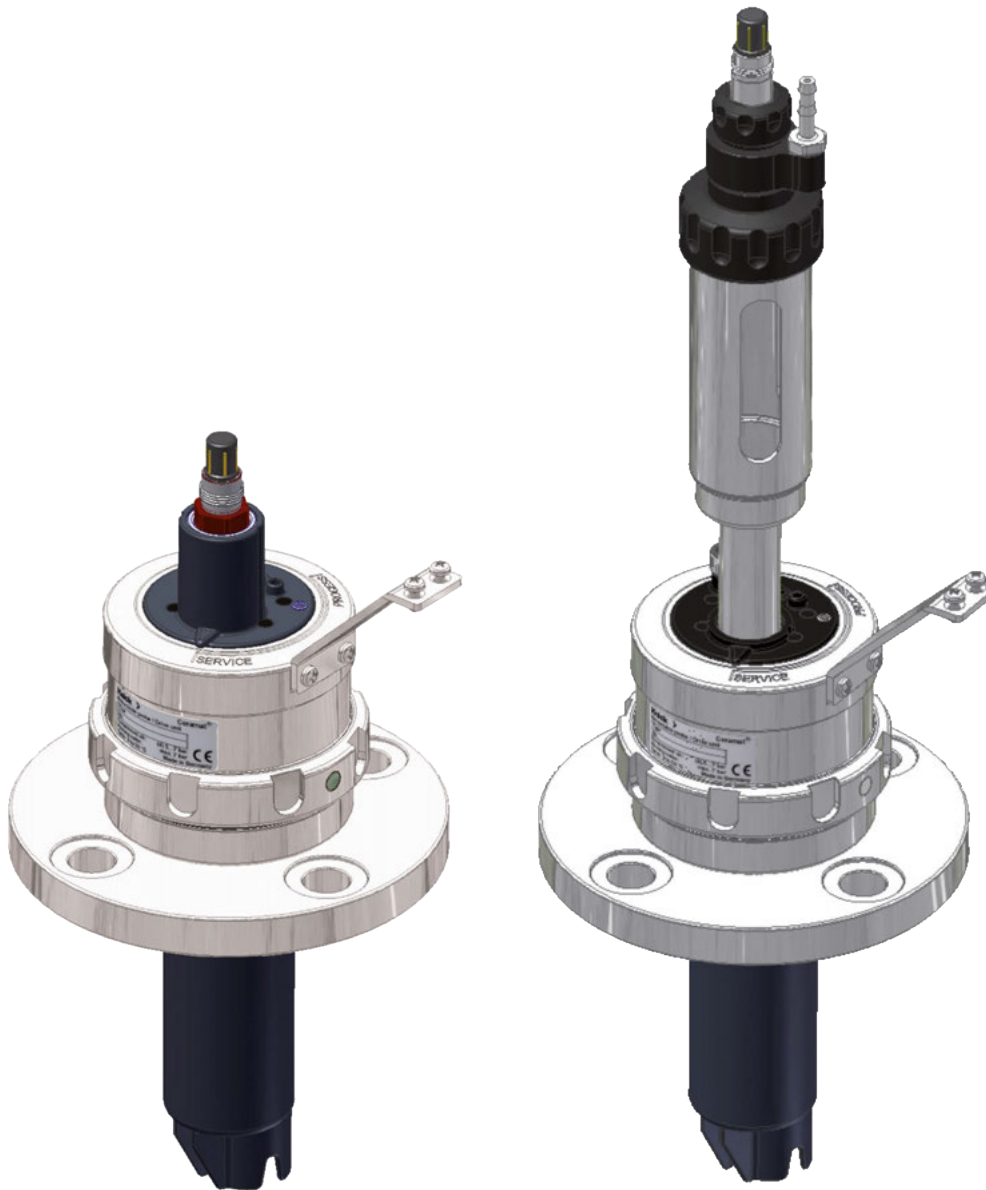


Ceramat® WA 150

User Manual



**Ceramic
Sensor Lock-Gate**



097309

Knick 

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Ceramat® WA 150 Sensor Lock-Gate

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Safety Information

Ceramat® WA 150 Sensor Lock-Gate



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 150 sensor lock-gate.

WARNING

Always make sure that the sensor lock-gate cannot be activated by other persons during servicing or installation (e.g. cleaning or replacing the sensor).

During operation the drive unit of the Ceramat 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.

Note:

Supplementary information is provided in the Ceramat® WA 150 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).

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

Safety Information

Ceramat® WA 150 Sensor Lock-Gate

Operation in Explosive Atmospheres

The Ceramat WA150-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 WA150-X with care and apply suitable measures, e.g., use covers and pads.

The metallic parts of the Ceramat WA150-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 WA150-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 WA150-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.

Intended Use

Ceramat® WA 150 Sensor Lock-Gate

The Ceramat® WA 150 pneumatic sensor lock-gate is used for installing a sensor for measuring process variables in liquids. The sensor can be cleaned, calibrated or replaced under process conditions (pressure and temperature).

The separation of the pneumatic drive unit from the ceramic sensor lock-gate allows removing or replacing the drive unit under process conditions.

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

- **with gel electrolyte, 225mm long, sensor head with Pg13.5**
- **with liquid electrolyte, 250mm long**

The Ceramat® WA 150 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)

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 Ceramat® WA 150 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.

To ensure smooth performance of the measuring points with the Ceramat®, a number of important operating and maintenance parameters must be complied with (see Ceramat® WA 150 maintenance instructions).

Package Contents

Ceramat® WA 150 Sensor Lock-Gate

Check the shipment for transport damage and completeness.

The package should contain:

- Sensor lock-gate
- Documentation
- Test certificates





Intended Use

Ceramat® WA 150 Sensor Lock-Gate





Rating Plates

Ceramat® WA 150-N


Drive




Knick >	Ceramat®
Retractable Fitting / Drive Unit	
Type	
No.	
 	Max. pressure Temperature range
14163 Berlin Made in Germany	
	

Process

Knick >	Ceramat®
Retractable Fitting / Process Unit	
Type	
No.	
 	Max. pressure Temperature range
14163 Berlin Made in Germany	
	





Process, small rating plates




Knick >	Ceramat®
Retractable Fitting/Process Unit	
Type	
No.	
14163 Berlin Made in Germany	

 	Max. pressure Temperature range
14163 Berlin Made in Germany	
	







Ceramat WA 150-X

Drive

Knick >	Ceramat®
Retractable Fitting / Drive Unit	
Type	
No.	
 	Max. pressure Temperature range
14163 Berlin Made in Germany	
 0044	






KEMA 04 ATEX 4035X	
	II 1 G Ex h IIC T6 ... T3 Ga
	II 1 D Ex h IIC T80°C ... 140°C Da
Tamb -10 ... 70°C	
 	No self-heating Special conditions

Process

Knick >	Ceramat®
Retractable Fitting / Process Unit	
Type	
No.	
 	Max. pressure Temperature range
 	See Drive Unit for Ex marking
14163 Berlin Made in Germany	
 0044	

Process, small rating plates

Knick >	Ceramat®
Retractable Fitting / Process Unit	
Type	
No.	
14163 Berlin Made in Germany	

 	See Drive Unit for Ex marking
 	Max. pressure Temperature range
 0044	

Ceramat® WA 150(X) Product Coding

WA 150-

Explosion protection	ATEX Zone 0 Without	X N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sensor	Sensor, Ø 12 mm, with PG 13.5 pH sensor, Ø 12 mm, pressurized Optical sensor, Ø 1/2" (12.7 mm) Optical sensor, Ø 12 mm	0 1 2 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Material of gaskets	FKM EPDM FFKM / FKM FFKM / EPDM EPDM - FDA FFKM - FDA FFKM	A B C D E H K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Material of probe housing and sensor socket	PEEK with integrated sensor protection PVDF with integrated sensor protection PEEK without integrated sensor protection PVDF without integrated sensor protection PEEK, without integrated sensor protection, long sensor socket, 1.4571 PEEK, without integrated sensor protection, long sensor socket, C22 PVDF, without integrated sensor protection, long sensor socket, 1.4571 PVDF, without integrated sensor protection, long sensor socket, C22 PEEK, without integrated sensor protection, socket with PEEK scraper ring PEEK, without integrated sensor protection, sensor socket with full sensor protection, 1.4571 PVDF, without integrated sensor protection, sensor socket with full sensor protection, 1.4571 PEEK, without integrated sensor protection, sensor socket with full sensor protection, C22 PVDF, without integrated sensor protection, sensor socket with full sensor protection, C22	A B C D H J K L M N O P R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ceramat® WA 150(X) Product Coding

WA 150-

Process adaptation	Flange, fixed, 1.4571, PN10/16, DN 50	A	1				
	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, PN40, DN 50	E	1				
	Flange, loose, 1.4571, PN40, DN 65	E	2				
	Flange, loose, 1.4571, PN40, DN 80	E	3				
	Flange, loose, 1.4571, PN40, DN 100	E	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, 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 1/2"	D	4				
	Flange, loose, ANSI 316, 150 lbs, 4"	D	5				
	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 1/2"	P	4				
	Flange, loose, ANSI 316, 300 lbs, 4"	P	5				
	Flange, loose, 1.4571, PN10/16, DN 65, deposit remover, EPDM	F	2				
	Flange, loose, 1.4571, PN10/16, DN 80, deposit remover, EPDM	F	3				
	Varivent, 1.4404 (≥ DN 50)	V	1				
	Flange, loose, 1.4571, PN10/16, DN 65, cover, EPDM	Y	2				
	Special version	On demand			0	0	0

Function Description

Ceramat® WA 150 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 can be moved between two positions:

PROCESS position: Sensor located in the process medium.

SERVICE position: Sensor 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 probe between SERVICE 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.

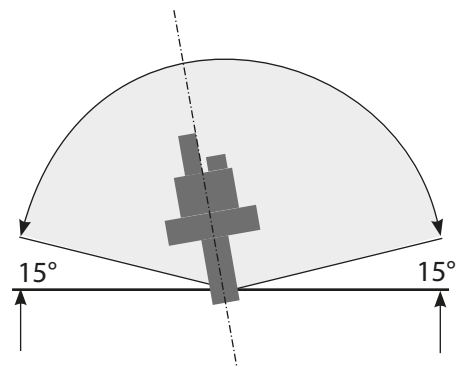
To replace the sensor, you must move the sensor lock-gate into SERVICE position.

With 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).

The separation of the pneumatic drive unit from the ceramic sensor lock-gate allows removing or replacing the drive unit under process conditions.

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.



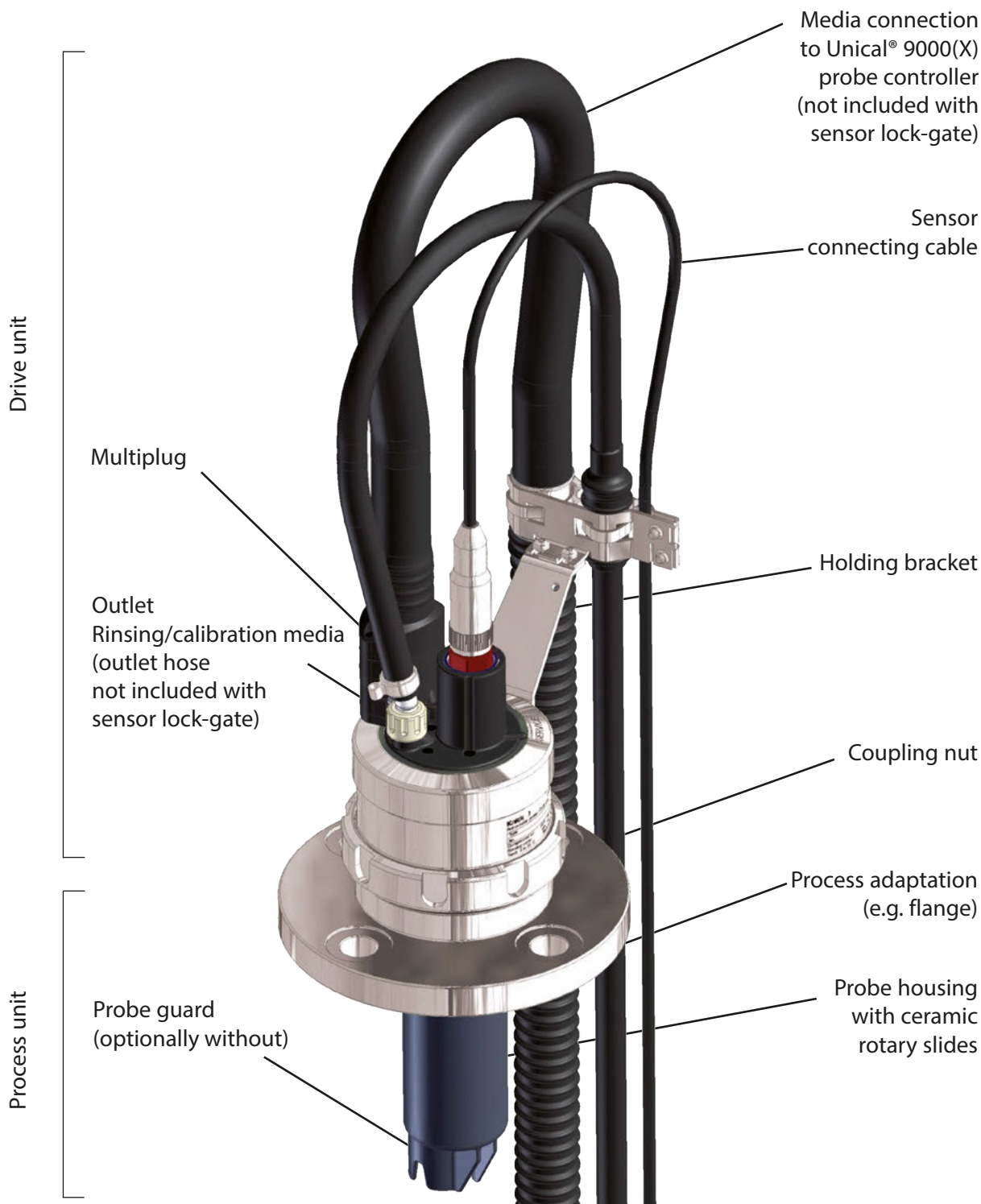
Build-Up of the Sensor Lock-Gate

Ceramat® WA 150 Sensor Lock-Gate

The Ceramat® sensor lock-gate consists of 2 main units: drive unit and process unit.

The **drive unit** performs the required movements 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 (e.g. 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 27).



Build-Up of the Sensor Lock-Gate

Modules available: Drives, process adaptations

Drives

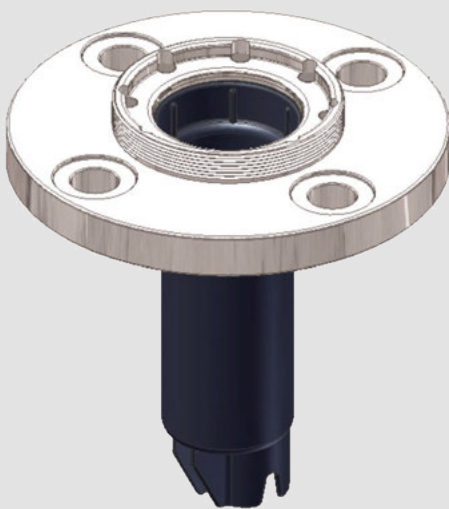


Drive unit for sensors with gel electrolyte



Drive unit for sensors with liquid electrolyte

Process adaptations (examples)



Fixed or loose flange



Dairy-pipe screw joint

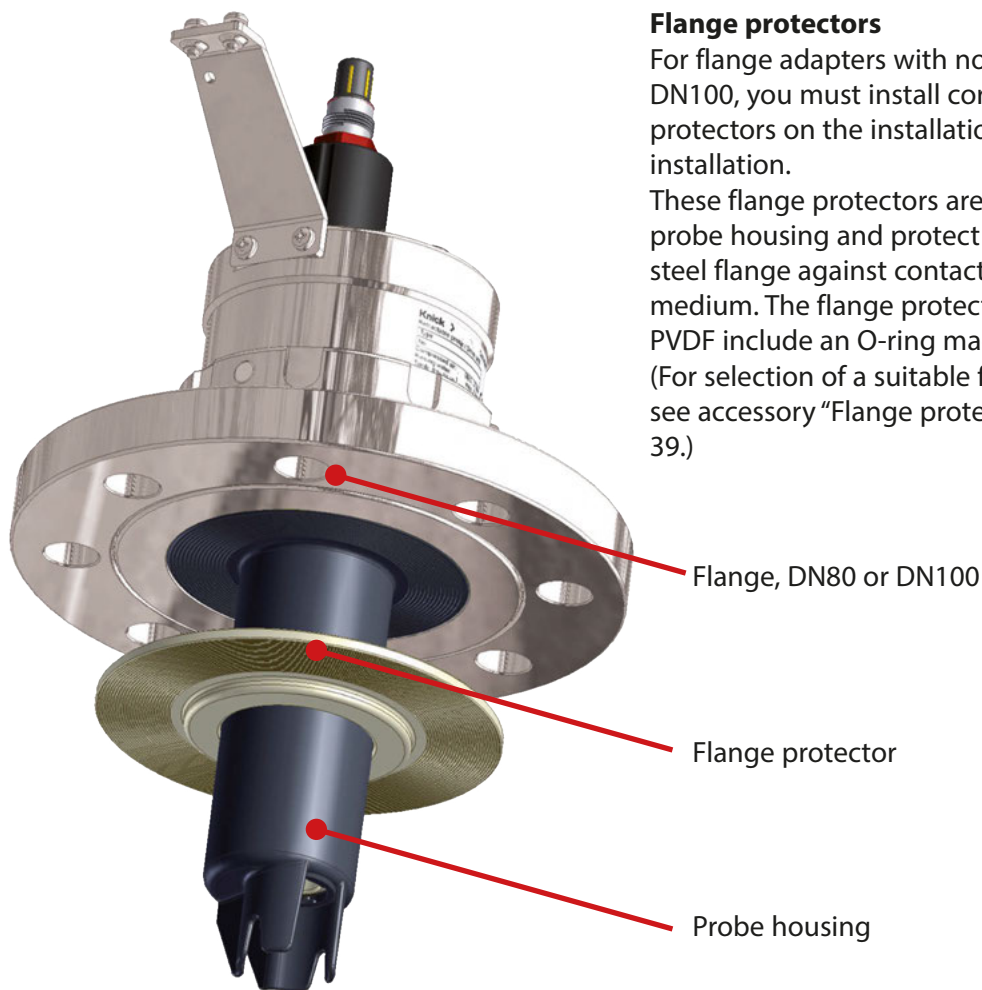


Varivent coupling

Information on Installation

Flange protectors, position of sensor protection

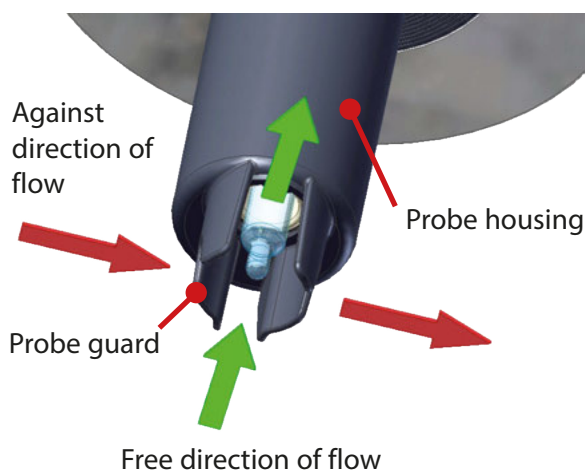
Only soft process seals (flange sealing) should be used (e.g. PTFE, elastomer).



Flange protectors

For flange adapters with nominal size DN80 or DN100, you must install corresponding flange protectors on the installation flange prior to installation.

These flange protectors are slid over the probe housing and protect the stainless steel flange against contact with the process medium. The flange protectors in PEEK or PVDF include an O-ring made of FFKM. (For selection of a suitable flange protector, see accessory "Flange protector" on Page 39.)



Position of sensor protection

For the probe housing with sensor protection option, pay attention to the position of the sensor protector, for example in flowing media. With corresponding installation in the flange bores, the sensor lock-gate can be aligned for the process.

Information on Installation

Ceramat® WA 150 Sensor Lock-Gate

For operation of the Ceramat®, you must connect control air, rinsing or calibration media, and the electrical check-back signal for display of the probe position with the Ceramat®. There are two basic options for this.

In conjunction with the Unical® or Uniclean® electro-pneumatic controllers and the Protos® measuring system, air pressure, rinsing, or calibration media, and the check-back cable are combined in a single hose with just one plug connection (multiplug), in the following 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 the Protos® measuring system), you can connect the supply lines for control air, rinsing or calibration media, and electrical check-back to the Ceramat® with a free hose connection via the ZU 0631 standard-media interface.

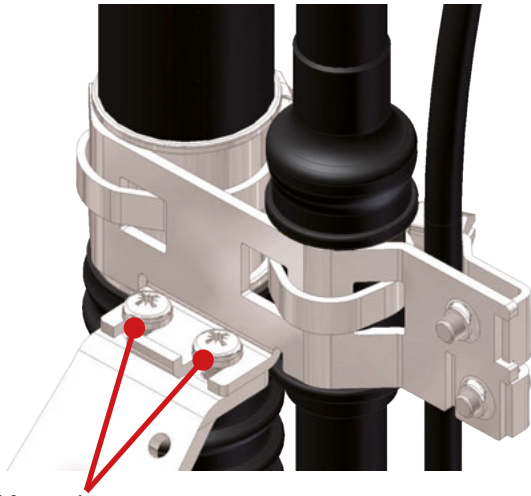


Hosing for operation with
Unical®/ Uniclean® and Protos®

Hosing for operation with
ZU 0631 standard-media interface

Information on Installation

Mounting on the holding bracket, mounting of the outlet hose

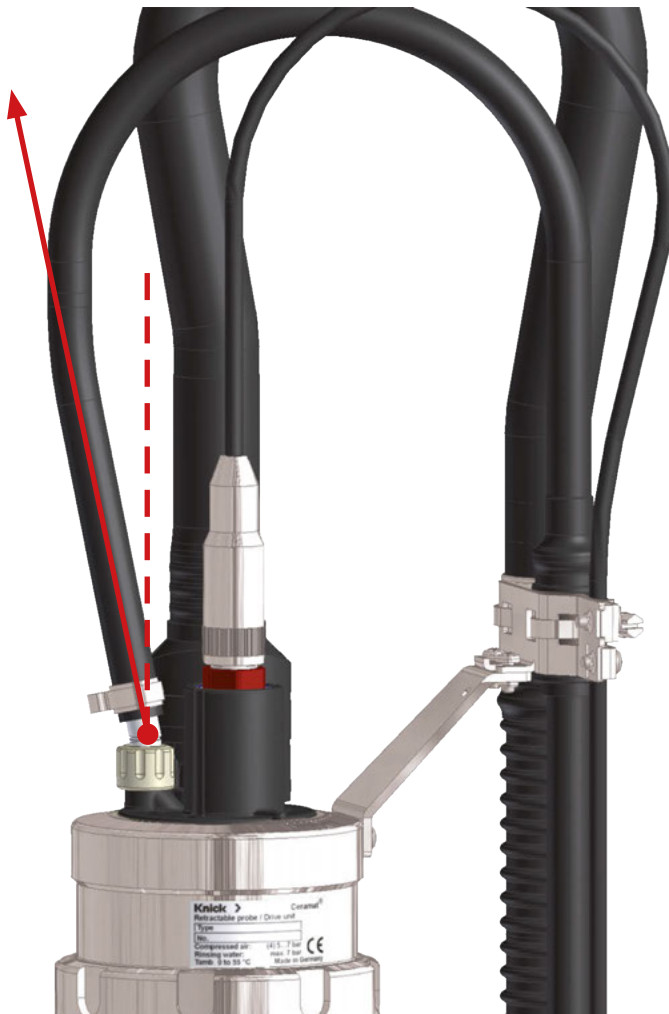


Mounting screws

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

Mounting on the holding bracket of the Ceramat®

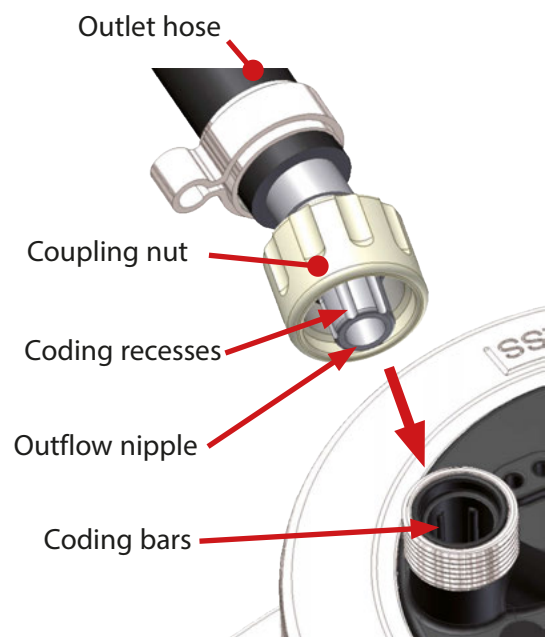
Attach the media connection bracket to the Ceramat holding bracket with screws.



Installing the outlet hose

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

NOTICE! Check positioning of coding recesses and coding bars to locking device.



Information on Installation

Ceramat® WA 150 Sensor Lock-Gate

Installing the outlet hose

Do not install the outlet hose more than 1 meter downwards (see figure 2).

Doing so would raise 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).

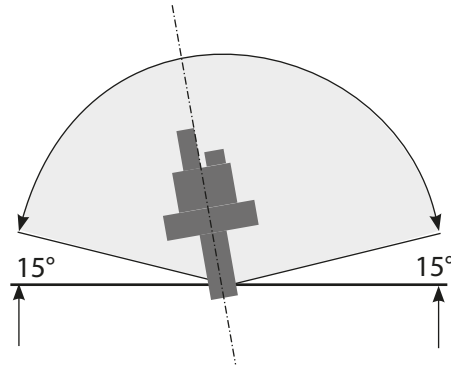


Fig. 1

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

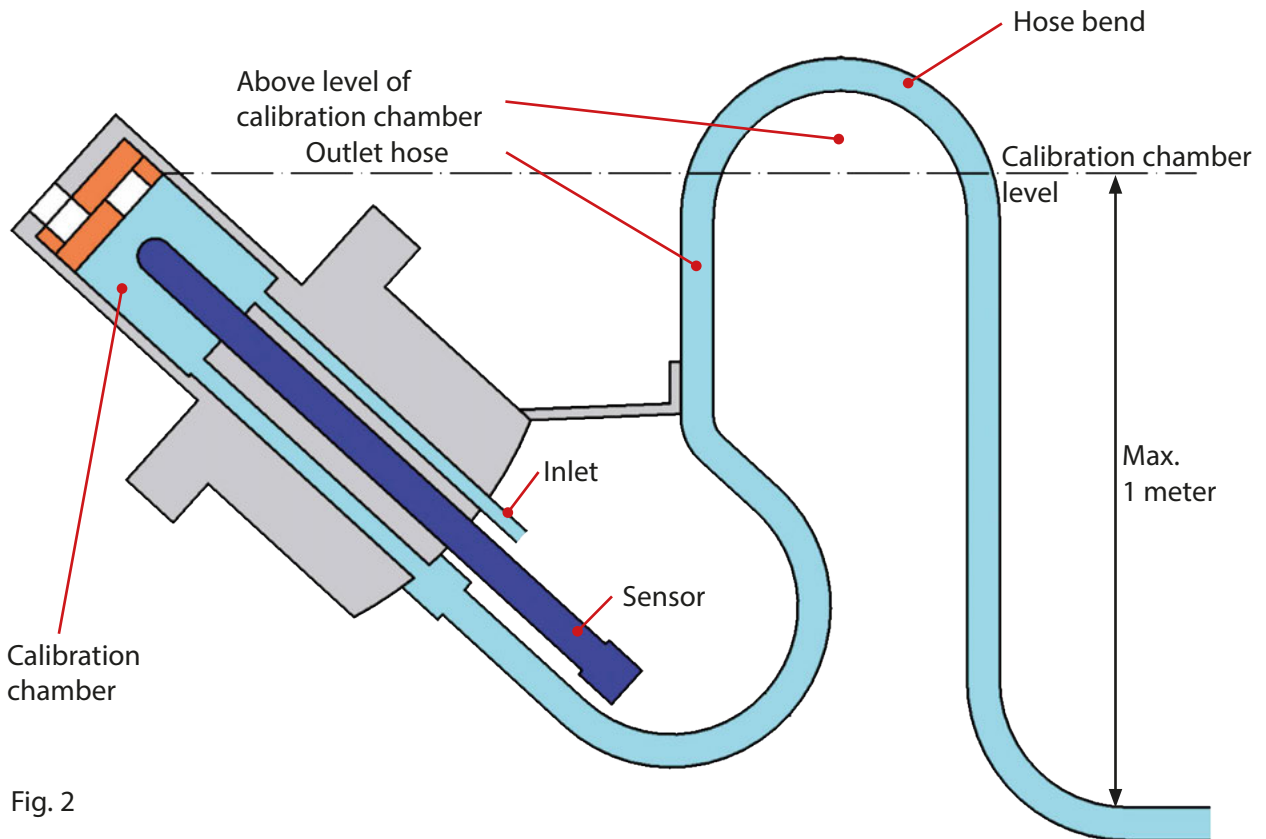
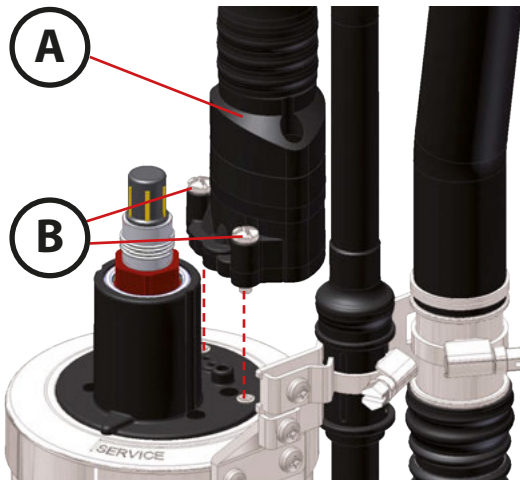


Fig. 2

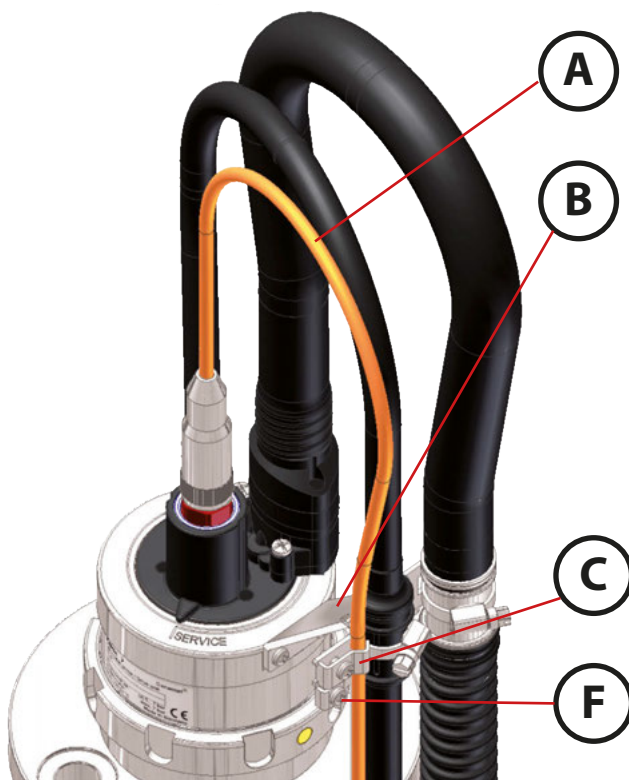
Information on Installation

Mounting the multiplug, mounting the sensor cable



Installing the multiplug

Install multiplug (A) with 2 screws (B) as shown.



Installing the sensor cable

Attach the connecting cable (A) to the sensor and connect it to the mounting bracket (B) in a loop as shown in the image.

Attach the cable with the clamp (C) 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).

Connection to Unical® or Uniclean®

Cerammat® WA 150 Sensor Lock-Gate

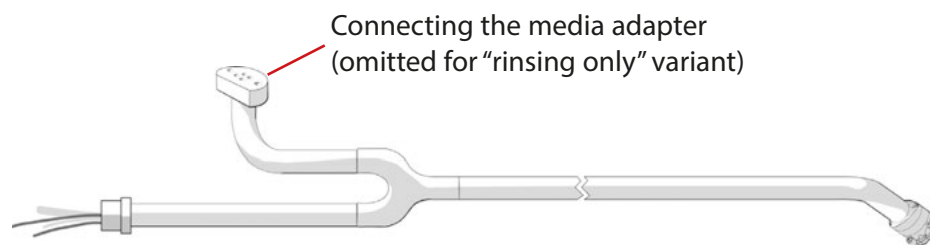
The media connection is available in 5 m or 10 m length (special lengths on request). It consists of a Ø 30 mm corrugated hose with a metal coil.

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 probe are of a plug-in design. They are mechanically fixed by screwing. All media are guided separately through the corrugated hose, secured by check valves. This prevents contamination or mixing of the fluids.



Connecting the Unical® 9000(X)

Multiplug for connecting the Ceramat®

Connection to Unical® or Uniclean®

The corrugated hose is screwed to the joining piece of the Unical® bzw. Uniclean®. Thanks to a slitted coupling nut the different media tubes can easily be fed through. The tubes are color-coded for clear assignment. See also Unical® 9000(X) / Uniclean® 900(X) installation instructions.

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 user manuals of Unical® 9000(X) / Uniclean® 900(X) probe controllers and other accompanying documents for connecting the Ceramat® to Unical® 9000(X) / Uniclean® 900(X) and the Protos® measuring system.

Process Adaptation: Flange DN50

Mounting instructions for flange DN50

The Ceramat® requires a minimum free diameter of the measuring point of 53.5 mm. (When a 2" ANSI flange is used, a minimum free diameter of 52.6 mm is possible by using a modified centering ring.)

In the welding zone of the installation flange the free diameter of the measuring point may be narrowed due to the welding process. With a nominal size of DN 50, the Ceramat® 's probe tube may form contact with this neck when it is not centered in the installation flange. If the Ceramat flange is then tightened asymmetrically (due to the soft seal), there is the danger of incorrect mechanical stress of the probe tube all the way to a breakage in the sealing strip area of the Ceramat flange (see figure 1).

For installation in DN50 flanges, every Ceramat® is therefore supplied with a centering ring. This ring, made of PTFE, is mounted on the probe tube and centers the process unit in the flange of the measuring point (see figure 2). This ensures the centering of the Ceramat flange and eliminates any incorrect mechanical stress on the probe tube.

NOTICE!

When installing the Ceramat® in a DN50 flange, check for the presence of the centering ring (figure 2).

Mounting instructions for flange DN50

- 1) Check the mounting aperture of the flange for protruding weld seams or irregularities, rework if required.
- 2) Push the centering ring onto the probe housing (pre-assembled as delivered).
- 3) Apply elastomeric sealing ring, optimum thickness 1.5 ... 3 mm.
- 4) Insert Ceramat, place the screws.
- 5) Evenly tighten the screws crosswise. Be sure not to cant the Ceramat.

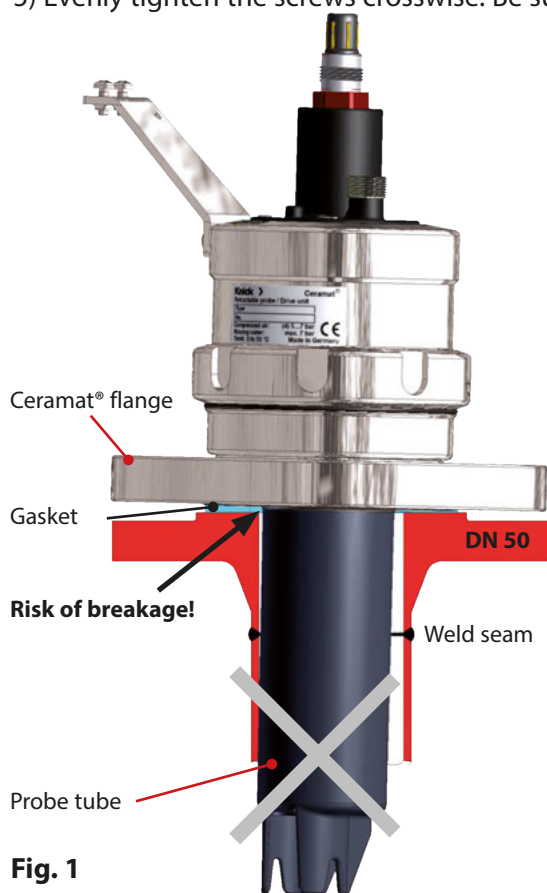


Fig. 1

Installation without centering ring, with risk of breakage of the sealing strip

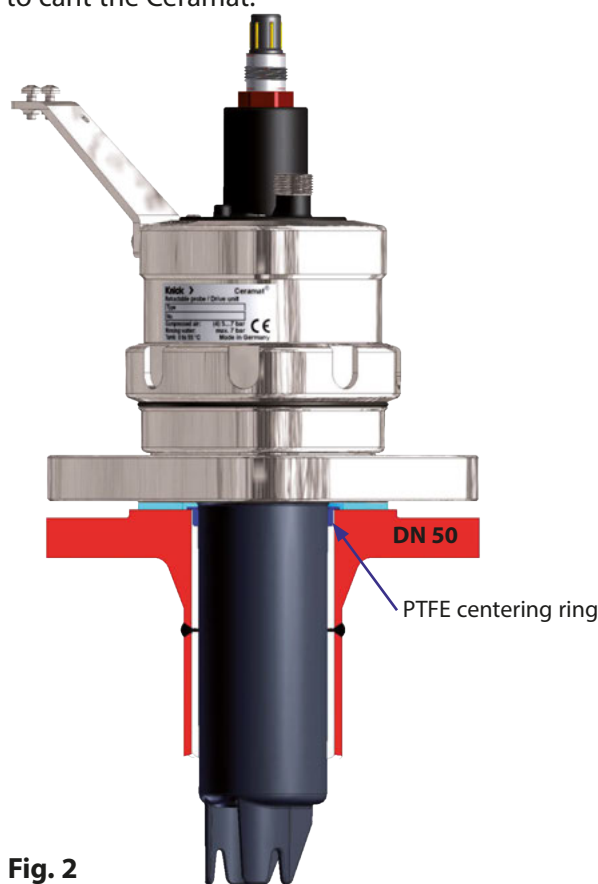
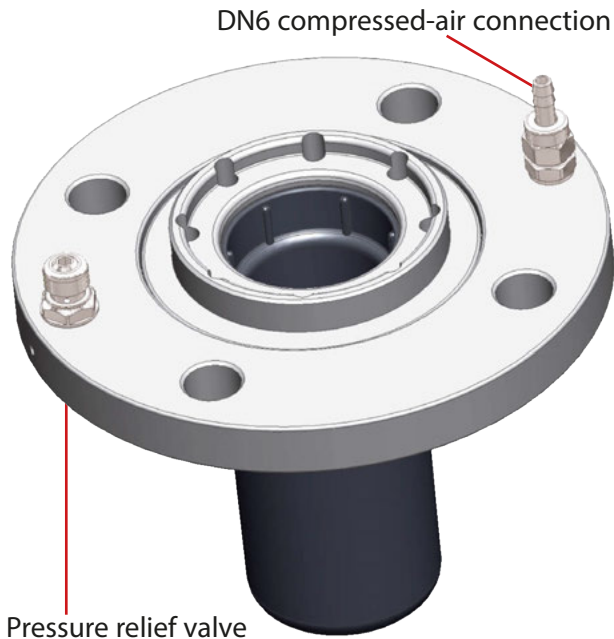


Fig. 2

Correct installation with centering ring

Process Adaptation: Flange with Deposit Remover

Ceramat® WA 150 Sensor Lock-Gate



For process fluids which tend to form brittle incrustations, you can use a process adaptation with deposit remover. Here, an elastomeric coating is momentarily pumped up and released again. The change in volume breaks off the brittle incrustations. A pressure relief valve prevents an overload on the elastomeric coating. For that purpose, the setpoint of the pressure relief valve is factory set depending on the process pressure.

The compressed air is supplied through a DN6 hose with hose grommet. To adjust the required pressure, we recommend the accessory ZU0670/1 or ZU0670/2. In addition to the elastomeric coating, you should also use an extended sensor socket (ZU 0672 or ZU 0673, see "Accessories / Spare Parts" on Page 37). To automate the deposit removal (time control of pump strokes) using the Unical® 9000 or Uniclean® 900, you require the supplementary external valve control kit (see Unical® 9000 / Uniclean® 900 user manuals). Flanges with nominal widths of DN65 or DN80 PN16 are available (see "Ceramat® WA 150(X) Product Coding" on Page 8).



Adhering brittle deposits



Brittle deposits are removed

Installing and Removing a Sensor

Ceramat® WA 150 sensor lock-gate, sensor dismount guard for sensors with solid electrolyte



NOTICE!

Sensors must only be installed or removed by trained personnel authorized by the operating company. The Ceramat® WA 150(X) sensor lock-gate must be in **SERVICE position**.

This position is attained by:

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

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.
- Internally pressurized sensors might have a silicone seal on the diaphragm (as transport protection). Remove this seal using the knife shipped with the sensor.

Sensor Dismount Guard

(for sensors with solid electrolyte only)

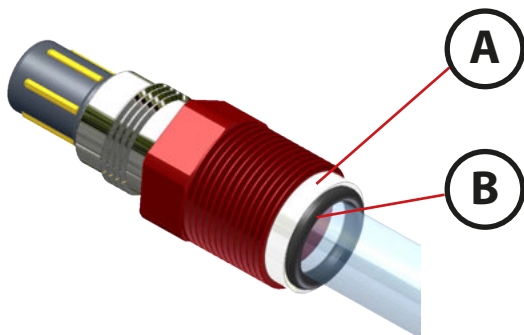


In conjunction with the Unical® or Uniclean® electro-pneumatic controllers and the Protos® measuring system, the Ceramat® is fitted with a sensor dismount guard. This serves to prevent the immersion of the sensor lock-gate without sensor (a message is triggered in Protos®). If the sensor is absent or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

The compressed air escaping from this leak is detected by a flow switch in the Unical® and signals the missing or incorrectly mounted sensor in the Protos®.

Please note!

All information regarding the sensor dismount guard in Unical® is equally applicable to Uniclean®.



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, a "Sensor dismounted" message is shown in Protos®. Before installing a new sensor, check whether any sealing elements remain at the bottom of the sensor holder from previous installations which have not been removed!

Note

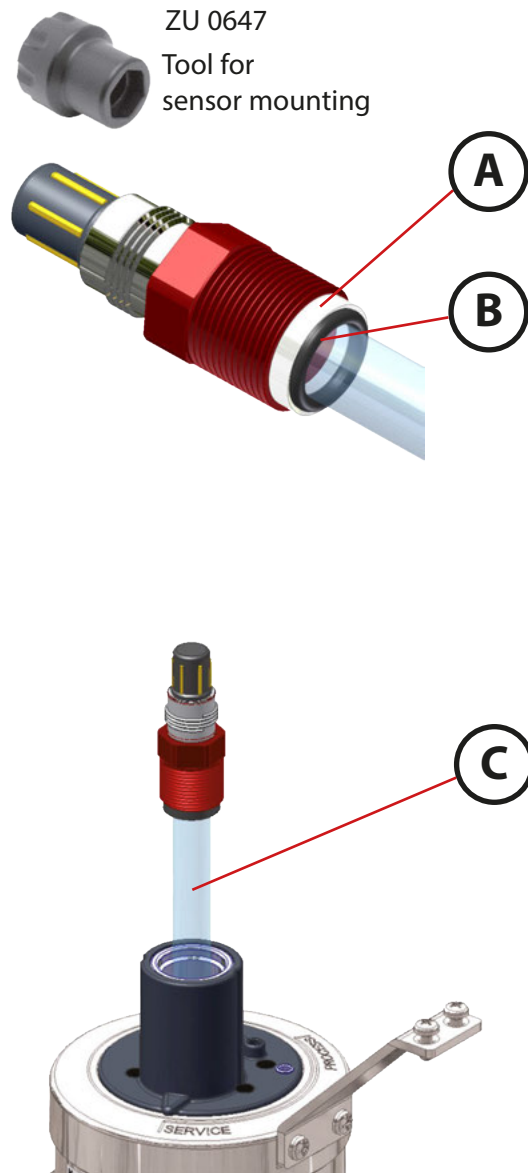
When using a PEEK scraper ring on the sensor socket of the Ceramat® WA 150, e.g. Ceramat® WA150- M , or when retrofitting a Ceramat® WA 150 with sensor socket including scraper ring as accessory ZU 0705, ZU 0706 or ZU 0707 (see Accessories Page 39), the proper functioning of the sensor dismount guard in combination with the Unical®/ Uniclean® cannot be guaranteed. Buildup of contaminations can result in high stripping forces which disturb the sensor dismount guard.

NOTICE!

Therefore, the operator of the Ceramat® WA 150 must always make sure that a sensor is installed before moving the probe to PROCESS position (measuring).

Installing and Removing a Gel-Electrolyte Sensor

Ceramat® WA 150 Sensor Lock-Gate



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: 225 mm
Observe pressure resistance of the sensor.
- 3) Before removing 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, Pg 13.5 thread) with a max. torque of 3 Nm (recommended tool: 19 mm, e.g. Knick ZU 0647 wrench).
- 6) Mount sensor cable and media connection (see "Information on Installation" on Page 17).

Removing the sensor

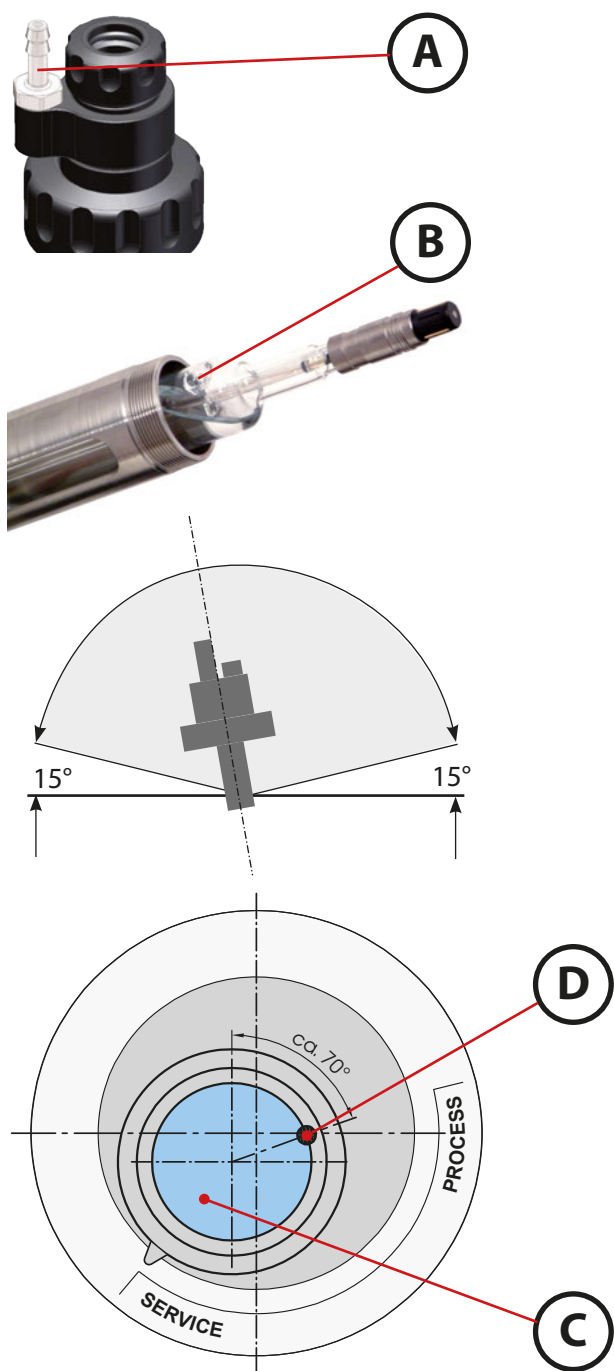
- 1) Move probe into SERVICE position.
The sensor must only be removed in **SERVICE position**.
- 2) Before removing the sensor, check that there is no liquid flowing out of the outlet (ceramic slides or probe housing might be defective).
- 3) Loosen the sensor plug.
- 4) Loosen the sensor using a suitable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

Installing and Removing a Liquid-Electrolyte Sensor

Ceramat® WA 150 Sensor Lock-Gate

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. We recommend the ZU 0670/1 or ZU 0670/2 module (see "Accessories" on Page 39) to maintain the defined overpressure in the pressure chamber of the sensor. It is connected to the sensor pressure chamber via connection nipple **(A)** (dia. 6 mm).

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.

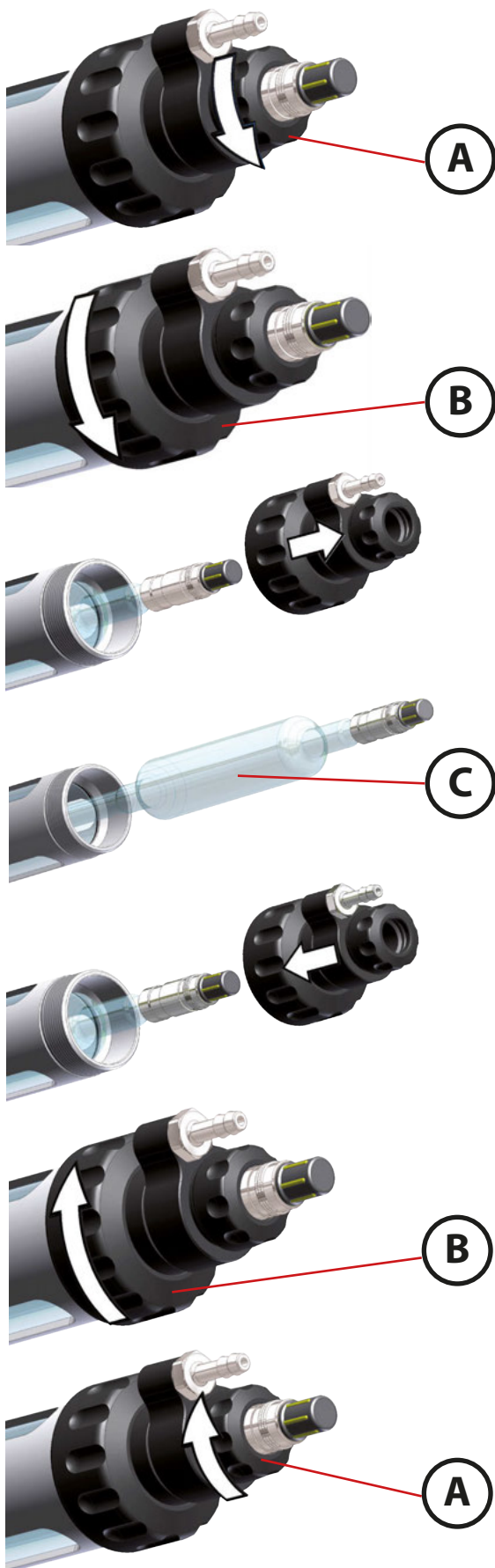
Within the permitted installation angle the probe can be positioned as desired (at least at 15°)

As the Ceramat® performs a rotary movement in addition to the stroke movement, position the sensor **(C)** in a way that the filling hole **(B)** (e.g. Schott) or the "TOP" labeling **(D)** (e.g. Mettler) 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®.

Installing and Removing a Liquid-Electrolyte Sensor

Ceramat® WA 150 Sensor Lock-Gate



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).

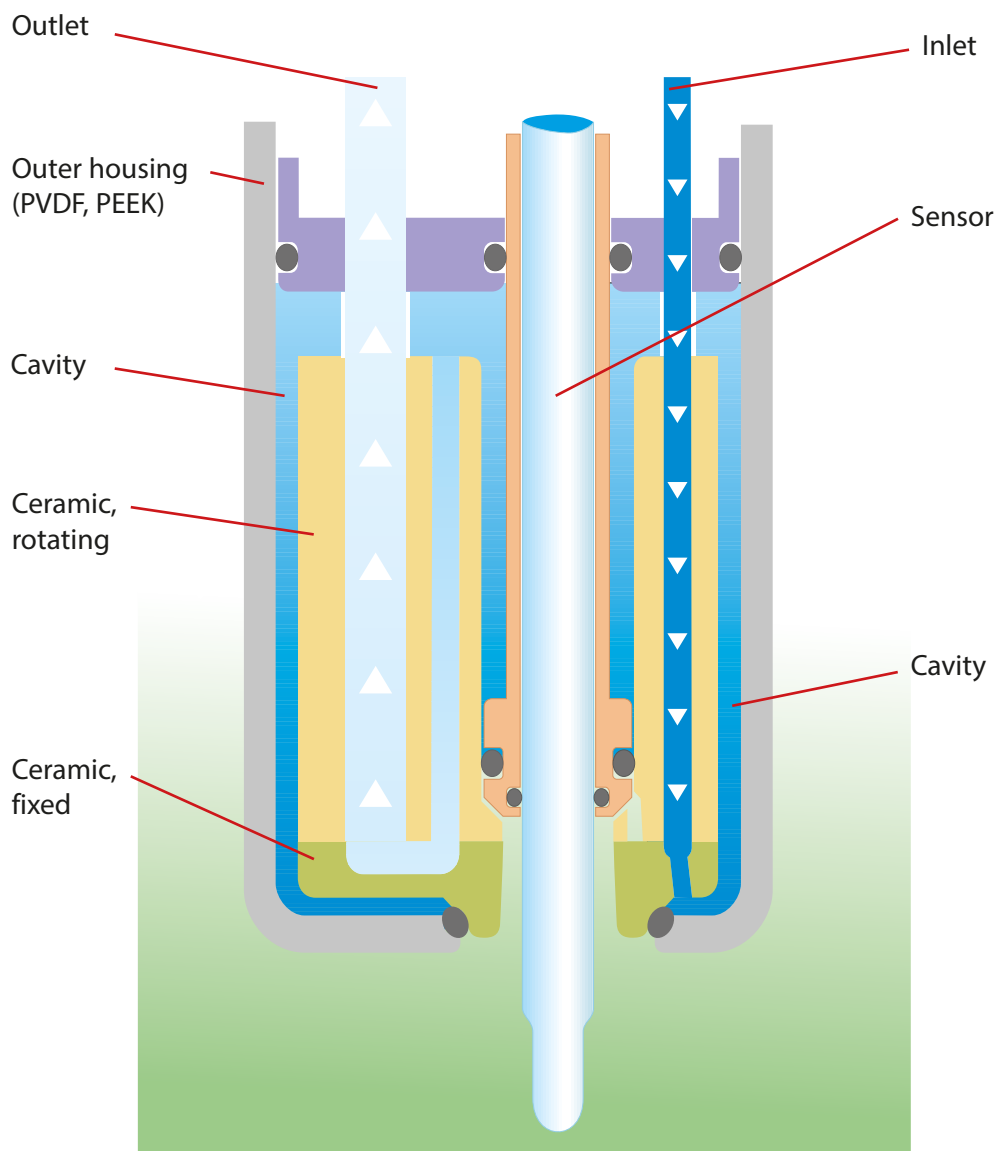
Cavity Rinsing Function

Ceramat® WA 150 Sensor Lock-Gate

In SERVICE position, inlet and outlet are directly connected with the calibration chamber.

The ceramic slides are mounted in an outer housing made of plastic, which is in contact with the process. Due to diffusion (permeation), process fluids may penetrate 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 WA150 moves to PROCESS position. When the rinsing function is activated (e.g. 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, sticky, or fibrous process media, the rinsing intervals should be accordingly reduced.



Ceramic process gate in PROCESS position

Maintenance Work on the Drive Unit

Ceramat® WA 150 Sensor Lock-Gate

The drive unit must be removed, for example:

- for 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.

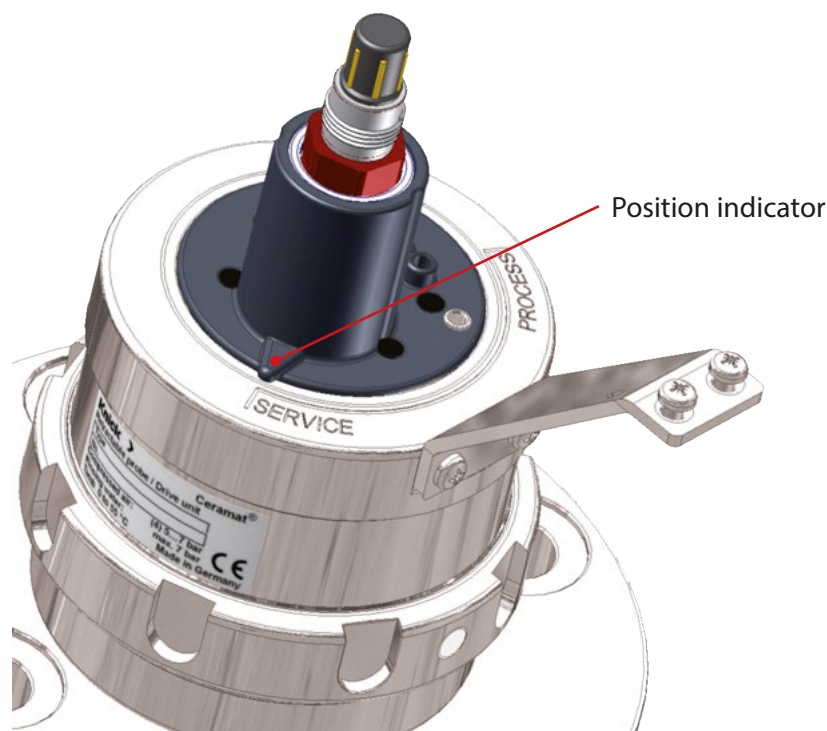


NOTICE!

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 uncontrolled escaping of process fluid is prevented. When dismantling the drive unit under process conditions, you must check whether the first barrier (rotary slides, probe housing) functions properly.

Removing the Drive Unit

Ceramat® WA 150 Sensor Lock-Gate



NOTICE:

Be sure to follow these instructions in the correct sequence!

Take appropriate safety precautions against escaping process fluids.

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

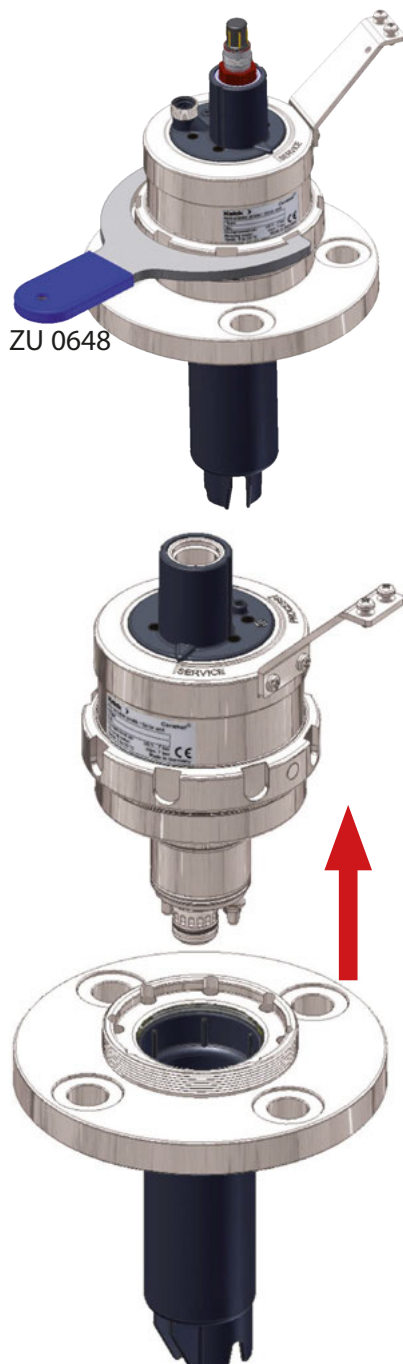
2) Switch off compressed air and deaerate device!

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

4) Turn the coupling nut counterclockwise. Use the ZU 0647 Ceramat mounting wrench (19 mm) for this (see "Accessories", Page 37). 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.

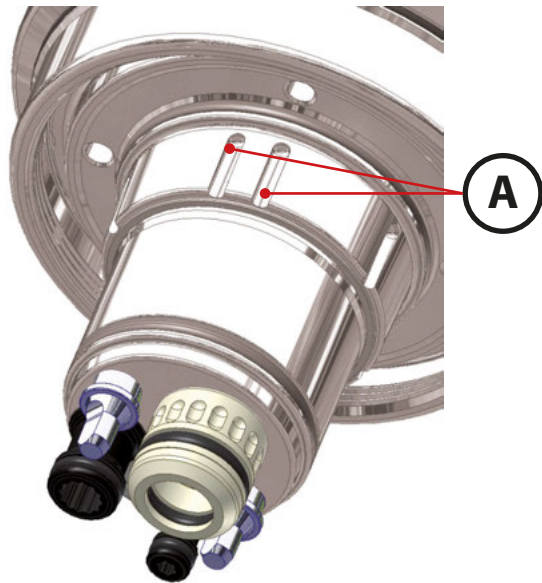
5) Make sure that no process fluid is leaking from the outlet.

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



Installing the Drive Unit

Ceramat® WA 150 Sensor Lock-Gate

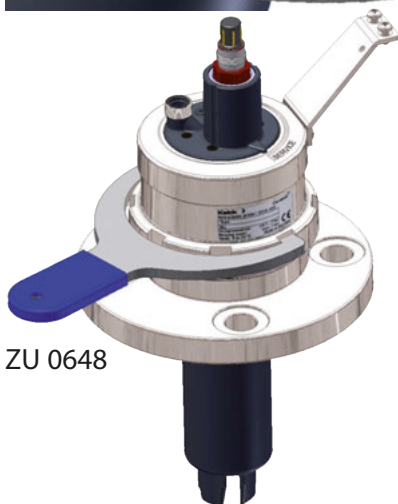


NOTICE:

Be sure to follow these instructions in the correct sequence!

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

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

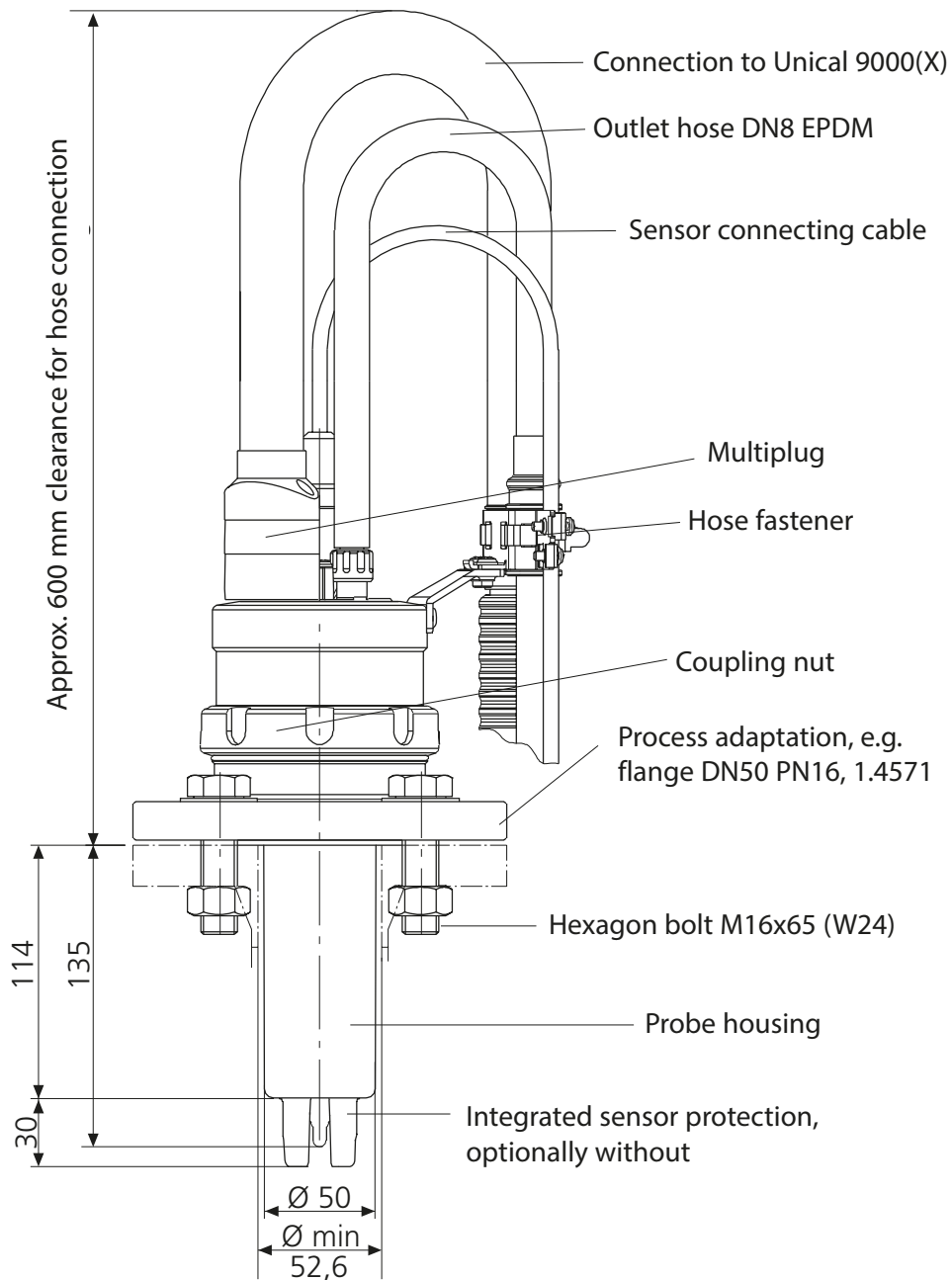


ZU 0648

3) After successful alignment, the drive unit can be inserted and the coupling nut screwed 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 with the ZU 0648 Ceramat mounting wrench, see "Accessories", Page 37.

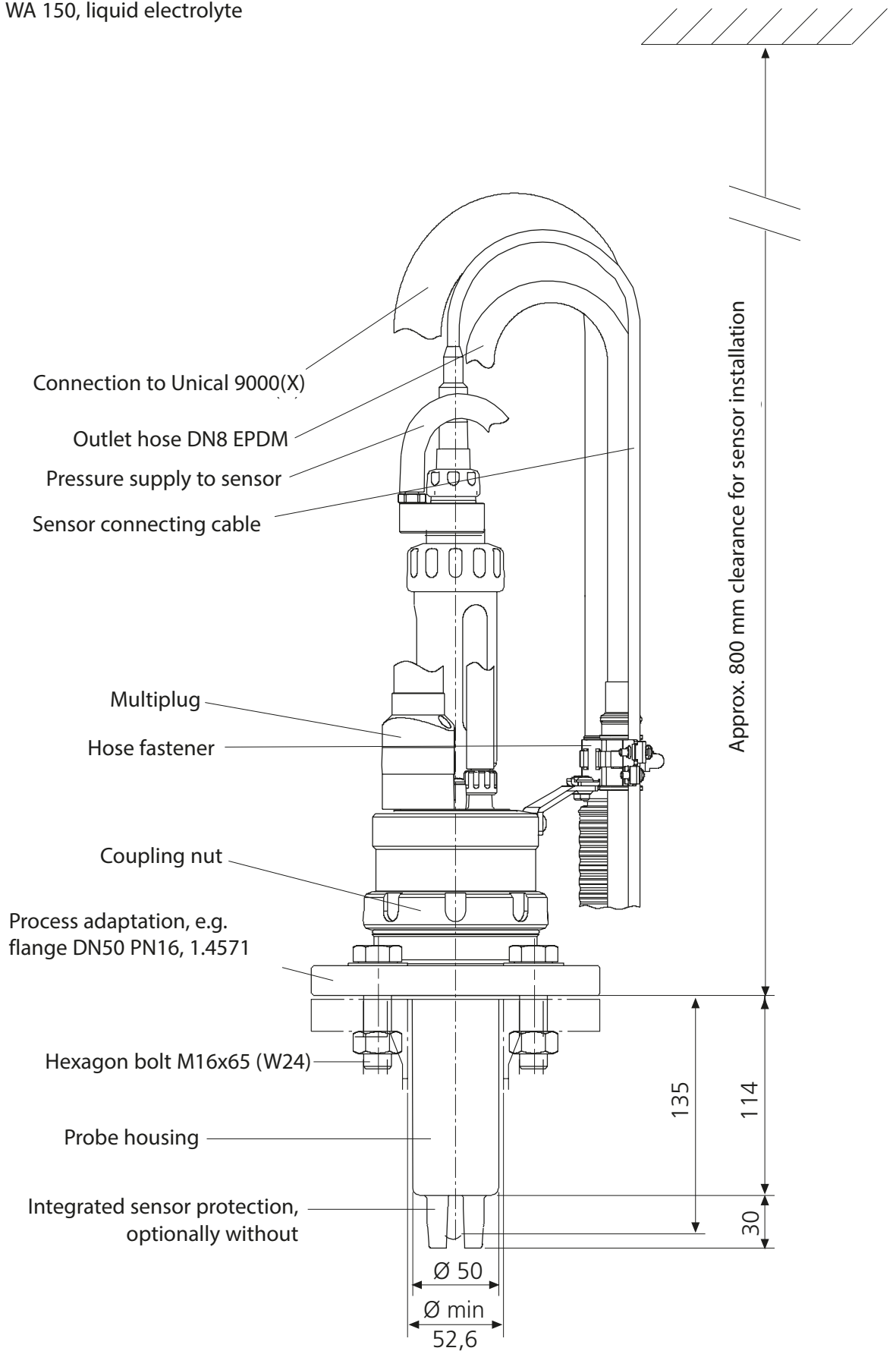
Installation Dimensions

Ceramat® WA 150, solid electrolyte



Installation Dimensions

Ceramat® WA 150, liquid electrolyte



Specifications

Ceramat® WA 150

Permissible process pressure and temperature during movement	
Process adaptation PEEK HD	6 bar (at 0 ... 120 °C), temporarily (30 min 140 °C)
Process adaptation PVDF HD	6 bar (at 0 ... 120 °C), temporarily (30 min 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 ... 7 bar
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/m ³)
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/m ³)
Sensors	
with gel electrolyte	Ø 12 mm, length 225 mm with temp detector, Pg 13.5 thread
with liquid electrolyte	Ø 12 mm, length 250 mm with temp detector
Process adaptations	
Flanges, DIN EN 1092-1	DN50 to DN100
Flanges, ANSI B 16.5	2" bis 3"
Dairy pipe, DIN 11851	DN50 to DN100
Connections	
Outlet	Socket for Unical media hose
for pressurized sensors	Hose connection 6mm Pressure in sensor chamber 0.5 ... 1 bar above process pressure (max. 7 bar)
for compressed air, rinsing and calibration media (control air for retractable fitting)	for Unical multiplug
Immersion depths / Installation dimensions	See dimension drawings
Process-wetted materials	See order code

Maintenance Intervals

Ceramat® WA 150

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 under 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 PROCESS position and observe the outlet. If the sensor lock-gate is untight, 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 see "Maintenance Work on the Drive Unit" on Page 27. 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 probe travels (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 probe travels	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.

Material Properties of the Available Probe Housings and Sensor Sockets

	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

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.

Sealing Kits for Maintenance and Servicing

Ceramat® WA 150

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

The following sealing kits are available for repair and servicing:

Sealing kit	Process-wetted sealings	Rinse-wetted sealings	Order No.	Suitable lubricant (included)
Set A	FKM	FKM	ZU 0624	Syntheso Glep1
Set B	EPDM	EPDM	ZU 0625	Syntheso Glep1
Set C	FFKM	FKM	ZU 0626	Syntheso Glep1
Set E	EPDM FDA	EPDM	ZU 0661	Beruglide L
Set H	FFKM FDA	FFKM FDA	ZU 0885	Beruglide L
Set K	FFKM	FFKM	ZU 0951	Syntheso Glep1

Lubricants, O-Rings

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	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 elastomeric gaskets			
FKM	X	X	X
FFKM	X	X	X
EPDM	X	X	X

Accessories / Spare Parts

Overview for Ceramat® WA 150

Accessories / Spare Parts	Order No.
Sensor mounting wrench, 19 mm	ZU 0647
Air supply for pressurized sensors, 0.5–4 bars	ZU 0670/1
Air supply for pressurized sensors, 1-7 bars	ZU 0670/2
Ceramat® mounting wrench	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
Flange protector DN80, PEEK	ZU 0595
Flange protector DN80, PVDF	ZU 0596
Flange protector DN100, PEEK	ZU 0597
Flange protector DN100, PVDF	ZU 0598
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, Hastelloy C22/FKM	ZU 0673/A
Sensor socket, long, Hastelloy C22/EPDM	ZU 0673/B
Sensor socket, long, 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

Accessories / Spare Parts

Ceramat® WA 150



ZU0647

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 (caused by an open-end wrench).



ZU0648

Ceramat® mounting wrench

Serves to disconnect and mount the drive unit on the process unit via the coupling nut of the drive unit.

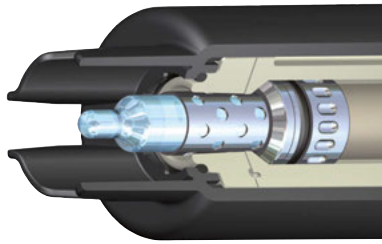


Sensor socket with mounted O-rings

- **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

Accessories / Spare Parts

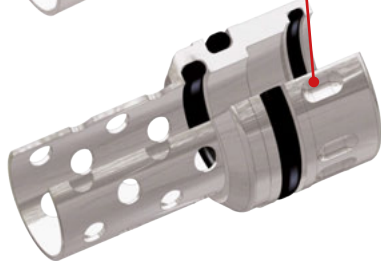
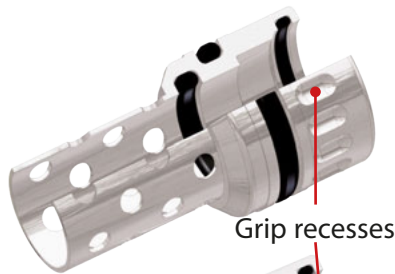
Ceramat® WA 150



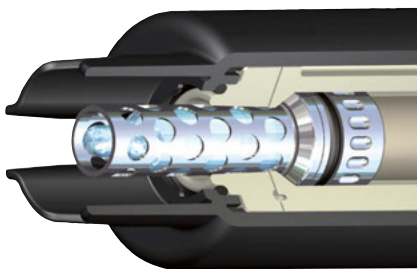
Long sensor socket with mounted O-rings

This sensor socket is recommended for brittle incrustations (e.g. lime). (Hastelloy C22 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 (e.g. lime). The sensor is also better mechanically protected. (Hastelloy C22 can be identified by a missing grip recess.)

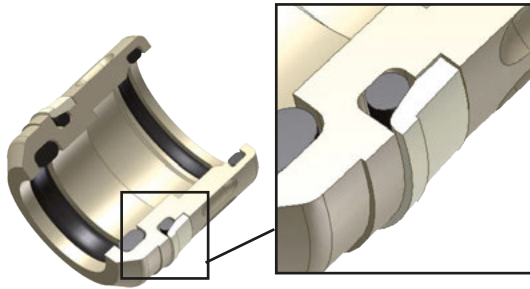
- **ZU 0808/A** Sensor socket 1.4571, O-rings FKM
- **ZU 0808/B** Sensor socket 1.4571, O-rings EPDM
- **ZU 0808/C** Sensor socket 1.4571, O-rings FFKM



- **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

Accessories / Spare Parts

Ceramat® WA 150

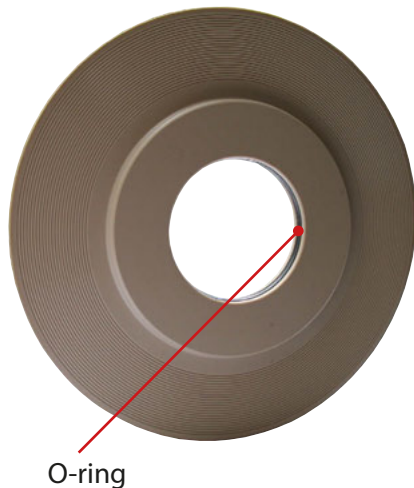


Sensor socket with mounted O-rings and scraper ring with scraper edge made of PEEK

This sensor socket is recommended for sticky media and for particles in the process medium.

Please observe notice on Page 22.

- **ZU 0705** Sensor socket PEEK, O-rings FKM
- **ZU 0706** Sensor socket PEEK, O-rings EPDM
- **ZU 0070** Sensor socket PEEK, O-rings FFKM



Flange protector

Protects a stainless-steel Ceramat® flange (W. No.: 1.4571) against aggressive media for nominal widths of DN80 or larger, O-ring made of FFKM

- **ZU 0595** Flange protector DN80, PEEK
- **ZU 0596** Flange protector DN80, PVDF
- **ZU 0597** Flange protector DN100, PEEK
- **ZU 0598** Flange protector DN100, PEEK



ZU0670/1

Air supply for pressurized sensors, 0.5 – 4 bar

ZU0670/2

Air supply for pressurized sensors, 1 – 7 bar

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

Accessories / Spare Parts

Ceramat® WA 150



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 multiplug of the media hose.

The following variants are available:

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

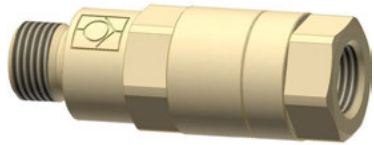


ZU 0646 pneumatic manual control valve

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

Accessories / Spare Parts

Ceramat® WA 150



RV/01-xxxx check valve

The RV/01 check valve is suitable for preventing backflow of process medium or rinse/calibration solution into the inlet of sensor lock-gates, controllers or fittings made by Knick.

Connections : G1/8 or G1/4 (female or male)

Material of housing and flow body:
stainless steel 1.4404 or PEEK

Material of gaskets: FKM, EPDM, FFKM, FKM FDA,
EPDM FDA, FFKM FDA (see product range)

Declaration of Contamination

Ceramat® WA 150



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:

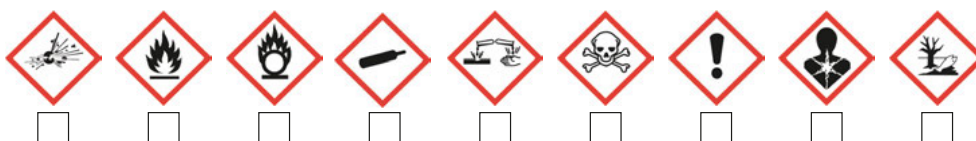
Serial number:

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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TE-Kontaminationserklärung_KNX01



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