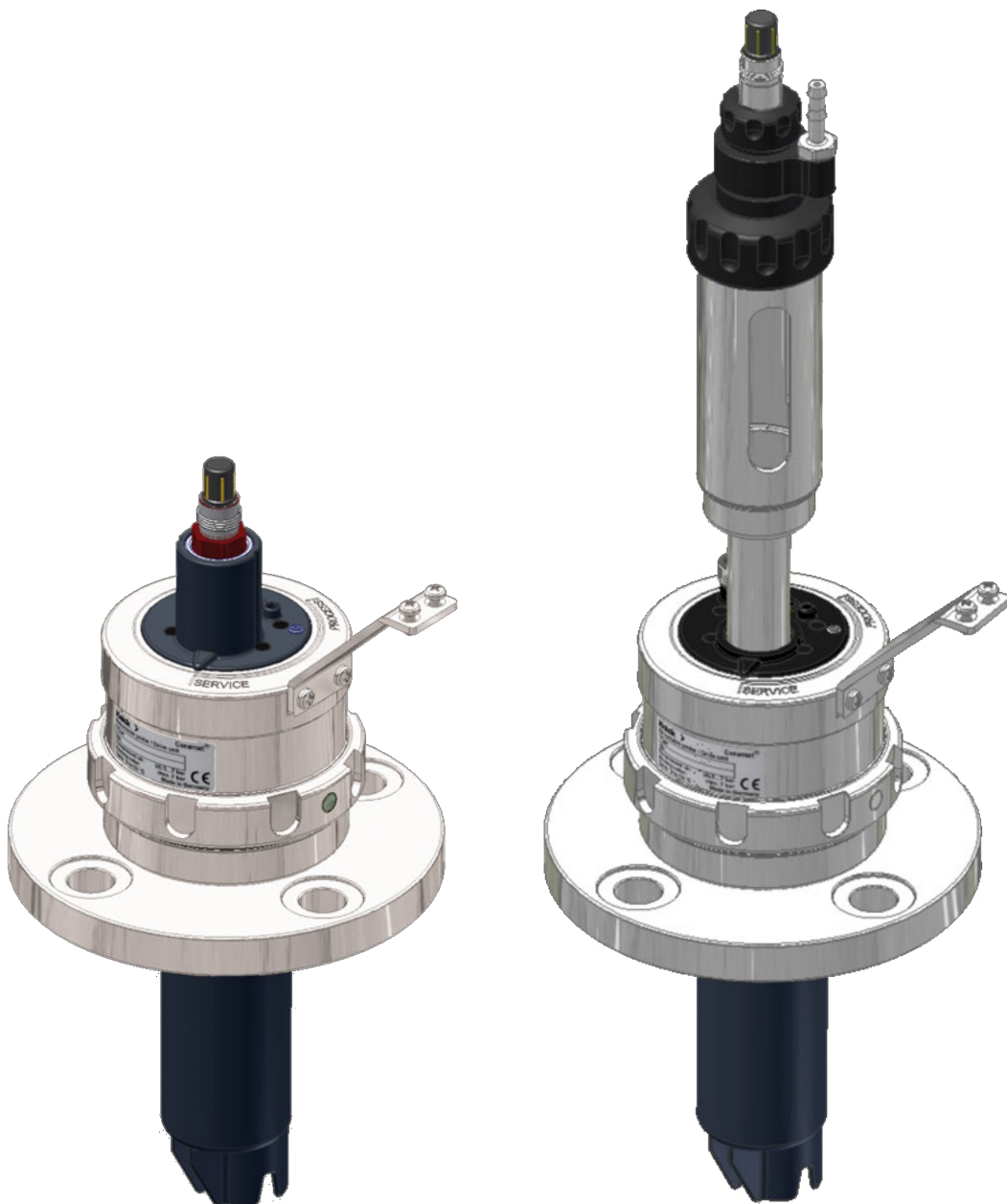


# Ceramat WA150

Retractable Fitting



Read before installation.  
Keep for future use.



## Supplemental Directives

READ AND SAVE THIS DOCUMENT FOR FUTURE REFERENCE. BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT, PLEASE ENSURE A COMPLETE UNDERSTANDING OF THE INSTRUCTIONS AND RISKS DESCRIBED HEREIN. ALWAYS OBSERVE ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS IN THIS DOCUMENT COULD RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE. THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.



These supplemental directives explain how safety information is laid out in this document and what content it covers.

### Safety Chapter

This document's safety chapter is designed to give the reader a basic understanding of safety. It illustrates general hazards and gives strategies on how to avoid them.

### Warnings

This document uses the following warnings to indicate hazardous situations:

Symbol	Category	Meaning	Remark
	WARNING	Designates a situation that can lead to death or serious (irreversible) injury.	The warnings contain information on how to avoid the hazard.
	CAUTION	Designates a situation that can lead to slight or moderate (reversible) injury.	
None	NOTICE	Designates a situation that can lead to property or environmental damage.	

## Symbols Used in this Document

Symbol	Meaning
→	Reference to additional information
✓	Interim or final result in instructions for action
▶	Sequence of figures attached to an instruction for action
①	Item number in a figure
(1)	Item number in text

## Related Documents

- Special datasheet for special version B <sup>1)</sup>
- Special datasheet for special version J <sup>1)</sup>
- Maintenance Instructions Ceramat WA150

<sup>1)</sup> Further information on the special versions is available in the "Product Code" section. → *Product Code*, p. 10

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# 1 Safety

This document contains important instructions for the use of the product. Always follow all instructions and operate the product with caution. If you have any questions, please contact Knick Elektronische Messgeräte GmbH & Co. KG (sometimes hereafter referred to as "Knick") using the information provided on the back page of this document.

## 1.1 Intended Use

The Ceramat WA150 (the "product") is a retractable fitting for installation in boilers, tanks, and pipes. The product is used to mount a sensor for measuring process parameters. The sensor is immersed in the process medium by the Ceramat WA150. The Ceramat WA150 is pneumatically operated.

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

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

The Ceramat WA150 can be used with the following sensor types:

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

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

The defined operating conditions must be observed when using this product. → *Specifications, p. 52*

Thanks to its modular design, the Ceramat WA150 can be adapted to changed conditions by the customer.

→ *Changes for Different Conditions, p. 17*

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

The Ceramat WA150-X version is certified for operation in explosive atmospheres.

→ *Operation in Explosive Atmospheres, p. 7*

## 1.2 Personnel Requirements

The operating company shall ensure that any personnel using or otherwise interacting with the product is adequately trained and has been properly instructed.

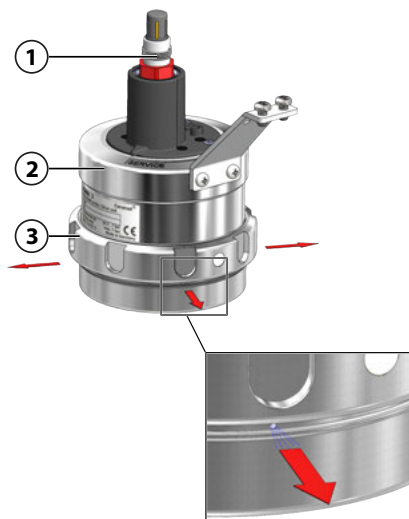
The operating company shall comply and cause its personnel to comply with all applicable laws, regulations, codes, ordinances and relevant industry qualification standards related to product. Failure to comply with the foregoing shall constitute a violation of operating company's obligations concerning the product, including but not limited to an unintended use as described in this document.

### 1.3 Safeguards

The Ceramat WA150 safety concept is based on the interplay of functions within a Knick process analysis system. The Ceramat WA150 safeguards and safety functions require the functions of the electro-pneumatic controller and the process analyzer. → *Process Analysis System: Installation Example, p. 19*

Safeguards and safety functions are not available if the Ceramat WA150 is operated without a Knick process analysis system. The operating company must assess the risks and take appropriate action. It must be possible to safely isolate media and power connections from the Ceramat WA150 using shut-off devices.

Use the product as intended only. → *Intended Use, p. 5*



#### Immersion Lock Without a Mounted Solid-Electrolyte Sensor

The safeguard is only available for versions of the Ceramat WA150 intended for solid-electrolyte sensors and when using a Knick process analysis system.

The safeguard is not available in versions of the Ceramat WA150 that have a sensor socket with a PEEK scraper or if the sensor socket is retrofitted with a PEEK scraper.

The safeguard function is only available if the O-ring and the washer are correctly installed on the solid-electrolyte sensor **(1)**.

**Function:** Moving into the process position (PROCESS limit position) without or with an incorrectly mounted solid-electrolyte sensor **(1)** can be detected and prevented.

Compressed air noticeably and audibly escapes through holes underneath the coupling nut **(2)** of the drive **(2)**. This compressed air is detected by a flow switch in the electro-pneumatic controller. The process analyzer displays a **Sensor Removed** message; the Ceramat WA150 does not move into the process position (PROCESS limit position).

Environmental influences may affect the functionality of safeguards (e.g., components stuck together by process medium).

→ *Residual Risks, p. 6*

### 1.4 Residual Risks

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

#### Environmental Influences

The effects of moisture, ambient temperature, chemicals, and corrosion can negatively impact the safe operation of the product.

Please observe the following instructions:

- Only operate the Ceramat WA150 in compliance with the stated operating conditions.  
→ *Specifications, p. 52*
- Install the product inside a protected area of the plant. Alternatively, take appropriate action to protect the Ceramat WA150.
- If using aggressive chemical process media, adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance Intervals, p. 35*
- Adhering and sticky process media can impact the functionality of the Ceramat WA150 (e.g., by causing components to stick together). Adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance Intervals, p. 35*

## 1.5 Hazardous Substances

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

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

- Process medium
- Calibration or cleaning medium
- Lubricant

The operating company is responsible for conducting a hazard assessment.

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

## 1.6 Operation in Explosive Atmospheres

The Ceramat WA150-X is certified for operation in explosive atmospheres.

- EU Type Examination Certificate KEMA 04ATEX4035X

The conditions for installation and operation in explosive atmospheres can be found on the corresponding certificates.

Exceeding the standardized atmospheric conditions within the manufacturer's specifications, e.g., with regard to the ambient temperature and pressure, does not endanger the retractable fitting's durability.  
→ *Specifications, p. 52*

Related certificates are included in the product's scope of delivery and are available at [www.knick.de](http://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)

### 1.6.1 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 system 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.

→ *Nameplates, p. 12*

## 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.

### 1.6.2 Possible Ignition Hazards During Operation

When using non-water-based cleaning, rinsing, or calibration media with a 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 explosive atmospheres. Further information can be found in the sensor manufacturer's documentation.

## 1.7 Safety Training

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

## 1.8 Maintenance and Spare Parts

### Preventive Maintenance

Preventive maintenance can keep the product in good condition and minimize downtimes. Knick provides recommended inspection and maintenance intervals. → *Maintenance, p. 35*

### Lubricants

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

→ *Maintenance, p. 35*

### Tools and Mounting Aids

Special and accessory tools help maintenance personnel to replace components and wear parts safely and professionally. → *Tools, p. 49*

### Spare Parts

For professional corrective maintenance of the product, only use Knick genuine spare parts. Usage of any other spare parts shall constitute an unintended use of the product.

→ *Spare Parts, p. 45*

### Repair Service

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

Further information can be found at [www.knick.de](http://www.knick.de).



## 2 Product

### 2.1 Package Contents

- Ceramat WA150 in the version ordered
- User Manual
- As applicable, supplementary datasheet for special versions<sup>1)</sup>
- EU Declaration of Conformity<sup>2)</sup>
- EU Type Examination Certificate<sup>1)</sup>

### 2.2 Product Identification

The different versions of the Ceramat WA150 are encoded in a product code.

The product code is stated on the nameplate, the delivery note, and the product packaging.

→ *Nameplates, p. 12*

#### 2.2.1 Example of a Version

<b>Basic Device with Pneumatic Drive, Stainless Steel</b>		WA150	-	X	0	A	B	B	2	-	0	0	0	
Explosion protection	ATEX Zone 0			X						-				
Sensor	Sensor Ø 12 mm with PG 13.5				0					-				
Seal material	FKM					A				-				
Material of probe housing and sensor socket	PVDF with integrated sensor protection						B			-				
Process connections	Flange, loose, 1.4571, PN10/16, DN 65							B	2	-				
Special version	None										-	0	0	0

<sup>1)</sup> Supplied depending on the ordered version of the Ceramat WA150. → *Product Code, p. 10*

<sup>2)</sup> Part of package contents only for Ex-approved products.

## 2.2.2 Product Code

Basic Device with Pneumatic Drive, Stainless Steel		WA150	-	-	-	-	-	-	-	-
Explosion protection	ATEX Zone 0	X								
	None	N								
Sensor	Sensor Ø 12 mm with PG 13.5	Ø								
	pH sensor Ø 12 mm with pressurization unit, pressure chamber for compressed air supply	1								
	Optical sensor Ø ½" (12.7 mm)	2								
	Optical sensor Ø 12 mm	3								
Seal material	FKM	A								
	EPDM	B								
	FFKM / FKM <sup>1)</sup>	C								
	FFKM / EPDM <sup>1)</sup>	D								
	EPDM – FDA	E								
	FFKM – FDA	H								
	FFKM	K								
Material of probe housing and sensor socket	PEEK with integrated sensor protector	A								
	PVDF with integrated sensor protector	B								
	PEEK without integrated sensor protector	C								
	PVDF without integrated sensor protector	D								
	PEEK without integrated sensor protector, long sensor socket, 1.4404	H								
	PEEK without integrated sensor protector, long sensor socket, C22	J								
	PVDF without integrated sensor protector, long sensor socket, 1.4404	K								
	PVDF without integrated sensor protector, long sensor socket, C22	L								
	PEEK without integrated sensor protector, PEEK sensor socket with PEEK scraper ring	M								
	PEEK without integrated sensor protector, sensor socket with full sensor protection, 1.4404	N								
	PVDF without integrated sensor protector, sensor socket with full sensor protection, 1.4404	O								
	PEEK without integrated sensor protector, sensor socket with full sensor protection, C22	P								
	PVDF without integrated sensor protector, sensor socket with full sensor protection, C22	R								
Process connections	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 <sup>2)</sup>	B 3								
	Flange, loose, 1.4571, PN10/16, DN 100 <sup>2)</sup>	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 <sup>2)</sup>	E 3								

<sup>1)</sup> Process-wetted gaskets / rinse-wetted gaskets

<sup>2)</sup> One of the following flange protectors is required for the version with a plastic bottom calibration chamber from flange size DN80 / 3": ZU0595, ZU0596, ZU0597, ZU0598. → *Accessories*, p. 47

Basic Device with Pneumatic Drive, Stainless Steel		WA150	-	-	-	-	-	-	-	-	-	-	-	-
	Flange, loose, 1.4571, PN40, DN 100 <sup>1)</sup>													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" <sup>1)</sup>													D 3 -
	Flange, loose, ANSI 316, 150 lbs, 3 1/2" <sup>1)</sup>													D 4 -
	Flange, loose, ANSI 316, 150 lbs, 4" <sup>1)</sup>													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" <sup>1)</sup>													P 3 -
	Flange, loose, ANSI 316, 300 lbs, 3 1/2" <sup>1)</sup>													P 4 -
	Flange, loose, ANSI 316, 300 lbs, 4" <sup>1)</sup>													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 <sup>1)</sup>													F 3 -
	Varivent 1.4404 (≥ DN 50) <sup>2)</sup>													V 1 -
	Flange, loose, 1.4571, PN10/16, DN 65, EPDM coated													Y 2 -
	Without process connection													0 0 -
Special version	None													- 0 0 0
	Equipped with special grease (provided by customer)													- 0 0 1
	Fixation ring (process unit) made of Hastelloy C22, driving pin (rotary drive) made of Hastelloy C22													- 0 0 A
	Sensor protection tube for optical sensor (Hellma) with Ø 12 mm and additional anti-twist protection for the sensor cables, rotating adapter 12 mm/PG 13.5 (according to drawing)													- 0 0 B
	Ceramam, process unit with split (removable) slide ring													- 0 0 C
	Customer-specific special datasheet													- 0 0 F
	Sensor protection tube for optical sensor (Hellma) with Ø 12 mm or 1/2" (12.7 mm) and additional anti-twist protection for the sensor cables, rotating adapter 12 mm (1/2") / PG 13.5 (according to drawing)													- 0 0 J
	Ceramam, inlet and outlet made of 1.4404													- 0 0 K
	Drive on ceramic side and driving pin made of Hastelloy C22													- 0 0 M

<sup>1)</sup> One of the following flange protectors is required for the version with a plastic bottom calibration chamber from flange size DN80 / 3": ZU0595, ZU0596, ZU0597, ZU0598. → *Accessories, p. 47*

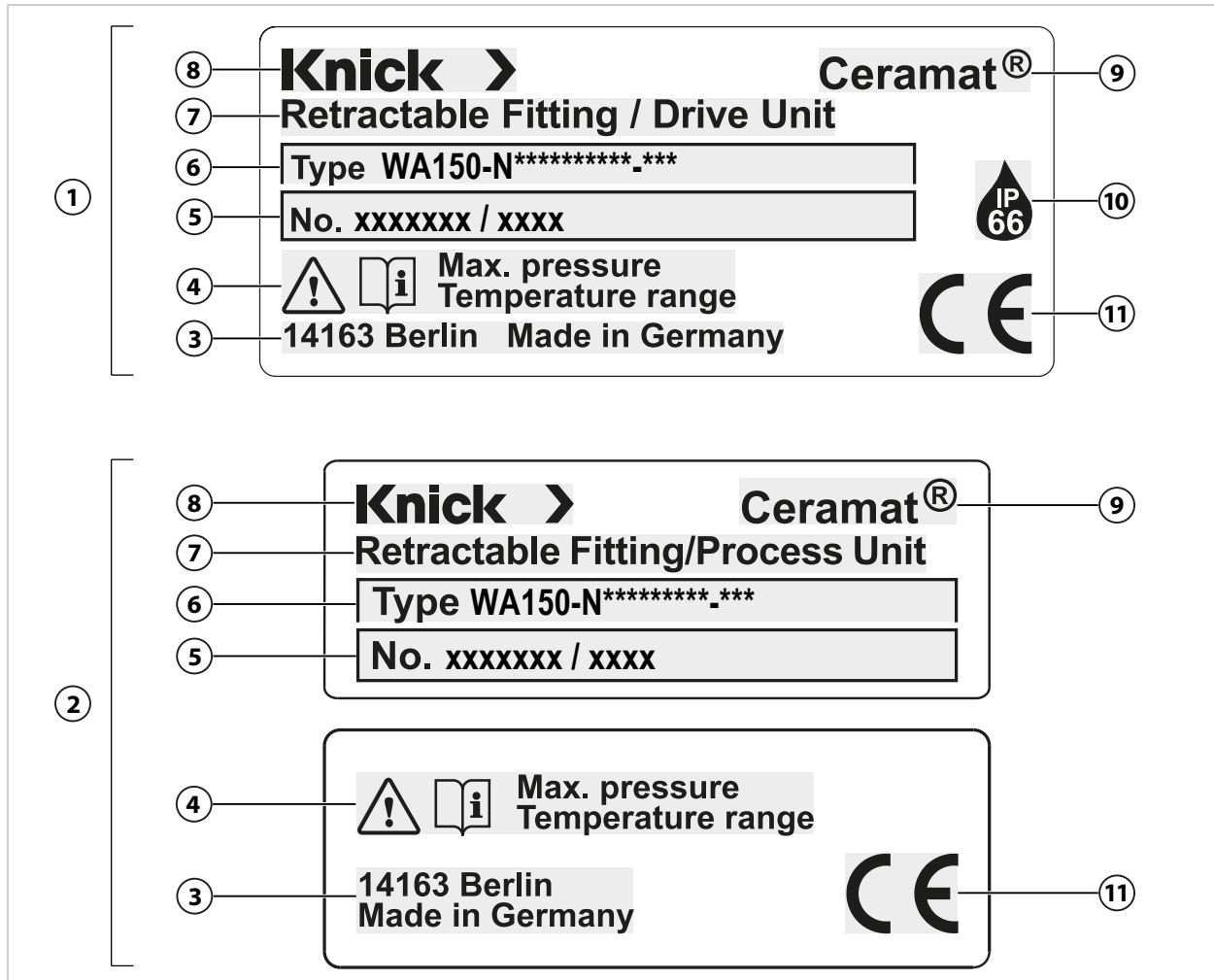
<sup>2)</sup> Special option, lead time on request

### 2.3 Nameplates

The Ceramat WA150 is identified by nameplates on the drive unit and the process unit. The information provided on the nameplates varies according to the version of the Ceramat WA150.

#### Nameplate, Version Without ATEX Approval

**Note:** The figure shows a nameplate for the Ceramat WA150-N version by way of example.

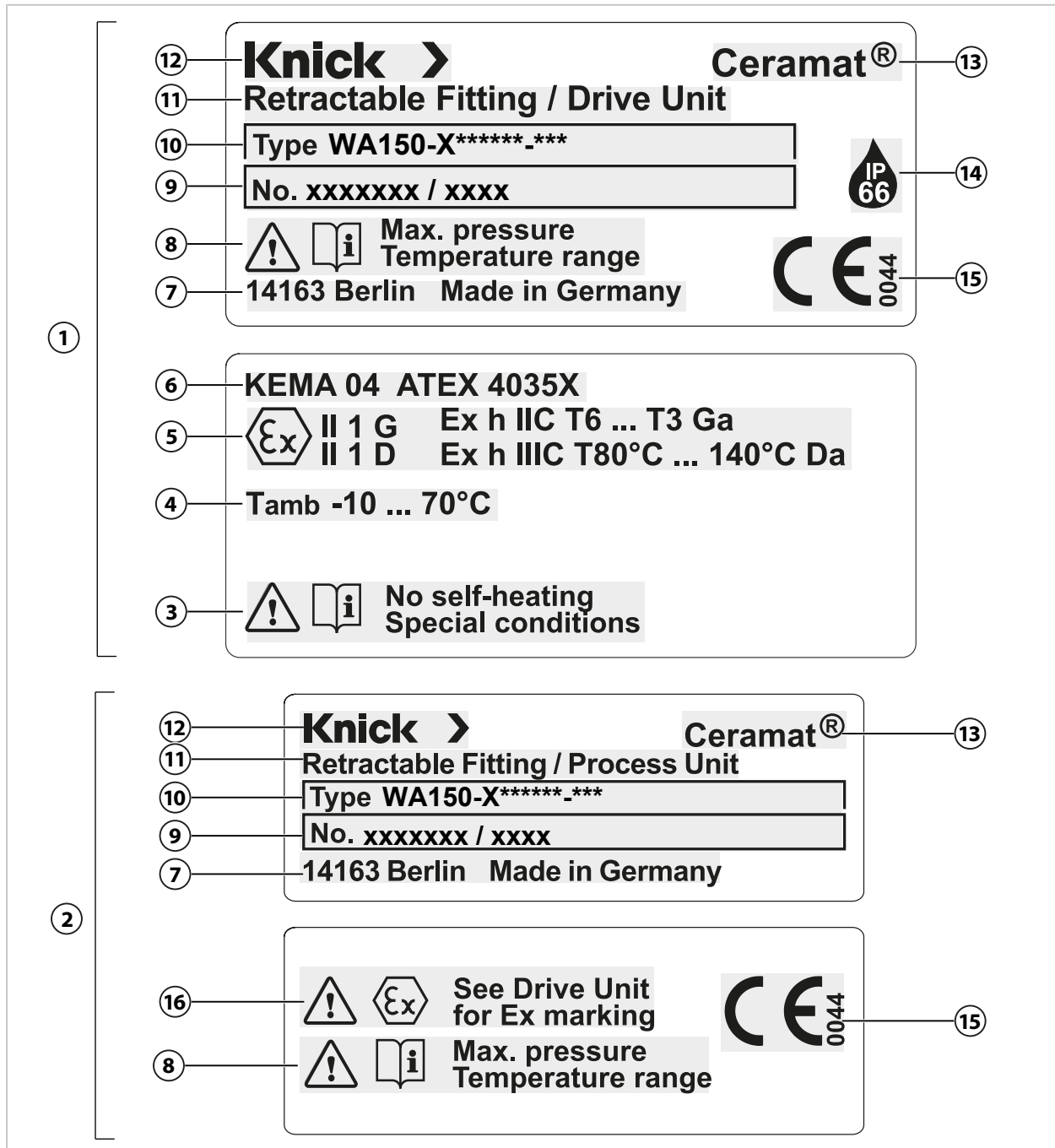


1	Drive unit nameplate	7	Product line / assembly group
2	Process unit nameplates	8	Manufacturer
3	Manufacturer's address with designation of origin	9	Product line
4	Max. operating pressure and temperature range <sup>1)</sup>	10	IP degree of protection
5	Serial number / year and week of production	11	Conformity marking
6	Type (product code)		

<sup>1)</sup> Further information is available in the related EU Type Examination Certificate and in the → *Safety*, p. 5 and → *Specifications*, p. 52 chapters.

**Nameplate, Version With ATEX Approval**








**Note:** The figure shows a nameplate for the Ceramat WA150-X version by way of example.



1	Drive unit nameplate	9	Serial number / year and week of production
2	Process unit nameplate	10	Type (product code)
3	No self heating / special conditions <sup>1)</sup>	11	Product line / assembly group
4	Permissible ambient temperature	12	Manufacturer
5	ATEX marking / information on explosion protection	13	Product line
6	EU Type Examination Certificate test number	14	IP degree of protection
7	Manufacturer's address with designation of origin	15	Conformity marking with identification number
8	Max. operating pressure and temperature range <sup>1)</sup>	16	Reference to ATEX information for the drive unit

<sup>1)</sup> Further information is available in the related EU Type Examination Certificate and in the → *Safety*, p. 5 and → *Specifications*, p. 52 chapters.

## 2.4 Symbols and Markings

	Special conditions and danger points! Observe the safety information and instructions on safe use of the product as outlined in the product documentation.
	Reminder to read the documentation.
	CE marking with identification number <sup>1)</sup> of the notified body involved in production control.
	ATEX marking <sup>1)</sup> of the European Union for operation of the Ceramat WA150-X in hazardous locations. → <i>Operation in Explosive Atmospheres, p. 7</i>
	IP66 protection: The product is dust-tight and offers complete protection against contact as well as protection against strong water jets.
	Display indicating process position (PROCESS limit position). → <i>Moving into the Process Position (PROCESS Limit Position), p. 29</i>
	Display indicating service position (SERVICE limit position). → <i>Moving into the Service Position (SERVICE Limit Position), p. 29</i>

## 2.5 Design and Function

The Ceramat WA150 consists of two main assemblies:

- Drive unit
- Process unit

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

Different versions of drive and process unit can be combined.

→ *Changes for Different Conditions, p. 17*

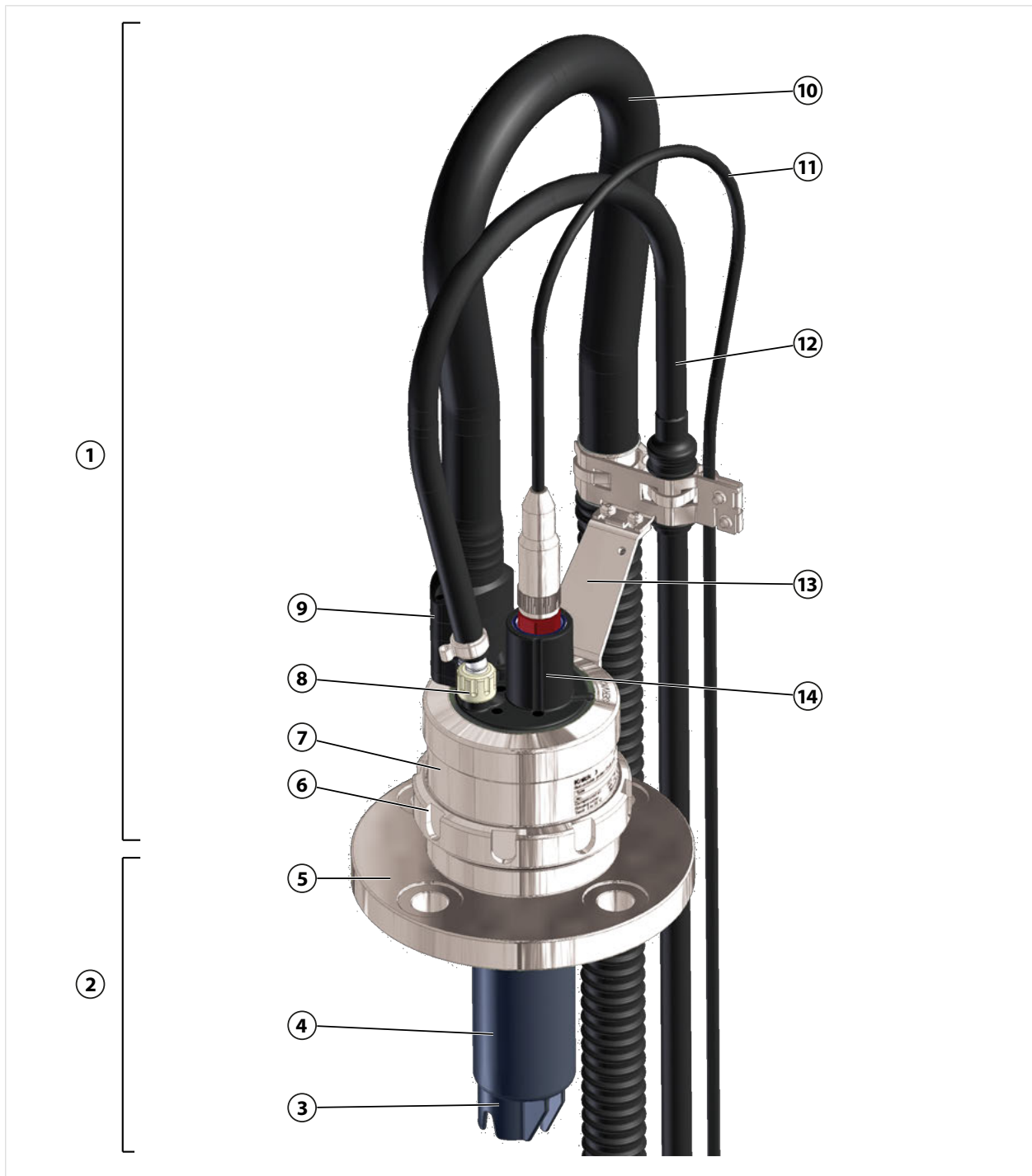
The process connection is used to fasten the Ceramat WA150 to the process port on the measuring point.

The pneumatically operated drive unit moves the Ceramat WA150 into the service position (SERVICE limit position) or the process position (PROCESS limit position). → *Service and Process Position, p. 18*

<sup>1)</sup> Dependent on the ordered version. → *Product Code, p. 10*

### 2.5.1 Retractable Fitting

**Note:** The figure shows an example version of the Ceramat. → *Product Code, p. 10*

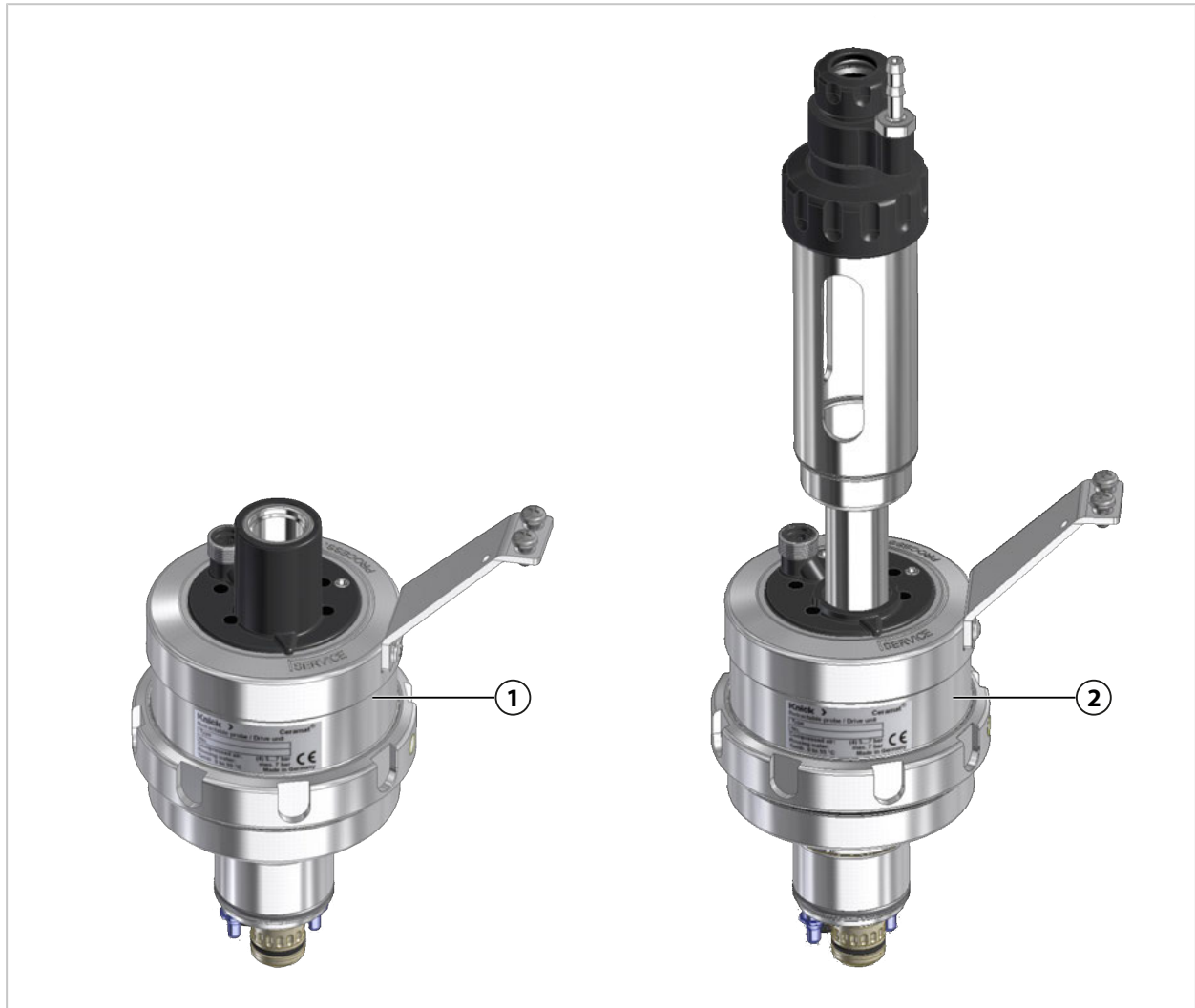


1 Drive unit	8 Media outlet
2 Process unit	9 Multiplug <sup>1)</sup>
3 Probe guard	10 Media connection <sup>1)</sup>
4 Sensor housing with ceramic rotary slides	11 Sensor cable <sup>1)</sup>
5 Process connection (e.g., flange)	12 Outlet hose <sup>1)</sup>
6 Coupling nut	13 Strain relief bracket
7 Drive unit	14 Sensor holder

<sup>1)</sup> Not included in the Ceramat WA150 package contents

### 2.5.2 Drive Units

**Note:** The figure shows a selection from the product line. → *Product Code, p. 10*

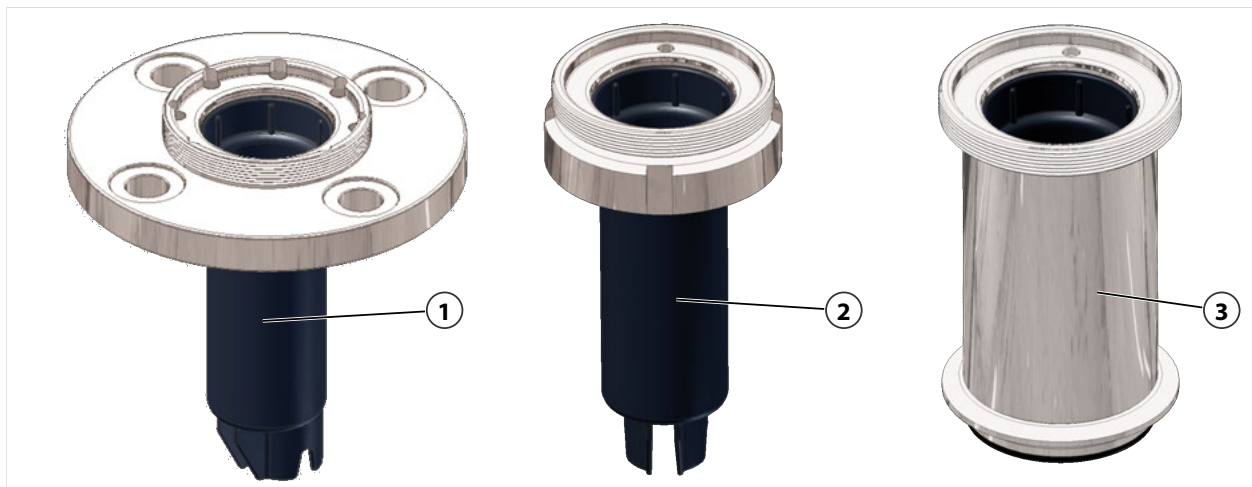


1 Drive unit, solid-electrolyte sensor

2 Drive unit, liquid-electrolyte sensor

### 2.5.3 Process Connections

**Note:** The figure shows a selection from the product line. → *Product Code, p. 10*



1 Flange

2 Dairy pipe

3 Varivent



### 2.5.4 Option: Deposit Remover

A process connection with deposit remover can optionally be used for process media that tend to cause brittle scaling (product variant WA150-\*\*\*\*F2-\*\*\* or WA150-\*\*\*\*F2-\*\*\*). → *Product Code, p. 10*

This process connection has an elastomeric coating that is briefly inflated and deflated using compressed air. The change in the coating's volume causes the brittle scaling to flake off.

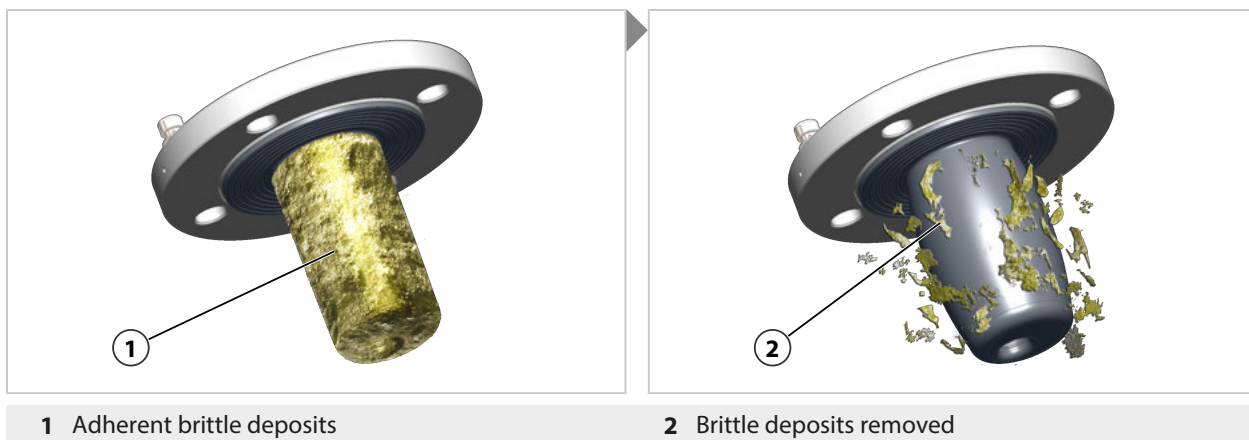
A pressure relief valve prevents overloading of the elastomeric coating due to the process pressure. The pressure relief valve's setpoint is permanently set at the factory to match the process pressure.

Accessories ZU0670/1 or ZU0670/2 are recommended for the required pressure setting.

→ *Accessories, p. 47*

In addition, an extended sensor socket ZU0672 or ZU0673 should be used where brittle scaling is expected. → *Spare Parts, p. 45*

When using a process analysis system with Unical 9000 or Uniclean 900, the "Actuation of external valve Aux 1" supplementary kit is required in the Unical 9000 or Uniclean 900 controller. <sup>1)</sup>



## 2.6 Changes for Different Conditions

The Ceramat WA150 can be adapted to changed conditions by the customer. Prior to making any changes, contact Knick Elektronische Messgeräte GmbH & Co. KG. The following are examples of possible changes:

- Change to a different process connection → *Process Connections, p. 16*
- Replacement of process-wetted components with other material characteristics → *Maintenance, p. 35*
- Replacement of the drive unit to mount a different sensor type → *Drive Units, p. 16*

Any changes may result in deviations between the information on the nameplate and the actual version of the Ceramat WA150. The operating company must assess and document the changes. In the event of a change to the version, the product must be identified accordingly.

It is recommended that changes to the Ceramat WA150 be carried out by the Knick Repair Service. After making the necessary changes, a functional and pressure test is carried out and, if necessary, a modified nameplate is attached. → *Knick Repair Service, p. 39*

More information on changes can be found in the related supplementary datasheet.

<sup>1)</sup> Observe the User Manual for the Unical 9000 or Uniclean 900 electro-pneumatic controllers.

## 2.7 Service and Process Position

The Ceramat WA150 can assume two limit positions (service or process position).

**Note:** The Ceramat WA150 is only disconnected from the process in the service position (position indicator points to SERVICE). This is *not* the case in any other position, i.e., there remains contact with the process.

### Service position (SERVICE limit position)

- The ceramic rotary slide is closed (sensor is retracted in the sensor housing).
- The sensor is not in contact with the process medium.
- The position indicator points to SERVICE.
- The sensor can be installed, removed, and, as necessary, cleaned under process conditions.
- The drive unit can be removed under process conditions.

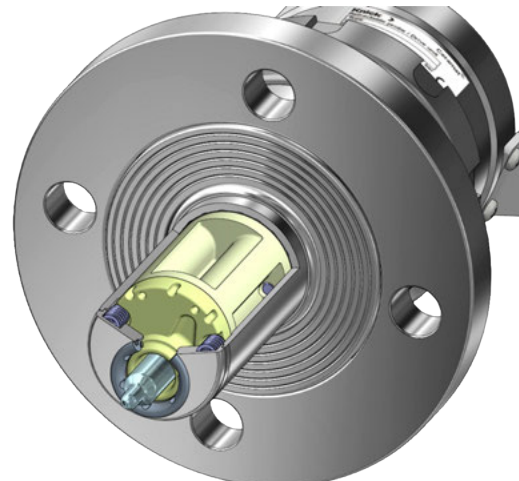
### Process position (PROCESS limit position)

- The ceramic rotary slide is open (sensor is extended out of the sensor housing).
- The sensor is in contact with the process medium.
- The position indicator points to PROCESS.
- The desired process parameters can be measured.

Service position (SERVICE limit position)



Process position (PROCESS limit position)



On reaching one of the limit positions, a contact is closed in the limit switch. The electrical signal can be processed further, for example in the electro-pneumatic controller, the process analyzer, or the process control system (PCS).

The service position (SERVICE limit position) and process position (PROCESS limit position) are indicated in different ways depending on the version of the Ceramat WA150.

See also

→ *Moving into the Service Position (SERVICE Limit Position)*, p. 29

→ *Moving into the Process Position (PROCESS Limit Position)*, p. 29

## 3 Installation

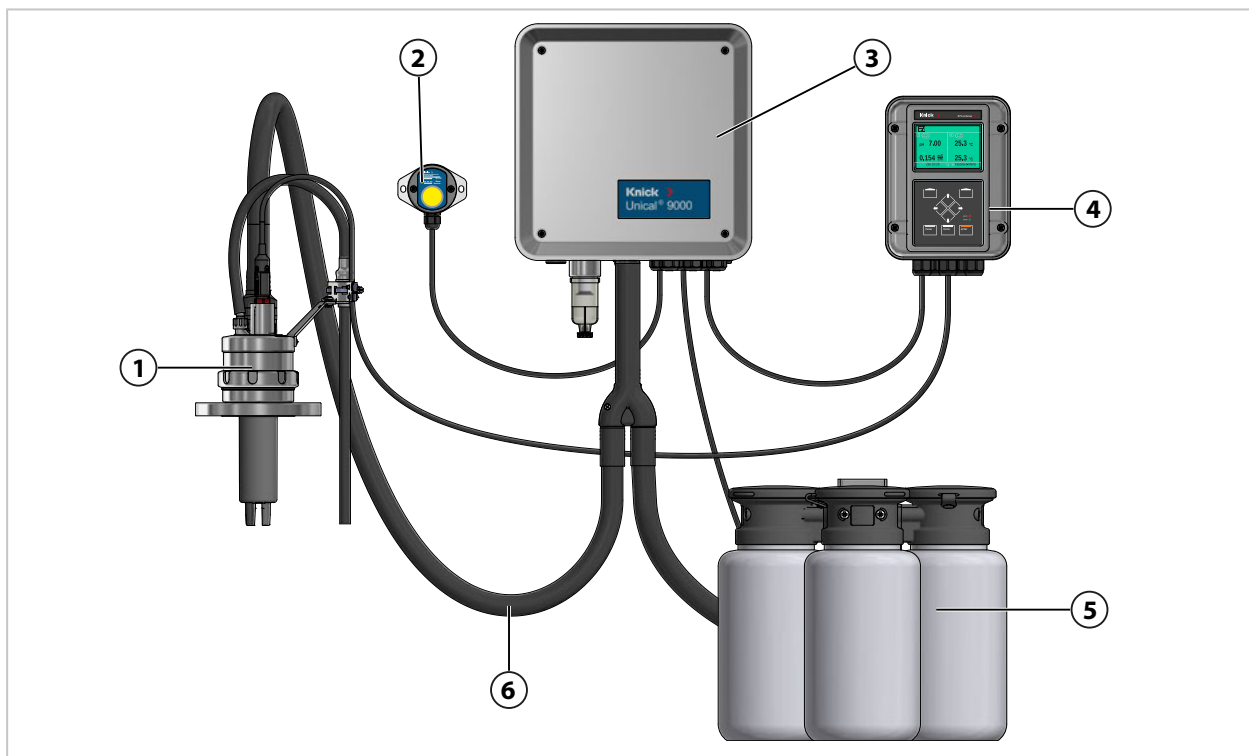
### 3.1 General Installation Instructions

#### Process Analysis System: Installation Example

The Ceramat WA150 is designed for operation within a fully automatic Knick process analysis system. The process analysis system may typically comprise the following products:

- Protos industrial transmitter
- Unical 9000 electro-pneumatic controller
- Ceramat WA150 retractable fitting

**Note:** The figure shows an example installation of a Knick process analysis system. Further information can be found at [www.knick.de](http://www.knick.de).

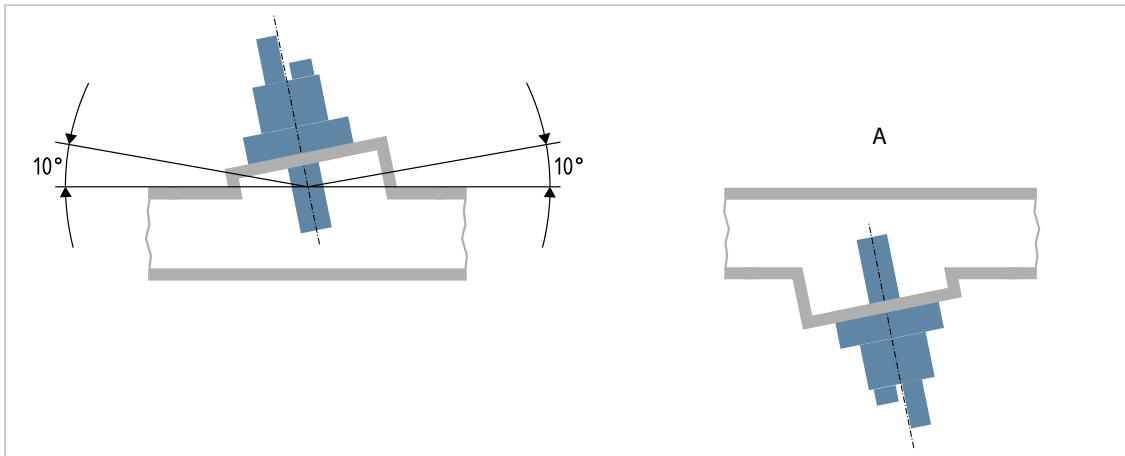


- |  |                                    |
|--|------------------------------------|
| 1 Ceramat WA150 retractable fitting        | 4 Protos industrial transmitter    |
| 2 Service switch                           | 5 Media adapter with metering pump |
| 3 Unical 9000 electro-pneumatic controller | 6 Media connection with multiplug  |

**Note:** The Ceramat WA150 may also be operated without a process analysis system. In this case, accessory ZU0631, "Standard media connection," is required. The Ceramat WA150 is then controlled via the process control system (PCS) or manually with accessory ZU0646, "Pneumatically operated manual control valve". → *Accessories, p. 47*

### 3.2 Retractable Fitting: Installation

**⚠ WARNING! Risk of explosion from mechanically generated sparks when used in explosive atmospheres.** Take appropriate action to prevent mechanically generated sparks. Follow the safety instructions. → *Operation in Explosive Atmospheres, p. 7*



01. Check the package contents of the Ceramat WA150 for completeness. → *Package Contents, p. 9*
02. Check the Ceramat WA150 for damage.
03. Ensure sufficient installation clearance to mount the sensor and allow the hoses and cables to move freely. → *Dimension Drawings, p. 50*

**Note:** The installation angle of the Ceramat WA150 depends on the sensor type. An installation angle of up to 10° above the horizontal plane is permissible for all sensor types. An installation angle of 360° (i.e., upside down, see view A) is only permitted if using sensors approved for upside-down operation.

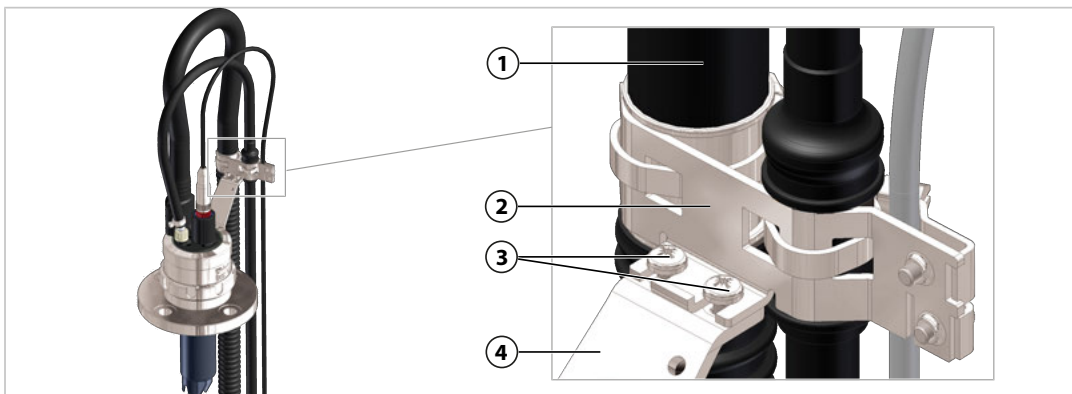
04. Fasten the Ceramat WA150 to the process port using the process connection.
05. Optional: If using the product in explosive atmospheres, connect the metallic parts of the Ceramat WA150 to the plant's equipotential bonding system.

See also

- *Operation in Explosive Atmospheres, p. 7*
- *Commissioning, p. 28*

### 3.3 Media Connection / ZU0631: Installation on Strain Relief Bracket

**Note:** The figure shows installation on the Ceramat WA150 strain relief bracket when using the media connection. The steps involved are the same when using accessory ZU0631, "Standard media connection". → *Process Analysis System: Installation Example, p. 19*



01. Position the bracket **(2)** of the media connection **(1)** on the strain relief bracket **(4)** of the Ceramat WA150. If necessary, loosen the screws **(3)** a few rotations.
02. Tighten the screws **(3)** using a screwdriver.

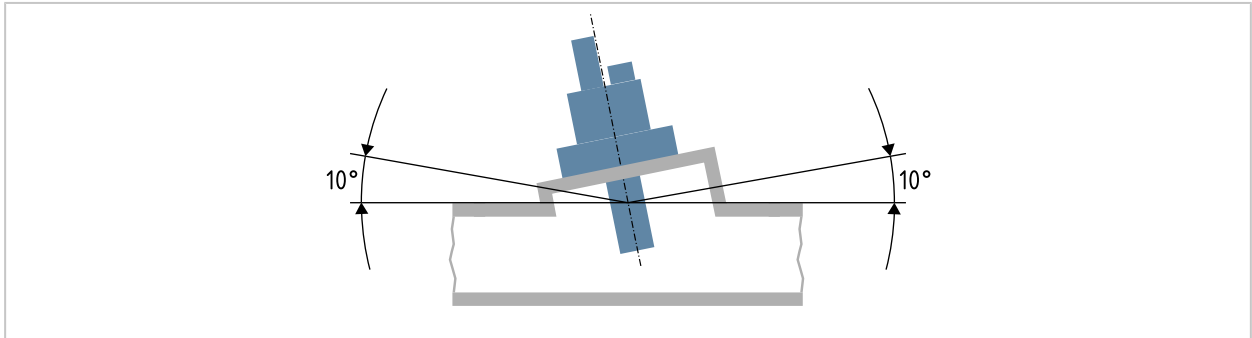
### 3.4 Outlet

#### 3.4.1 Outlet Hose: Installation Instructions

Install the outlet hose a maximum of 1 meter down (measured from the level of the calibration chamber). The resulting negative pressure creates a risk of the calibration chamber being drained if the outlet hose is not ventilated.

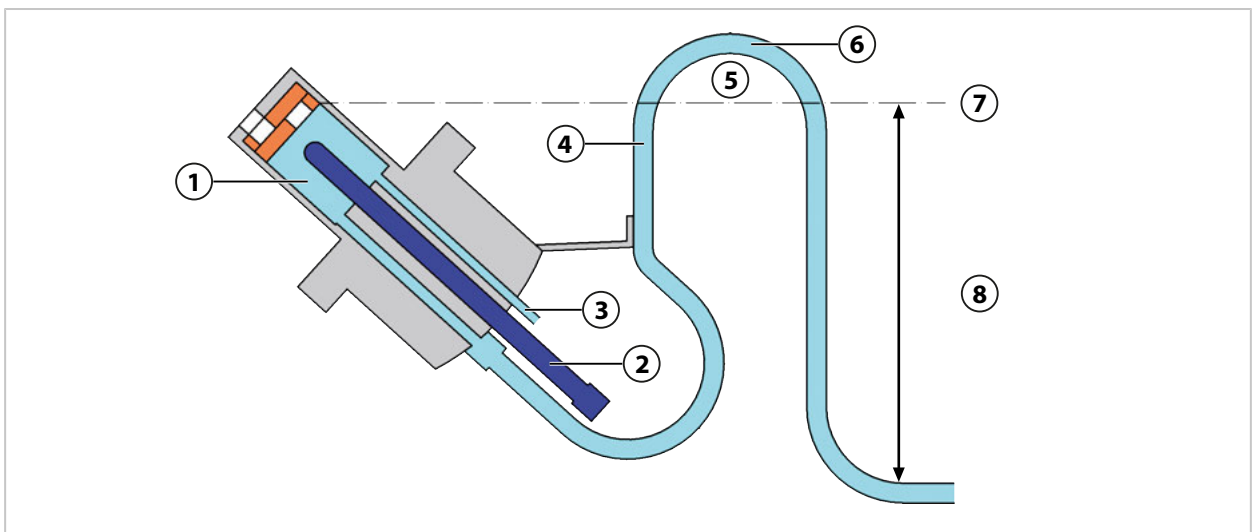
#### Installation Angle up to 10° Above the Horizontal Plane

Install the outlet hose in an arc and fasten it to the strain relief bracket on the Ceramat WA150. With an installation angle of up to 10° above the horizontal plane, this prevents the calibration chamber from leaking due to gravity.



#### 360° Installation Angle

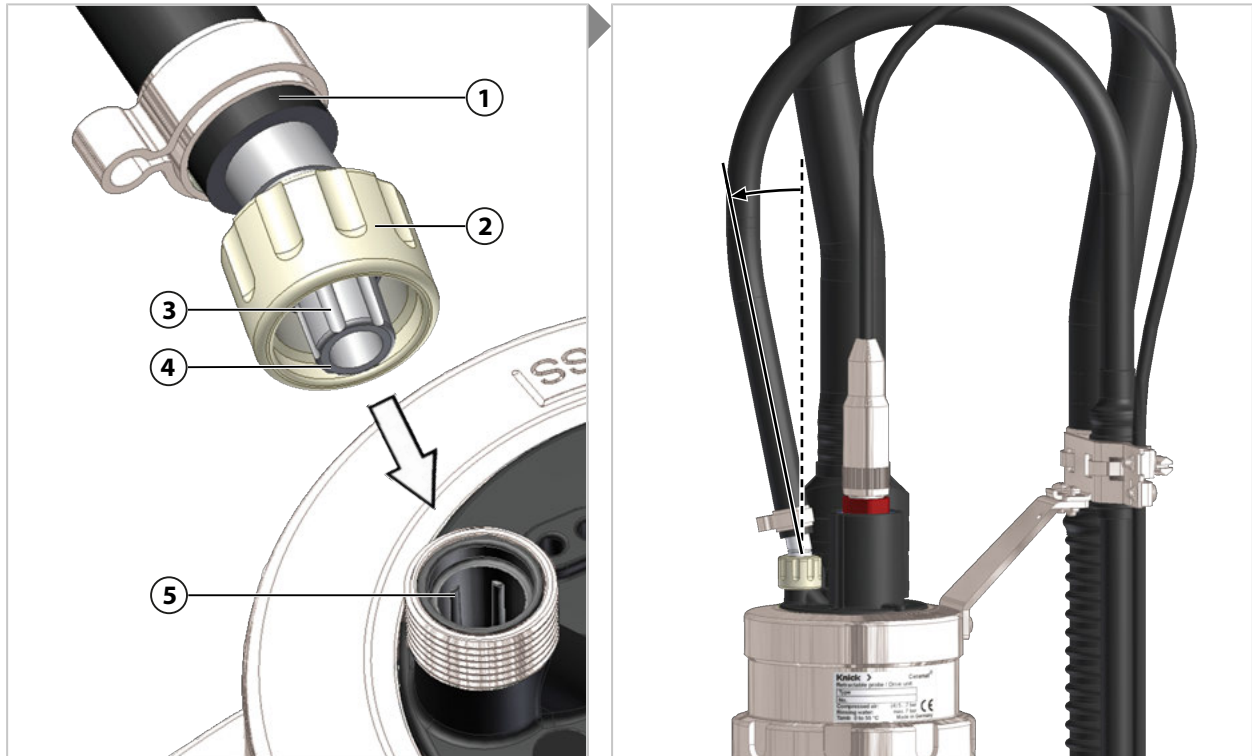
If the Ceramat WA150 is installed at an angle of 360° (i.e., upside-down), install the outlet hose in an arc above the level of the calibration chamber (see figure). This prevents the calibration chamber from leaking due to gravity.



1 Calibration chamber	5 Area above level of calibration chamber
2 Sensor	6 Hose arc (outlet hose)
3 Inlet	7 Level of calibration chamber
4 Outlet hose	8 Max. 1 m below level of calibration chamber

### 3.4.2 Outlet Hose: Installation

**Note:** The outlet is used to discharge rinse medium and trapped process medium and must not be closed. By moving the sensor to the respective limit positions, pressurized process medium can enter the calibration chamber and be compressed when the outlet is closed. This process medium may splash out during sensor replacement.



01. Push the outflow nozzle (4) into the mount on the Ceramat WA150. In the process, correctly position the coding ribs (5) in the coding recesses (3) (locking device).
02. Turn the outflow nozzle (4) so that the outlet hose (1) points outward.
03. Fasten the coupling nut (2) finger tight.



## 3.5 Media Connection

### 3.5.1 Media Connection: Installation Instructions

Media can be connected to the Ceramat WA150 in the following ways:

- “Media connection” of the electro-pneumatic controller (operation with process analysis system)
- Accessory ZU0631 “Standard media connection” (operation without process analysis system)

#### “Media Connection” for Operation With Process Analysis System

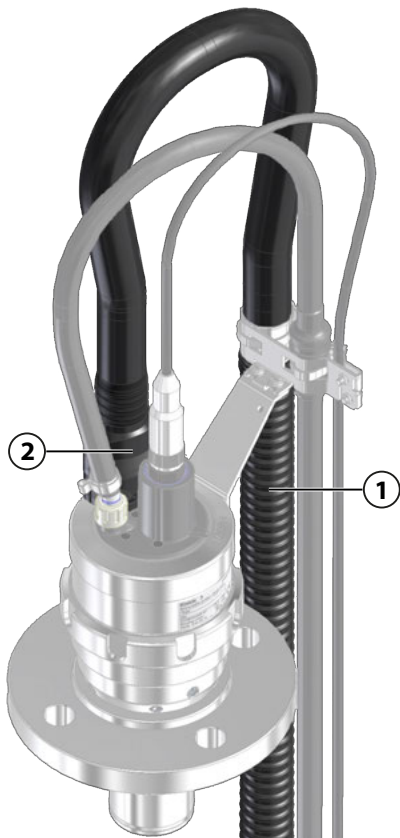
When using a Knick process analysis system, all media cables and the connecting cable for limit signals are combined in one hose, the media connection **(1)**. It is connected to the Ceramat WA150 using a shared connector, the multiplug **(2)**.

The supply cables for the various media are connected to the process analysis system’s electro-pneumatic controller. Further information is available in the documentation for the electro-pneumatic controller.

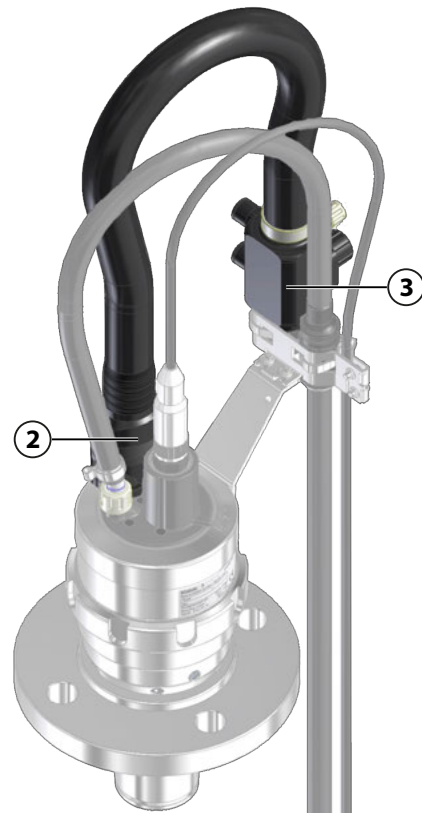
#### “Standard Media Connection” for Operation Without Process Analysis System

Accessory ZU0631, “Standard media connection,” **(3)** is required for manual control of the Ceramat WA150 with accessory ZU0646, “Pneumatically operated manual control valve,” or the process control system (PCS). The Ceramat WA150 is connected using a common plug connection, the multiplug **(2)**.

The supply cables for the various media are connected to accessory ZU0631, “Standard media connection,” **(3)** or ZU0646, “Pneumatically operated manual control valve,” with a free hose connection. Further information can be found in the accessory documentation. → *Accessories, p. 47*



“Media connection” for operation with process analysis system



Accessory ZU0631, “Standard media connection,” for operation without process analysis system

See also

→ *Process Analysis System: Installation Example, p. 19*

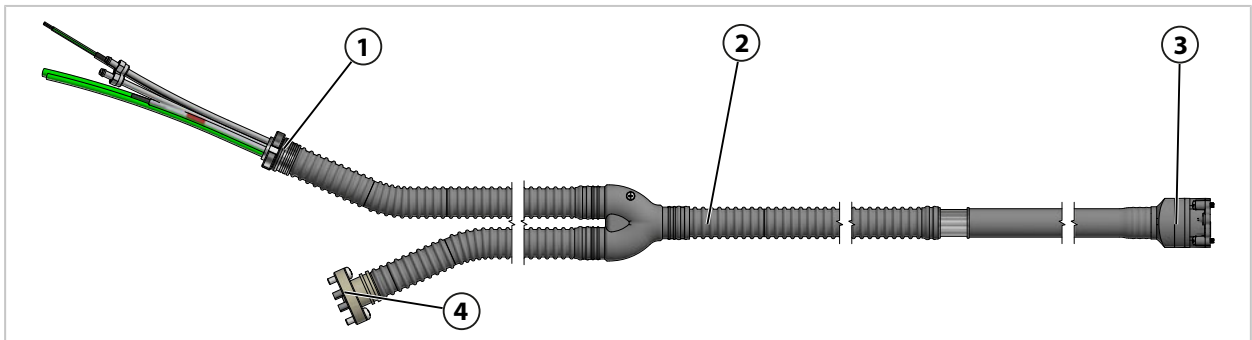
### 3.5.2 Multiplug: Installation



01. Check the gaskets and O-rings of the multiplug (1) for correct positioning and damage, and replace them if necessary. → *Troubleshooting, p. 40*
02. Position and connect the multiplug (1) to the Ceramat WA150.
03. Fasten the multiplug (1) with two screws (2).

### 3.5.3 Electro-Pneumatic Controller: Connection

The method of connecting the Ceramat WA150 to the electro-pneumatic controller with media connection is set out in the relevant documentation.



- 1 Electro-pneumatic controller connection
- 2 Process connection

- 3 Multiplug for connecting the Ceramat WA150
- 4 Media adapter connection <sup>1)</sup>

### 3.5.4 ZU0631 Standard Media Connection: Installation

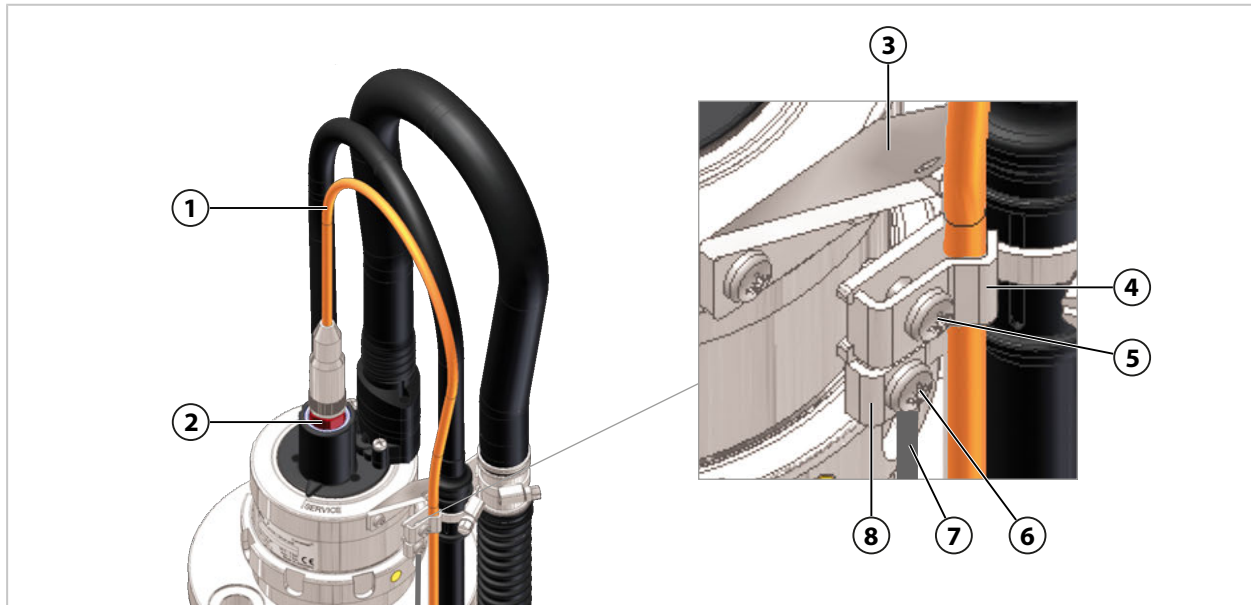
**Note:** Accessory ZU0631, "Standard media connection", is only required for operation of the Ceramat WA150 without a process analysis system. → *Process Analysis System: Installation Example, p. 19*

The method of installing accessory ZU0631, "Standard media connection", is set out in the accessory documentation. → *Accessories, p. 47*

<sup>1)</sup> Availability depends on the version of the process analysis system.



### 3.6 Sensor Cable: Installation



01. Install the sensor. → *Installing and Removing a Sensor, p. 30*

02. Connect the sensor cable (1) to the sensor (2).

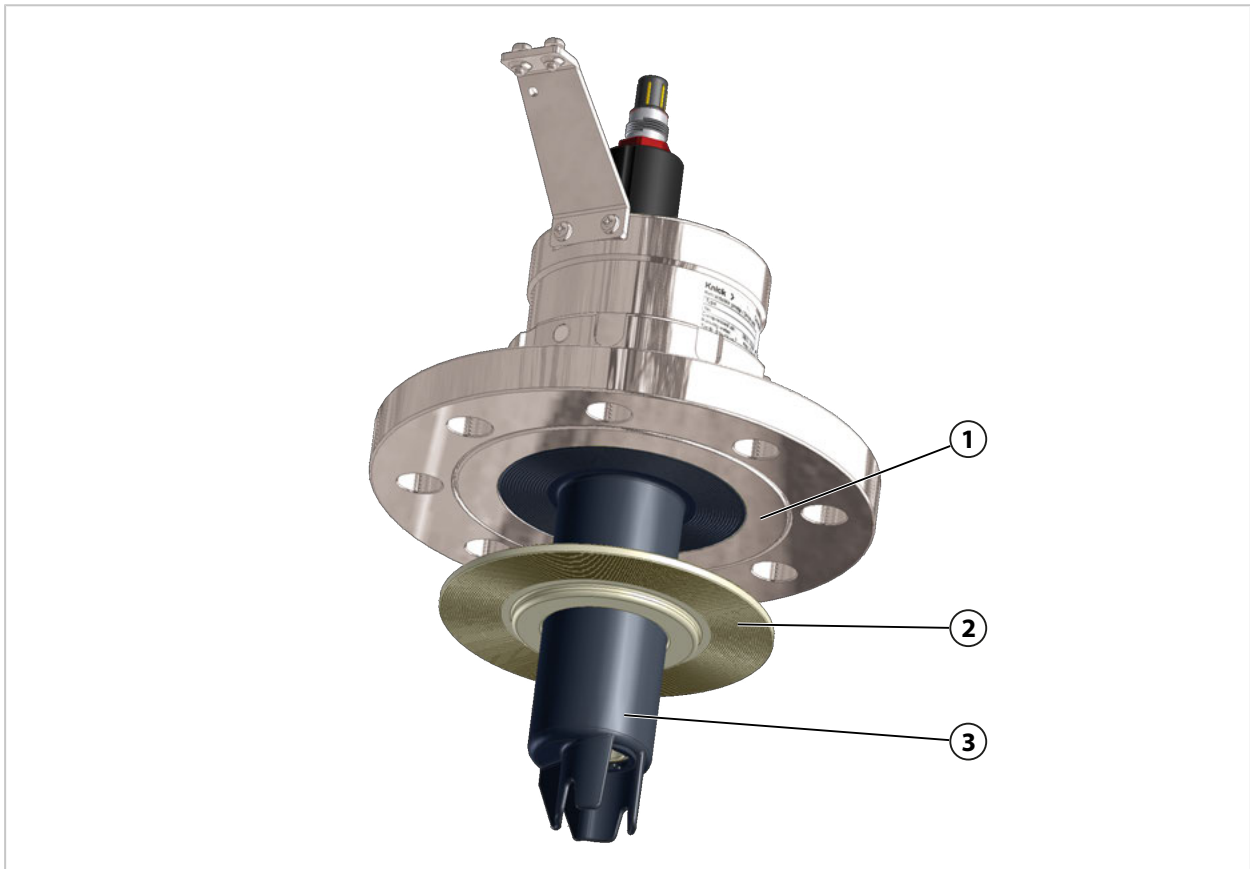
**Note:** Loosely fasten the sensor cable with the clamp, but do not constrict it. If you do, rotary movement of the Ceramat WA150 may damage the sensor cable. The sensor cable arc must be long enough so that the sensor cable does not impede the stroke movement of the Ceramat WA150.

03. Guide the sensor cable (1) in an arc to the strain relief bracket (3), fasten it with the clamp (4), and tighten the screw (5).

04. Optional: Fasten the equipotential bonding line (7) with the clamp (8) and tighten the screw (6).  
→ *Operation in Explosive Atmospheres, p. 7*

### 3.7 Protective Pane Option: Installation

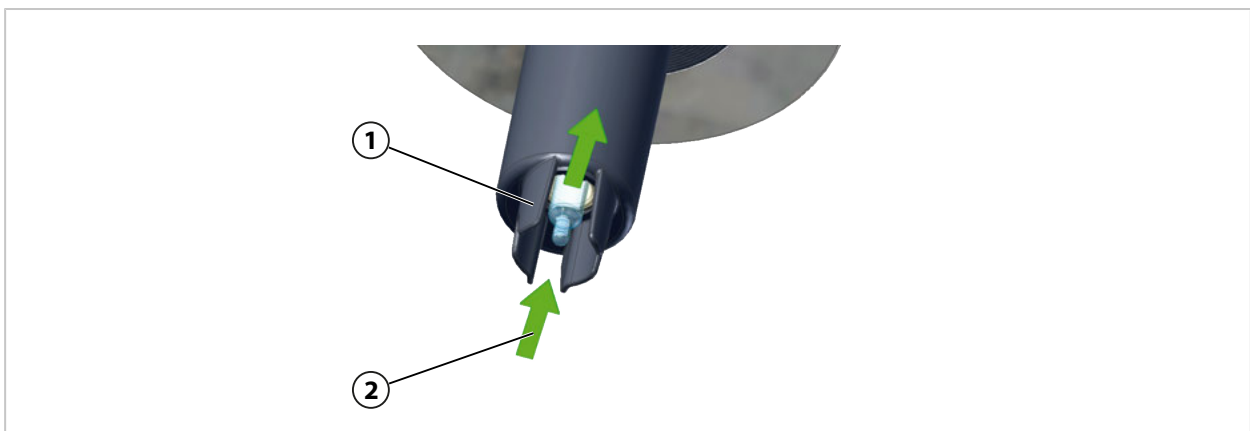
**Note:** Accessories ZU0595 protective pane DN80, PEEK; ZU0596 protective pane DN80, PVDF; ZU0597 protective pane DN100, PEEK, and ZU0598 protective pane DN100, PVDF are required to protect the flange (1) of the Ceramat WA150 from aggressive media.



01. Push the protective pane (2) over the sensor housing (3).
02. Fully cover the flange surface (1).

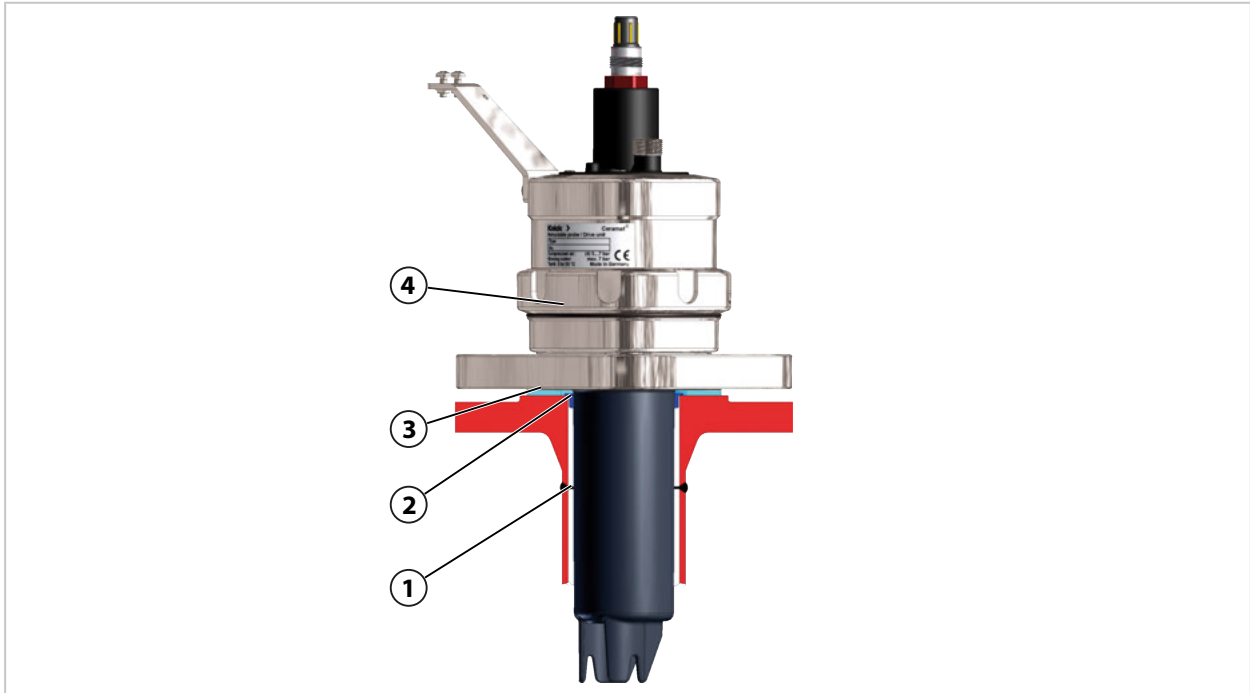
### 3.8 Probe Guard with Integrated Sensor Protection Option: Position of Probe Guard

**Note:** Probe guard with integrated sensor protection option: Note the position of the sensor protector.



01. Point the probe guard (1) in the direction of flow (2).

### 3.9 DN50, ANSI 2" Flange Process Connection



01. Check the mounting holes of the measuring point flange for protruding weld seams **(1)** or constrictions, and rework where necessary.
02. Check to ensure the centering ring **(2)** is present.
03. Fit the elastomeric flange gasket **(3)**, optional thickness 1.5 ... 3 mm.
04. Insert the Ceramat WA150 **(4)**, position the screws.
05. Tighten the screws evenly crosswise, without tilting the Ceramat WA150 **(4)**.

## 4 Commissioning

**⚠ WARNING! Process medium may leak from the Ceramat WA150 in the event of damage or improper installation, and may contain hazardous substances.** Follow the safety instructions.  
→ *Safety, p. 5*

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

01. Install the Ceramat WA150. → *Retractable Fitting: Installation, p. 20*
02. Install the media connection or ZU0631, "Standard media connection", on the strain relief bracket.  
→ *Media Connection / ZU0631: Installation on Strain Relief Bracket, p. 20*
03. Install the outlet hose. → *Outlet, p. 21*
04. Install the multiplug. → *Multiplug: Installation, p. 24*
05. Install the sensor. → *Installing and Removing a Sensor, p. 30*
06. Install the sensor cable. → *Sensor Cable: Installation, p. 25*
07. Ensure that the process connection is securely fastened to the process port.
08. Optional: Ensure that the Ceramat WA150-X is correctly connected to the plant's equipotential bonding system. → *Operation in Explosive Atmospheres, p. 7*
09. Move the Ceramat WA150 into the process position (PROCESS limit position).  
→ *Moving into the Process Position (PROCESS Limit Position), p. 29*  
✓ The position indicator points to PROCESS.
10. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*  
✓ The position indicator points to SERVICE.
11. Check the Ceramat WA150 for leaks under process conditions.<sup>1)</sup>  
✓ The Ceramat WA150 and connections have no leaks.

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<sup>1)</sup> If using a fully automatic Knick process analysis system, a range of functions can be tested via the process analyzer.  
→ *Process Analysis System: Installation Example, p. 19*

## 5 Operation

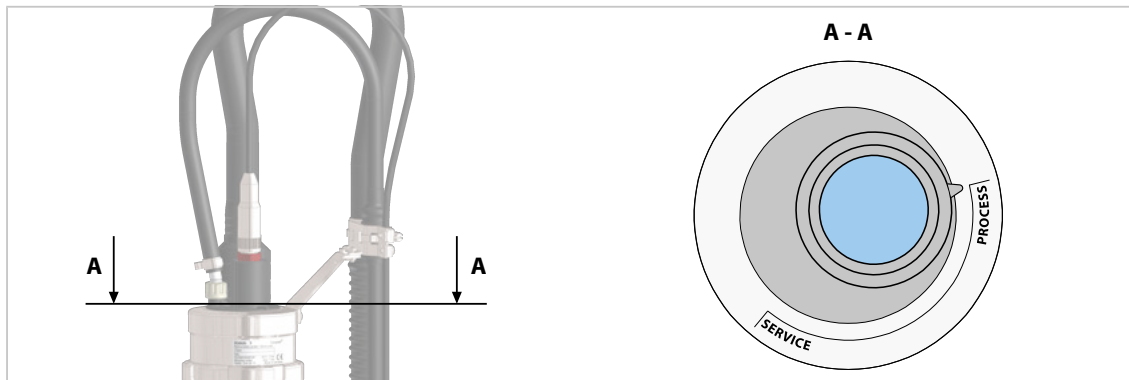
### 5.1 Moving into the Process Position (PROCESS Limit Position)

**⚠ WARNING! Process, rinse, or additional media, potentially containing hazardous substances, may escape from the Ceramat WA150.** Only move the Ceramat WA150 into the process position (PROCESS limit position) if a sensor is installed. → *Installing and Removing a Sensor, p. 30*

**⚠ CAUTION! Risk of crushing injuries to hands and fingers. When moving to the limit positions, the Ceramat WA150 performs a rotary movement (approx. 140°) and a stroke movement (approx. 43 mm).** Do not touch the Ceramat WA150 while it is moving to the limit positions.

**Note:** Movement to the limit positions is triggered differently depending on the installation of the Ceramat WA150: (a) process analyzer, (b) service switch of the electro-pneumatic controller, (c) process control system (PCS), or (d) ZU0604 "Pneumatically operated manual control valve".

→ *Process Analysis System: Installation Example, p. 19*



01. Install the sensor. → *Installing and Removing a Sensor, p. 30*

02. Move the Ceramat WA150 into the process position (PROCESS limit position).

✓ The position indicator points to PROCESS.

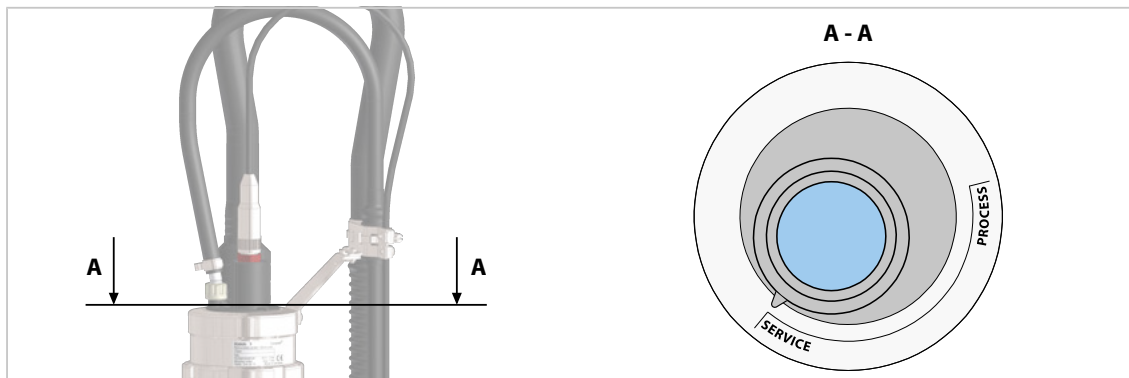
### 5.2 Moving into the Service Position (SERVICE Limit Position)

**⚠ CAUTION! Risk of crushing injuries to hands and fingers. When moving to the limit positions, the Ceramat WA150 performs a rotary movement (approx. 140°) and a stroke movement (approx. 43 mm).** Do not touch the Ceramat WA150 while it is moving to the limit positions.

**Note:** The Ceramat WA150 is only disconnected from the process in the service position (position indicator points to SERVICE). This is *not* the case in any other position, i.e., there remains contact with the process.

**Note:** Movement to the limit positions is triggered differently depending on the installation of the Ceramat WA150: (a) process analyzer, (b) service switch of the electro-pneumatic controller, (c) process control system (PCS), or (d) ZU0604 "Pneumatically operated manual control valve".

→ *Process Analysis System: Installation Example, p. 19*



01. Move the Ceramat WA150 into the service position (SERVICE limit position).

✓ The position indicator points to SERVICE.

## 5.3 Installing and Removing a Sensor

### 5.3.1 Safety Instructions when Installing and Removing Sensors

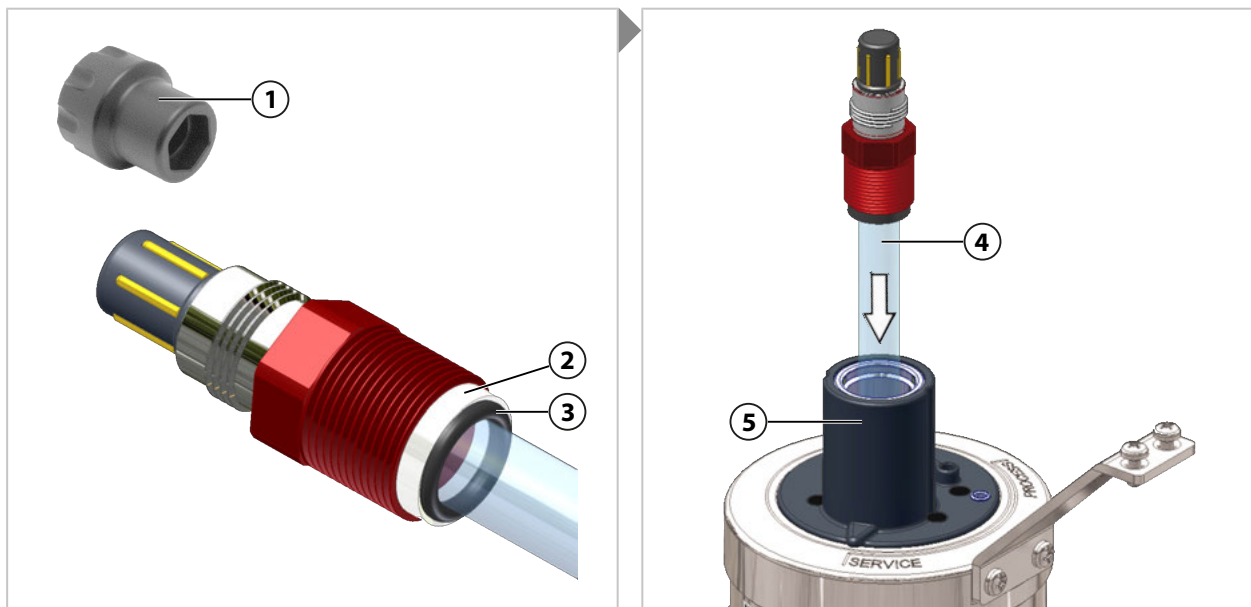
**⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the Ceramat WA150.** Only replace the sensor in the service position (SERVICE limit position). Secure the Ceramat WA150 from unintentional movement out of the service position (SERVICE limit position). Follow the safety instructions. → *Safety, p. 5*

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

**Note:** The Ceramat WA150 is only disconnected from the process in the service position (position indicator points to SERVICE). This is *not* the case in any other position, i.e., there remains contact with the process.

**Note:** The outlet is used to discharge trapped process medium and must not be closed. By moving the Ceramat WA150 to the limit positions, pressurized process medium may enter the calibration chamber. When the outlet is closed, this process medium may be compressed and splash out during a sensor replacement. → *Design and Function, p. 14*

### 5.3.2 Solid-Electrolyte Sensor: Installation

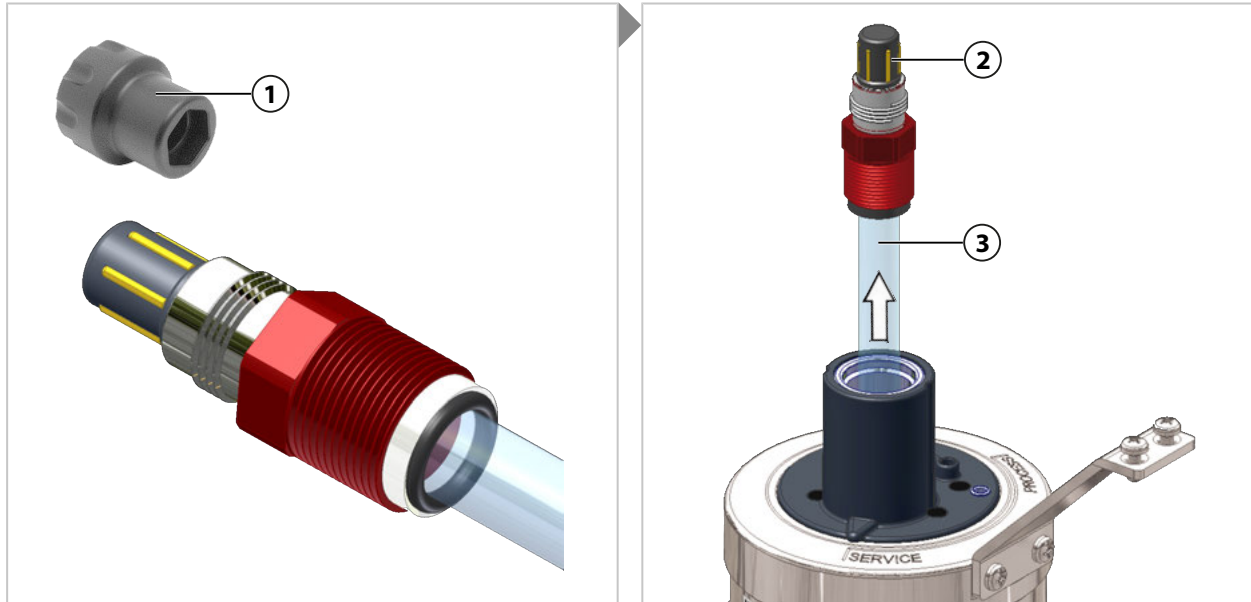


01. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
02. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*
03. Check the sensor for permissibility and damage. → *Intended Use, p. 5*
  - ✓ Diameter 12.0 - 0.5 mm
  - ✓ Length 225 mm
  - ✓ Pressure resistance permissible for process
  - ✓ No damage (e.g., glass breakage)
04. Check the washer (2) and O-ring (3) of the sensor (4) for correct positioning and damage, and replace them if necessary.
05. Remove the watering cap from the sensor tip and rinse the sensor (4) with water (see the sensor manufacturer's documentation).
06. Check the inside of the sensor holder (5) for foreign particles (e.g., washer, O-ring). Remove any foreign particles.

07. Push the sensor **(4)** into the Ceramat WA150.
08. Tighten the sensor **(4)** using the spanning wrench **(1)** to max. 3 Nm (A/F 19 mm). Recommended tool: ZU0647 "Sensor spanning wrench". → *Tools, p. 49*
09. Connect the sensor cable. → *Sensor Cable: Installation, p. 25*

### 5.3.3 Solid-Electrolyte Sensor: Removal

**Note:** Rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.

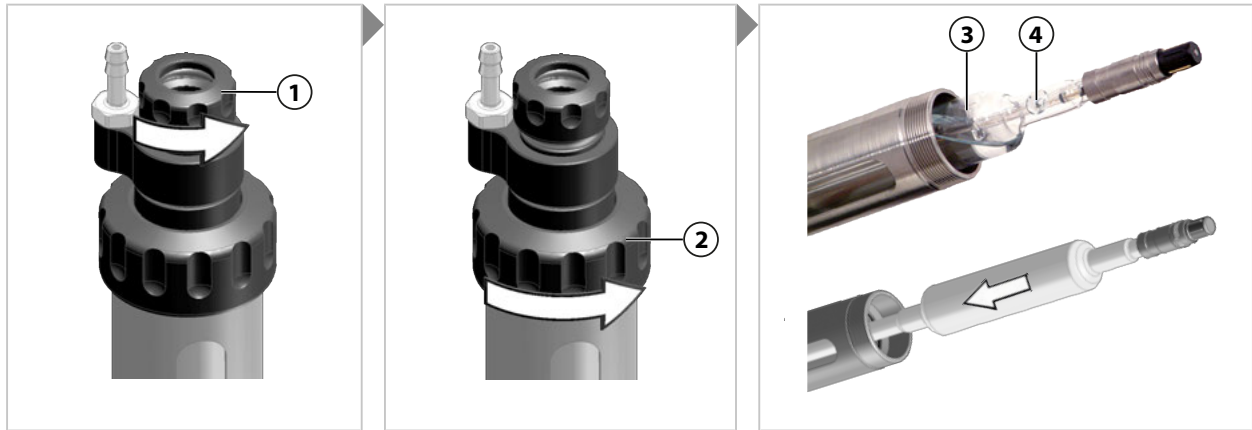


01. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
02. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*
03. Disconnect the cable bushing of the sensor cable from the sensor head **(2)**.
04. Release the sensor **(3)** using the spanning wrench **(1)** (A/F 19 mm). Recommended tool: ZU0647 "Sensor spanning wrench" → *Tools, p. 49*
05. Pull the sensor **(3)** out of the Ceramat WA150.
06. If the sensor glass is broken, check the gaskets of the sensor holder, the sensor socket, and the sealing ring for damage and replace if necessary. → *Troubleshooting, p. 40*



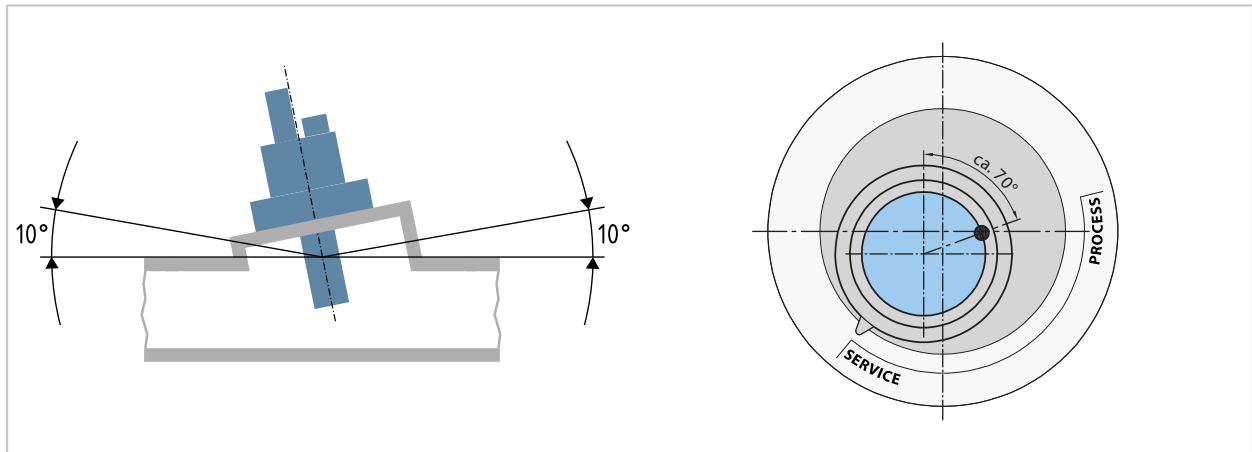
### 5.3.4 Liquid-Electrolyte Sensor: Installation

**Note:** 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. Recommended accessory: ZU0670 "Air supply for pressurized sensors". → *Accessories, p. 47*



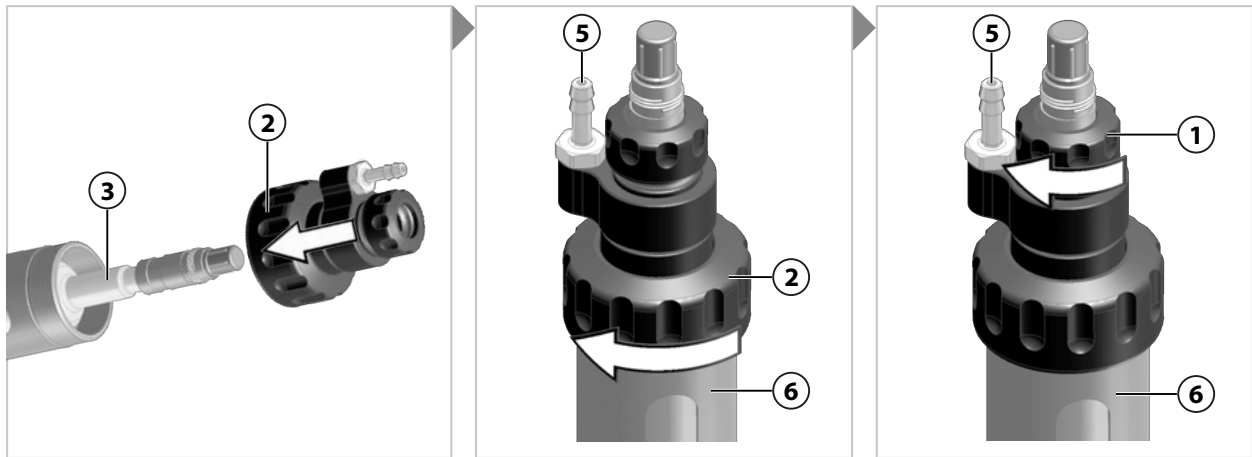
01. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
02. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*
03. Loosen the small coupling nut **(1)** by a few rotations; do not loosen completely.
04. Fully loosen the large coupling nut **(2)** and pull off the entire unit.
05. Check the sensor for permissibility and damage. → *Intended Use, p. 5*
  - ✓ Diameter 12 mm
  - ✓ Length 250 mm
  - ✓ Pressure resistance permissible for process
  - ✓ No damage (e.g., glass breakage)
06. Remove the watering cap from the sensor tip and rinse the sensor **(3)** with water (see the sensor manufacturer's documentation).
07. Remove the cap of the filling hole **(4)** of the sensor **(3)**.

**Note:** Electrolyte may escape from the sensor if the Ceramat WA150 is installed at an incline. While moving to the limit positions, both a stroke movement and a rotary movement are performed. It is therefore important to turn the filling hole (e.g., Schott sensors) or the *Top* marking (e.g., Mettler sensors) approximately 70° from the vertical plane.



08. Push the sensor **(3)** into the Ceramat WA150.

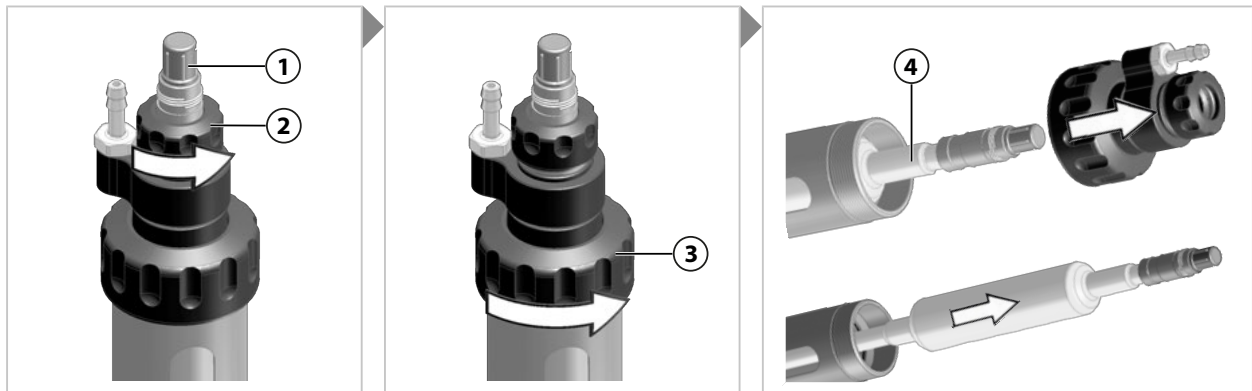




09. Position the large coupling nut **(2)** and fasten finger tight.
10. Fasten the small coupling nut **(1)** finger tight.
11. Connect the sensor cable. → *Sensor Cable: Installation, p. 25*
12. On first-time installation: Connect the compressed air supply for the sensor pressure chamber **(6)** to the DN6 connection nozzle **(5)**. → *Specifications, p. 52*

### 5.3.5 Liquid-Electrolyte Sensor: Removal

**Note:** Rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.



01. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
02. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*

03. Disconnect the cable bushing of the sensor cable from the sensor head **(1)**.
04. Loosen the small coupling nut **(2)** by a few rotations; do not loosen completely.
05. Fully loosen the large coupling nut **(3)** and pull off the entire unit.

**Note:** Hold the sensor's filling hole upward at an inclined angle during removal to prevent electrolyte from escaping. Follow the instructions in the sensor manufacturer's documentation. During transport and storage, close the sensor's filling hole with the cap.

06. Pull out the sensor **(4)**.
07. If the sensor glass is broken, check the gaskets of the sensor holder, the sensor socket, and the sealing ring for damage and replace if necessary. → *Troubleshooting, p. 40*

### 5.4 Cavity Rinsing

In the service position (SERVICE limit position), the inlet and outlet of the Ceramat WA150 are directly connected to the calibration chamber.

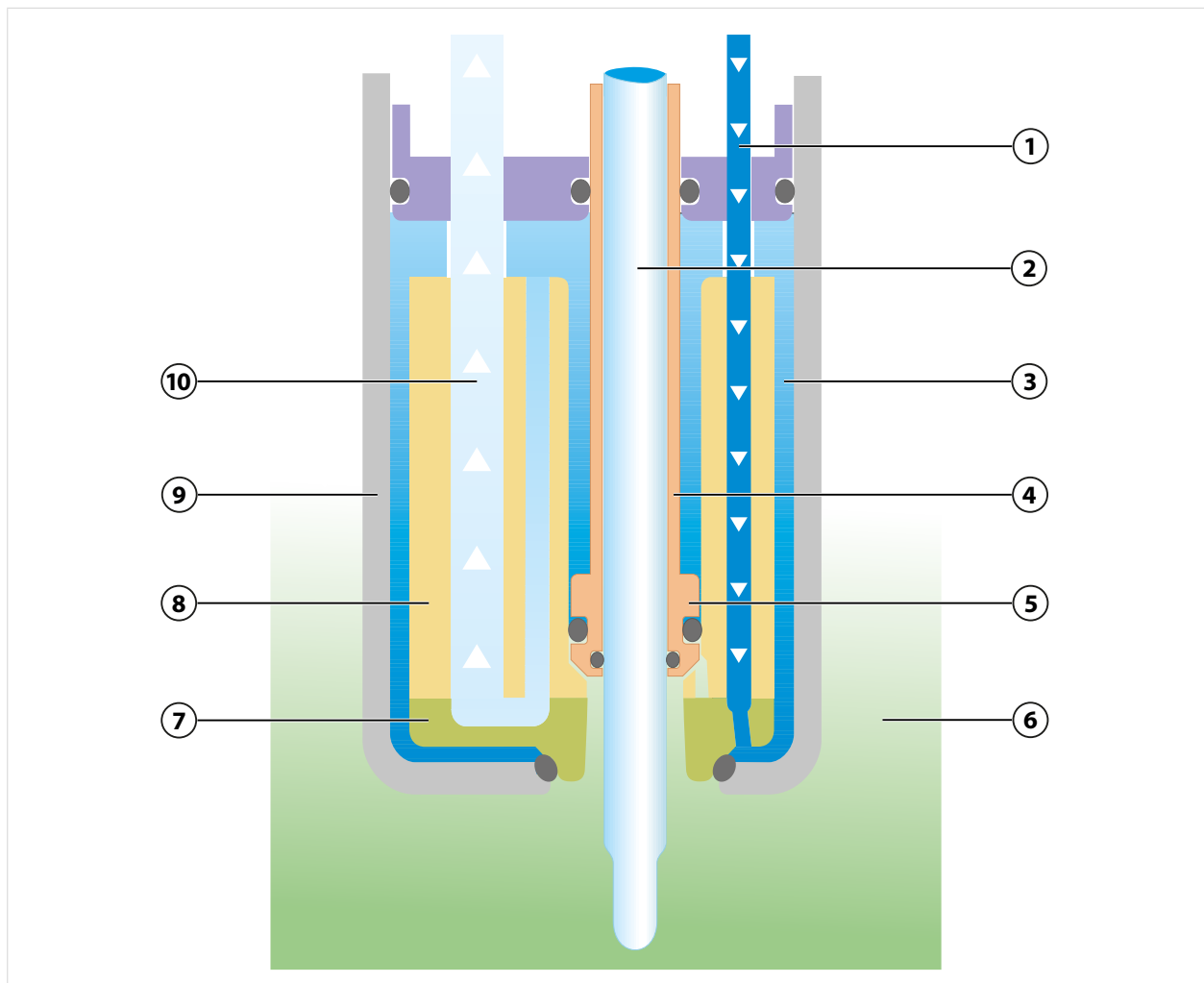
The ceramic rotary slides are installed in the sensor housing and have contact with the process medium. There is a risk that process medium may penetrate the cavities between the ceramic rotary slides and the sensor housing.

In this case, the process medium may be drained off by rinsing the cavities. This helps to keep the Ceramat WA150 in good working condition for longer.

When moving the Ceramat WA150 into the process position (PROCESS limit position), the inflow into the cavities is reversed. By activating the rinse function (e.g., in the process analyzer), the cavities are rinsed and media is drained off via the outlet.

It is advisable to rinse the cavities for 30 seconds every 8 hours. This interval may be adjusted in the event of very frequent movements and if using chemically aggressive or adherent process media.

**Note:** The figure shows the Ceramat WA150 in the process position (PROCESS limit position).



1 Inlet	6 Process medium
2 Sensor	7 Ceramic rotary slide, bottom part (fixed)
3 Cavity	8 Ceramic rotary slide, top part (rotating)
4 Sensor tube	9 Sensor housing
5 Sensor socket	10 Outlet

## 6 Maintenance

### 6.1 Inspection and Maintenance

#### 6.1.1 Inspection and Maintenance Intervals

**NOTICE!** Different process conditions (e.g., pressure, temperature, chemically aggressive media) will affect the inspection and maintenance intervals. Analyze the specific application and process conditions at hand. Define appropriate intervals based on similar application cases where experience has already been gained.

Interval <sup>1)</sup>	Work Required
First inspection after a few weeks	<p>Move the Ceramat WA150 into the process position (PROCESS limit position). → <i>Moving into the Process Position (PROCESS Limit Position)</i>, p. 29</p> <p>Check the outlet hose for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting. → <i>Troubleshooting</i>, p. 40</p> <hr/> <p>Move the Ceramat WA150 into the service position (SERVICE limit position). → <i>Moving into the Service Position (SERVICE Limit Position)</i>, p. 29</p> <p>Remove the drive unit. → <i>Drive Unit: Disassembly</i>, p. 37</p> <p>Visually inspect the O-rings to check the suitability of the used materials under the prevailing process conditions. If necessary, replace the O-rings. → <i>Seal Kits</i>, p. 44</p> <p>Mount the drive unit. → <i>Drive Unit: Assembly</i>, p. 39</p>
After 1-2 years, or 30,000 strokes <sup>2)</sup>	<p>Move the Ceramat WA150 into the service position (SERVICE limit position). → <i>Moving into the Service Position (SERVICE Limit Position)</i>, p. 29</p> <p>Remove the drive unit. → <i>Drive Unit: Disassembly</i>, p. 37</p> <p>Visually inspect the dynamically loaded O-ring on the sensor socket and the statically loaded O-rings. If necessary, replace the O-rings. → <i>Seal Kits</i>, p. 44</p> <p>As required, check the cavity rinsing function.</p> <p>Mount the drive unit. → <i>Drive Unit: Assembly</i>, p. 39</p> <hr/> <p>Check the process unit if deposits are suspected or in the event of chemical corrosion on the sensor housing (visible after removing the drive unit). As required, send the process unit to your local contact for repair. → <i>knick.de</i></p>
After 10 years or 500,000 strokes	<p>Send the Ceramat WA150 to your local contact for full maintenance (replacement of the pneumatic gaskets and lubricants, check of all functions, pressure test, leak test). → <i>knick.de</i></p>

<sup>1)</sup> The stated intervals are general recommendations based on Knick's experience. The actual intervals are dependent on the specific application for which the Ceramat WA150 is used.

<sup>2)</sup> Following successful first inspection and confirmation of the suitability of all materials used, the interval may be lengthened.

### 6.1.2 Used and Approved Lubricants

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

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

### 6.1.3 Immersion Lock Without a Mounted Solid-Electrolyte Sensor: Functional Test

**Note:** The functional test can only be performed with versions of the Ceramat WA150 intended for solid-electrolyte sensors and during operation within a Knick process analysis system.

→ *Safeguards*, p. 6

01. Move the Ceramat WA150 into the service position (SERVICE limit position).

→ *Moving into the Service Position (SERVICE Limit Position)*, p. 29.

02. Remove the drive unit. → *Drive Unit: Disassembly*, p. 37

03. Remove the sensor. → *Installing and Removing a Sensor*, p. 30

04. Press the service switch on the electro-pneumatic controller.

✓ Ceramat WA150 does not move.

✓ The process analyzer displays the **Sensor Removed** message.

05. Install the sensor. → *Installing and Removing a Sensor*, p. 30

06. Loosen the sensor around one full turn.

**▲ CAUTION! Risk of product damage if the drive unit's coupling nut is excessively tightened.**

The clear, audible escape of compressed air underneath the coupling nut during the functional test is normal and does not indicate a fault. Do not tighten the coupling nut any further.

07. Press the service switch on the electro-pneumatic controller.

✓ Ceramat WA150 does not move.

✓ Compressed air noticeably and audibly escapes underneath the drive unit's coupling nut.

✓ The process analyzer displays the **Sensor Removed** message.

08. Fully screw in and tighten the sensor. → *Installing and Removing a Sensor*, p. 30

09. Press the service switch on the electro-pneumatic controller.

✓ Ceramat WA150 moves to the process position (PROCESS limit position).

✓ The position indicator points to PROCESS.

10. Move the Ceramat WA150 into the service position (SERVICE limit position).

→ *Moving into the Service Position (SERVICE Limit Position)*, p. 29.

11. Mount the drive unit. → *Drive Unit: Assembly*, p. 39

12. Repeat the functional test every 12 months. As applicable, adjust the interval to match the specific application for which the Ceramat WA150 is used.

<sup>1)</sup> FDA compliant, NSF-H1 registered

<sup>2)</sup> FDA compliant, USDA H1 registered

### 6.1.4 Cavity Rinsing: Functional Test

Information can be found in the Ceramat WA150 Maintenance Instructions.

## 6.2 Corrective Maintenance

### 6.2.1 Corrective Maintenance Safety Instructions

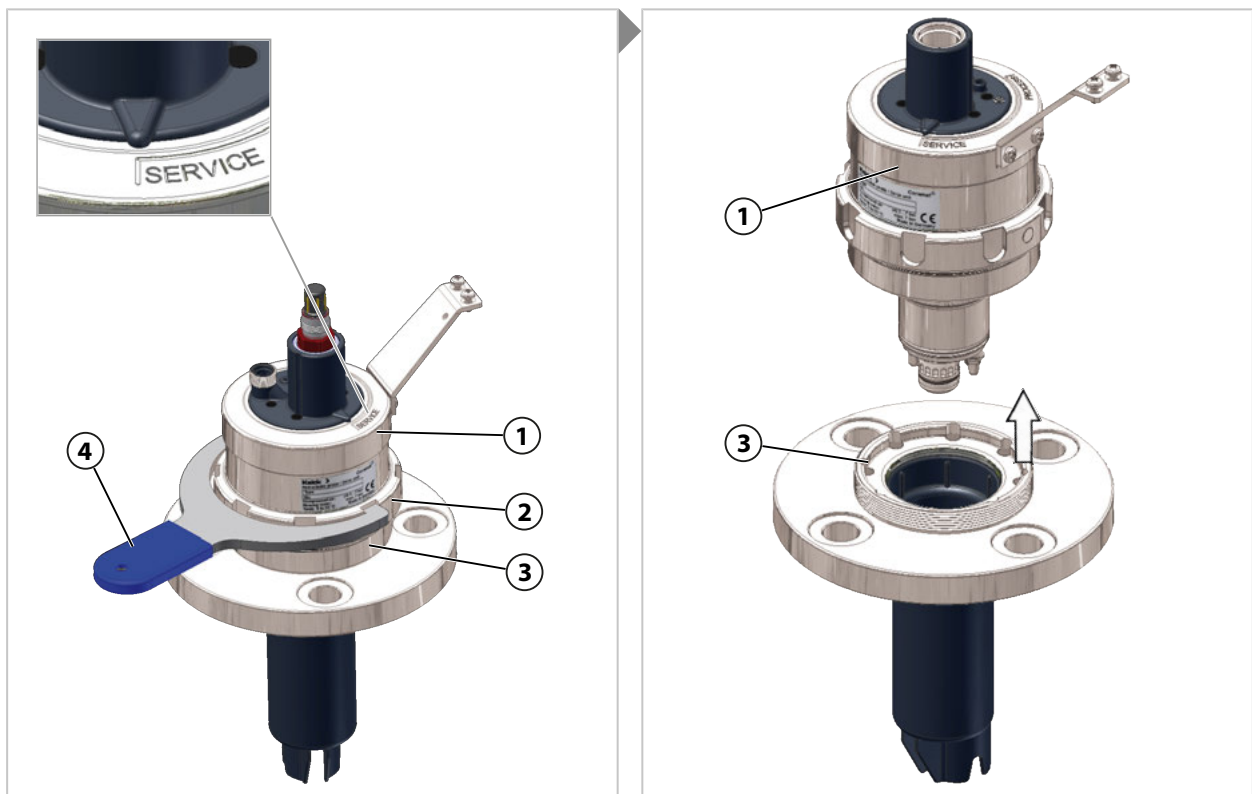
**⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the Ceramat WA150.** Only perform corrective maintenance in the service position (SERVICE limit position). Disconnect the Ceramat WA150 from all power sources and secure it against accidental reconnection. Follow the safety instructions. → *Safety, p. 5*

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

**Note:** The sensor housing with the ceramic rotary slides is the first barrier to the process. In the event of a fault, e.g., following ceramic breakage, the drive unit acts as a second barrier. Prior to removing the drive unit under process conditions, check to ensure that the ceramic rotary slides and the sensor housing are operational. Also check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting. → *Troubleshooting, p. 40*

### 6.2.2 Drive Unit: Disassembly

**Note:** The drive unit needs to be removed for procedures such as maintenance, cleaning, or troubleshooting. → *Troubleshooting, p. 40*



01. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
02. Switch off the compressed air supply and vent the compressed air system.
03. Rinse and, if necessary, blow off the media connections to prevent entrainment of process medium. → *Process Analysis System: Installation Example, p. 19*

04. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*

05. As required, disconnect the multiplug from the drive unit **(1)**.

06. As required, disconnect the outlet hose from the drive unit **(1)**.

07. As required, disconnect the sensor cable bushing from the sensor and remove the sensor.  
→ *Installing and Removing a Sensor, p. 30*

**Note:** Do not tilt the coupling nut. Recommended tool: ZU0648 "Cerammat spanning wrench".  
→ *Tools, p. 49*

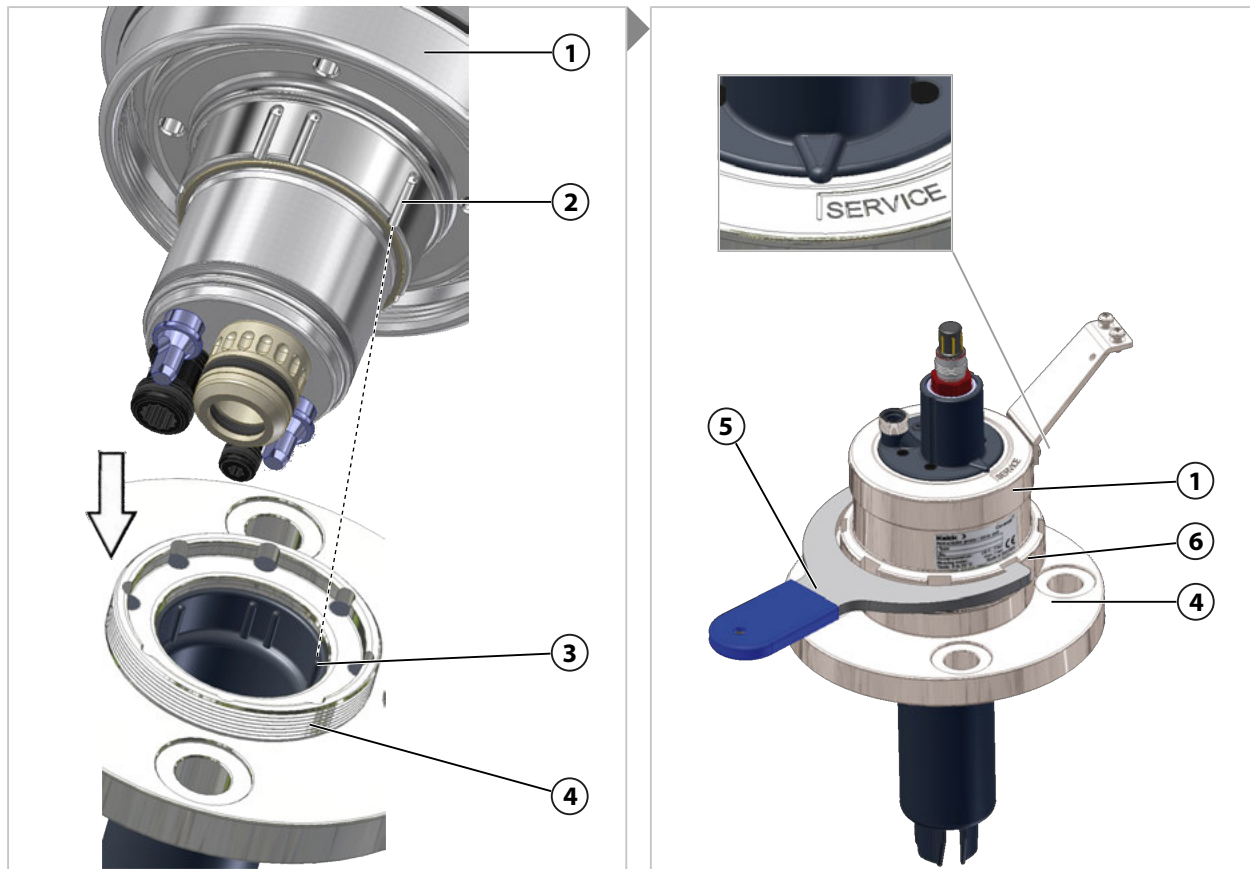
08. Loosen the coupling nut **(2)** approximately 1.5 full counterclockwise turns using the spanning wrench **(4)**, but do not fully loosen it.

09. Check the outlet for escaping process medium. If process medium escapes, stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.  
→ *Troubleshooting, p. 40*

10. Fully loosen the coupling nut **(2)**. In the process, the drive unit **(1)** is pulled out of the process unit **(3)**. While turning the coupling nut **(2)**, this motion can be assisted by slightly lifting the drive unit **(1)**.

11. Pull the drive unit **(1)** out of the process unit **(3)**.

### 6.2.3 Drive Unit: Assembly



01. Ensure that the drive unit **(1)** is in the service position (SERVICE limit position).

→ *Service and Process Position, p. 18*

**Note:** The coupling nut can only be tightened if the process unit is correctly inserted and pushed in far enough that the coupling nut's thread can engage.

02. Push the drive unit **(1)** into the process unit **(4)**. In the process, align the guide grooves **(2)** on the drive unit **(1)** so that they engage with the guide ribs **(3)** in the process unit **(4)**.

03. Position the coupling nut **(6)** and screw it clockwise until it firmly stops. If necessary, continue to press down on the drive unit **(1)** to make it easier to screw on the coupling nut **(2)**.

**Note:** Do not tilt the coupling nut. Recommended tool: ZU0648 "Ceramam spanning wrench".

→ *Tools, p. 49*

04. Using the spanning wrench **(5)**, fasten the coupling nut **(6)** clockwise finger tight.

05. As required, install the outlet hose. → *Outlet, p. 21*

06. As required, install the multiplug. → *Multiplug: Installation, p. 24*

07. As required, install the sensor. → *Installing and Removing a Sensor, p. 30*

08. As required, install the sensor cable. → *Sensor Cable: Installation, p. 25*

### 6.2.4 Knick Repair Service

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

Further information can be found at [www.knick.de](http://www.knick.de).

See also

→ *Returns, p. 43*



## 7 Troubleshooting

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

Malfunction State	Possible Causes	Remedy	
Medium escapes from the outlet hose.	Faulty ceramic rotary slide.	Send the Ceramat WA150 to your local contact for repair. → <i>knick.de</i>	
	Faulty sensor housing.	Send the Ceramat WA150 to your local contact for repair. → <i>knick.de</i>	
Medium escapes from the multiplug's connection point.	Multiplug not installed correctly.	Install the multiplug correctly. → <i>Multiplug: Installation, p. 24</i>	
	Gaskets or O-rings of the multiplug damaged or missing.	Check the gaskets and O-rings of the multiplug for correct positioning and damage, and replace them if necessary.	
	Connection point contaminated.	Clean the connection point and the multiplug.	
	Foreign objects between connection point and multiplug.	Remove foreign objects (e.g., old O-rings).	
	Faulty multiplug.	Send the media connection to your local contact for repair. → <i>knick.de</i>	
Cerammat WA150 does not move.	Multiplug not installed correctly.	Install the multiplug correctly. → <i>Multiplug: Installation, p. 24</i>	
	Sensor not installed correctly.	Install the sensor correctly. → <i>Installing and Removing a Sensor, p. 30</i>	
	Compression ring or O-ring of the sensor damaged or missing.	Check the compression ring and O-rings of the sensor for correct positioning and damage, and replace them if necessary.	
	Foreign objects in the sensor holder.	Remove foreign objects (e.g., old compression ring or O-ring).	
	Gaskets or O-rings of the drive unit damaged.	Replace the gaskets or O-rings of the drive unit and calibration chamber.	
	Faulty drive unit.	Send the Ceramat WA150 to your local contact for repair. → <i>knick.de</i>	
	No compressed air supply.		Install the multiplug correctly. → <i>Multiplug: Installation, p. 24</i>
			Check the function of the compressed air system.
		Check the function of the electro-pneumatic controller.	
		Check the process analyzer for error messages.	



Malfunction State	Possible Causes	Remedy
Cerammat WA150 does not fully move to the SERVICE or PROCESS limit position.	Faulty drive unit.	Follow the instructions for help. → <i>Malfunction: Retractable Fitting Does Not Fully Move to the Service or Process Position, p. 42</i>
	No compressed air supply.	Install the multiplug correctly. → <i>Multiplug: Installation, p. 24</i> Check the function of the compressed air system. Check the function of the electro-pneumatic controller. Check the process analyzer for error messages.
Compressed air noticeably and audibly escapes underneath the drive unit's coupling nut. <sup>1)</sup>	Sensor missing or incorrectly installed.	Install the sensor correctly. → <i>Installing and Removing a Sensor, p. 30</i> Check the compression ring and O-rings of the sensor for correct positioning and damage, and replace them if necessary.
	Foreign objects in the sensor holder.	Remove foreign objects (e.g., old compression ring or O-ring).
Sensor glass shattered.	Mechanical impact on the sensor glass (e.g., by process medium).	Replace the sensor. → <i>Installing and Removing a Sensor, p. 30</i> Remove any glass splinters from the sensor holder and the sensor housing. Check the sensor tube gaskets for damage and replace them if necessary. → <i>Drive Unit: Disassembly, p. 37</i> If required, stop the process (depressurize or drain off the process medium if necessary) and remove the Ceramat WA150. Remove glass splinters from the ceramic rotary slides and check the sensor housing gaskets for damage; replace them if necessary. → <i>Retractable Fitting: Removal, p. 43</i>
No or wrong measured value displayed.	Faulty sensor.	Replace the sensor. → <i>Installing and Removing a Sensor, p. 30</i>
	Defective plug connection or damaged sensor cable.	Fasten plug connection or replace damaged sensor cable. → <i>Sensor Cable: Installation, p. 25.</i>
	Process analyzer incorrectly configured.	Correctly configure the process analyzer (see relevant documentation).

<sup>1)</sup> Without a sensor or with an incorrectly installed sensor, the clear and audible escape of compressed air underneath the coupling nut is normal and does not indicate a fault. Do not tighten the coupling nut any further.  
→ *Safeguards, p. 6*

## Malfunction: Retractable Fitting Does Not Fully Move to the Service or Process Position

**▲ CAUTION! Risk of injury to hands and fingers from the drive unit's rotary movement.** Do not manually turn the drive any further or reach inside the Ceramat WA150.

**NOTICE!** Risk of product damage if additional manual force is applied (i.e., not due to the compressed air in the retractable fitting). Do not turn the drive any further by force.

01. Increase the drive control pressure up to the maximum permissible value to move fully to the service position (SERVICE limit position) or the process position (PROCESS limit position).

→ *Specifications, p. 52*

✓ The position indicator points to SERVICE or PROCESS.

**Note:** If troubleshooting was successful, continue with step 02. If troubleshooting was unsuccessful, continue with step 03.

02. Troubleshooting successful: Eliminate the cause of the malfunction. If required, remove the drive unit. Perform maintenance on the drive unit or check the functionality of the process unit using a replacement drive.

03. Troubleshooting unsuccessful: Stop the process; depressurize or drain off the process medium if necessary. Remove the Ceramat WA150 and send it to your local contact for repair. → *knick.de*

See also

→ *Drive Unit: Disassembly, p. 37*

→ *Knick Repair Service, p. 39*

→ *Retractable Fitting: Removal, p. 43*

## 8 Removal from Operation

### 8.1 Retractable Fitting: Removal

**⚠ WARNING! Risk of explosion from mechanically generated sparks when used in explosive atmospheres.** Take appropriate action to prevent mechanically generated sparks. Follow the safety instructions. → *Operation in Explosive Atmospheres, p. 7*

**⚠ WARNING! Process or rinse medium, potentially containing hazardous substances, may escape from the Ceramat WA150 or the process port.** Follow the safety instructions. → *Safety, p. 5*

01. Stop the process; depressurize or drain off the process medium if necessary.
02. Move the Ceramat WA150 into the service position (SERVICE limit position).  
→ *Moving into the Service Position (SERVICE Limit Position), p. 29.*
03. Switch off the compressed air supply and vent the compressed air system.
04. Disconnect the cable bushing of the sensor cable from the sensor.
05. Loosen and remove the sensor cable from the media connection bracket.
06. If required, loosen and remove the equipotential bonding line from the media connection bracket.
07. Remove the multiplug.
08. Remove the outlet hose.
09. Remove the media connection bracket from the strain relief bracket of the Ceramat WA150.
10. Loosen the process connection.
11. Remove the Ceramat WA150 from the customer's process port.
12. Close off the process port appropriately.

### 8.2 Returns

If required, send the product in a clean condition and securely packed to your local contact.  
→ *knick.de*

If there has been contact with hazardous substances, the product must be decontaminated or disinfected prior to shipment. The consignment must always be accompanied by a corresponding return form (declaration of decontamination) to prevent service employees being exposed to potential hazards. → *knick.de*

### 8.3 Disposal

The local codes and regulations must be observed when disposing of the product.

The Ceramat WA150 can contain various materials, depending on the version concerned.

→ *Product Code, p. 10*

## 9 Spare Parts, Accessories, and Tools

### 9.1 Seal Kits

The Ceramat WA150 is a modular system. The correct seal kits required for corrective maintenance depend on the version ordered.

The ordered version of the Ceramat WA150 is encoded in a product code. → *Product Identification, p. 9*

The seal kits are available in different materials.

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

The extended seal kits ("Set X/2") also include O-rings for contact with the rinse medium.

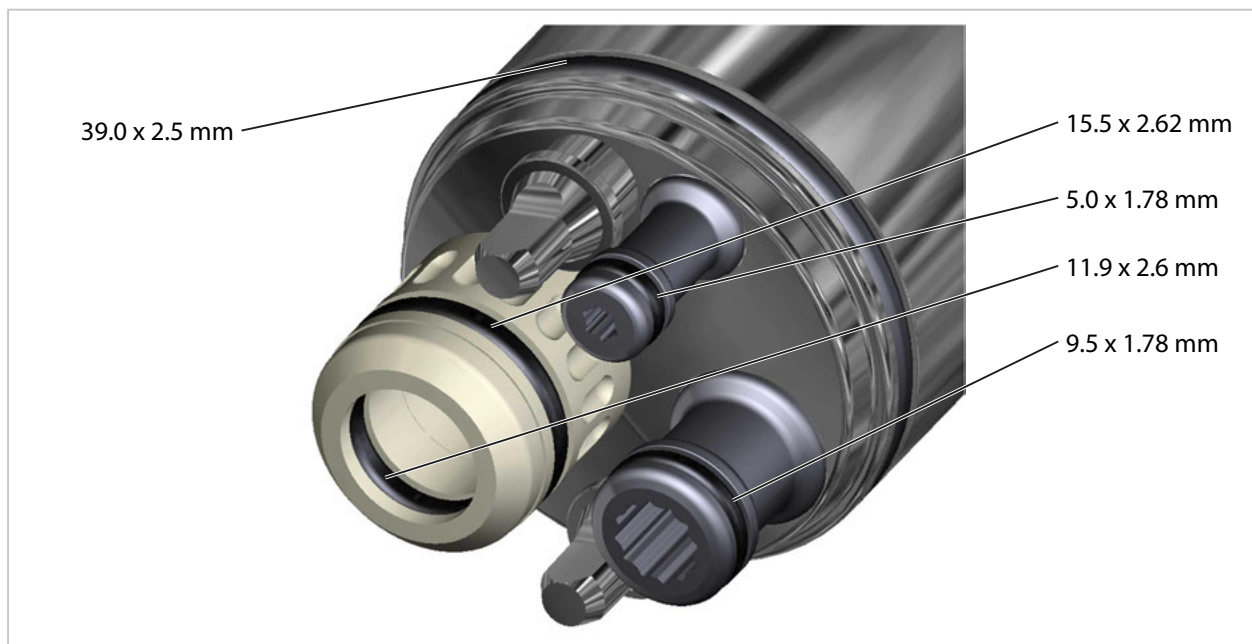
Each seal kit comes with an accompanying slip that provides information about the package contents, where the O-rings are to be installed, and where the lubrication points are. Replacement O-rings must be greased with the lubricant that is supplied.

To ensure correct installation of the O-rings and the scraper ring, we recommend using the accessory tools ZU0746 and ZU0747. The procedure for handling the accessory tools is described in the relevant product documentation. → *Tools, p. 49*

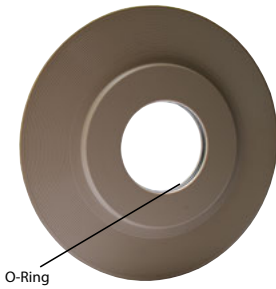
Seal Kit	Seals Wetted by Process	Seals Wetted by Rinse Media	Order Code	Suitable Lubricant
Set A	FKM	FKM	ZU0624	Syntheso Glep1
Set B	EPDM	EPDM	ZU0625	Syntheso Glep1
Set C	FFKM	FKM	ZU0626	Syntheso Glep1
Set E	EPDM FDA	EPDM	ZU0661	Beruglide L
Set H	FFKM FDA	FFKM FDA	ZU0885	Beruglide L
Set K	FFKM	FFKM	ZU0951	Syntheso Glep1
Set D	FFKM	EPDM	ZU1084	Syntheso Glep1

**Note:** Further seal kits are available on request.

#### Seal Kit

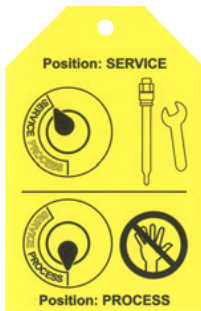


## 9.2 Spare Parts



- ZU0595 Protective Pane DN80, PEEK
- ZU0596 Protective Pane DN80, PVDF
- ZU0597 Protective Pane DN100, PEEK
- ZU0598 Protective Pane DN100, PVDF

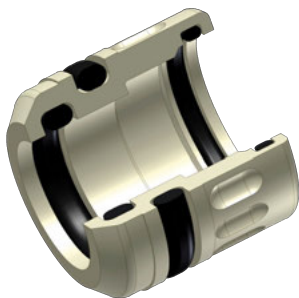
Protection of the stainless steel flange (material 1.4571) from aggressive media from nominal size DN80, O-ring material FFKM



### Safety Label

The safety label contains information on safely installing and removing solid-electrolyte sensors. → *Installing and Removing a Sensor, p. 30*

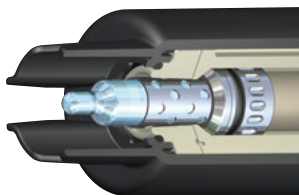
Damaged or lost safety labels will be replaced on request.



### Sensor Socket with Mounted O-Rings

Materials:

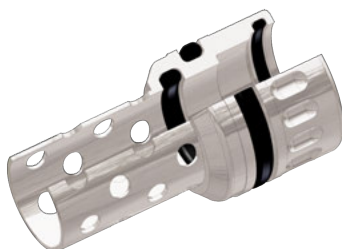
- ZU0616 sensor socket PEEK, O-rings FKM
- ZU0617 sensor socket PEEK, O-rings EPDM
- ZU0618 sensor socket PEEK, O-rings FFKM
- ZU0619 sensor socket PEEK, O-rings EPDM FDA
- ZU0620 sensor socket PVDF, O-rings FKM
- ZU0621 sensor socket PVDF, O-rings EPDM
- ZU0622 sensor socket PVDF, O-rings FFKM
- ZU0623 sensor socket PVDF, O-rings EPDM FDA



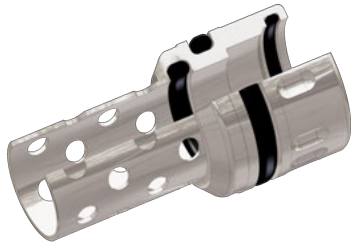
### Sensor Socket, Long with Mounted O-Rings

This sensor socket is recommended for brittle scaling (e.g., lime).

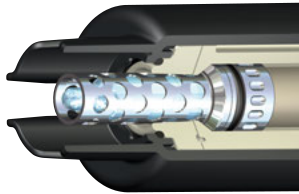
(Hastelloy C22 material identifiable by a missing grip recess)



- 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



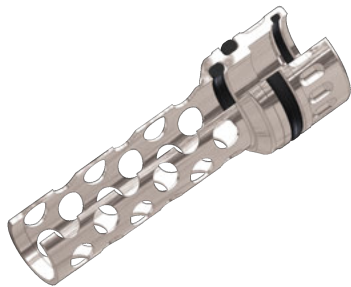
ZU 0673/A Hastelloy Sensor Socket, O-Rings FKM  
 ZU 0673/B Hastelloy Sensor Socket, O-Rings EPDM  
 ZU 0673/C Hastelloy Sensor Socket, O-Rings FFKM



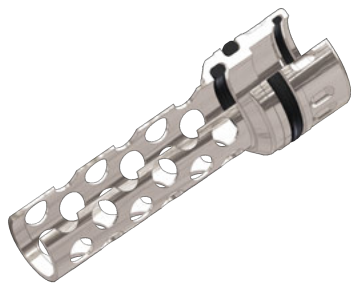
**Sensor Socket, Full Sensor Protection with Mounted O-Rings**

This sensor socket is recommended for brittle scaling (e.g., lime). The sensor is also provided with better mechanical protection.

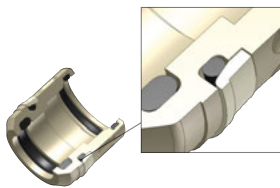
(Hastelloy C22 material identifiable by a missing grip recess)



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 Hastelloy Sensor Socket, O-Rings FKM  
 ZU 0820/B Hastelloy Sensor Socket, O-Rings EPDM  
 ZU 0820/C Hastelloy Sensor Socket, O-Rings FFKM



**Sensor Socket with Mounted O-Rings and Scraper Ring with PEEK Strip Edge**

This sensor socket is recommended for adherent or sticky media, as well as particles in the process medium.

Materials:

- ZU0705 sensor socket PEEK, O-rings FKM
- ZU0706 sensor socket PEEK, O-rings EPDM
- ZU0707 sensor socket PEEK, O-rings FFKM

### 9.3 Accessories



#### RV01 Check Valve

The RV01 check valve prevents process medium or calibration, cleaning, or rinse media from flowing back into the inlet. The check valve is selected using a product code.

Check valve		RV01	-	-	-	-	-
Housing material, valve body	Stainless steel 1.4404		H				
	PEEK		E				
Seal material	FKM			A			
	EPDM			B			
	FFKM			C			
	FKM-FDA			F			
	EPDM-FDA			E			
	FFKM-FDA			H			
Inlet connection, female thread	G1/4"					4	
	G1/8"					8	
Outlet connection, male thread	G1/4"						4
	G1/8"						8



#### ZU0631 Standard Media Connection

Connection kit for manual operation of the Ceramat WA150 in conjunction with accessory ZU0646, "Pneumatically operated manual control valve," or for operation with the process control system (PCS).



#### ZU0646 Pneumatically Operated Manual Control Valve

Switch (rocker switch from reversing compressed air) for manual operation of the Ceramat WA150 in conjunction with accessory ZU0631 "Standard media connection".



### ZU0654 / ZU0655 Adapter for Additional Media

The adapter enables use of an additional medium, e.g., hot water or steam, directly on the Ceramat WA150. A check valve is integrated in the adapter's media connection.

The adapter is installed between the Ceramat WA150 and the media connection's multiplug.

Available versions:

- ZU0654/1 PEEK adapter, FKM O-rings
- ZU0654/2 PEEK adapter, EPDM O-rings
- ZU0654/3 PEEK adapter, FFKM O-rings
- ZU0655/1 1.4571 adapter, FKM O-rings
- ZU0655/2 1.4571 adapter, EPDM O-rings
- ZU0655/3 1.4571 adapter, FFKM O-rings



### ZU1043 Sensor Adapter 360

The sensor adapter 360 enables operation of the Ceramat WA150 with solid-electrolyte sensors that have a length of 360 mm.

The "Immersion lock without a mounted solid-electrolyte sensor" safeguard remains fully operational. → *Safeguards, p. 6*



### ZU0670/1 Air Supply for Pressurized Sensors 0.5 - 4 bar

### ZU0670/2 Air Supply for Pressurized Sensors 1-7 bar

### ZU0713 Hose, 20 m (Extension for ZU0670)

This assembly group maintains the defined gauge pressure in the sensor pressure chamber in versions of the Ceramat WA150 for liquid-electrolyte sensors.



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

The connection kit enables installation of accessory ZU0670 "Air supply for pressurized sensors" to customers' permanently installed 1/4" pipes.

ZU0953 is an elastic connection between the permanent piping (solid 1/4" pipes) and the moving parts of the Ceramat WA150.



## 9.4 Tools

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### ZU0648 Spanning Wrench

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ZU0648 "Spanning wrench" is used to loosen and fasten the drive unit coupling nut (removal or installation of the drive unit).

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### ZU0647 Sensor Spanning Wrench

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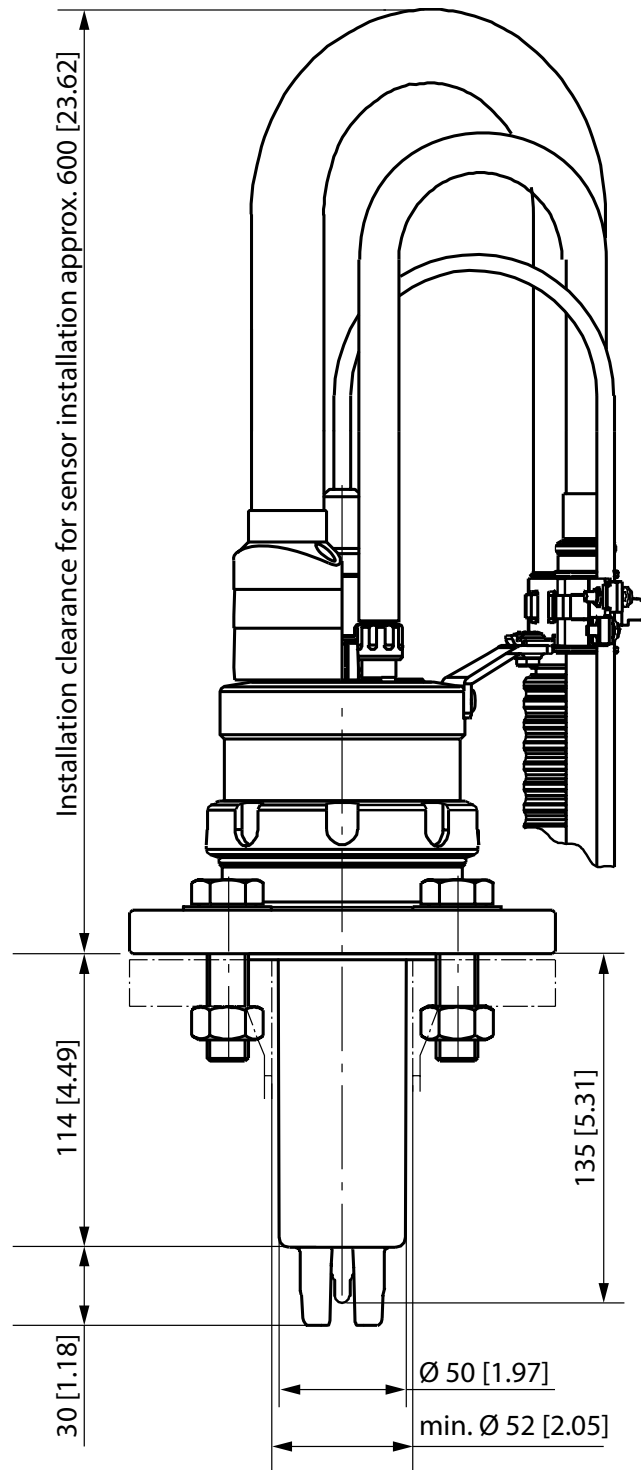
The sensor spanning wrench is used to properly tighten sensors. It prevents damage to the plastic thread of the sensor head PG 13.5 caused by applying an excessive tightening torque (e.g., when using an open-end wrench).

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## 10 Dimension Drawings

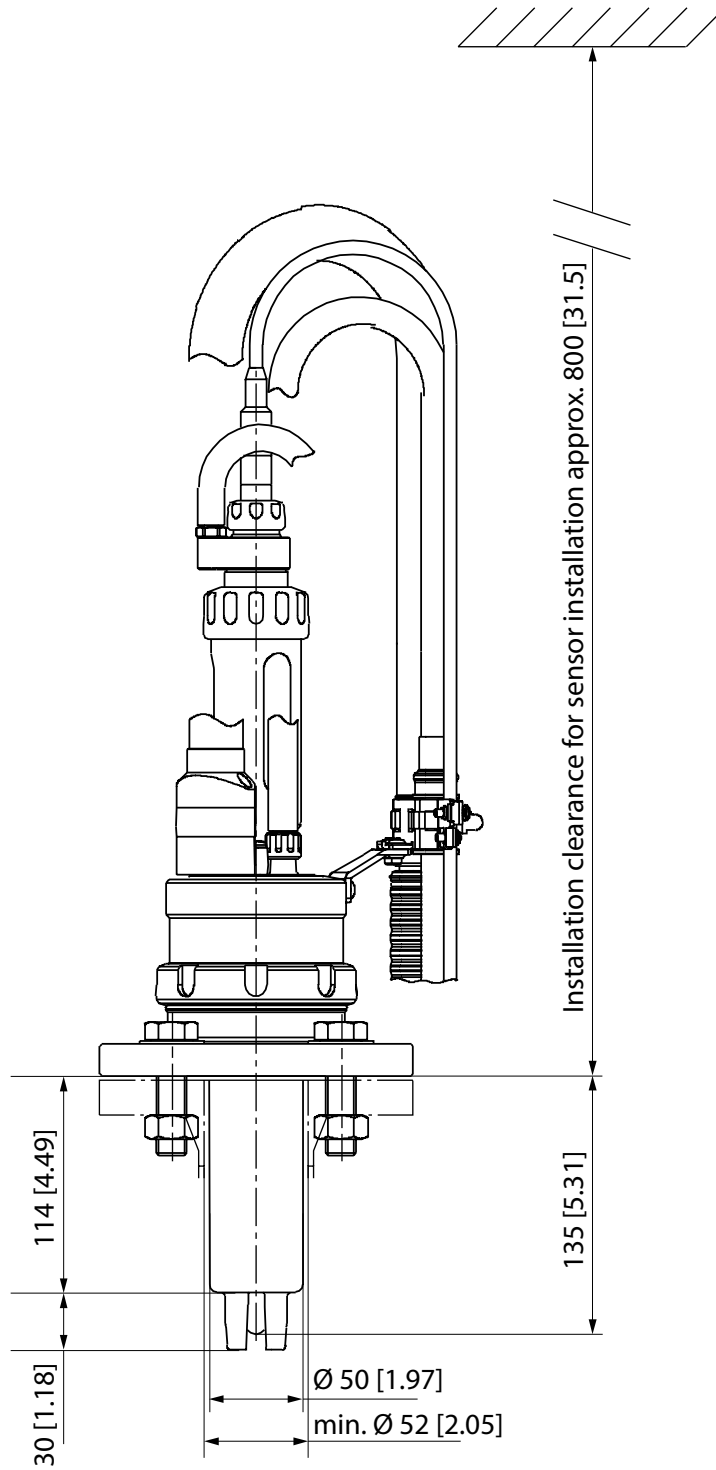
### Retractable Fitting for Solid-Electrolyte Sensor

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



**Retractable Fitting for Liquid-Electrolyte Sensor**

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



## 11 Specifications

<b>Permissible process pressure and temperature during movement</b>	
PEEK HD process connection	
0 ... 120 °C (32 ... 248 °F)	6 bar (87 psi)
120 ... 140 °C (248 ... 284 °F)	6 bar (87 psi) short-time 30 min
PVDF HD process connection	
0 ... 120 °C (32 ... 248 °F)	6 bar (87 psi)
120 ... 140 °C (248 ... 284 °F)	6 bar (87 psi) short-time 30 min
<b>Permissible process pressure and temperature when static in service position</b>	
0 ... 40 °C (32 ... 104 °F)	16 bar (232 psi)
<b>Permissible pressure for control</b>	4 ... 7 bar (58 ... 101.5 psi)
<b>Ambient temperature</b>	-10 ... 70 °C (14 ... 158 °F)
<b>Degree of protection</b>	IP66
<b>Sensors</b>	→ <i>Product Code, p. 10</i>
<b>Process connections</b>	→ <i>Product Code, p. 10</i>
<b>Immersion depths / dimensions</b>	→ <i>Dimension Drawings, p. 50</i>
<b>Wetted materials</b>	→ <i>Product Code, p. 10</i>
<b>Quality of compressed air</b>	
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/m <sup>3</sup> )
Water content for temperatures > 15 °C	Class 4, pressure dew point 3 °C (37.5 °F) or lower
Water content for temperatures 5 ... 15 °C	Class 3, pressure dew point -20 °C (-4 °F) or lower
Oil content	Class 3 (max. 1 mg/m <sup>3</sup> )
<b>Terminals</b>	
Outlet	Connector plug matching Unical media hose
For pressurized sensors	Connection nozzle DN6 with G1/8 thread for connecting a pneumatic hose with an inner diameter of 6 mm or ¼" Pressure in sensor chamber 0.5 ... 1 bar ( 7.25 ... 14.5 psi) above process pressure max. 7 bar (101.5 psi)
For compressed air, rinse and calibration media (retractable fitting control air)	For Unical multiplug
<b>Weight</b>	Depending on material and version

## Abbreviations

A/F	Width across flats
ANSI	American National Standards Institute
ATEX	Atmosphères Explosibles (explosive atmospheres)
CE	Conformité Européenne (European conformity)
CLP	Classification, labeling, and packaging
DIN	Deutsches Institut für Normung (German Institute for Standardization)
DN	Diamètre nominal (nominal size)
EPDM	Ethylene propylene diene monomer rubber
EU	European Union
FFKM	Perfluoro rubber
FKM	Fluoro rubber
IEC	International Electrotechnical Commission
IP	International Protection / Ingress Protection
ISO	International Organization for Standardization
KEMA	Keuring van Elektrotechnische Materialen te Arnhem (inspection of electrical equipment in Arnhem)
LED	Light-emitting diode
PEEK	Polyether ether ketone
PCS	Process control system
PG	Panzergewinde
PVDF	Polyvinylidene fluoride

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