   Observe pressure resistance of the sensor.
3) Check if slide washer **(C)** or O-ring **(D)** on the sensor are damaged.
4) Screw in the sensor head **(B)** (19 mm A/F, Pg 13.5) with a max. torque of 3 Nm
   (recommended tool: 19 mm, e.g. Knick ZU 0647 wrench).
5) Thread the cable jack with cable **(G)** through the extension **(H)**.
   Caution!
   The cable loop must be long enough so that the cable does not impede the stroke movement of the fitting.
   When the cable is installed for the first time, you must first pull off the split red service cap **(L)**.
6) Connect the cable jack of cable **(G)** with the sensor plug (connection with coupling nut).

Installing a Gel-Electrolyte Sensor

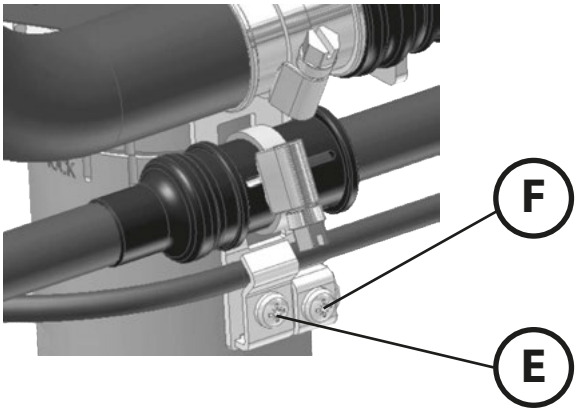
Long immersion depth



7) Attach the extension **(H)** and turn it clockwise. Correct mounting is signaled by an audible snapping in of the extension **(H)**.



8) Put the split (red) service cap **(L)** on the cable as shown. Then push it into the extension **(H)** until it noticeably snaps in.

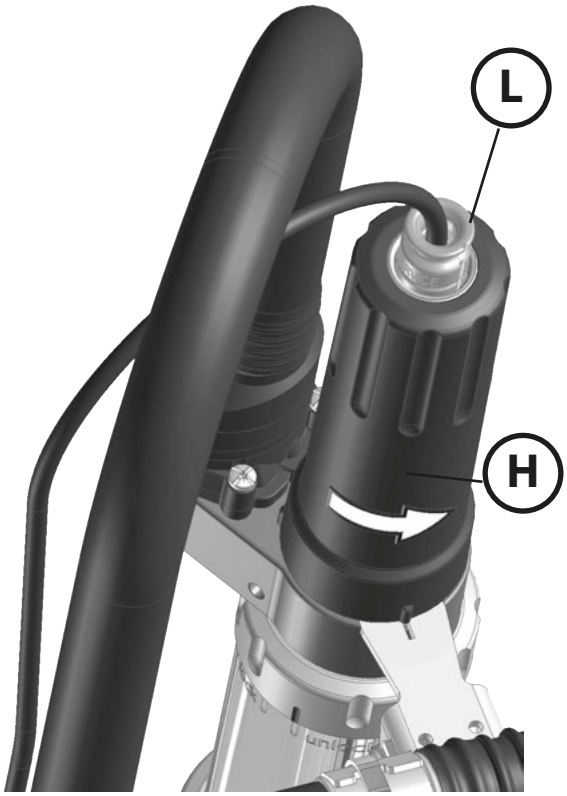


9) Hold the cable in a loop and fix it using clamp **(E)**.

10) Connect equipotential bonding cable to terminal **(F)** (if required).

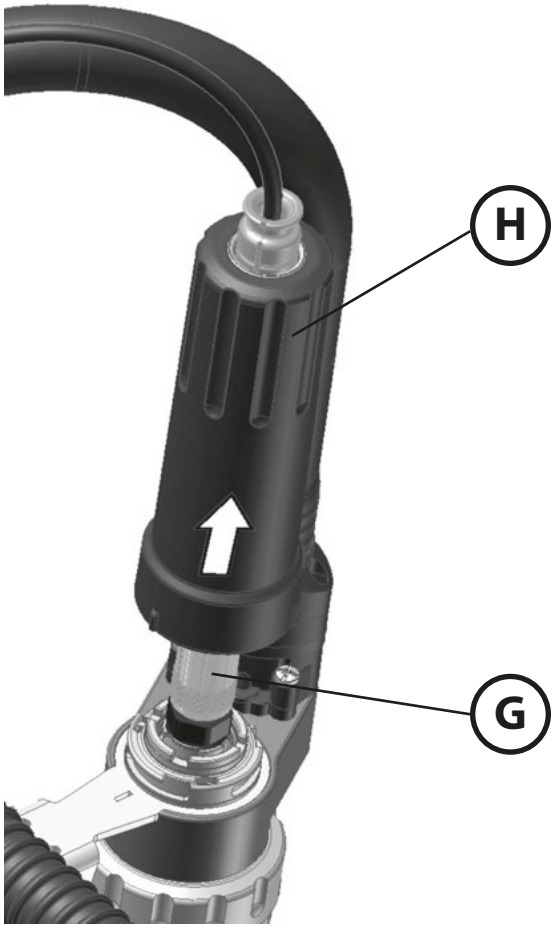
Removing a Gel-Electrolyte Sensor

Long immersion depth



Removing the sensor

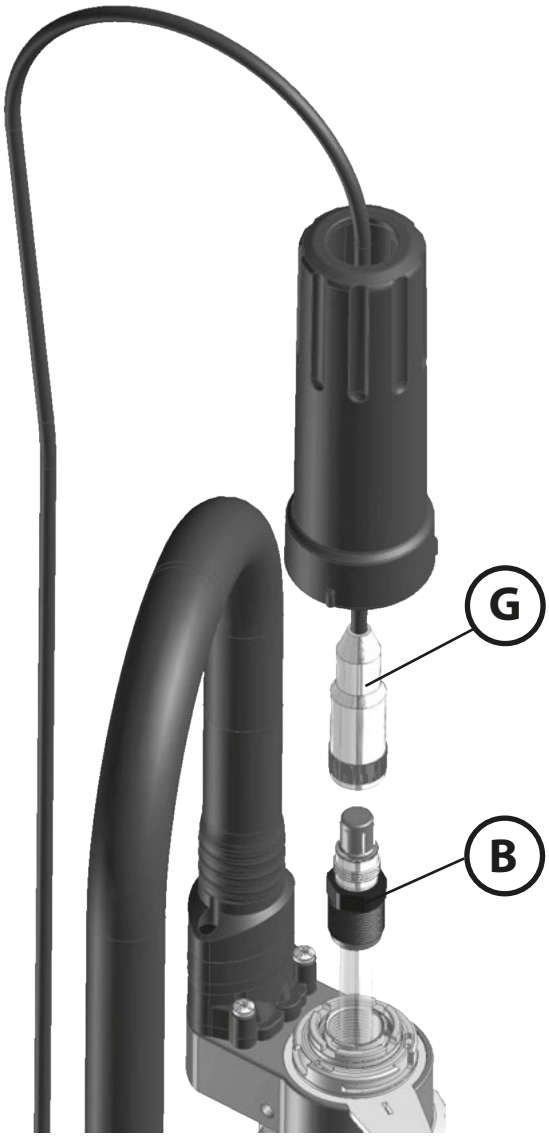
1) The sensor must only be removed in **SERVICE position** (red service cap **(L)** is visible).
2) Before removing the sensor, check that there is no liquid leaking from the outlet (process sealing might be defective).
3) Turn extension **(H)** counterclockwise.
   This unlocks the bayonet coupling.
   Note: The extension **(H)** can only be unlocked in SERVICE position (safety function).



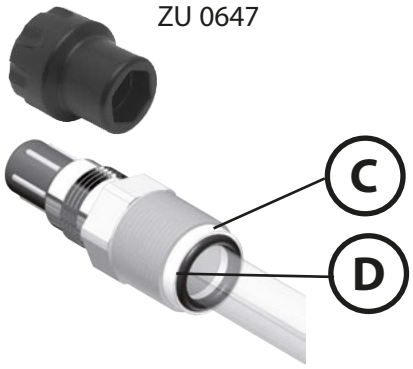
4) Pull off the extension **(H)** in direction of the arrow. Now you can see the cable jack and cable **(G)**.

Removing a Gel-Electrolyte Sensor

Long immersion depth



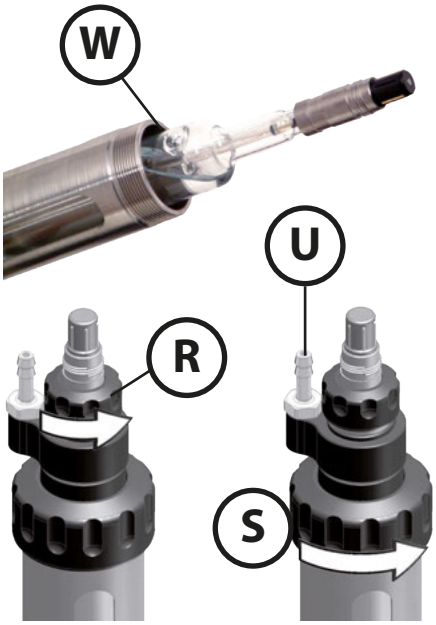
5) Disconnect the cable jack **(G)** from the sensor.
6) Screw off the sensor head **(B)** (19 mm, Pg 13.5), (recommended tool: 19 mm, e.g. Knick ZU 0647 wrench) and pull out the sensor.



7) Check if slide washer **(C)** or O-ring **(D)** on the sensor are damaged.
Caution!
When replacing damaged sensors (glass breakage), you must check the sensor seal in the immersion tube and replace it if required.
(See "Replacing the Immersion Tube" on page 30.)

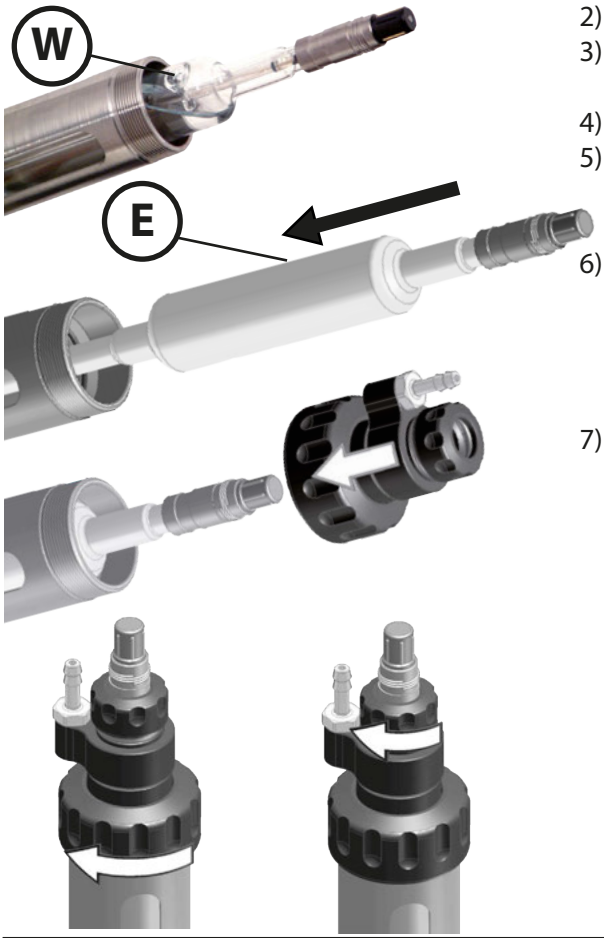
Installing a Liquid-Electrolyte Sensor

You can use sensors with a length of 250 mm and a diameter of 12 mm, e.g. Knick SE551.
To ensure that the electrolyte flows from the reference electrode to the process medium, the air pressure in the sensor pressure chamber must be 0.5 to 1 bar above that of the process medium.
Compressed-air connection **(U)** for sensor pressure chamber via connection nipple (NW 6 mm).
Check if the sensor is damaged (glass broken?). Remove watering cap from the sensor tip and rinse sensor with water.



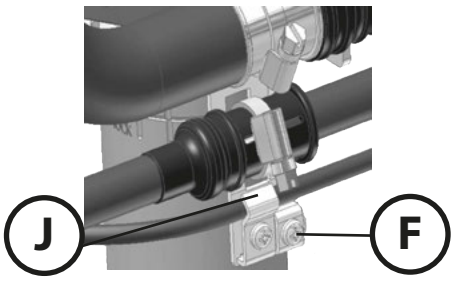
Caution!
In the case of inclined installation, the sensor must be installed as described below to prevent electrolyte from flowing out during operation of the sensor lock-gate. First, move the sensor lock-gate into SERVICE position.

Remove the plug and turn the electrolyte filling hole **(W)** towards the top to prevent electrolyte from flowing out when the sensor is inclined. Observe the installation instructions of the sensor manufacturer.

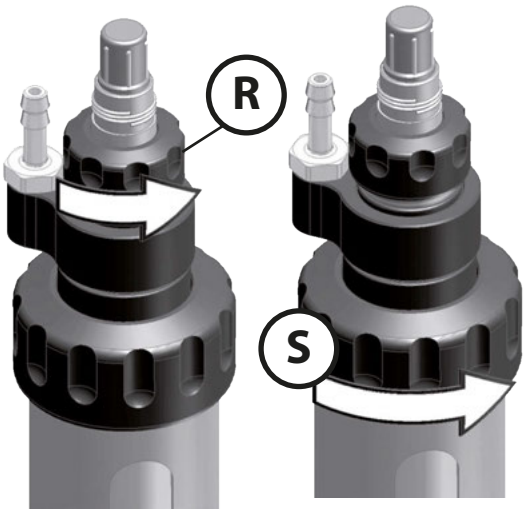


Installing the sensor

1) The sensor must only be installed in **SERVICE position**.
2) Loosen small coupling nut **(R)** – do not remove it.
3) Unscrew large coupling nut **(S)** completely and pull the detached unit upwards.
4) Install sensor **(E)**.
5) Replace the unit you have detached in step 3. First hand-tighten the large coupling nut **(S)** and then the small coupling nut **(R)**.
6) Connect cable jack and cable. Hold the cable in a loop and fix it using clamp **(J)**.
   Caution! The cable loop must be long enough so that the cable does not impede the stroke movement of the fitting.
7) Connect equipotential bonding cable to terminal **(F)** (if required).

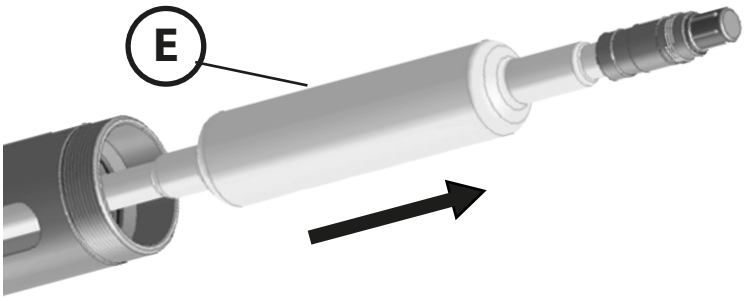


Removing a Liquid-Electrolyte Sensor



Removing the sensor

1) The sensor must only be removed in **SERVICE position**.
2) Remove cable jack with cable.
3) Before removing the sensor, check that there is no liquid leaking from the outlet (process sealing might be defective).
4) Loosen small coupling nut **(R)** – do not remove it.
5) Unscrew large coupling nut **(S)** completely and pull the detached unit upwards.
6) Remove sensor **(E)**.



Maintenance Work on the Drive Unit

The drive unit must be removed, for example:
- general maintenance or inspection
- to clean the calibration chamber, e.g. after a sensor has broken
- to change the sensor / calibration-chamber gaskets
- in the event of a technical fault of the drive unit.

Warning!
To separate the sensor lock-gate safely from the process, make sure that it is disconnected from all process media and process pressure.

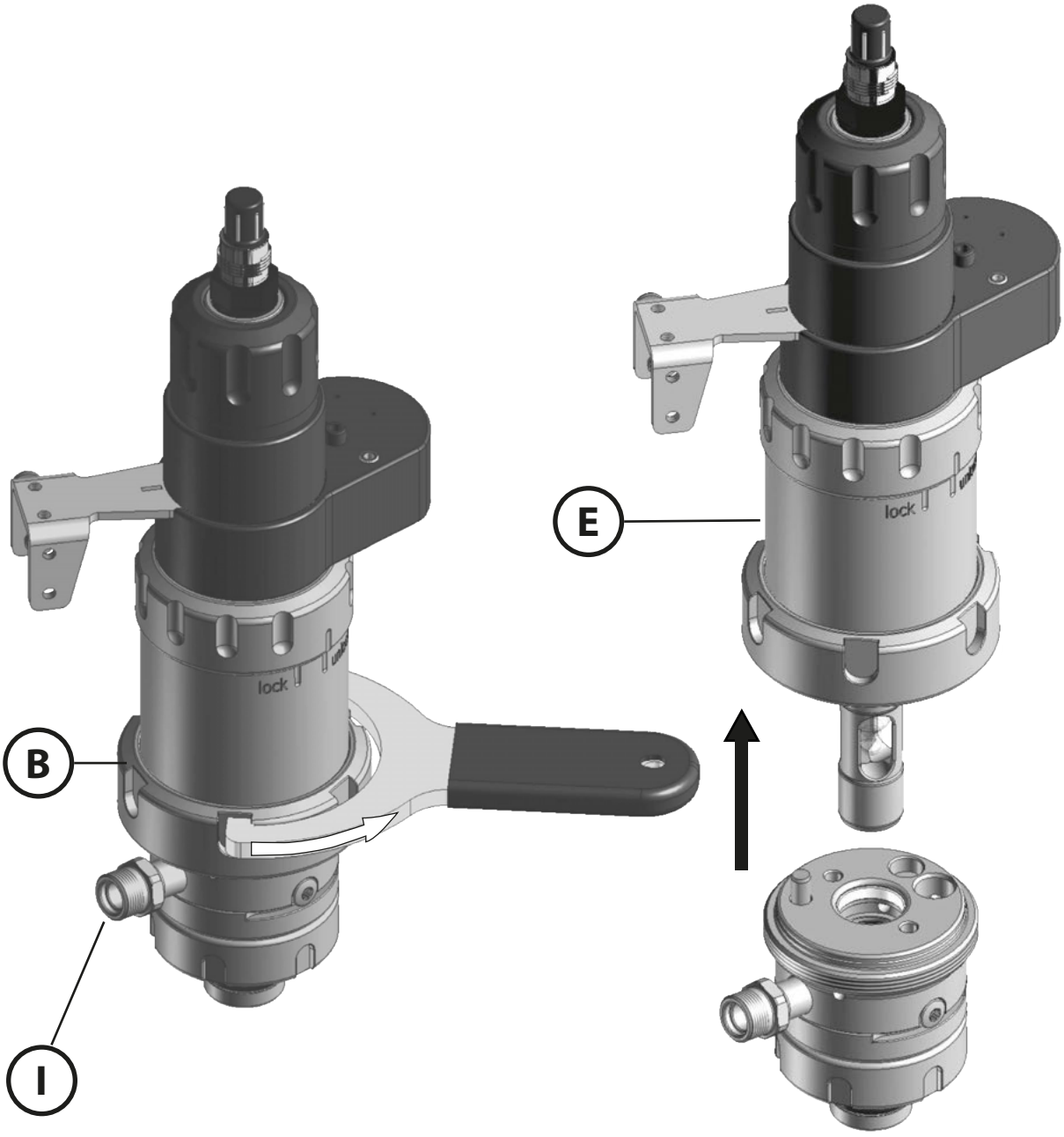
Caution!
Before working on the drive unit, make sure that the sensor lock-gate is in SERVICE position (see "Function Description" on page 10).

Removing the Drive Unit

Step-by-Step Instructions

Caution:
Be sure to follow the steps below in the correct order. Take appropriate safety precautions against escaping process fluids.

1) Move probe into SERVICE position.
2) Make sure that no process fluid is leaking from the outlet **(I)**.
3) If required, remove sensor as described in section "Installing and Removing a Sensor" on page 17.
4) Separate outlet **(I)** and rinse connection if required.
5) Turn coupling nut **(B)** counterclockwise (using the ZU 0680 accessory wrench if required – see figure). Do not cant the unit and do not exert force.
6) Pull off the drive unit upwards **(E)**.

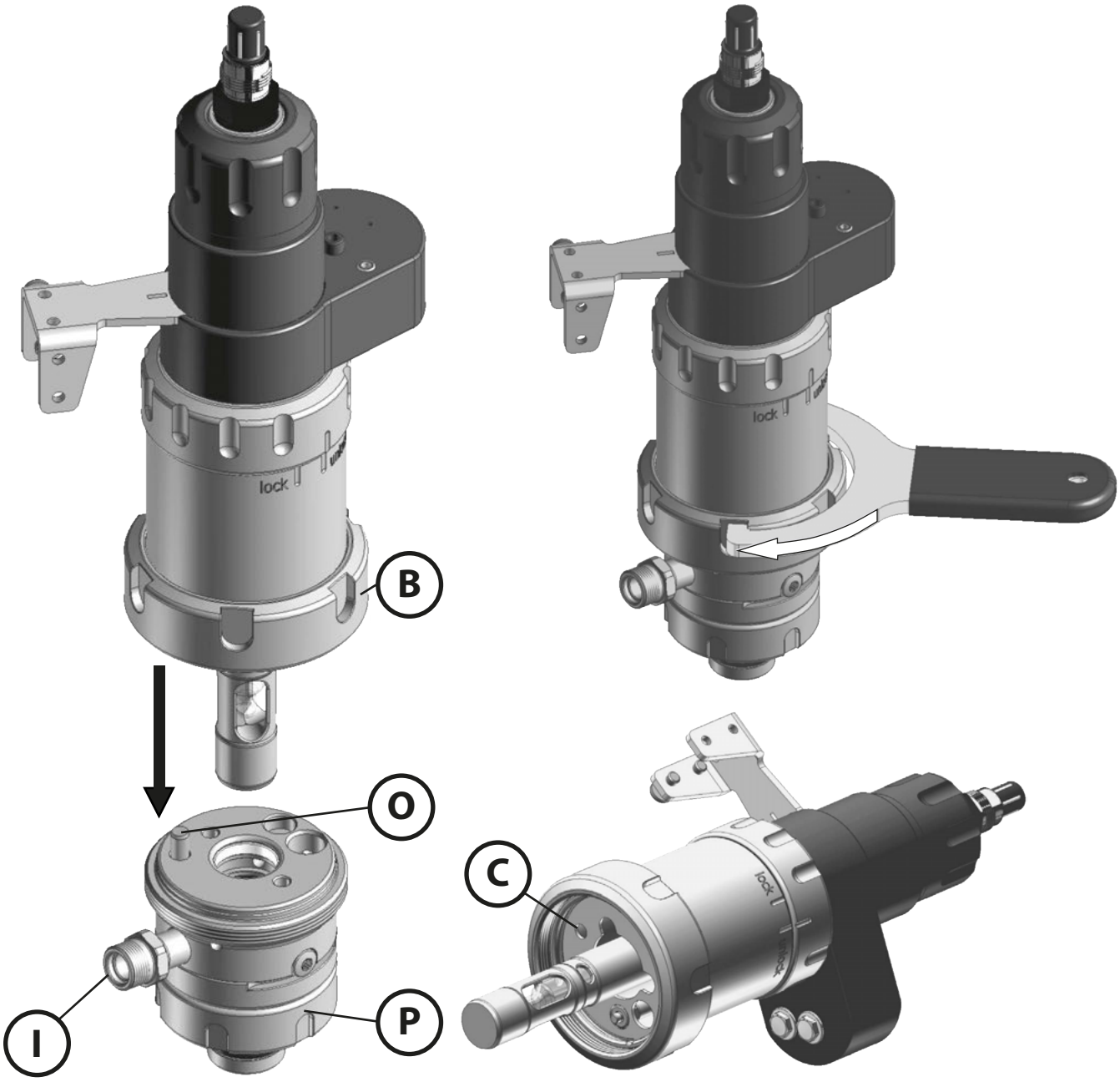


Installing the Drive Unit

Step-by-Step Instructions

Caution:
Be sure to follow the steps below in the correct order.

1) Insert the drive unit (in **SERVICE position**) into the process unit **(P)**
   The radial position of the drive unit is determined by a coding pin **(O)** in the calibration chamber and an opening **(C)** in the drive unit. The coupling nut can only be tightened when the drive unit is in the correct position.
2) Now tighten the coupling nut **(B)** (turn clockwise – hand-tight or 10 Nm – using the ZU 0680 accessory wrench if required).
3) Install outlet **(I)**.
4) Install sensor as described in section "Installing and Removing a Sensor" on page 17.



Replacing the Immersion Tube

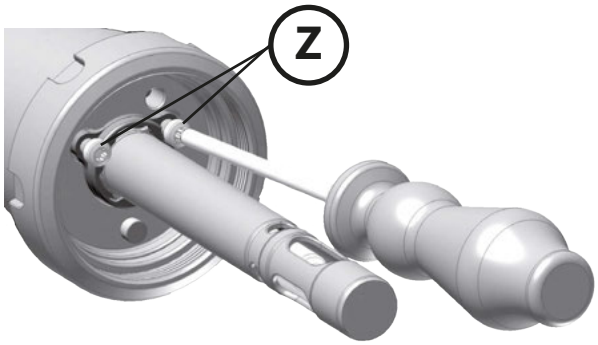
The immersion tube must be removed or replaced:
- for general maintenance
- for cleaning the immersion tube, e.g. after the sensor is broken
- for replacing the sensor gasket (O-ring)
- when an immersion tube made of another material is required
- in the event of a technical fault of the drive unit

Warning!
To separate the sensor lock-gate safely from the process, make sure that it is disconnected from all process media and process pressure.

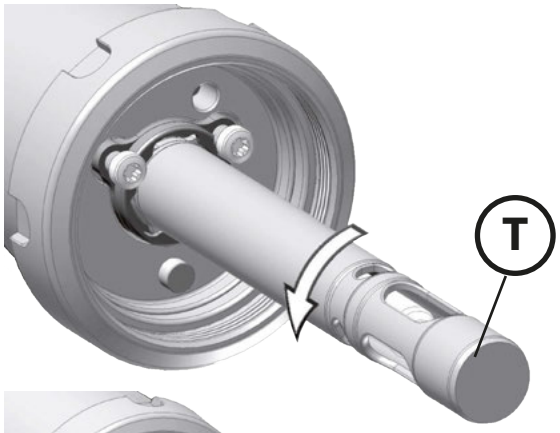
Caution!
Before working on the drive unit, make sure that the sensor lock-gate is in SERVICE position (see "Function Description" on page 10).

Removing the Immersion Tube

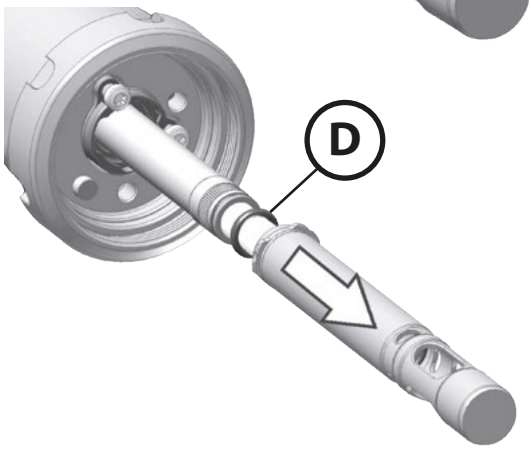
First, separate the drive unit from the process unit (see "Removing the Drive Unit" on page 28).



1) After having separated the drive unit from the process unit, move the drive unit into PROCESS position.
2) In PROCESS position two screws **(Z)** are accessible.
3) Loosen the two screws **(Z)** by approx. 4 turns using a screwdriver (TX25) (do not remove them).



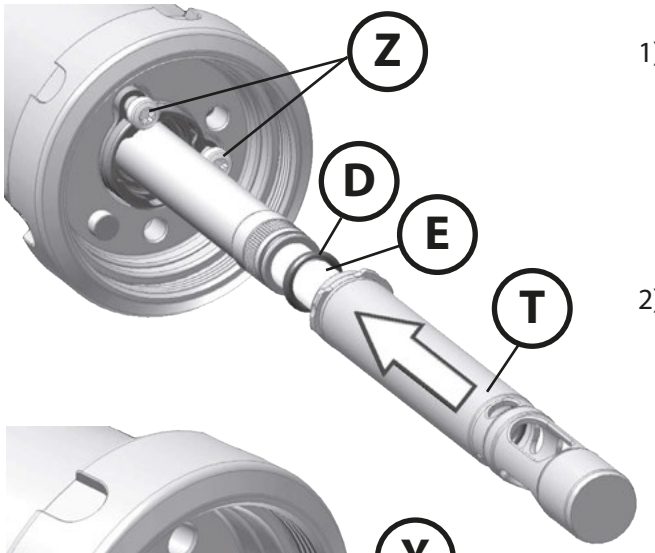
4) Turn the immersion tube **(T)** counterclockwise by approx. 60°.



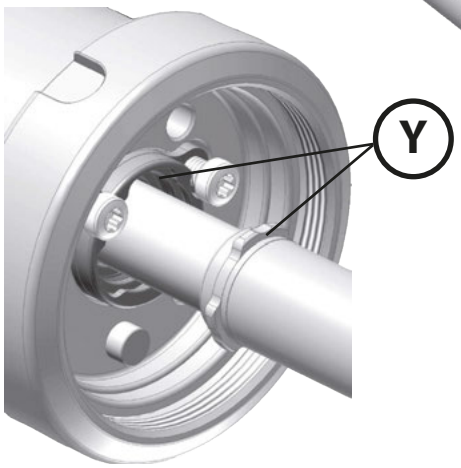
5) The bayonet coupling opens and the immersion tube **(T)** can be pulled out in direction of the arrow.
6) Now, O-ring **(D)** (sensor gasket) is visible. Check and replace if required. (For O-ring dimensions, see page 51 "Sealing Kits for Maintenance and Servicing")

Note:
Contrary to the figure, the O-ring may still be in the immersion tube. From there, you can easily remove it.

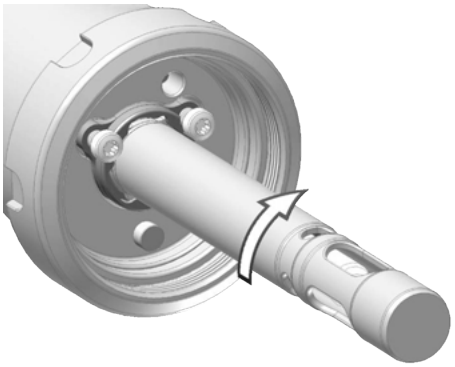
Installing the Immersion Tube



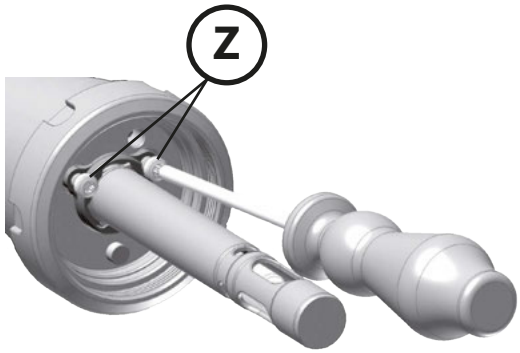
1) Push the O-ring **(D)** (sensor gasket) onto the sensor **(E)** as shown.
   Note: Make sure that there is no further O-ring in the immersion tube **(T)** (installed by mistake). (For O-ring dimensions, see page 51 "Sealing Kits for Maintenance and Servicing")
2) Loosen the two screws **(Z)** by approx. 4 turns (do not detach them) if you have not done that when removing the immersion tube.



3) Push the immersion tube **(T)** in direction of the arrow and insert it in the bayonet coupling **(Y)**.



4) Press the tube firmly in place and turn it clockwise until the stop (approx. 60°).

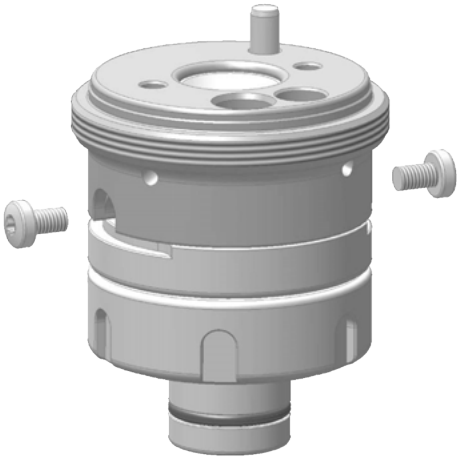


5) Fasten the two screws **(Z)** using a screw-driver (TX25).

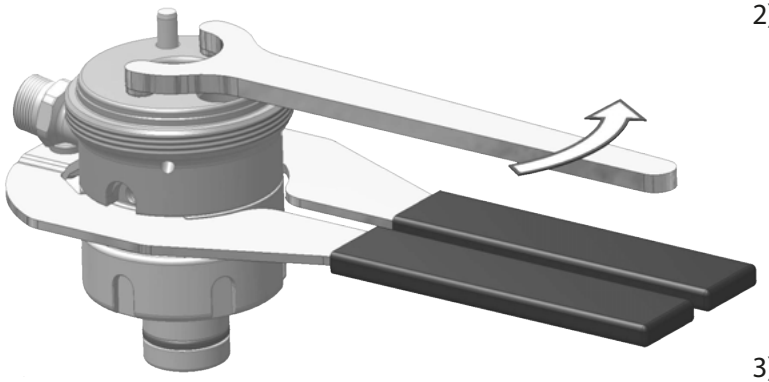
   Note:
   The bayonet coupling is locked by the form-fit screw heads. The immersion tube, however, remains movable to compensate for tolerances.

Removing and Installing the Calibration Chamber

To separate the calibration chamber, you require ZU 0754 or ZU 0740 Service Set (see Accessories). We recommend the ZU 0746 and ZU 0747 mounting aids for proper mounting of the gaskets and scraper rings.



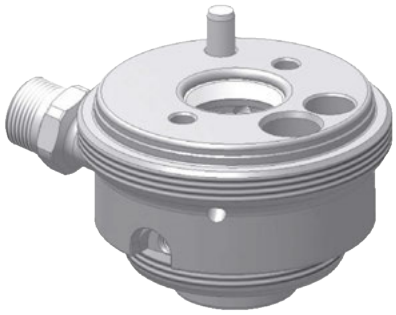
1) Remove the screws (screwdriver TX25).



2) Position a plier and loosen the thread of the split calibration chamber using a face pin spanner wrench.

3) Completely screw off the split calibration chamber. Now, the gaskets are accessible and can be checked and replaced if required. Use the ZU 0746 and ZU 0747 mounting aids for mounting the gaskets and scraper rings.

How to handle the mounting aids is described in the respective user manual.

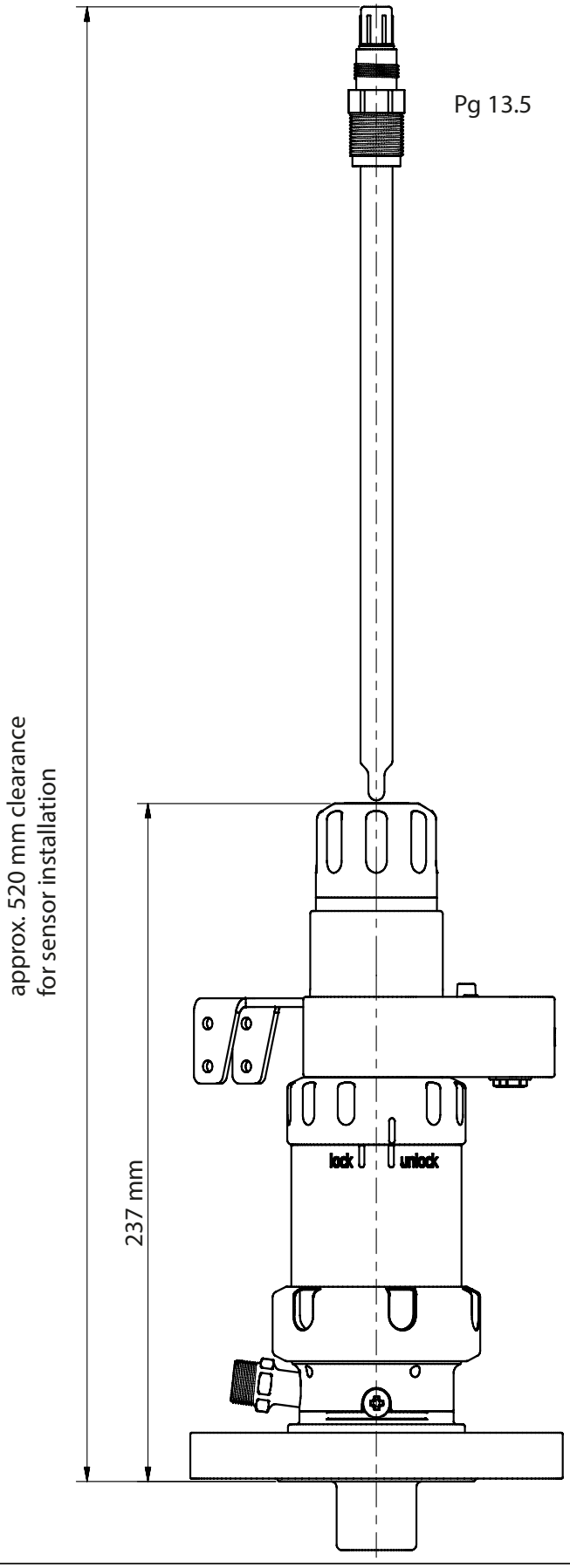


4) To re-install the split calibration chamber, screw the parts together using plier and face pin spanner wrench and secure them with screws.

Note:
The calibration chamber parts must be firmly screwed together (until the stop is reached) before it can be secured with the two screws.

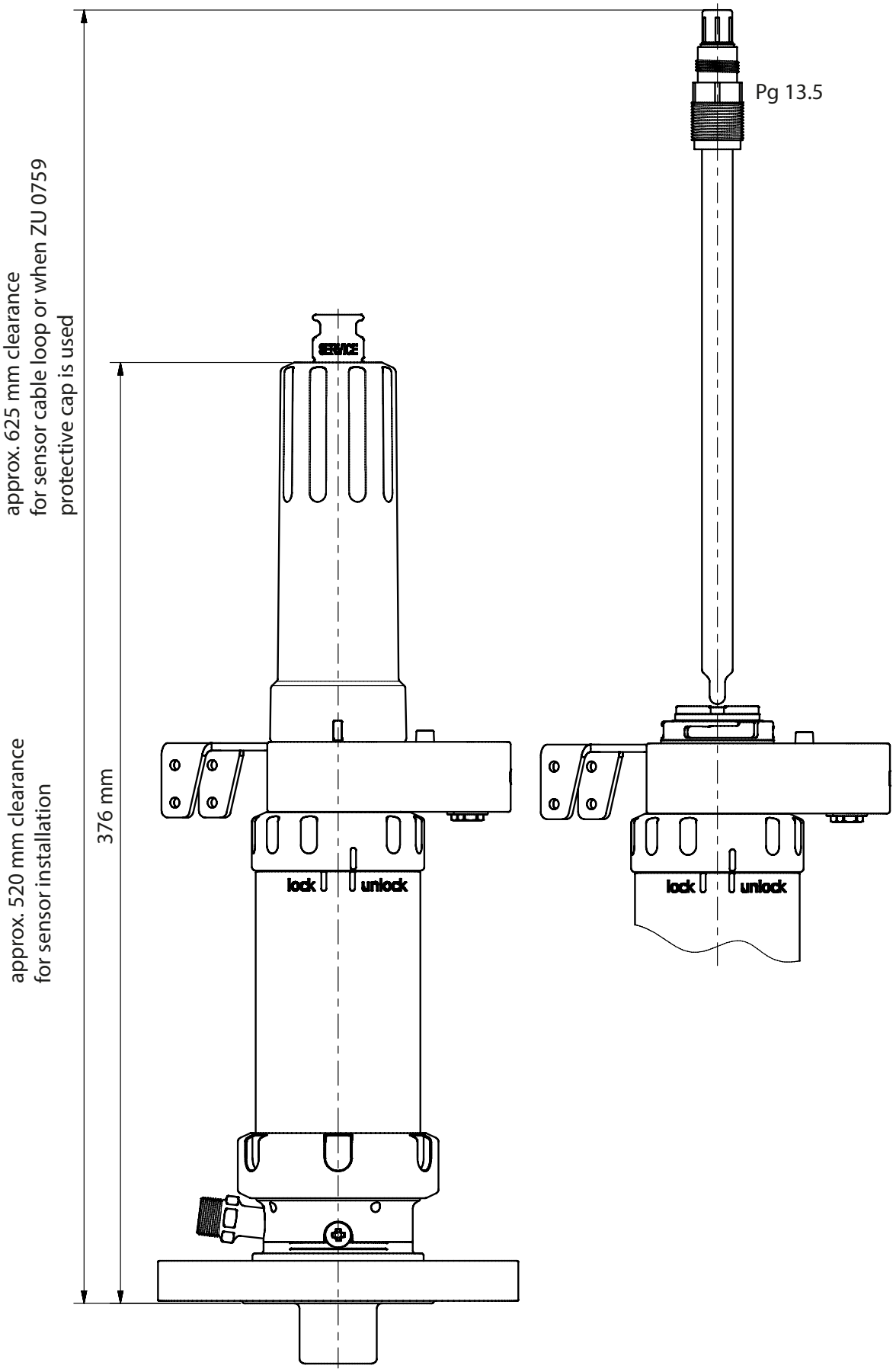
Installation Dimensions

WA 130 short immersion depth for sensors with gel electrolyte



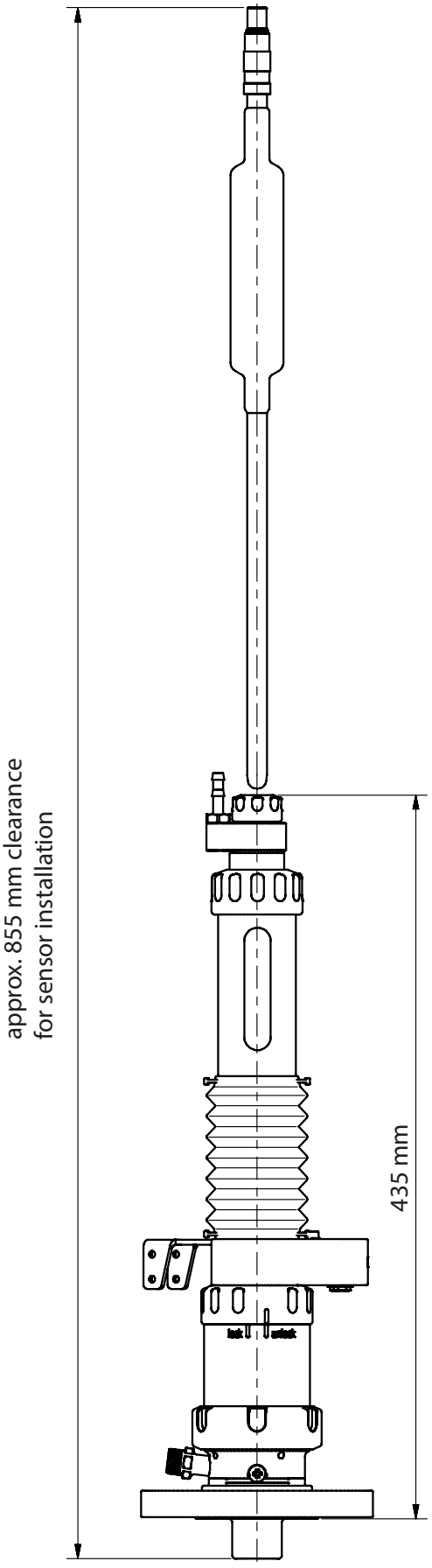
Installation Dimensions

WA 130 long immersion depth for sensors with gel electrolyte



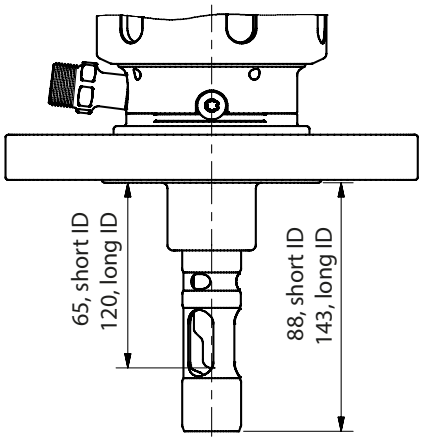
Installation Dimensions

WA 130 for sensors with liquid electrolyte

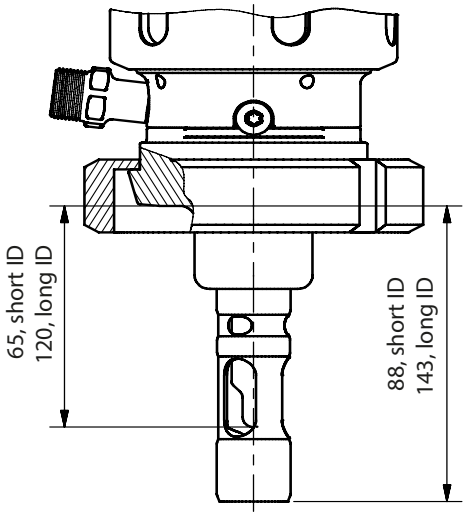


Immersion Depths

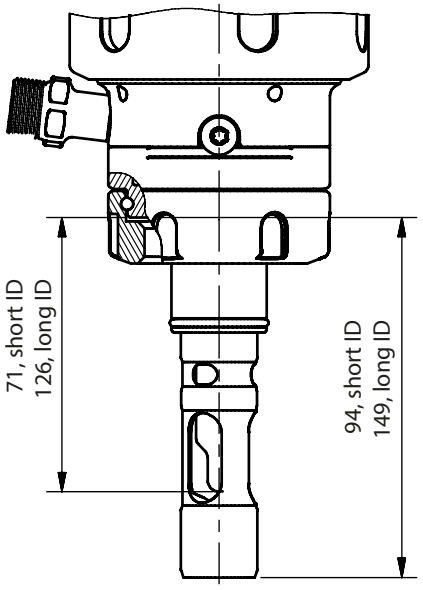
SensoGate® WA 130



Process Adaptation
DIN flange DN32 ... DN100
ANSI 316, 1½“ ... 3“
short and long immersion depth (ID)



Process Adaptation
Dairy pipe, DIN 11851, DN50 ... DN100
short and long immersion depth (ID)

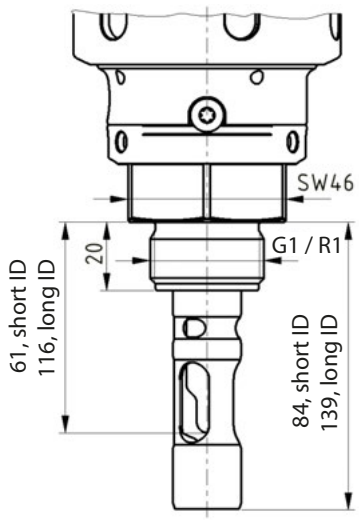


Process Adaptation
Ingold socket, 25 mm
short and long immersion depth (ID)

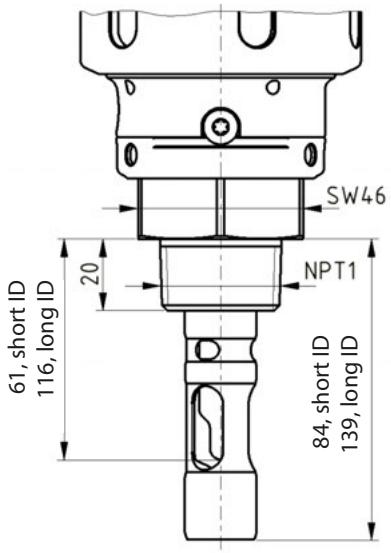
All dimensions in mm

Immersion Depths

SensoGate® WA 130



Process Adaptation
G1 external, R1
short and long immersion depth (ID)



Process Adaptation
NPT1 external
short and long immersion depth (ID)

All dimensions in mm

Specifications

SensoGate® WA 130

Permissible process pressure and temperature during movement	
Process adaptation 1.457 / Hastelloy	10 bars (at 0 ... 140 °C)
Process adaptation PEEK HD	10 bars (at 0 ... 140 °C)
Process adaptation PVDF HD	10 bars (0 to 120 °C) 6 bars (140°C) 30 min
Process adaptation PEEK / PVDF	6 bars (0 to 40 °C) falling linearly to 2 bar (120 °C)
Process adaptation PP	6 bars (5 to 30 °C) falling linearly to 1 bar (80 °C)
Process adaptation titanium grade 2	10 bars (at 0 ... 140°C)
Permissible process pressure and temperature, statically in SERVICE position	16 bars (at 0 … 40°C) PP 10 bars (at 5 … 20°C)
Ambient temperature	-10 ... 70 °C
Ingress protection	IP 66
Housing material	Stainless steel A2 / PP
Permissible pressure for probe control	4 ... 7 bars
Quality of compressed air	
Standard	acc. to ISO 8573-1:2001
Quality class	3.3.3 or 3.4.3
Solid contaminants	3 (max. 5µm, max. 5 mg/m3)
Water content for temperatures ≥ 15 °C	Class 4, pressure dew point 3 °C or below
Water content for temperatures 5 ... 15°C	Class 3, pressure dew point -20 °C or below
Oil content	Class 3 (max. 1 mg/m3)
Sensors	
with gel electrolyte	Ø12 mm, length 225 mm with temp detector, Pg 13.5 thread
with liquid electrolyte	Ø12 mm, length 250 mm with temp detector
Process adaptations	
Flanges, DIN EN 1092-1	DN32 to DN100
Flanges, ANSI B 16.5	1½“ to 3“
Dairy pipe, DIN 11851	DN50 to DN100
Ingold socket, 25 mm	25 mm
G2¼“	for Knick ARF210/30X
Connections	
Outlet	3 m EPDM hose, NW 8 mm
for pressurized sensors	Hose connection NW 6 mm, pressure in sensor chamber 0.5 … 1 bar above process pressure (max. 7 bars)
for compressed air (control air for retractable fitting)	for Unical multiplug
Immersion depths / Installation dimensions	See dimension drawings
Process-wetted materials	See order code

Maintenance Intervals

SensoGate® WA 130

As a result of highly variable process conditions (pressure, temperature, chemically aggressive media etc.), general information on necessary maintenance intervals is difficult to provide. If proven experience from similar points of measurement with regard to materials used and their resistance unter process conditions is available, the maintenance intervals can be adjusted by the customer. If previous experience is positive, parts of the first inspection may be omitted.

The following maintenance intervals are generally recommended:

Maintenance interval*	**Operations required**
First inspection after a few weeks	Move the probe to the SERVICE position and observe the outlet. If the sensor lock-gate is not tight, process fluid will leak from the outlet hose. Observe the leakage bores (located directly below the coupling nut, see "Build-up of the Sensor Lock-Gate" on page 11). When there are deposits on the leakage bores or compressed air is escaping, there may be a leak in the calibration chamber or the pneumatic system.
After 6 – 12 months (after successful first inspection and suitability of all materials used, this time period may be extended.)	Repeat the measures of the first inspection. When there are deposits on the leakage bores or compressed air is escaping, replace the process-wetted (dynamically stressed) gaskets.
After 10,000 – 20,000 probe travels	You should replace the process-wetted (dynamically stressed) gaskets.
After approx. 2 years	Particularly if you use chemically aggressive cleaning agents, you should check the rinse-wetted gaskets and replace them if required.
After approx. 5 years	Servicing the pneumatic drive unit and relubricating the gaskets.

*) These maintenance intervals are rough recommendations.
The actual intervals depend on the application of the sensor lock-gate.

Material Properties of the Available Immersion Tubes and Calibration Chambers

	Mechanical strength	Temperature resistance	Resistance to acids	Resistance to alkaline solutions	Resistance to salt solutions	Resistance to cleaning agents or solvents
Stainless steel, material no. 1.4571	1	1	3 1)	2	3	2
Hastelloy C-22, material no. 2.4602	1	1	2	1	1	1
PEEK (carbon-fiber reinforced)	1	1	2 2)	1	1	2
PVDF (carbon-fiber reinforced)	2	2	2 3)	2	1	2
PP (carbon-fiber reinforced)	3	4 5)	3 4)	3	2	2
Titanium grade 2, material no. 3.7035	1	1	2	1	1	1

1 = very good 5 = unsuitable

1) not resistant to hydrochloric or sulfuric acid
2) not resistant to strongly oxidizing media (conc. sulfuric acid, nitric acid or hydrofluoric acid)
3) not resistant to ketones, amines, fuming sulfuric and nitric acid
4) not resistant to strongly oxidizing media (e.g. nitric acid, chromic acid or halogens)
5) max. 80°C

The specified values are guidance value for general information. Concentrations, temperatures, mechanical influences and load duration influence the material resistance. Therefore we offer no guarantee for the specified values.
For new applications, you should carry out a pilot test. This is particularly important for substance mixtures.

Lubricants, O-Rings

SensoGate® WA 130

For fittings used in the chemical industry, the lubricant Syntheso Glep1 (silicone-free) is applied.
For fittings used in the pharmaceutical / food industry (when FDA conformity is required), the lubricant Beruglide L (silicone-free) is applied (registered according to NSF-H1).

On request, the lubricant Paraliq GTE 703 can be applied (excellent lubricating properties also at increased temperatures and for a large number of travel movements).
This lubricant contains silicone and is only used as special application on specific request.

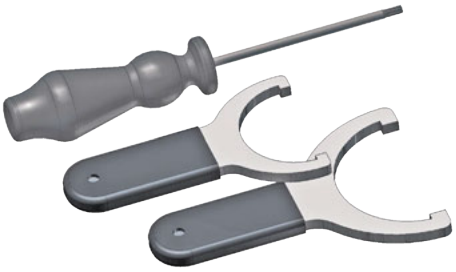
Application	Pharmaceutics / Food		Chemistry / Wastewater
Lubricant	Beruglide L (silicone-free) FDA-conforming NSF-H1-registered	Paraliq GTE 703 (containing silicone) FDA-conforming (USDA H1)	Syntheso Glep 1 (silicone-free)
Materials of elastomeric gaskets			
FKM	X	X	X
FFKM	X	X	X
EPDM	X	X	X

Accessories / Spare Parts

Overview for SensoGate® WA 130

Accessories	Order No.
Service set, basic	ZU 0680
Service set, maintenance, repair, retrofit	ZU 0740
Service set, calibration chamber	ZU 0754
Sensor mounting wrench, 19 mm	ZU 0647
Mounting aid for 20x2.5 O-rings	ZU 0747
Mounting aid for scraper ring	ZU 0746
Protective cap (for gel electrolyte only)	ZU 0759
Air supply for pressurized sensors, 0.5 - 4 bars	ZU 0670/1
Air supply for pressurized sensors, 1 - 7 bars	ZU 0670/2
Hose, 20 m (extension for ZU 0670)	ZU 0713
Retainer clamp for Ingold socket, 25 mm	ZU 0818
Sealing washer, PEEK/FFKM DN80	ZU 0755
Sealing washer, PEEK/FFKM DN100	ZU 0756
Sealing washer, PVDF/FFKM DN80	ZU 0757
Sealing washer, PVDF/FFKM DN100	ZU 0758
Safety weld-in socket, straight	ZU 0717
Safety weld-in socket, beveled 15°	ZU 0718
Safety weld-in socket, straight, adapted for DN50	ZU 0717/DN50
Safety weld-in socket, straight, adapted for DN65	ZU 0717/DN65
Safety weld-in socket, straight, adapted for DN80	ZU 0717/DN80
Safety weld-in socket, straight, adapted for DN100	ZU 0717/DN100
Safety weld-in socket, 15°, adapted for DN50	ZU 0718/DN50
Safety weld-in socket, 15°, adapted for DN65	ZU 0718/DN65
Safety weld-in socket, 15°, adapted for DN80	ZU 0718/DN80
Safety weld-in socket, 15°, adapted for DN100	ZU 0718/DN100
Adapter for free hose connection, with electrical limit switches, PP housing	ZU 0733
Adapter for free hose connection, without electrical limit switches, PP housing	ZU 0734
Adapter for free hose connection, with electrical limit switches, PEEK housing	ZU 0742
Locking clamp for sensor lock-gates G1, R1, NPT1	ZU 0877
Outlet hose for retractable fittings with electro-pneumatic control	ZU 0889
Adapter for Ingold Safety Socket, 48 mm	YF-ZU 1459/1 ... 2

Spare Parts	Order No.
Scraper ring, reinforced, PTFE/PEEK	ZU 0760
Bellows (for liquid-electrolyte sensors)	ZU 0739
Immersion tube, short, 1.4571	ZU 0722
Immersion tube, long, 1.4571	ZU 0723
Immersion tube, short, Hastelloy C-22	ZU 0853
Immersion tube, long, Hastelloy C-22	ZU 0854
Immersion tube, short, PEEK	ZU 0724
Immersion tube, long, PEEK	ZU 0725
Immersion tube, short, PVDF	ZU 0726
Immersion tube, long, PVDF	ZU 0727
Immersion tube, short, titanium	ZU 0893
Immersion tube, long, titanium	ZU 0894



ZU 0680
SensoGate® Service Set, Basic

These tools are suitable for minor maintenance operations. They help separating the drive unit from the process unit, allow mounting an Ingold socket and replacing the immersion tube including sensor gasket maintenance.

ZU 0754
SensoGate® Calibration Chamber Service Set

These tools are suitable for maintenance operations at the calibration chamber and its gaskets. They allow easy separation of the split calibration chamber.

ZU 0740
SensoGate® Service Set
Maintenance/Repair/Retrofit

This set provides all tools required for comprehensive maintenance, repair or retrofitting of the sensor lock-gate. With this set, you can completely dismantle every SensoGate®.

ZU 0647
Sensor Mounting Wrench

Required for safely screwing in the sensor without overloading the Pg 13.5 plastic thread of the sensor head by an excessive torque (caused by an open-end wrench).

ZU 0747
Mounting Aid for 20 x 2.5 O-Rings

The ZU 0747 mounting aid is used for easy and correct fitting of the 20x2.5 O-rings in the calibration chamber of the Sensogate®.

ZU 0746
Mounting Aid for Scraper Ring

The ZU 0746 mounting aid is used for easy and correct fitting of the scraper rings in the calibration chamber of the Sensogate®.

ZU 0670/1
Air Supply for Pressurized Sensors
0.5 – 4 bars

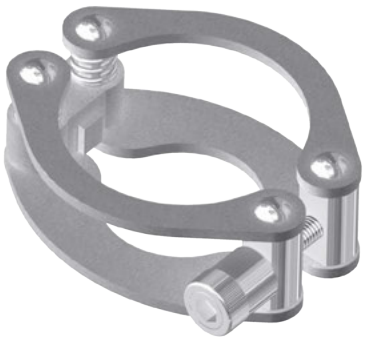
ZU 0670/2
Air Supply for Pressurized Sensors
1 – 7 bars

This module maintains the defined overpressure in the pressure chamber of the sensor.

ZU 0713
Hose, 20 m (extension for ZU 0670)

ZU 0755 sealing washer, PEEK / FFKM DN80
ZU 0756 sealing washer, PEEK / FFKM DN100
ZU 0757 sealing washer, PVDF / FFKM DN80
ZU 0758 sealing washer, PVDF / FFKM DN100

These sealing washers are required for process adaptations made of plastic material with DIN flanges and nominal widths of DN80 or DN100.



ZU 0818
Retainer clamp for 25mm socket (Ingold)

The ZU 0818 retainer clamp is only suitable for Ingold sockets. It prevents unintended loosening or twisting of the coupling nut or the fitting from the tank port, thus avoiding possible hazards. Even if the coupling nut is not properly tightened (due to incorrect mounting, vibrations, or the like), it cannot loosen any further (increased safety).

ZU 0759
Protective Cap

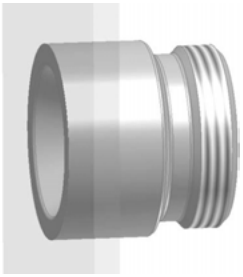
The ZU0759 protective cap protects against intrusion of liquids or particles into the area of the electrical connector of a sensor (e.g. due to weather exposure during outdoor use).

Caution! Can only be used with fittings for gel-electrolyte sensors.

Safety Weld-in Socket, Straight
adapted to DN50 **ZU 0717/DN50**
adapted to DN65 **ZU 0717/DN65**
adapted to DN80 **ZU 0717/DN80**
adapted to DN100 **ZU 0717/DN100**

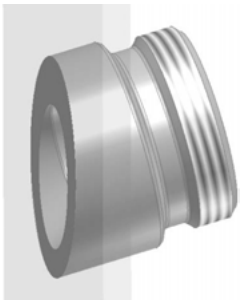
Safety Weld-in Socket, Beveled 15°
adapted to DN50 **ZU 0718/DN50**
adapted to DN65 **ZU 0718/DN65**
adapted to DN80 **ZU 0718/DN80**
adapted to DN100 **ZU 0718/DN100**

The weld-in sockets are suitable for mounting fittings with Ingold socket (dia. 25 mm, G1 ¼).
The contour-optimized straight and beveled (15°) weld-in sockets are adapted to the nominal width of the pipeline (outer diameter). This minimizes the gap widths during welding.
The sockets are designed in a way that the thicknesses of socket and pipe wall are similar at the welding point. This allows welding with low energy input and therefore reduced warping.
Thanks to the special contour and the weld zone being separated from the mating hole (dia. 25 H7), there should be no need to rework the parts after welding, provided that the welding has been done properly. If required, check the hole using a plug gauge, dia. 25 H7.



ZU 0717
Safety Weld-in Socket, Straight

The safety weld-in sockets are suitable for mounting fittings with Ingold socket (dia. 25 mm, G1 ¼) to plane tank walls, straight version.



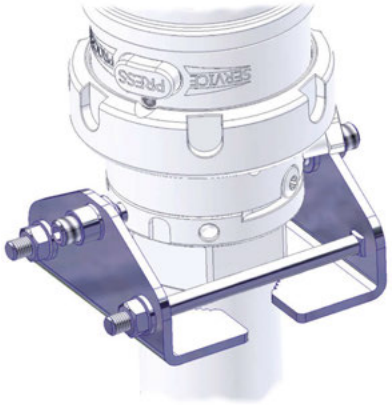
ZU 0718
Safety Weld-in Socket, Beveled 15°

The safety weld-in sockets are suitable for mounting fittings with Ingold socket (dia. 25 mm, G1 ¼) to plane tank walls, 15° beveled version.

ZU 0742
Adapter for Free Hose Connection with electrical limit switches, PEEK housing
This adapter is used for operating the SensoGate WA130 via multiplug without Unical 9000(X) probe controller and the corresponding media connection.

ZU 0733
Adapter for Free Hose Connection with electrical limit switches, PP housing
This adapter is used for operating the SensoGate WA130 via multiplug without Unical 9000(X) probe controller and the corresponding media connection.

ZU 0734
Adapter for Free Hose Connection without electrical limit switches, PP housing
This adapter is used for operating the SensoGate WA130 via multiplug without Unical 9000(X) probe controller and the corresponding media connection.



ZU 0877
Locking Clamp for SensoGate® Sensor Lock-Gate with Process Adaptation G1, R1, NPT1

The locking clamp prevents mounted sensor lock-gates from twisting. It is suitable for installed WA130 sensor lock-gates with G1 process adaptation.
It can be used with threaded couplings with a minimum length of 10 mm and an outer diameter of 39 to 48 mm.

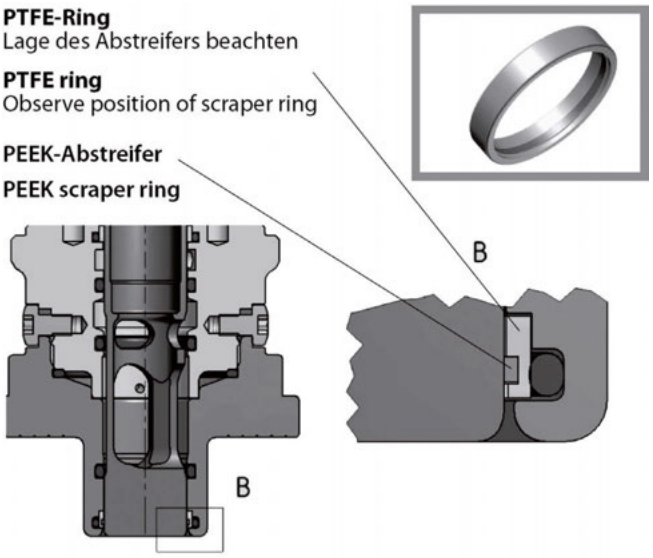
ZU 0889
Outlet Hose for Retractable Fittings

The outlet hose serves for transporting the rinse or calibration solutions from the calibration chamber of the SensoGate® WA130 sensor lock-gate when it is operated by a Unical 9000® or Uniclean 900® electro-pneumatic controller.

YF-ZU1459/1… /2

Adapter for Ingold Safety Socket, 48 mm

The YF-ZU1459 adapter for Ingold safety sockets, 48 mm allows installing SensoGate® sensor lock-gate models WA130 , WA130H, WA131, WA131H, WA131M and WA131MH made by Knick into Ingold weld-in sockets made by Roche.



ZU 0760 Scraper Ring, Reinforced, PTFE/PEEK

The reinforced scraper ring (with PEEK edge) is recommended for adhering, sticky media. ZU 0746 is required as mounting aid.

ZU 0739
Bellows

The bellows (for liquid-electrolyte sensors only) protects the fitting beneath the sensor pressure chamber against pollution and wear.

Immersion Tubes, Metal

Immersion tube, short

Material:	1.4571	ZU 0722
	Hastelloy	ZU 0853
	Titanium	ZU 0893

Immersion tube, long

Material:	1.4571	ZU 0723
	Hastelloy	ZU 0854
	Titanium	ZU 0894

Immersion Tubes, Plastic

Immersion tube, short

Material:	PP (reinforced)	ZU 0825
	PEEK	ZU 0724
	PVDF	ZU 0726

Immersion tube, long

Material:	PP (reinforced)	ZU 0826
	PEEK	ZU 0725
	PVDF	ZU 0727

Sealing Kits for Maintenance and Servicing

SensoGate® WA 130

The sealing kits are available in different materials.
The smaller sealing kits (“Set X/1”) only contain gaskets for direct contact with the process.
The extended sealing kits (“Set X/2”) also include gaskets for contact with the rinse medium.
Caution! Take account of the process adaptations.
Special sealing kits are available for Ingold sockets.
The sealing kits come with detailed illustrations for installation.
The new gaskets must be lubricated with the included lubricant.

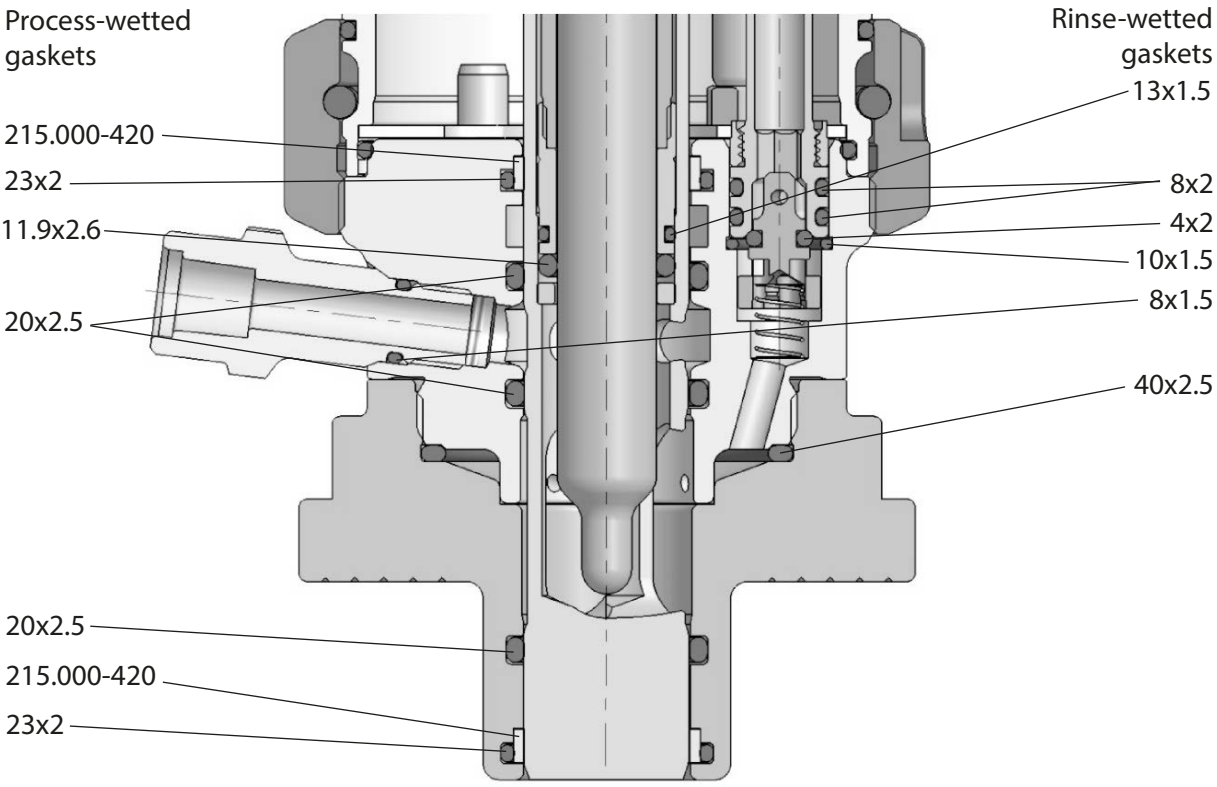
The following sealing kits are available:

Gaskets			**Order No.**
Flange or dairy pipe process connection	Set A/1	Process-wetted gasket material: FKM	ZU 0689/1
	Set A/2	Process-wetted gasket material: FKM, wetted by rinse medium: FKM	ZU 0689/2
	Set B/1	Process-wetted gasket material: EPDM	ZU 0690/1
	Set B/2	Process-wetted gasket material: EPDM, wetted by rinse medium: EPDM	ZU 0690/2
	Set C/1	Process-wetted gasket material: FFKM	ZU 0691/1
	Set C/2	Process-wetted gasket material: FFKM, wetted by rinse medium: FKM	ZU 0691/2
	Set D/1	Process-wetted gasket material: FFKM	ZU 0691/1
	Set D/2	Process-wetted gasket material: FFKM, wetted by rinse medium: EPDM	ZU 0827
	Set E/1	Process-wetted gasket material: EPDM FDA	ZU 0692/1
	Set E/2	Process-wetted gasket material: EPDM FDA, wetted by rinse medium: EPDM FDA	ZU 0692/2
	Set K/1	Process-wetted gasket material: FFKM	ZU 0691/1
	Set K/2	Process-wetted gasket material: FFKM, wetted by rinse medium: FFKM	ZU 0730
Ingold socket process connection	Set A/1	Process-wetted gasket material: FKM	ZU 0693/1
	Set A/2	Process-wetted gasket material: FKM, wetted by rinse medium: FKM	ZU 0693/2
	Set B/1	Process-wetted gasket material: EPDM	ZU 0694/1
	Set B/2	Process-wetted gasket material: EPDM, wetted by rinse medium: EPDM	ZU 0694/2
	Set C/1	Process-wetted gasket material: FFKM	ZU 0695/1
	Set C/2	Process-wetted gasket material: FFKM, wetted by rinse medium: FKM	ZU 0695/2
	Set D/1	Process-wetted gasket material: FFKM	ZU 0695/1
	Set D/2	Process-wetted gasket material: FFKM, wetted by rinse medium: EPDM	ZU 0828
	Set E/1	Process-wetted gasket material: EPDM FDA	ZU 0696/1
	Set E/2	Process-wetted gasket material: EPDM FDA, wetted by rinse medium: EPDM FDA	ZU 0696/2
	Set K/1	Process-wetted gasket material: FFKM	ZU 0695/1
	Set K/2	Process-wetted gasket material: FFKM, wetted by rinse medium: FFKM	ZU 0731

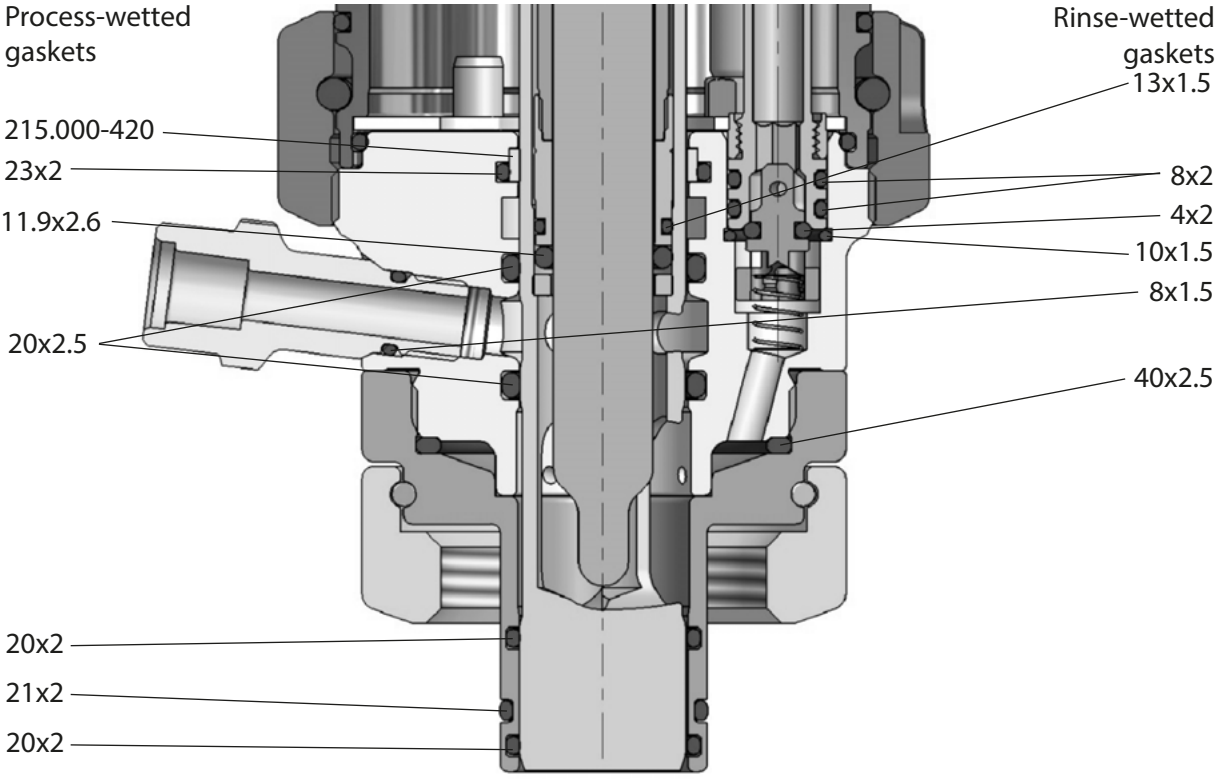
Sealing Kits for Maintenance and Servicing

SensoGate® WA 130

Flange or Dairy Pipe Process Adaptation



Ingold Socket Process Adaptation



Declaration of Contamination

SensoGate® WA 130

Knick

Declaration on the potential hazards presented by the enclosed devices/sensors

For acceptance and execution of your order we require this completed declaration form.
Please enclose it with the shipping documents.

Customer data

Company name: _____

_____

Address: _____

_____

Contact person: _____ Phone: _____

Device/sensor specifications

Sensor: _____
(Catalog number)

Serial no. _____

Your order number: _____

Knick order confirmation no.: _____

Included accessories: _____

Reason for return of product: _____

Warning notices as to the medium in which the device/sensor has been used (please tick where applicable):

☐	☐	☐	☐	☐
harmless	harmful/ irritant	toxic / corrosive	oxidizing / explosive	infectious / radioactive

Cleaning measures taken before shipment (cleaning methods and cleaning agents used):

1. _____ 2. _____

3. _____ 4. _____

I herewith declare that the shipped parts do not pose any health hazards for employees of Knick Elektronische Messgeräte GmbH & Co. KG. I further declare that I have answered the questions above truthfully and to the best of my knowledge. I understand that I may be held liable for any damage resulting from false or incorrect information.

Name: _____ Company: _____

Date: _____ Signature: _____

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