The Art of Measuring. Knick

User Manual
English

Ceramat WA 154
Sensor Lock-Gate

Latest Product Information: www.knick.de

Safety Information

⚠ WARNING

Always make sure that the sensor lock-gate cannot be activated by other persons during servicing or installation (eg, cleaning or replacing the sensor).
During operation the drive unit of the sensor lock-gate is rotating rather quickly by 140°.
There is a risk of injury!

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.

NOTICE

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 sensor lock-gate.

Please note:
Supplementary information is provided in the Ceramat Maintenance Instructions (Maintenance / Spare Parts / Accessories)

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 39), for the health and safety of our service personnel.

Trademarks
The following trademarks are used in this manual without further marking:
Ceramat®, Protos®, Unical®, Uniclean®
are registered trademarks of Knick Elektronische Messgeräte GmbH & Co. KG, Germany

Operation in Explosive Atmospheres

The Ceramat WA154-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 Ceramat WA154-X with care and apply suitable measures, e.g., use covers and pads.

The metallic parts of the Ceramat WA154-X must be connected to the plant's equipotential bonding using the metallic process connection or 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 Ceramat WA154-X. The operating company must assess and document this deviation.

Mechanically generated sparks

Single impacts on metal parts or collisions between metal parts of the Ceramat WA154-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 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 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.

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Intended Use

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The Ceramat pneumatic sensor lock-gate with ceramic sealing is used for installing a sensor for measuring process variables in liquid media. The sensor can be cleaned, calibrated, or replaced under process conditions (pressure and temperature).
Since the pneumatic drive unit and the process unit with the ceramic sensor lock-gate are separate modules, the drive unit can be removed and replaced under process conditions.

The sensor lock-gate is suitable for sensors with an outer diameter of 12 mm, for sensors:
- **with solid electrolyte, length 425 mm, sensor head with PG 13.5**
- **with liquid electrolyte, length 450 mm**

- **for optical sensors with a body diameter of 12 mm or 12.7 mm (1/2“)**
  (For installing an optical sensor, you require a special adapter which is listed in the Product Coding under “Special version”. Information on design and use of the suitable adapter is provided in a supplementary datasheet.)

The Ceramat 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)
- removing or replacing the sensor after separation from the process (in SERVICE position)

The Ceramat sensor lock-gate has been developed and manufactured in compliance with the applicable European directives and standards.
Compliance with the European directives and standards is confirmed by the EC Declaration of Conformity.
Compliance with the European Harmonized Standards for use in hazardous locations is confirmed by the EC-Type-Examination Certificate.
To ensure smooth performance of the measuring points with the Ceramat, a number of important operating and maintenance parameters must be complied with (see Maintenance Instructions).
There is no particular direct hazard caused by the operation of the device in the specified environment.

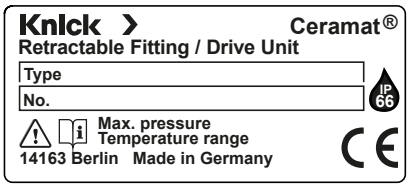
⚠ CAUTION

Safe use
- If you are not sure whether the sensor lock-gate can be safely used for your intended application, please contact the manufacturer.
- Take account of the influences of humidity, ambient temperature, chemicals, and corrosion.
- To ensure safe use of the equipment, you must follow the instructions given in the manual and observe the specified temperature and pressure ranges.

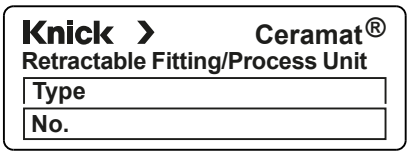
Rating Plates

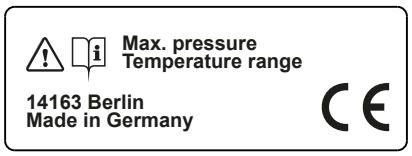
Ceramat WA 15x-N

Drive



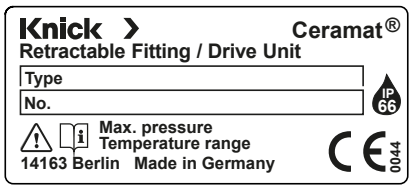
Process

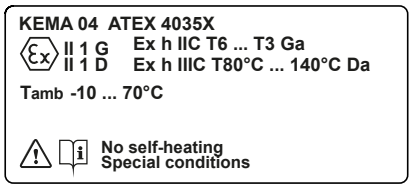




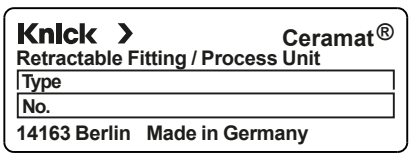
Ceramat WA 15x-X

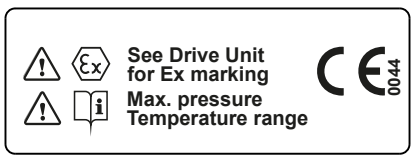
Drive





Process





Package Contents

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Check the shipment for transport damage and completeness.

The package should contain:

- Sensor lock-gate
- Documentation
- Test certificates

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Explosion protection	ATEX Zone 0	X
	Without	N
Sensor	Sensor, Ø 12 mm, with PG 13.5	0
	pH sensor, Ø 12 mm, pressurized	1
	Optical sensor, Ø 1/2" (12.7 mm)	2
	Optical sensor, Ø 12 mm	3
Material of gaskets	FKM	A
	EPDM	B
	EPDM - FDA	E
	FKM - FDA	F
	FFKM - FDA	H
	FFKM	K
Material of sensor protection sleeve	*Hastelloy C22*	B
	1.4404	H
	Titanium	T
Material of sensor socket	Hastelloy C 22, without protection	B 0
	Hastelloy C 22, short protection	B 1
	1.4404, without protection	H 0
	1.4404, short protection	H 1
	1.4404, long protection	H 2
	1.4404, full protection	H 3
	PEEK, without protection	E 0
	Titanium, without protection	T 0
	Titanium, short protection	T 1
Scraper for sensor socket	Without	0
	PEEK, natural	1
Immersion depth	Special immersion depth 26 - 299 mm (increase in 1 mm steps)	0 0 0
	Immersion depth 150 - 300 mm (increase in 10 mm steps)	0 0 0
Process-wetted material	*Hastelloy C22*	B
	1.4404	H
	Titanium	T
Process adaptation	Flange, loose, 1.4571, PN10/16, DN 50	B 1
	Flange, loose, 1.4571, PN10/16, DN 65	B 2
	Flange, loose, 1.4571, PN10/16, DN 80	B 3
	Flange, loose, 1.4571, PN10/16, DN 100	B 4
	Flange, loose, 1.4571, PN10/16, DN 125	B 5
	Flange, loose, 1.4571, PN10/16, DN 150	B 6
	Flange, loose, 1.4571, PN16, DN 200	B 7
	Flange, loose, 1.4571, PN 40, DN 50	E 1
	Flange, loose, 1.4571, PN 40, DN 65	E 2
	Flange, loose, 1.4571, PN 40, DN 80	E 3
	Flange, loose, 1.4571, PN 40, DN 100	E 4
	Flange, loose, 1.4571, PN 40, DN 125	E 5
	Flange, loose, 1.4571, PN 40, DN 150	E 6
	Flange, loose, 1.4571, PN 40, DN 200	E 7

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	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, loose, ANSI 316,150 lbs, 2"	D	1		
	Flange, loose, ANSI 316, 150 lbs, 2 1/2"	D	2		
	Flange, loose, ANSI 316, 150 lbs, 3"	D	3		
	Flange, loose, ANSI 316, 150 lbs, 3.5"	D	4		
	Flange, loose, ANSI 316, 150 lbs, 4"	D	5		
	Flange, loose, ANSI 316, 150 lbs, 5"	D	6		
	Flange, loose, ANSI 316, 150 lbs, 6"	D	7		
	Flange, loose, ANSI 316, 300 lbs, 2"	P	1		
	Flange, loose, ANSI 316, 300 lbs, 2 1/2"	P	2		
	Flange, loose, ANSI 316, 300 lbs, 3"	P	3		
	Flange, loose, ANSI 316, 300 lbs, 3.5"	P	4		
	Flange, loose, ANSI 316, 300 lbs, 4"	P	5		
	Flange, loose, ANSI 316, 300 lbs, 5"	P	6		
	Flange, loose, ANSI 316, 300 lbs, 6"	P	7		
	Clamp 2"	J	2		
	BioControl, 1.4404, DN 65	L	2		
	Varivent, 1.4404, ≥ DN 50	V	1		
	Special flange, to customer requirements	S	A-Y		
Probe guard	Without			0	
	With, version 1			1	
Special version	Without				000
	Equipped with special grease (provided by customer)				1
	Sensor protection sleeve for optical sensor with Ø 1/2" (12.7 mm) for RAMAN probe, with additional anti-twist protection for the sensor cables, adapter, rotating, 1/2"/PG 13.5 (according to drawing)				7
	Sensor protection sleeve for optical sensor (Hellma) with Ø 1/2 mm, with additional anti-twist protection for the sensor cables, adapter, rotating, 12 mm/PG 13.5 (according to drawing)				B
	Customer-specific special datasheet				F

Entries shown in italics are special options, delivery time on request

10 Function Description

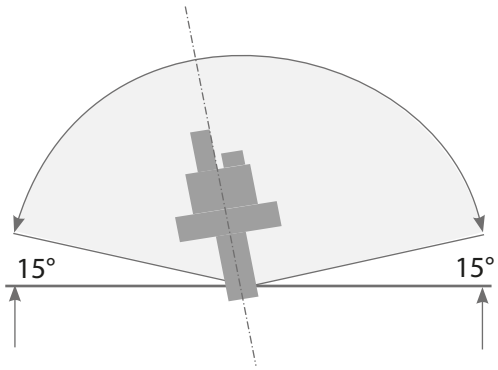
The pneumatically operated sensor lock-gate allows calibrating or adjusting the measuring system and cleaning the sensor in the running process. For that purpose, the sensor can be moved between two positions:

PROCESS position: The sensor is located in the process medium.
SERVICE position: The sensor is located in the calibration chamber.

In SERVICE position the measuring system can be calibrated or adjusted or the sensor can be cleaned.
Using compressed air, a control unit such as the Unical 9000 moves the sensor between SERVICE position and PROCESS position and leads different calibration and/or cleaning liquids to the sensor located in the calibration chamber.
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).
Since the pneumatic drive unit and the process unit with the ceramic sensor lock-gate are separate modules, the drive unit can be removed and replaced under process conditions.

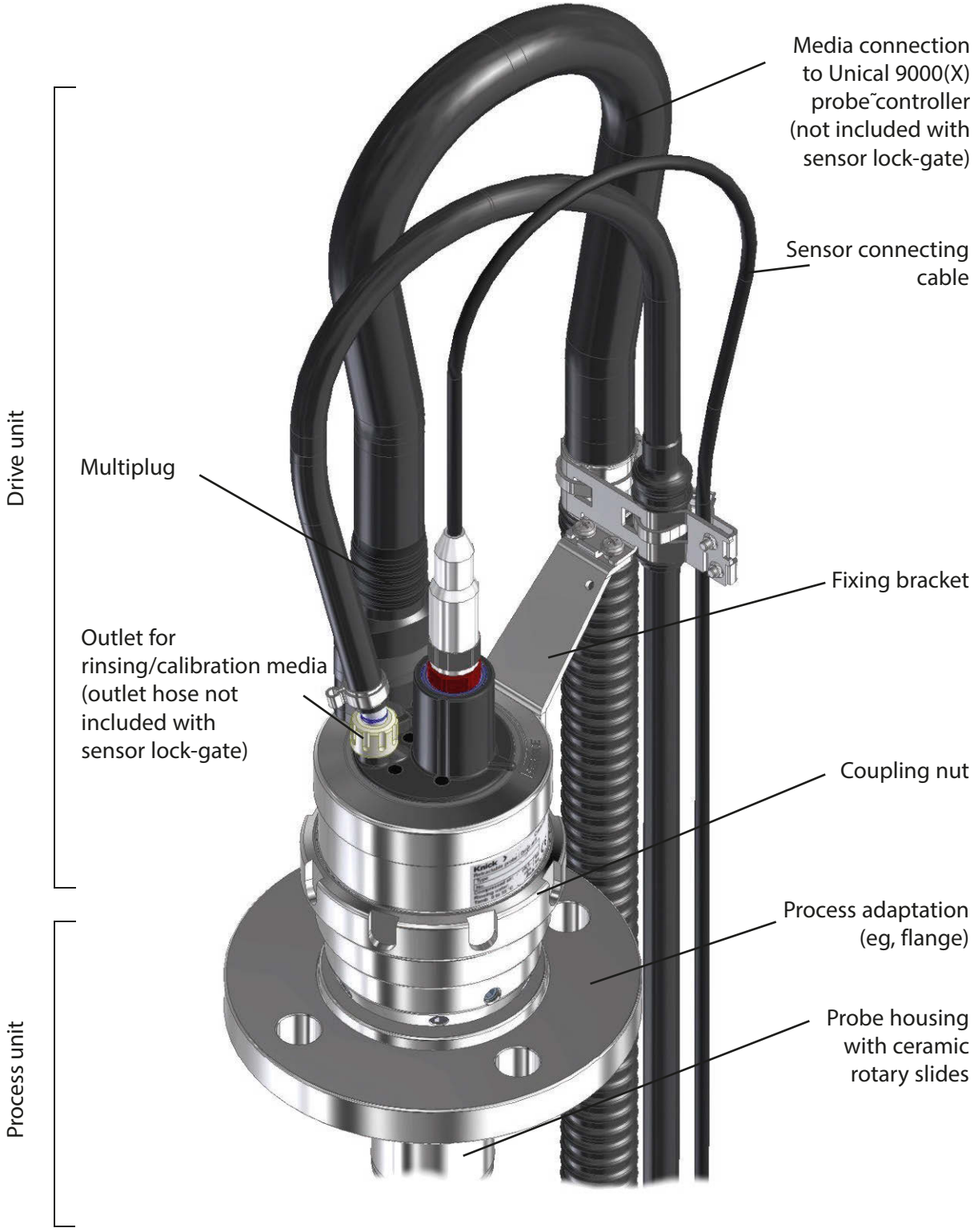
Mounting

- 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.



Composition of the Sensor Lock-Gate

The Ceramat sensor lock-gate consists of 2 main units: drive unit and process unit.
The **drive unit** performs the movements required to open and close the ceramic rotary slide and to move the sensor into and out of the process.
The **process unit** comprises the ceramic sensor lock-gate with calibration chamber in the probe housing as well as the process adaptation (eg,, flange or dairy-pipe screw joint). Drive unit and process unit can be separated by the operator even under process pressure when certain safety precautions are taken (see˜"Maintenance Work on the Drive Unit" on page˜24).



Drive Units

For sensors with
solid electrolyte

For sensors with
liquid electrolyte

Process Adadaption (Example)

Flange

For operation of the Ceramat, you must connect control air, rinsing or calibration media, and the electrical˜check-back signal for indicating the probe position.
There are two possible ways to do so.

When the Ceramat is operated with a Unical or Uniclean electro-pneumatic controller 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 (multiplug). This hose is referred to as media connection.
This media connection is installed on the Ceramat together with the outlet hose.

When you do not use a probe controller (Unical or Uniclean and Protos measuring system), you can connect the supply lines for control air, rinsing/calibration media and electrical check-back to the Ceramat with a free hose connection via the ZU 0631 standard-media interface.

Connection for operation with
Unical/Uniclean und Protos

Connection for operation with
ZU 0631 standard media interface

Installing the outlet hose

Do not install the outlet hose more than 1 meter below calibration chamber level (see figure 2).
Doing so raises the danger of air being sucked out of the calibration chamber due to the drop in pressure.
Leakage of the calibration chamber due to gravity alone is prevented by the loop in the outlet hose when the Ceramat is installed at an angle of up to 15° above the horizontal (see figure 1).

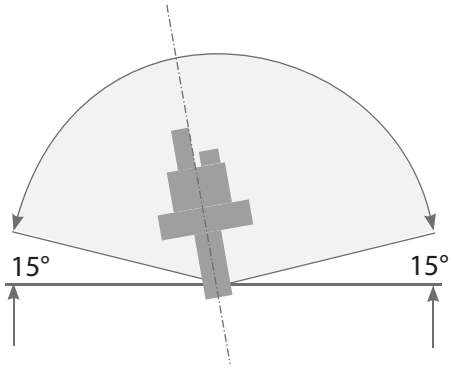


Fig. 1

With horizontal to upside-down installations, you must install an appropriate hose bend above the level of the calibration chamber to prevent leakage from the calibration chamber (see figure 2).

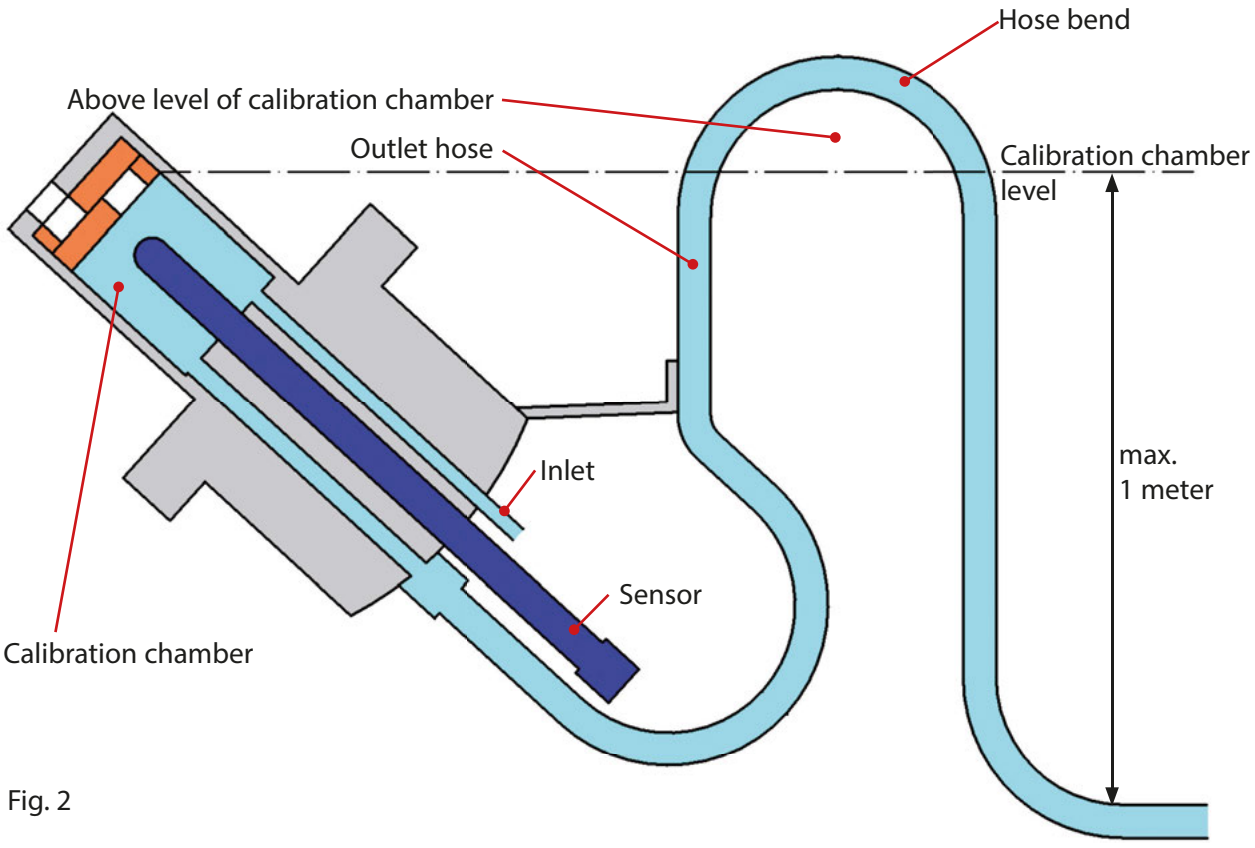
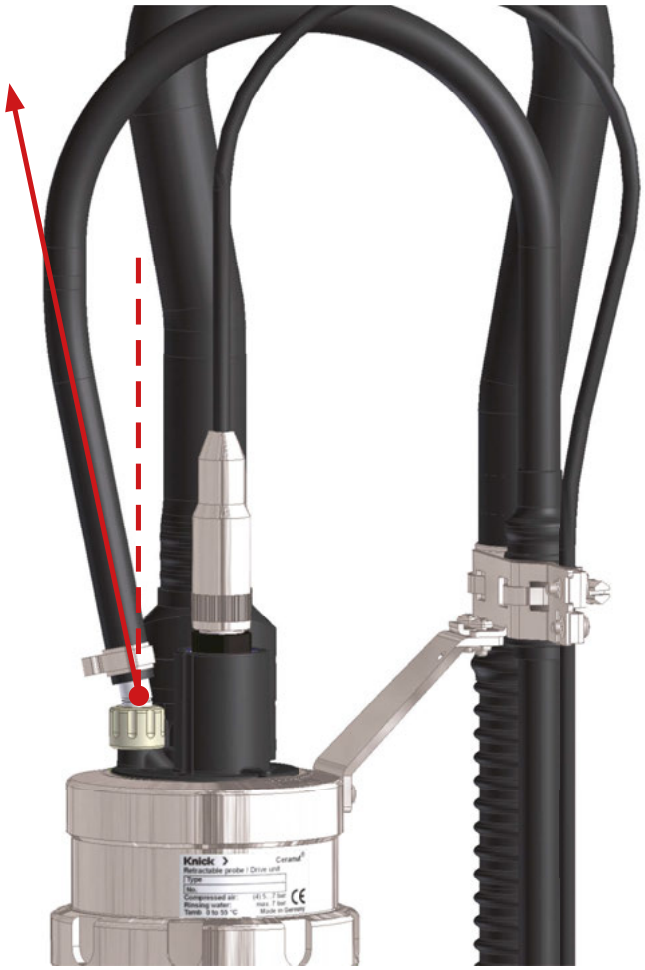
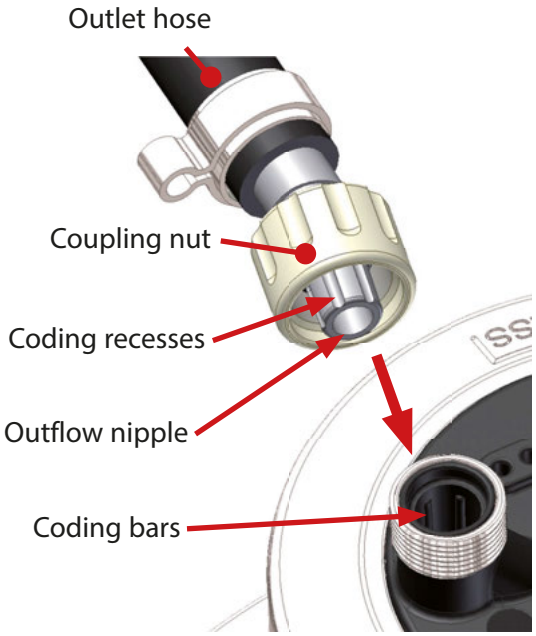


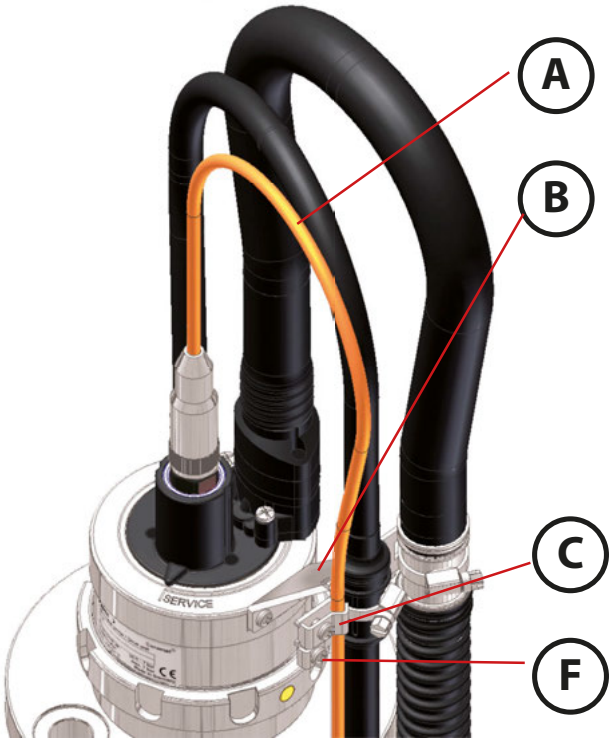
Fig. 2



Connecting the outlet hose
Turn the outflow nipple so that the outlet hose points outwards (see figure on the left). Before tightening the coupling nut, correctly align and insert the outflow nipple!

NOTICE
Check positioning of coding recesses and coding bars to lock the connection.

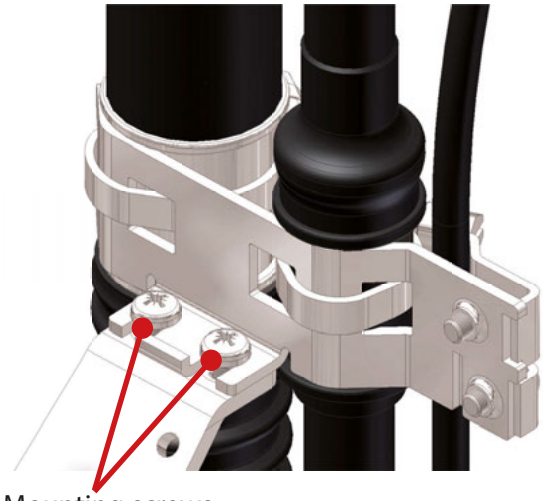




Installing the sensor cable
(pH, oxygen, and conductivity cables)
Attach the connecting cable **(A)** to the sensor and connect to the fixing bracket **(B)** in a loop as shown in the illustration.
Using clamp **(C)**, attach the cable lightly so that the cable is secured and not constricted. The rotational movement of the Ceramat would otherwise damage the cable.

NOTICE
The cable loop must be long enough so that the cable does not impede the stroke movement of the fitting.

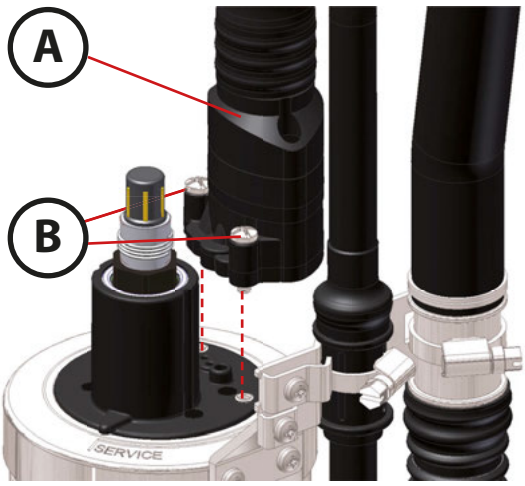
Connect equipotential bonding cable to terminal **(F)** (if required).



The following procedure is recommended for installing the media connection (also applies to installation of ZU 0631 standard-media interface):

Attaching the hose to the fixing bracket of the Ceramat

Attach the bracket of the media connection to the fixing bracket of the Ceramat with mounting screws.



Connecting the multiplug

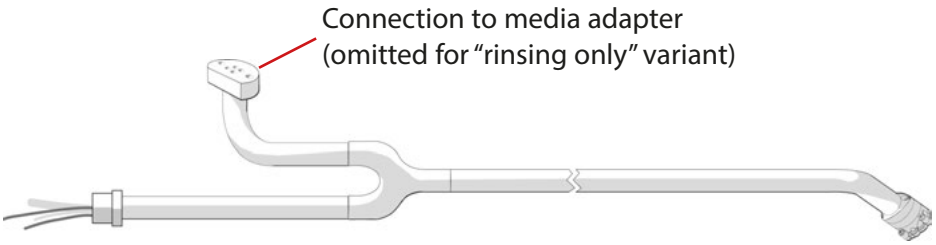
Connect multiplug **(A)** with 2 screws **(B)** as shown.

Connection to Unical or Uniclean

The media connection is available in 5 m, 10 m, 14 m, or 17 m length (other lengths on request).
It consists of a Ø 30 mm corrugated hose with a metal coil.
You can also order special lengths (also heated or with wall ducts).
2 variants are available:

- for rinsing only (without branch outlet to media adapter)
- for calibration and cleaning function (with branch outlet to media adapter)

Connections
The connections for media adapter and sensor lock-gate are of a plug-in design. They are mechanically fixed by screwing. Each fluid is fed to the sensor lock-gate through a separate tube of the media connection. Check valves in the multiplug minimize contamination and prevent mixing of the calibration fluids.



Connection to Unical 9000(X)
or Uniclean 900(X)

Multiplug for connecting the Ceramat

Connection to Unical or Uniclean
The corrugated hose is screwed to the joining piece of the Unical or Uniclean.
You can easily feed the different media tubes through the slit in the securing nut. The different tube lengths and diameters provide for a clear assignment to the different connection points (color coded).
See also Unical 9000(X) / Uniclean 900(X) installation manual.

Connection to media adapter
This connection is plugged and screwed to the media adapter. It includes the media tubing.
Electrical connection is made via a plug-in connector.
See also Unical 9000(X) / Uniclean 900(X) installation manual.

18 Installing/Removing a Sensor

NOTICE

Sensors must only be installed or removed by trained personnel authorized by the operating company.
The Ceramat sensor lock-gate must be in **SERVICE position**.
This position is attained by:

- the "Maintenance" menu when controlled by Protos 3400(X)
  (see user manual of PHU 3400(X)-110 module)
- the service switch (see Unical 9000(X) installation manual)

pH Sensors

Be sure to follow the assembly instructions step by step.

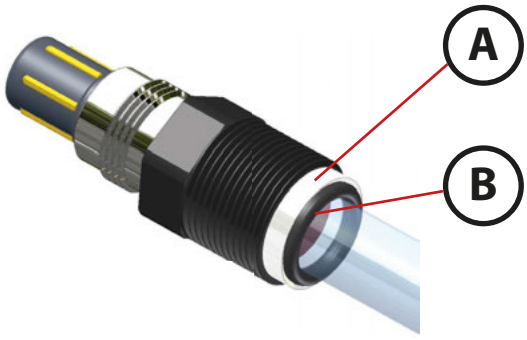
Preparations:

- Check whether the sensor is damaged (glass broken?).
  Never install a damaged sensor.
- Check whether 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.

Sensor Dismount Guard

(only for sensors with solid electrolyte)

In conjunction with the Unical or Uniclean electro-pneumatic controllers and the Protos measuring system, the Ceramat is fitted with a sensor dismount guard. This serves to prevent the immersion of the sensor lock-gate without sensor (a message is triggered in the Protos). If the sensor is absent or incorrectly mounted, compressed air noticeably and audibly escapes from below the drive's coupling nut.
The outflowing compressed air is detected by a flow switch in the Unical and signals the missing or incorrectly mounted sensor to the Protos.



The sensor dismount guard only works with a correctly installed O-ring **(B)** and slip ring **(A)** on the sensor. If these elements are not present, the "Sensor dismounted" message is shown in the Protos display.
Before installing a new sensor, check whether there are any sealing elements at the bottom of the sensor holder from previous installations which have not been removed!

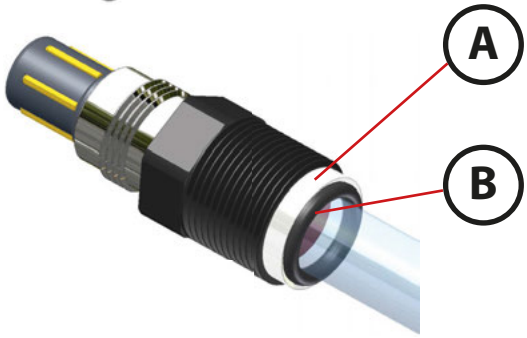
Note

When using a PEEK scraper ring on the sensor socket of the Ceramat, or when retrofitting a Ceramat with sensor socket including scraper ring as accessory ZU 0705, ZU 0706, or ZU 0707 (see Accessories page 35), the proper functioning of the sensor dismount guard in combination with the Unical/Uniclean cannot be guaranteed. Buildup of contaminations can result in high stripping forces which impair the functioning of the sensor dismount guard.

NOTICE
Therefore, the operator of the Ceramat must always make sure that a sensor is installed before moving the probe to PROCESS position (measuring).

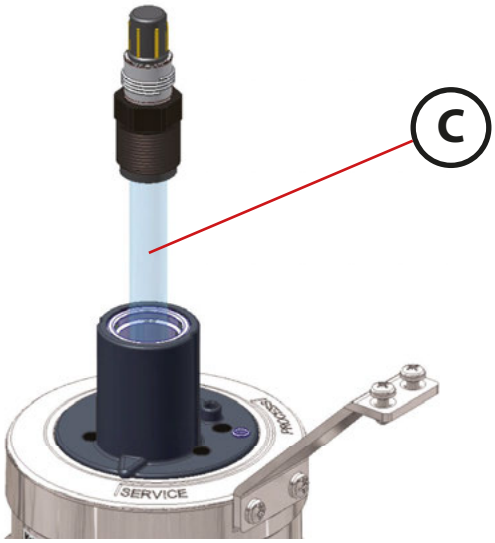
pH Sensors, Oxygen Sensors, Conductivity Sensors

ZU 0647
Tool for sensor installation



Installing the sensor

1) Move probe into SERVICE position.
   The sensor must only be installed in **SERVICE position**.
2) Use appropriate sensors **(C)** only:
   Diameter: 12-0.5 mm Length: 425 mm
   Observe pressure resistance of the sensor.
3) Before installing the sensor, check that there is no liquid flowing out of the outlet (ceramic slides or probe housing might be defective).
4) Check whether slide ring **(A)** or O-ring **(B)** on the sensor are damaged.
5) Screw in the sensor head (19 mm A/F, PG 13.5 thread) with a max. torque of 3 Nm (recommended tool: 19˜mm wrench, eg, Knick ZU˜0647).
6) Install sensor cable and media connection (see “Information on Installation“ on page˜13).



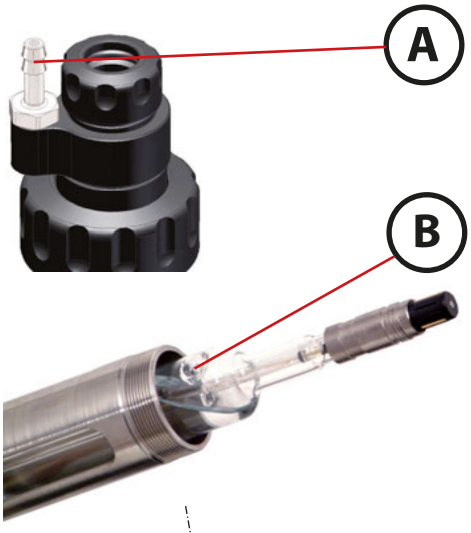
Removing the sensor:

1) Move probe into SERVICE position. The sensor must only be removed in **SERVICE position**.
2) Before removing the sensor, check that there is no liquid flowing out of the outlet (ceramic slides or probe housing might be defective).
3) Loosen the sensor plug.
4) Loosen the sensor using a suitable tool and pull it out. Be sure not to cant the sensor because it might break (recommended tool for removing the sensor: 19 mm A/F, eg, Knick ZU˜0647 wrench).

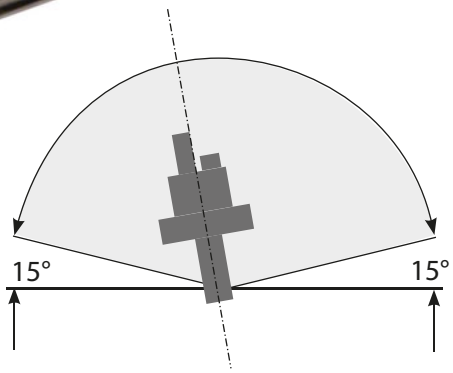
pH Sensors

You can use sensors with a length of 450 mm and an electrode diameter of 12 mm.
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. We recommend the ZU˜0670/1 or ZU˜0670/2 module (see "Accessories" on page˜35) to maintain the defined overpressure in the pressure chamber of the sensor.
It is connected to the sensor pressure chamber via connection nipple (NW 6 mm) **(A)**.

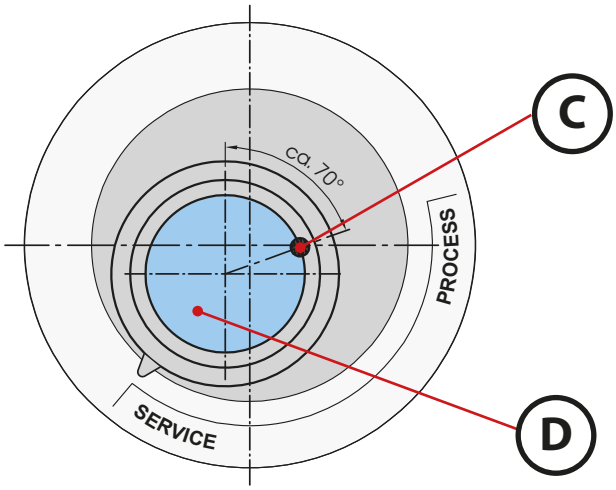
Check whether the sensor is damaged (glass broken?). Remove watering cap from the sensor tip and rinse sensor with water.



NOTICE
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.

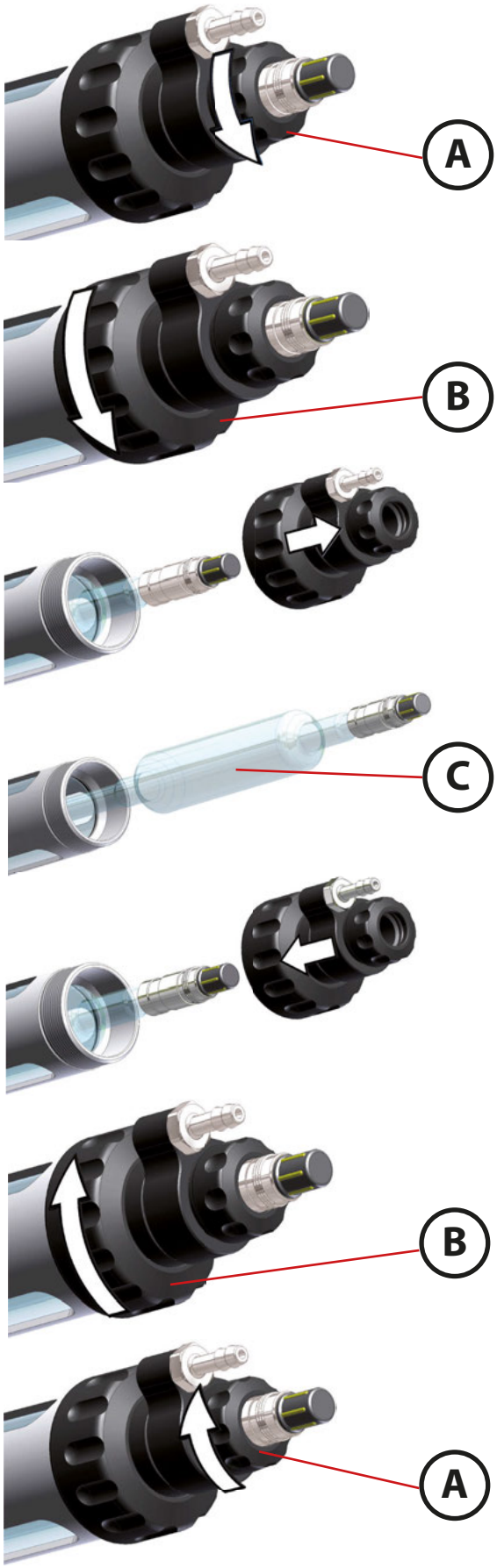


Within the permitted installation angle the probe can be positioned as desired (at least at 15°).



As the Ceramat performs a rotary movement in addition to the stroke movement, you must position the sensor **(D)** in a way that the filling hole˜**(B)** (eg, Schott) or the "TOP" labeling (eg, Mettler) **(C)** of the sensor is turned out of the vertical by approx. 70° when the sensor lock-gate is inclined (see figure).
Only this prevents electrolyte leakage during movement of the Ceramat.

22 Installing/Removing a Liquid-Electrolyte Sensor

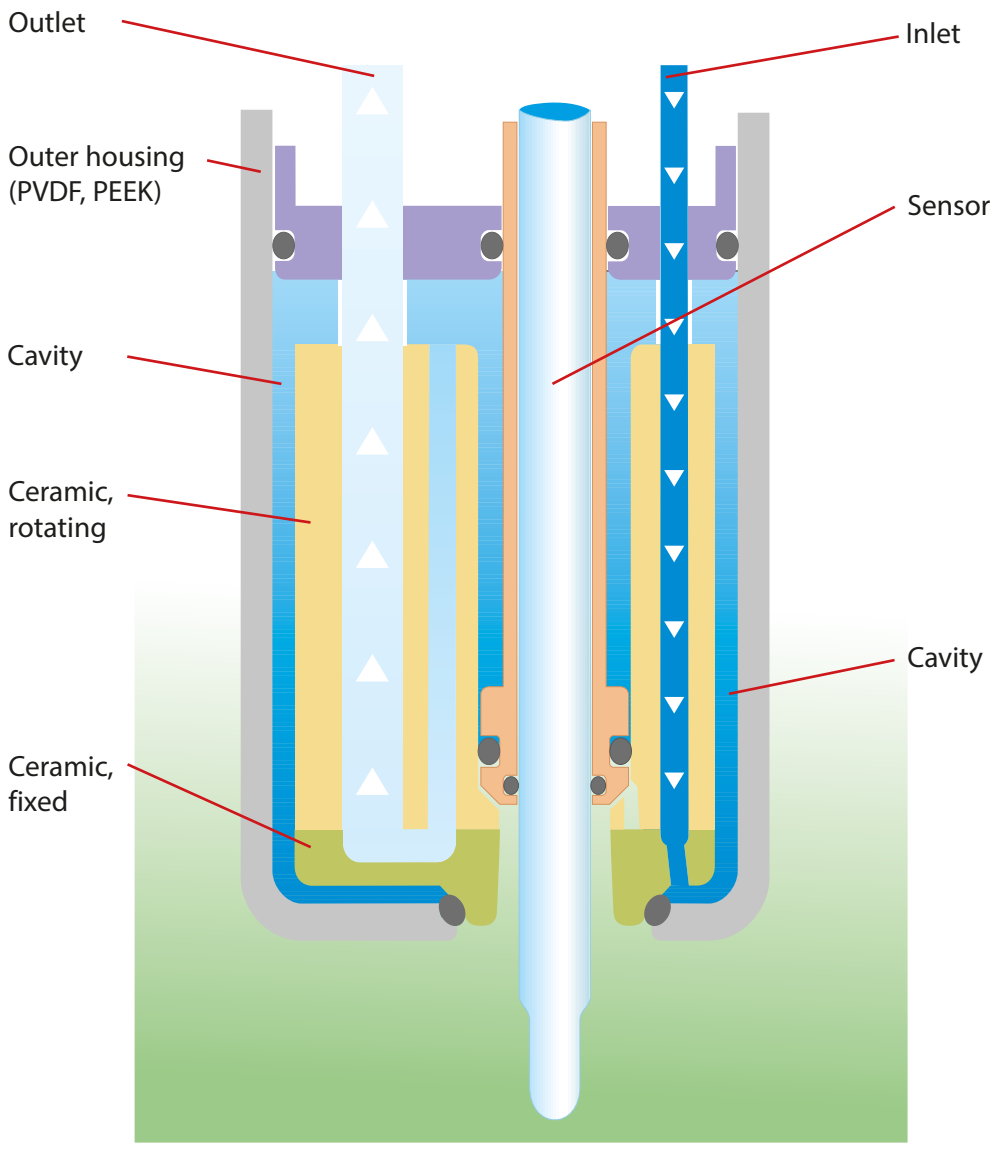


Installing or removing the sensor

1) Only install or remove the sensor when the sensor lock-gate is in SERVICE position.
2) Loosen small coupling nut **(A)** – do not remove it.
3) Unscrew large coupling nut **(B)** completely (counterclockwise).
4) Pull the detached unit upwards.
5) Install or remove sensor **(C)**.
6) Replace the unit you have detached in step 4. First hand-tighten the large coupling nut **(B)** and then the small coupling nut **(A)** (clockwise).

Cavity Rinsing Function

In SERVICE position, inlet and outlet are directly connected with the calibration chamber.
The ceramic slides are mounted in an outer housing, which is in contact with the process.
There is a risk that process fluid penetrates into the cavity between ceramic and outer housing.
Such fluids can be drained off using the cavity rinsing function. For this procedure, the inlet is rerouted to the cavities when the sensor lock-gate moves to PROCESS position. When the rinsing function is activated (eg, by Unical), the cavities are rinsed and the fluids are drained off through the outlet.
Normally, rinsing should be performed every 8 hours for 30 seconds.
With very frequent probe movements, aggressive or sticky process media, the rinsing intervals should be accordingly reduced.



Ceramic sensor lock-gate
in PROCESS position

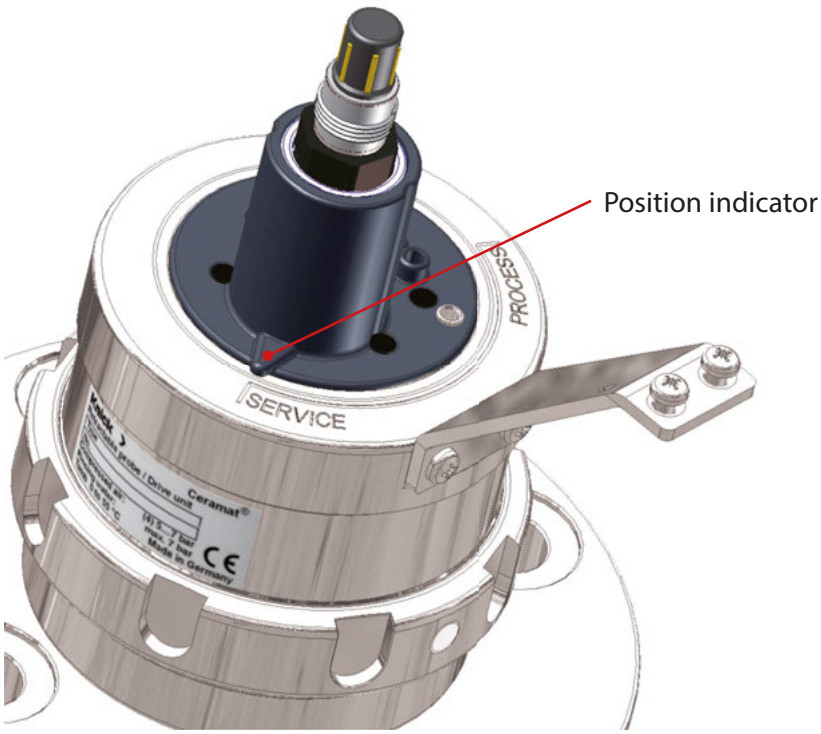
24 Maintenance Work on the Drive Unit

The drive unit must be removed, for example:

- for general maintenance or inspection
- to clean the calibration chamber, eg, after a sensor has broken
- to change the sensor / calibration-chamber gaskets
- in the event of a technical fault of the drive unit.

NOTICE

Before working on the drive unit make sure that the sensor lock-gate is in SERVICE position. This position is attained by: the service switch (see Unical 9000(X) installation manual) or the "Maintenance" menu of the Protos 3400(X) (see user manual of PHU 3400(X)-110 module).
While working on the sensor lock-gate, other persons must be prevented from actuating the control unit.
The position indicator shows whether the sensor lock-gate is in SERVICE position.



⚠ WARNING

When the drive unit must be removed under process conditions, be sure to wear protective clothing, gloves, and goggles to protect yourself against process fluid that might escape. The drive unit serves as second barrier after the ceramic rotary slides, i.e. even after a breakage in the ceramics or a defect in the probe housing an uncontrolled escaping of process fluid is prevented. When removing the drive unit under process conditions, you must check whether the first barrier (rotary slides, probe housing) functions properly.

Removing the Drive Unit

NOTICE
Be sure to follow these instructions in the correct sequence. Take appropriate safety precautions against escaping process fluids.

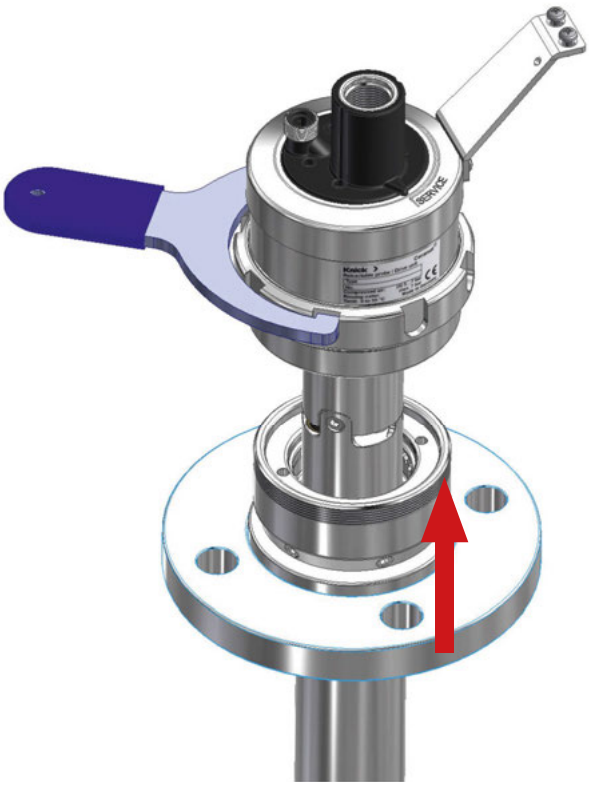
ZU 0648

1) Move probe into SERVICE position.
   Only in this position can the drive unit be removed.

2) Switch off compressed air and deaerate device!

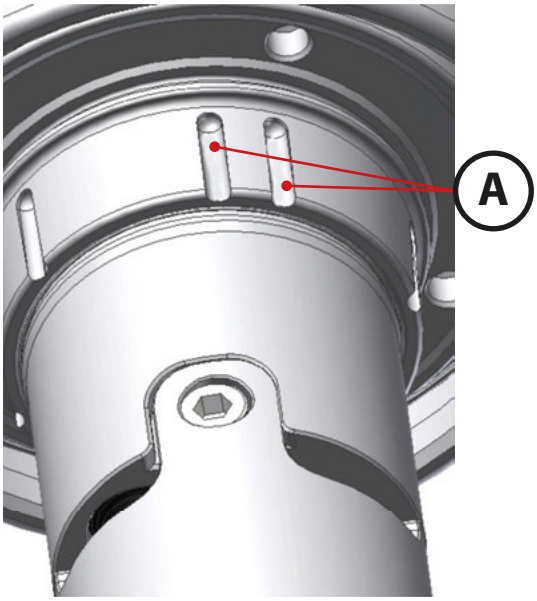
3) Make sure that no process fluid is leaking from the outlet.

4) Turn coupling nut counterclockwise using the ZU 0648 mounting wrench (see "Accessories", page˜35). This pulls the drive unit out of the process unit.
   You can slightly lift up the drive unit while turning the nut to support its movement. Do not cant the unit and do not exert force. Do not loosen the coupling nut completely.



5) Make sure that no process fluid is leaking from the outlet.

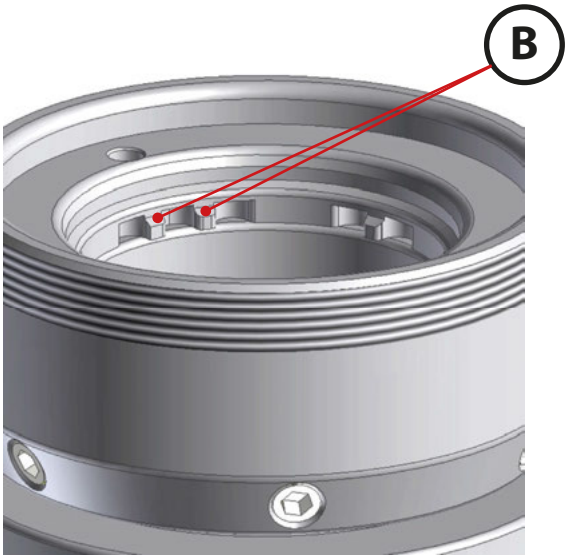
6) Completely loosen the coupling nut and pull off the drive unit upwards.



NOTICE
Be sure to follow these instructions in the correct sequence.

1) Before installing the drive unit in the process unit, check whether the drive unit is in SERVICE position. Only then can the drive unit be inserted sufficiently deep into the process unit so that the groove can engage with the coupling nut.

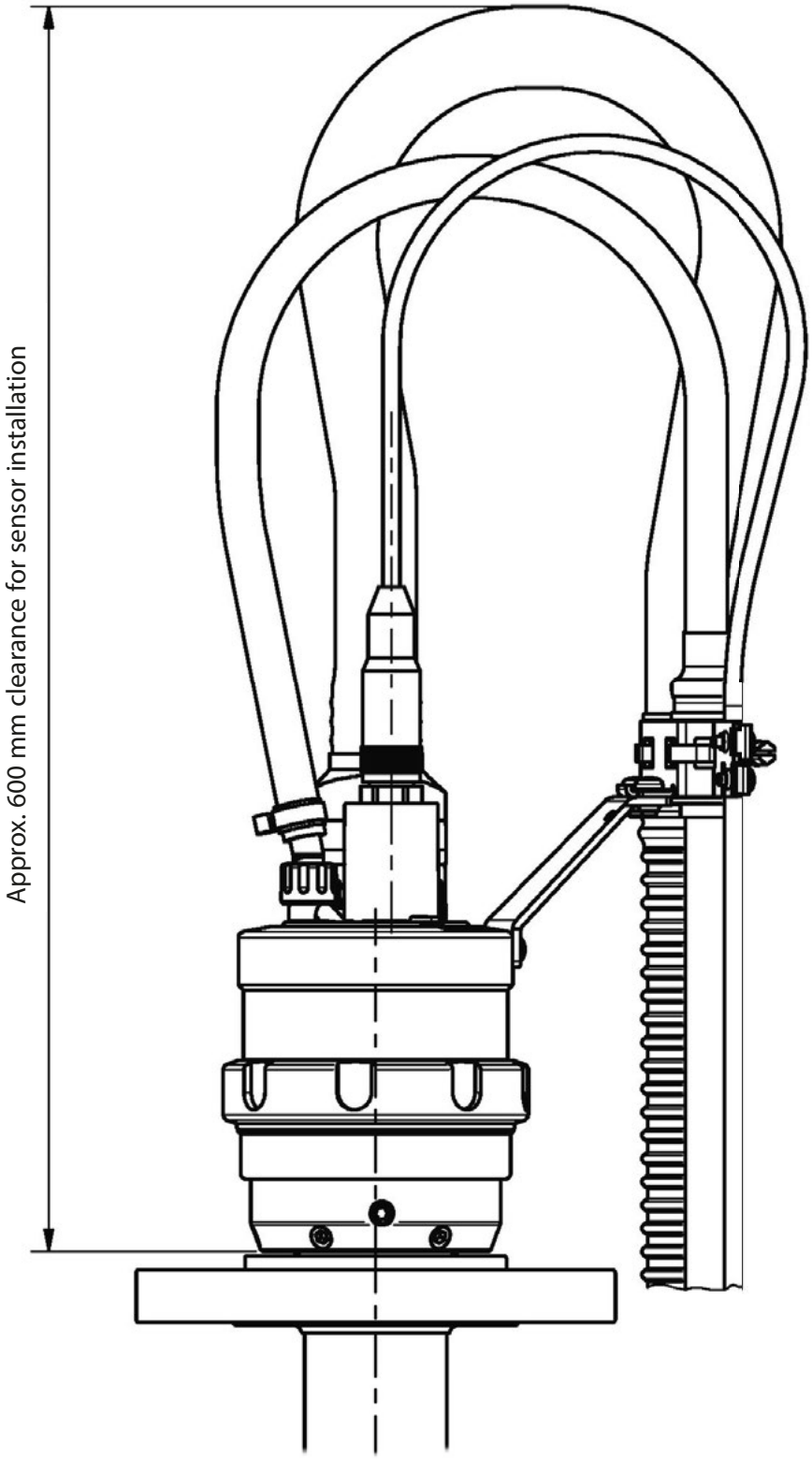
2) When mounting the drive unit to the process unit, make sure that the guiding grooves of the drive unit **(A)** engage with the guiding bars of the process unit **(B)**.



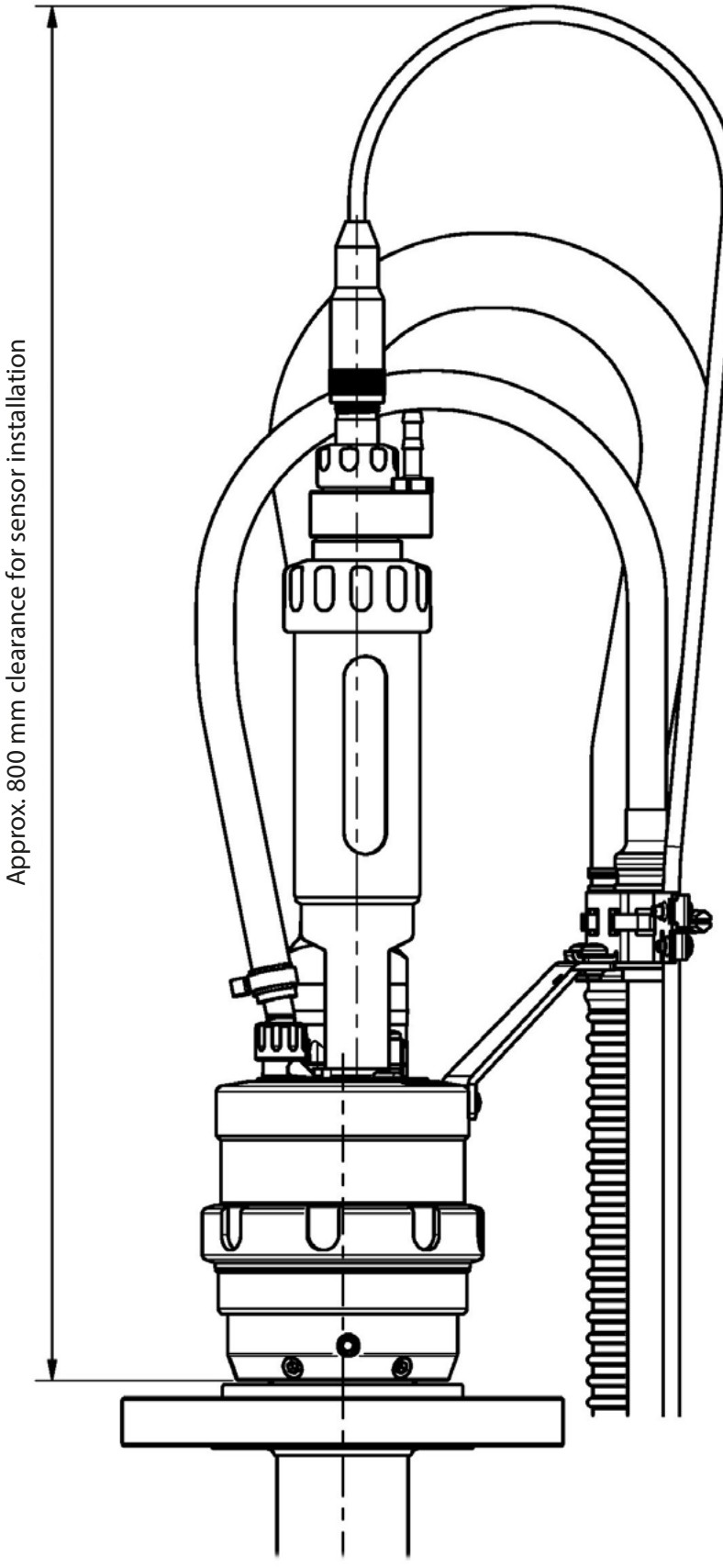
ZU 0648

3) After successful alignment, you can insert the drive unit and screw the coupling nut tight until it noticeably stops. Where required, continue to press the drive unit in while screwing the coupling nut to make screwing easier. Hand tighten the coupling nut using the ZU 0648 Ceramat mounting wrench, see “Accessories”, page˜35.

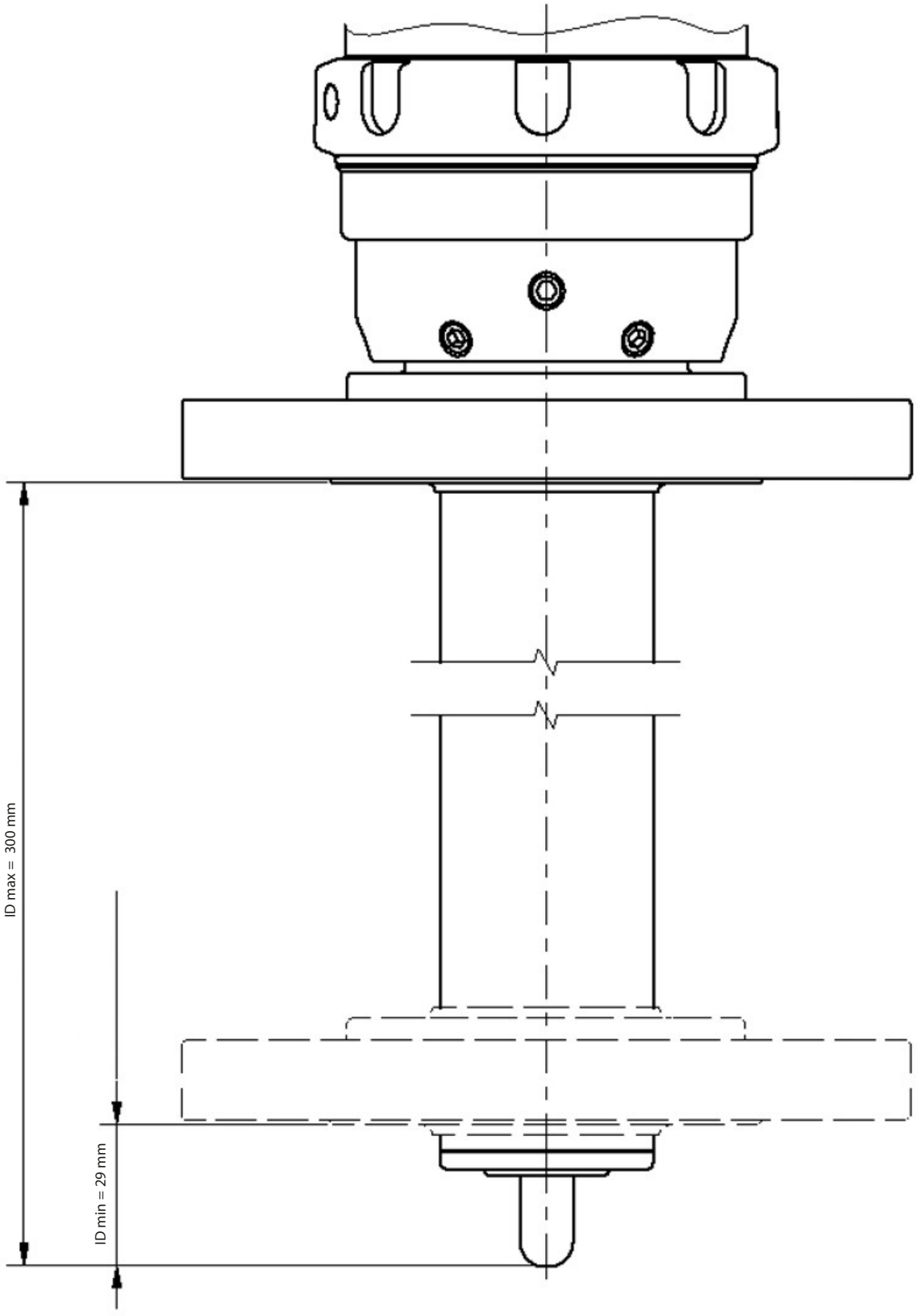
Solid Electrolyte



Liquid Electrolyte



Immersion Depths (Process Adadaption: Flange)



* ID = immersion depth

Permissible process pressure and temperature during movement	10 bar (up to 140 °C)
Permissible process pressure and temperature, statically in SERVICE position	16 bar (at 0 ... 40 °C)
Ambient temperature	-10 ... 70 °C
Ingress protection	IP 66
Permissible pressure for probe control	(4) 5 ... 7 bar *
Quality of compressed air	
Standard	according to ISO 8573-1:2001
Quality class	3.3.3 or 3.4.3
Solid contaminants	3 (max. 5 µm, 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 solid electrolyte	Ø 12 mm, length 425 mm with temp detector, PG 13.5 thread
with liquid electrolyte	Ø 12 mm, length 450 mm with temp detector
Optical sensors	Ø 12 mm, Ø 12.7 mm (1/2"), special version B required
Process adaptations	See product coding
Connections	
Outlet	Socket for Unical media hose
for pressurized sensors	Hose connection NW 6 Pressure in sensor chamber 0.5 … 1 bar above process pressure (max. 7 bar)
for compressed air, rinse and calibration media (control air for retractable fitting)	for Unical multiplug
Immersion depths / Dimensions	See dimension drawings
Process-wetted materials	See product coding

* Control pressure required for process pressure

Control pressure (bar)	Process pressure (bar)
5	7
6	8
7	10

Maintenance Intervals

Because of the highly variable process conditions (pressure, temperature, chemically aggressive media etc.), general information on necessary maintenance intervals is difficult to provide. If proven experience has been gained from similar points of measurement with regard to materials used and their resistance unter process conditions, 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 PROCESS position and observe the outlet. If the sensor lock-gate is not tight, process fluid will leak from the outlet hose. Move the probe to the SERVICE position. Remove the drive unit (no process interruption necessary). To do so, see "Maintenance Work on the Drive Unit" on page 24. Visually inspect the O-rings to check the general suitability of the material used under the present process conditions.
After 1-2 years or 30,000 cycles (after successful first inspection and suitability of all materials used, this time period may be extended.)	Check/replace the dynamically loaded O-ring on the sensor socket, check the statically loaded O-rings without process interruption. Where required, examine the cavity rinsing. If deposits or chemical attacks on the probe housing are suspected (visible in the probe housing after removing the drive unit), check the process unit.
After 10 years or 500,000 cycles	Complete maintenance at the factory with replacement of pneumatic sealings, lubricants, and check of all functions, pressure test, leak test

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

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 stroke movements). This lubricant contains silicone and is only used as special application on specific request.

Application	Pharma / 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 O-rings (elastomeric gaskets)			
FKM	X	X	X
FFKM	X	X	X
EPDM	X	X	X

Sealing Kits for Maintenance and Servicing

The sealing kits are available in different materials.
The new O-rings must be lubricated with the included lubricant.

The following sealing kits are available for repair and servicing:

Sealing kit	Process-wetted / rinse-wetted sealings	Order no.	Suitable lubricant (included)
Set A	FKM / FKM	On request	Syntheso Glep1
Set B	EPDM / EPDM	On request	Syntheso Glep1
Set E	EPDM FDA / EPDM FDA	On request	Beruglide L
Set F	FKM FDA / FKM FDA	On request	Beruglide L
Set H	FFKM FDA / FFKM FDA	On request	Beruglide L
Set K	FFKM / FFKM	On request	Syntheso Glep1

Accessories / Spare Parts	Order no.
Sensor mounting wrench, 19 mm	ZU 0647
Air supply for pressurized sensors, 0.5 - 4 bar	ZU 0670/1
Air supply for pressurized sensors, 1 - 7 bar	ZU 0670/2
Mounting wrench for Ceramat	ZU 0648
Pneumatically operated manual control valve	ZU 0646
Standard media (SM) interface	ZU 0631
Pneumatically controlled 3/8“ valve for additional medium	ZU 0669
Adapter for additional medium, PEEK/FKM	ZU 0654/1
Adapter for additional medium, PEEK/EPDM	ZU 0654/2
Adapter for additional medium, PEEK/FFKM	ZU 0654/3
Adapter for additional medium, steel/FKM	ZU 0655/1
Adapter for additional medium, steel/EPDM	ZU 0655/2
Adapter for additional medium, steel/FFKM	ZU 0655/3
Ceramat sensor socket PEEK/FKM	ZU 0616
Ceramat sensor socket PEEK/EPDM	ZU 0617
Ceramat sensor socket PEEK/FFKM	ZU 0618
Ceramat sensor socket PEEK/EPDM-FDA	ZU 0619
Ceramat sensor socket PVDF/FKM	ZU 0620
Ceramat sensor socket PVDF/EPDM	ZU 0621
Ceramat sensor socket PVDF/FFKM	ZU 0622
Ceramat sensor socket PVDF/EPDM-FDA	ZU 0623
Sensor socket, long, steel 1.4571/FKM	ZU 0672/A
Sensor socket, long, steel 1.4571/EPDM	ZU 0672/B
Sensor socket, long, steel 1.4571/FFKM	ZU 0672/C
Sensor socket, long, steel Hastelloy C22/FKM	ZU 0673/A
Sensor socket, long, steel Hastelloy C22/EPDM	ZU 0673/B
Sensor socket, long, steel Hastelloy C22/FFKM	ZU 0673/C
Sensor socket, full protection, steel 1.4571/FKM	ZU 0808/A
Sensor socket, full protection, steel 1.4571/EPDM	ZU 0808/B
Sensor socket, full protection, steel 1.4571/FFKM	ZU 0808/C
Sensor socket, full protection, Hastelloy/FKM	ZU 0820/A
Sensor socket, full protection, Hastelloy/EPDM	ZU 0820/B
Sensor socket, full protection, Hastelloy/FFKM	ZU 0820/C
Sensor socket PEEK/FKM (with scraper ring)	ZU 0705
Sensor socket PEEK/EPDM (with scraper ring)	ZU 0706
Sensor socket PEEK/FFKM (with scraper ring)	ZU 0707

ZU 0647
Sensor mounting wrench, 19 mm

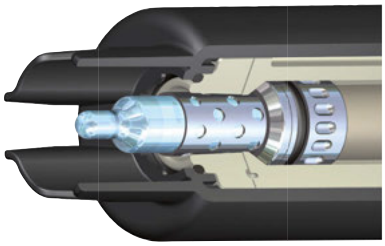
Required for safely screwing in the sensor without overloading the PG 13.5 plastic thread of the sensor head by an excessive torque (as caused by an open-end wrench).

ZU 0648
Mounting wrench for Ceramat

Serves to disconnect the drive unit or mount it to the process unit via the coupling nut of the drive unit.

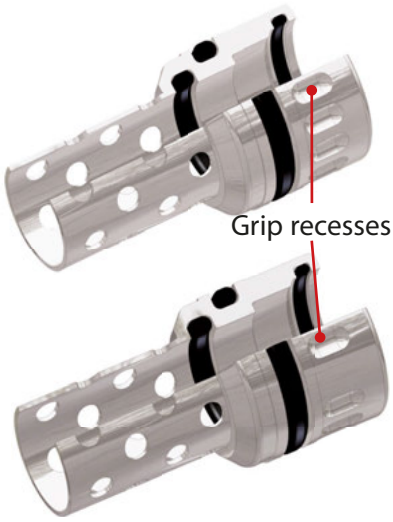
Sensor socket with mounted O-rings

- **ZU 0616** Sensor socket PEEK, O-rings FKM
- **ZU 0617** Sensor socket PEEK, O-rings EPDM
- **ZU 0618** Sensor socket PEEK, O-rings FFKM
- **ZU 0619** Sensor socket PEEK, O-rings EPDM FDA
- **ZU 0620** Sensor socket PVDF, O-rings FKM
- **ZU 0621** Sensor socket PVDF, O-rings EPDM
- **ZU 0622** Sensor socket PVDF, O-rings FFKM
- **ZU 0623** Sensor socket PVDF, O-rings EPDM FDA

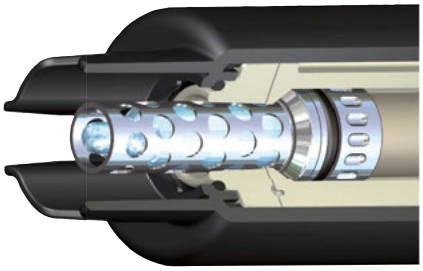


Long sensor socket with mounted O-rings
This sensor socket is recommended for brittle incrustations (eg, lime).
(Hastelloy C22 material can be identified by a missing grip recess.)

- **ZU 0672/A** Sensor socket 1.4571, O-rings FKM
- **ZU 0672/B** Sensor socket 1.4571, O-rings EPDM
- **ZU 0672/C** Sensor socket 1.4571, O-rings FFKM

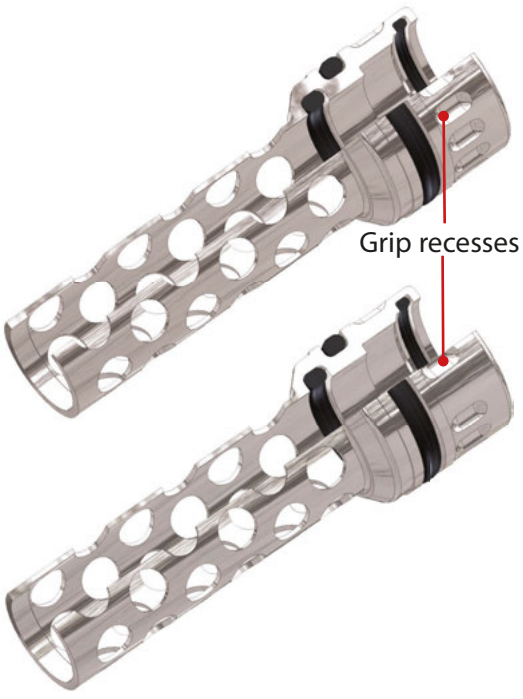


- **ZU 0673/A** Sensor socket Hastelloy, O-rings FKM
- **ZU 0673/B** Sensor socket Hastelloy, O-rings EPDM
- **ZU 0673/C** Sensor socket Hastelloy, O-rings FFKM

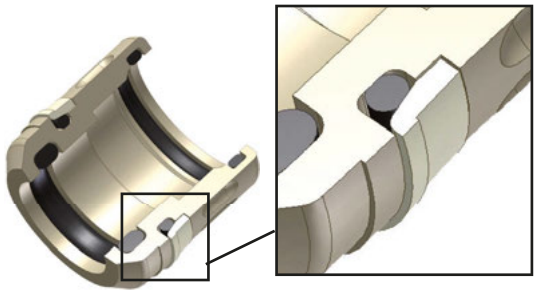


Sensor socket, full sensor protection with mounted O-rings
This sensor socket is recommended for brittle incrustations (eg, lime). In addition, the sensor is better mechanically protected.
(Hastelloy C22 material can be identified by a missing grip recess.)

- **ZU 0808/A** Sensor socket 1.4571, O-rings FKM
- **ZU 0808/B** Sensor socket 1.4571, O-rings EPDM
- **ZU 0808/C** Sensor socket 1.4571, O-rings FFKM



- **ZU 0820/A** Sensor socket Hastelloy, O-rings FKM
- **ZU 0820/B** Sensor socket Hastelloy, O-rings EPDM
- **ZU 0820/C** Sensor socket Hastelloy, O-rings FFKM



Sensor socket with mounted O-rings and scraper ring with scraper edge made of PEEK
This sensor socket is recommended for sticky media and for particles in the process medium.
Please observe the notice on page 19.

- **ZU 0705** Sensor socket PEEK, O-rings FKM
- **ZU 0706** Sensor socket PEEK, O-rings EPDM
- **ZU 0707** Sensor socket PEEK, O-rings FFKM

ZU 0670/1
Air supply for pressurized sensors,
0.5 - 4 bar

ZU 0670/2
Air supply for pressurized sensors,
1 - 7 bar

These modules maintain the defined overpressure in the pressure chamber of the sensor.

Adapter for additional medium
This adapter allows the introduction of an additional rinse medium beyond the available media connection (media hose).
It is mounted between the Ceramat and the media hose multiplug.
The following variants are available:

- **ZU 0654/1** Adapter PEEK, O-rings FKM
- **ZU 0654/2** Adapter PEEK, O-rings EPDM
- **ZU 0654/3** Adapter PEEK, O-rings FFKM
- **ZU 0655/1** Adapter 1.4571, O-rings FKM
- **ZU 0655/2** Adapter 1.4571, O-rings EPDM
- **ZU 0655/3** Adapter 1.4571, O-rings FFKM

ZU 0631 standard-media interface
Sensor lock-gate connection kit for manual operation (see ZU 0646) or for operation with a PLC.

ZU 0646 pneumatic manual control valve
Switch for manual operation (rocker switch to reverse compressed air) on ZU 0631 standard-media interface.

Declaration of Contamination

39

Knick

Return Form

Declaration of potential hazards in the enclosed products from exposure to chemicals

We can only accept and carry out the service order if this declaration is filled out completely.
Please include it with the shipping documents.

If you have any questions, please contact our repairs department in Berlin.

RMA number (can be obtained by calling +49 30 80 191-233): .....

Customer information (must be completed if no RMA no. available):

Company: .....

Address: .....

Contact: ..... Tel./E-mail: .....

Information on the product:

Product name: .....

Serial number: .....

Included accessories: .....

.....

☐ The product being returned is new/unused or
has not been exposed to hazardous substances.

☐ The product has been exposed to hazardous substances.

Please preferably state the classification of the hazardous substance, as applicable together with the H-phrases (or R-phrases), or at minimum provide the relevant hazard pictograms:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

☐ The product has been exposed to infectious substances.

☐ The product was subjected to suitable cleaning procedures
to prevent exposure to hazards prior to return.

☐ The product was not freed of hazardous substances prior to return.

I have answered the above questions to the best of my knowledge.

Name: ..... Company: .....

Date: ..... Signature: .....

Knick Elektronische Messgeräte GmbH & Co. KG, Beuckestr. 22, 14163 Berlin, Germany
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