Knick

User Manual

Ceramat WA153

Retractable Fitting

Read before installation.
Keep for future use.

www.knick.de

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

Supplementary Documents for Special Versions

- Special datasheet for special version B [1)]
- Special datasheet for special version J [1)]

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

Table of Contents

1 Safety

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

1.1 Intended Use

The Ceramat WA153 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 WA153. The Ceramat WA153 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 WA153 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[1)]	Body diameter 12 mm or 12.7 mm (½")

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. 51*

Thanks to its modular design, Ceramat WA153 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. CUSTOMER SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGES RESULTING FROM OR ARISING OUT OF AN UNINTENDED USE OF THE PRODUCT.

The Ceramat WA153-X version is certified for operation in explosive atmospheres.
→ *Operation in Explosive Atmospheres, p. 7*

1.2 Personnel Requirements

Customer 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.

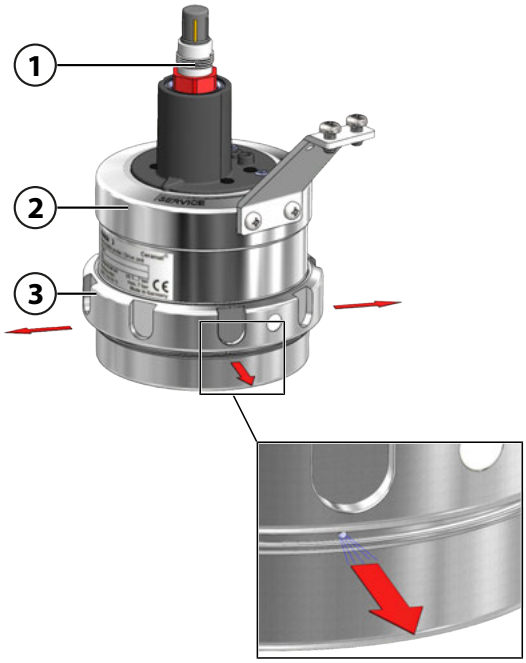
1) Use with optical sensors requires additional adapters. The special datasheets contain information on the design and use of the adapters. → *Product Code, p. 10*

1.3 Safeguards

The Ceramat WA153 safety concept is based on the interplay of functions within a Knick process analysis system. The Ceramat WA153 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 WA153 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 WA153 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 WA153 intended for solid-electrolyte sensors and when using a Knick process analysis system.
→ *Process Analysis System: Installation Example, p. 19*

The safeguard is not available in versions of the Ceramat WA153 that have a sensor socket with a PEEK scraper or if a sensor socket is retrofitted with a PEEK scraper. → *Spare Parts, p. 44*

The safeguard function is only available if the O-ring and the compression ring are correctly installed on the solid-electrolyte sensor **(1)**. → *Installing and Removing a Sensor, p. 28*

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 **(3)** 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 WA153 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*

See also
→ *Immersion Lock Without a Mounted Solid-Electrolyte Sensor: Functional Test, p. 34*

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 Ceramat WA153 in compliance with the stated operating conditions.
  → *Specifications, p. 51*
- Install the product inside a protected area of the plant. Alternatively, take appropriate action to protect the Ceramat WA153.
- If using aggressive chemical process media, adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance, p. 33*

- Adhering and sticky process media can impact the functionality of Ceramat WA153 (e.g., by causing components to stick together). Adjust the inspection and maintenance intervals accordingly.
  → *Inspection and Maintenance, p. 33*

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 WA153-X is certified for operation in explosive atmospheres.

- EU-Type Examination Certificate KEMA 04ATEX4035X

Explosion protection is ensured under atmospheric conditions with an absolute pressure of 0.8 … 1.1 bar and an ambient temperature of -20 … 60 °C. See the manufacturer's specifications for information on the durability of the retractable fitting. → *Specifications, p. 51*

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.

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)

1.6.1 Possible Ignition Hazards During Installation and Maintenance

To avoid mechanically generated sparks, handle the Ceramat WA153-X with care and apply suitable measures, e.g., use covers and pads.

The metallic parts of the Ceramat WA153-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 WA153-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 WA153-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 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 manufacturer's documentation.

1.7 Safety Training

Upon request, Knick Elektronische Messgeräte GmbH & Co. KG will provide safety instruction and product training during initial commissioning of the product. Further information is available from the relevant Knick representatives.

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. 33*

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. 33*

Tools and Mounting Aids

Special and accessory tools help maintenance personnel to replace components and wear parts safely and professionally. → *Tools, p. 46*

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. 44*

Repair Service

The Knick Repair Service offers professional corrective maintenance on the Ceramat WA153 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.

2 Product

2.1 Package Contents

- Ceramat WA153 in the version ordered
- User Manual
- As applicable, supplementary datasheet for special versions [1)]
- EU Declaration of Conformity
- EU-Type-Examination Certificate [1)]

2.2 Product Identification

The different versions of the Ceramat WA153 are coded 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

Basic device with pneum. drive, stainless steel		**WA153**	**–**	**N**	**0**	**K**	**B**	**B**	**0**	**1**	**1**	**0**	**5**	**B**	**D**	**1**	**0**	**–**	**0**	**0**	**0**
Explosion protection	None			**N**														**–**			
Sensor	Sensor ⌀ 12 mm with PG 13.5				**0**													**–**			
Material of seals	FFKM					**K**												**–**			
Sensor protection tube material	Hastelloy C22						**B**											**–**			
Sensor socket material	Hastelloy C22, without protection							**B**	**0**									**–**			
Scraper for sensor socket	PEEK, natural									**1**								**–**			
Immersion depth	Immersion depth 105 mm (max.)										**1**	**0**	**5**					**–**			
Process-wetted material	Hastelloy C22													**B**				**–**			
Process connection	Flange, loose, ANSI 316, 150 lbs, 2″														**D**	**1**		**–**			
Probe guard	None																**0**	**–**			
Special version	None																	**–**	**0**	**0**	**0**

[1)] Supplied depending on the ordered version of the Ceramat WA153 → *Product Code, p. 10*

2.2.2 Product Code

Basic device with pneum. drive, stainless steel version		WA153	–	_	_	_	_	_	_	_	_	_	_	_	_	_	_	–	_	_	_
Explosion protection	ATEX Zone 0			X														–			
	None			N														–			
Sensor	Sensor ⌀ 12 mm with PG 13.5				0													–			
	pH sensor ⌀ 12 mm with pressurization unit, pressure chamber for compressed air supply				1													–			
	Optical sensor ⌀ ½" (12.7 mm)				2													–			
	Optical sensor ⌀ 12 mm				3													–			
Gasket material	FKM					A												–			
	EPDM					B												–			
	EPDM – FDA					E												–			
	FKM – FDA					F												–			
	FFKM – FDA					H												–			
	FFKM					K												–			
Sensor protection tube material	Hastelloy C22 [1]						B											–			
	PEEK						E											–			
	1.4404						H											–			
	Titanium [1]						T											–			
Sensor socket material	Hastelloy C22, without protection							B	0									–			
	Hastelloy C22, short protection							B	1									–			
	1.4404, without protection							H	0									–			
	1.4404, short protection							H	1									–			
	1.4404, long protection							H	2									–			
	1.4404, full protection							H	3									–			
	PEEK, without protection							E	0									–			
	Titanium, without protection							T	0									–			
	Titanium, short protection							T	1									–			
Scraper for sensor socket	None									0								–			
	PEEK, natural									1								–			
Immersion depth	Special immersion depth 23 - 104 mm (1 mm increments)										0	0	0					–			
	Immersion depth 105 mm (max.)										1	0	5					–			
Process-wetted material	Hastelloy C22 [1]													B				–			
	1.4404													H				–			
	Titanium [1]													T				–			
Process connection	Flange, loose, 1.4571, PN10/16, DN 50														B	1		–			
	Flange, loose, 1.4571, PN10/16, DN 65														B	2		–			
	Flange, loose, 1.4571, PN10/16, DN 80														B	3		–			
	Flange, loose, 1.4571, PN10/16, DN 100														B	4		–			
	Flange, loose, 1.4571, PN10/16, DN 125 [1]														B	5		–			
	Flange, loose, 1.4571, PN10/16, DN 150 [1]														B	6		–			
	Flange, loose, 1.4571, PN10/16, DN 200 [1]														B	7		–			
	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		–			

[1] Special option, lead time on request

Basic device with pneum. drive, stainless steel version		WA153 - _ _ _ _ _ _ _ _ _ _ _ _ _ _ - _ _ _
	Flange, loose, 1.4571, PN40, DN 100	E 4 -
	Flange, loose, 1.4571, PN40, DN 125 [1]	E 5 -
	Flange, loose, 1.4571, PN40, DN 150 [1]	E 6 -
	Flange, loose, 1.4571, PN40, DN 200 [1]	E 7 -
	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 ½″	D 2 -
	Flange, loose, ANSI 316, 150 lbs, 3″	D 3 -
	Flange, loose, ANSI 316, 150 lbs, 3.5″ [1]	D 4 -
	Flange, loose, ANSI 316, 150 lbs, 4″ [1]	D 5 -
	Flange, loose, ANSI 316, 150 lbs, 5″ [1]	D 6 -
	Flange, loose, ANSI 316, 150 lbs, 6″ [1]	D 7 -
	Flange, loose, ANSI 316, 300 lbs, 2″	P 1 -
	Flange, loose, ANSI 316, 300 lbs, 2 ½″	P 2 -
	Flange, loose, ANSI 316, 300 lbs, 3″	P 3 -
	Flange, loose, ANSI 316, 300 lbs, 3.5″ [1]	P 4 -
	Flange, loose, ANSI 316, 300 lbs, 4″ [1]	P 5 -
	Flange, loose, ANSI 316, 300 lbs, 5″ [1]	P 6 -
	Flange, loose, ANSI 316, 300 lbs, 6″ [1]	P 7 -
	G2 ¼ for ARF210/215	K 8 -
	Clamp 2.5″	J 3 -
	Clamp DN 50, DIN 32676	J H -
	BioControl, 1.4404, DN 65 [1]	L 2 -
	Varivent 1.4404 (≥ DN 50)	V 1 -
Probe guard	None	0 -
	With, version 1	1 -
Special version	None	- 0 0 0
	Equipped with special grease (provided by customer)	- 0 0 1
	Sensor protection tube for optical sensor (Hellma) with ⌀ 12 mm and additional anti-twist protection for the sensor cables, rotating adapter 12 mm/PG 13.5 (according to drawing)	- 0 0 B
	Customer-specific special datasheet	- 0 0 F
	Sensor protection tube for optical sensor with ⌀ 12 mm or ½″ (12.7 mm) and additional anti-twist protection for the sensor cables, rotating adapter ⌀ 12 mm (½″)/PG 13.5 (according to drawing)	- 0 0 J
	Ceramat, inlet and outlet made of 1.4404	- 0 0 K

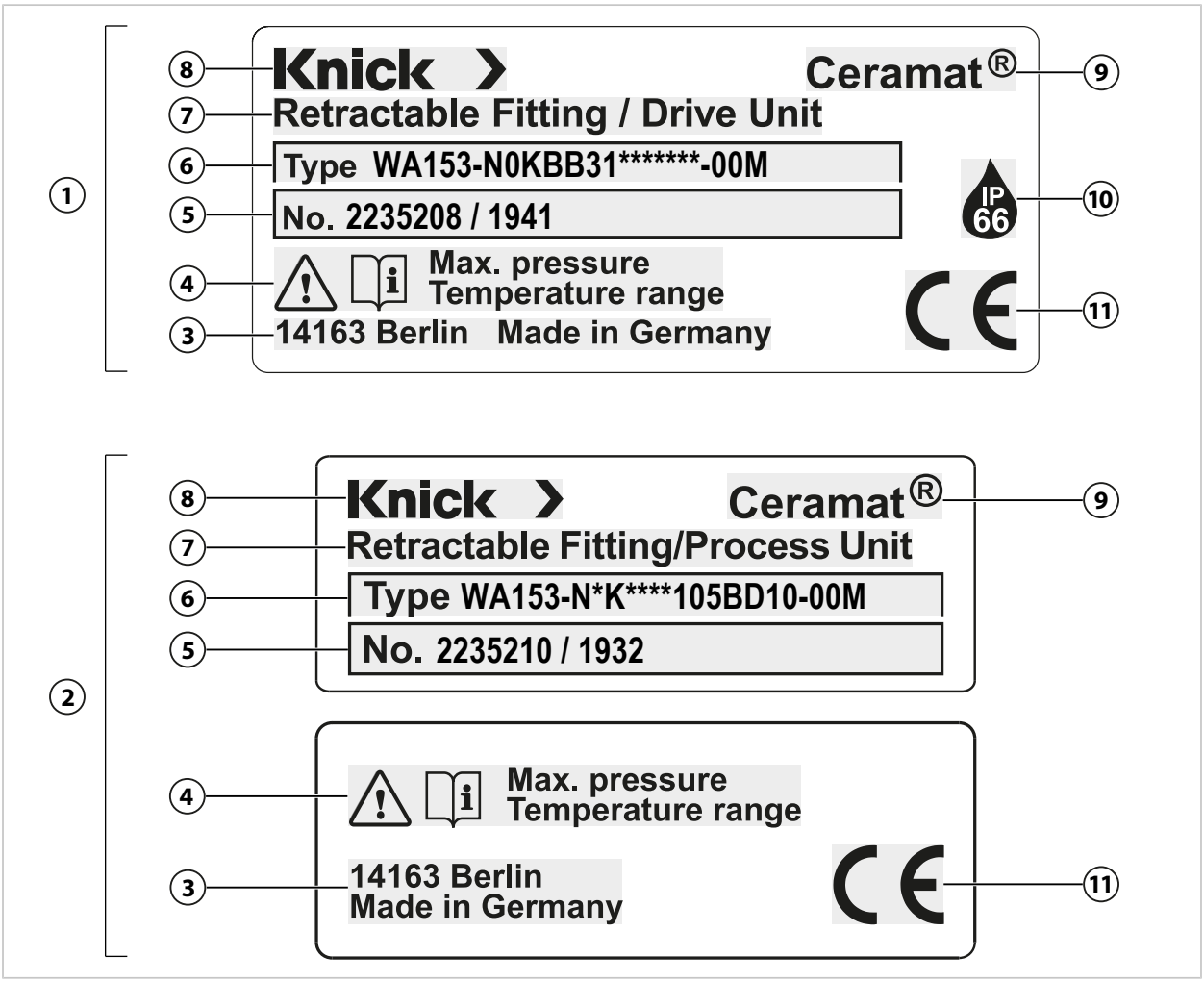
1) Special option, lead time on request

2.3 Nameplates

The Ceramat WA153 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 WA153.

Nameplate, Version Without ATEX Approval

Note: The figure shows a nameplate for the Ceramat WA153-N version by way of example.

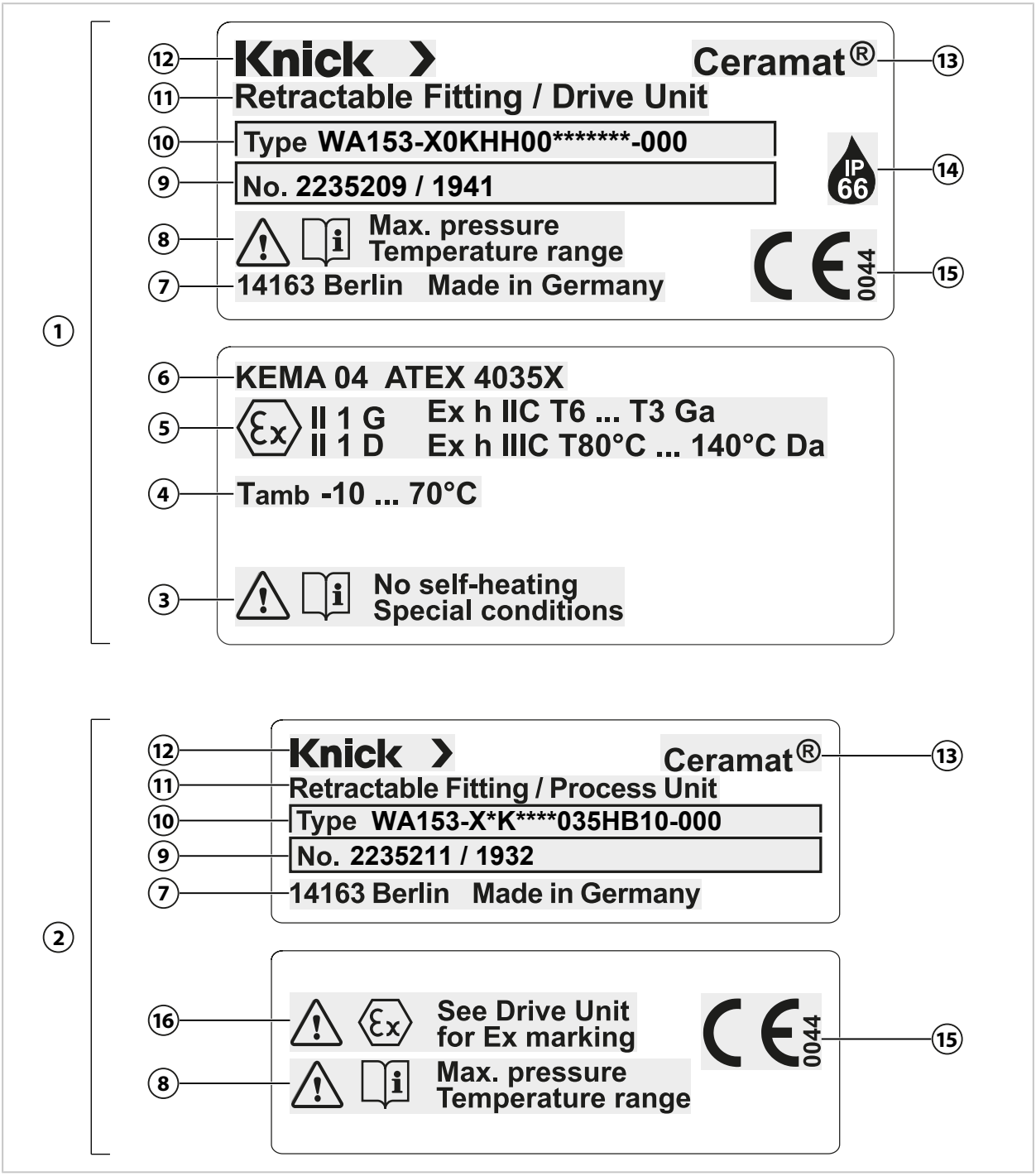


1	Drive unit nameplate	**7**	Product line / assembly group
2	Process unit nameplates	**8**	Manufacturer
3	Manufacturer's address with designation of origin	**9**	Product line
4	Max. operating pressure and temperature range [1)]	**10**	IP protection
5	Serial number / year and week of production	**11**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

[1)] Further information is available in the related EU Type Examination Certificate and in the → *Safety, p. 5* and → *Specifications, p. 51* chapters.

Nameplate, Version With ATEX Approval

Note: The figure shows a nameplate for the Ceramat WA153-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 [1]	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 protection
7	Manufacturer's address with designation of origin	15	CE marking with identification number
8	Max. operating pressure and temperature range [1]	16	Reference to ATEX information for the drive unit

[1] Further information is available in the related EU Type Examination Certificate and in the → *Safety, p. 5* and → *Specifications, p. 51* 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 of the notified body involved in the production control.
	ATEX marking[1] of the European Union for operation of Ceramat WA153-X in explosive atmospheres. → *Operation in Explosive Atmospheres, p. 7*
	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). → *Moving into the Process Position (PROCESS Limit Position), p. 27*
	Display indicating service position (SERVICE limit position). → *Moving into the Service Position (SERVICE Limit Position), p. 27*

2.5 Design and Function

Ceramat WA153 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. 35*

Different versions of drive and process unit can be combined.
→ *Changes for Different Conditions, p. 17*

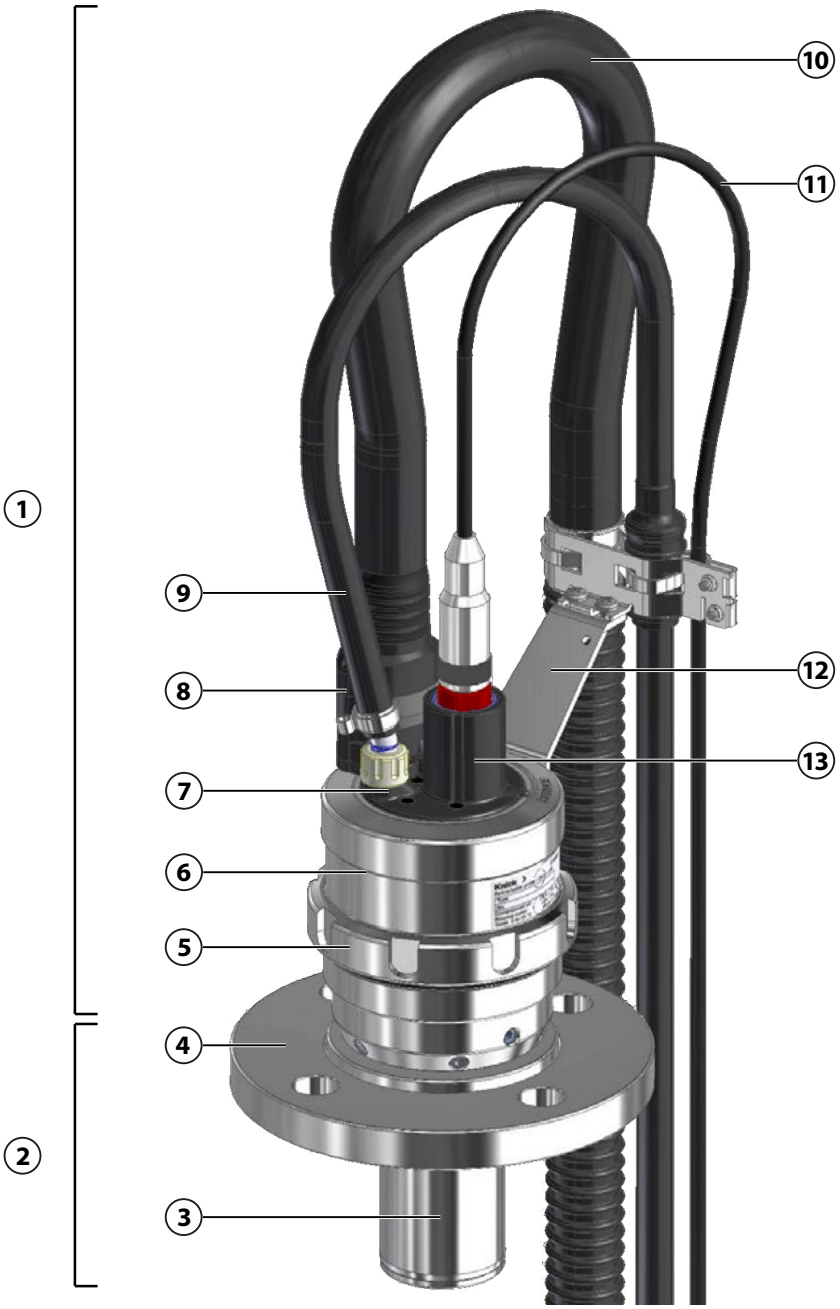
The process connection is used to fasten the Ceramat WA153 to the process port on the measuring point.

The pneumatically operated drive unit moves the Ceramat WA153 into the service position (SERVICE limit position) or the process position (PROCESS limit position).
→ *SERVICE/PROCESS Limit Positions , p. 18*

[1] Availability is 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*

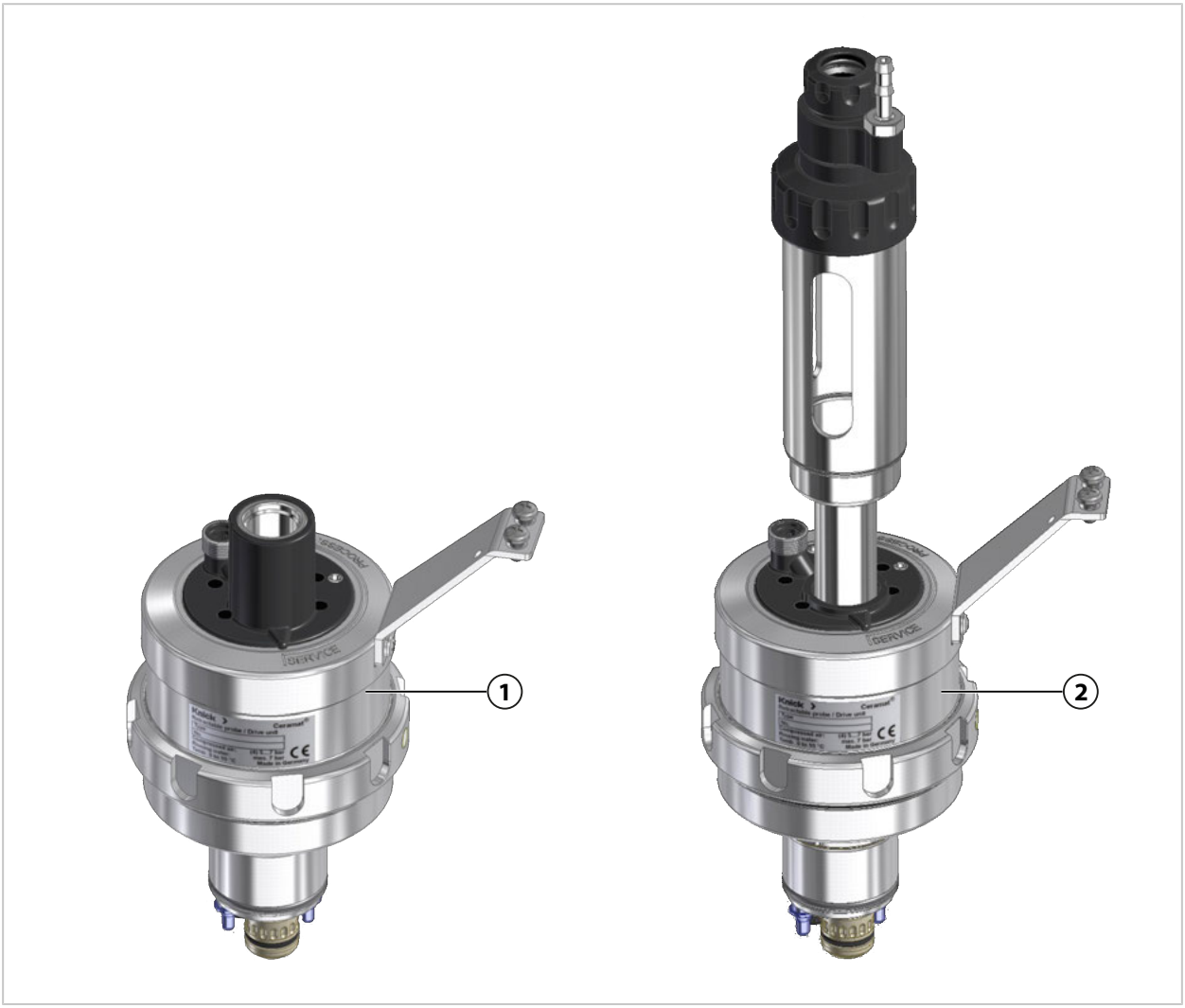


1	Drive unit	**8**	Multiplug[1)]
2	Process unit	**9**	Outlet hose[1)]
3	Sensor housing with ceramic rotary slides	**10**	Media connection[1)]
4	Process connection (e.g., flange)	**11**	Sensor cable[1)]
5	Coupling nut	**12**	Strain relief bracket
6	Drive unit	**13**	Sensor holder
7	Media outlet		

1) Not included in the Ceramat WA153 package contents

2.5.2 Drive Units

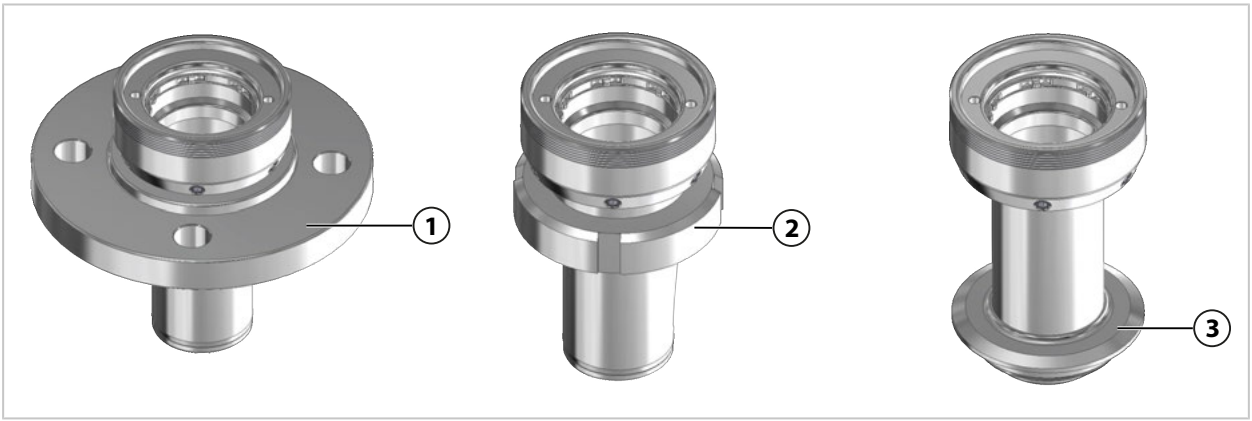
Note: The figure shows a selection from the product line. → *Product Code, p. 10*



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	**3** Varivent
2 Dairy pipe	

2.6 Changes for Different Conditions

Ceramat WA153 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. 33*
- 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 WA153. 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 WA153 are 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. 37*

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

2.7 SERVICE/PROCESS Limit Positions

Ceramat WA153 can assume two limit positions (service or process position).

Note: The Ceramat WA153 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)

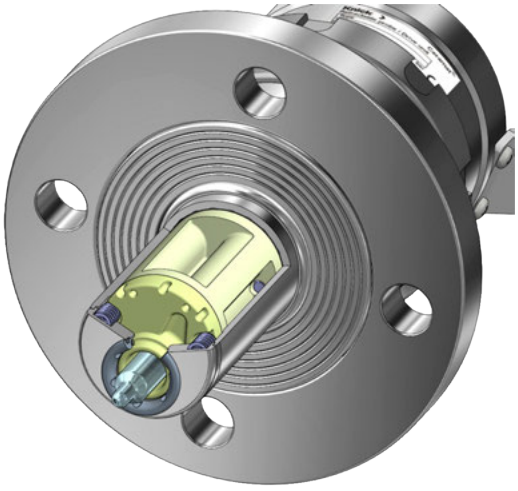
- The ceramic rotary slide is closed (sensor is retracted in the sensor housing).
- The sensor is not in contact with the process medium.
- The position indicator points to SERVICE.
- The sensor can be installed, removed, and, as necessary, cleaned under process conditions.
- The drive unit can be removed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

See also
→ *Moving into the Service Position (SERVICE Limit Position), p. 27*
→ *Moving into the Process Position (PROCESS Limit Position), p. 27*

3 Installation

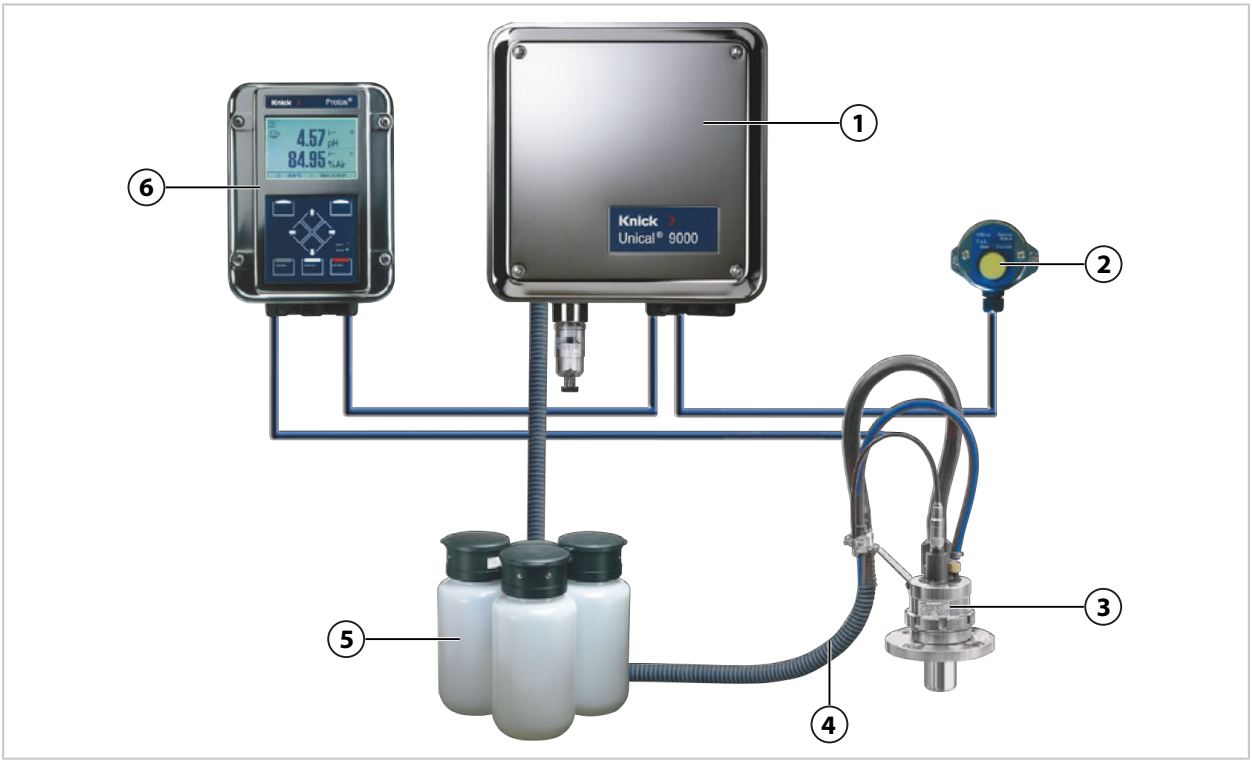
3.1 General Installation Instructions

Process Analysis System: Installation Example

The Ceramat WA153 is designed for operation within a fully automatic Knick process analysis system. The process analysis system may typically comprise the following products:

- Protos 3400(X) process analyzer
- Unical 9000(X) electro-pneumatic controller
- Ceramat WA153 retractable fitting

Note: The figure shows an example installation of a Knick process analysis system. Further information can be found at www.knick.de.

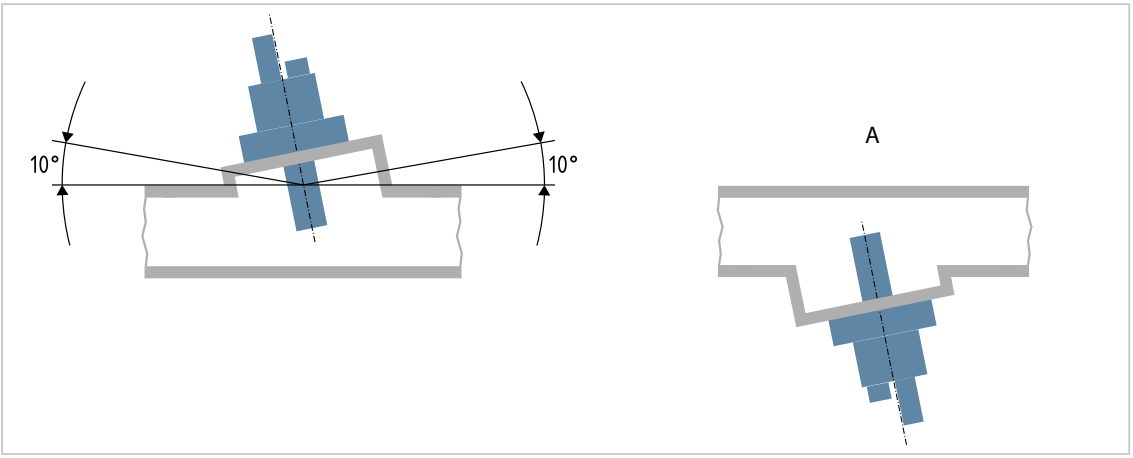


1	Unical 9000(X) electro-pneumatic controller	**4**	Media connection with multiplug
2	Service switch	**5**	Media adapter with metering pump
3	Ceramat WA153 retractable fitting	**6**	Protos 3400(X) process analyzer

Note: The Ceramat WA153 may also be operated without a process analysis system. In this case, accessory ZU0631, "Standard media connection", is required. The Ceramat WA153 is then controlled via the process control system (PCS) or manually with accessory ZU0646, "Pneumatically operated manual control valve". → *Accessories, p. 45*

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 scope of delivery of the Ceramat WA153 for completeness. → *Package Contents, p. 9*
02. Check the Ceramat WA153 for damage.
03. Ensure sufficient installation clearance to mount the sensor and allow the hoses and cables to move freely. → *Dimension Drawings, p. 47*

Note: The installation angle of the Ceramat WA153 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.

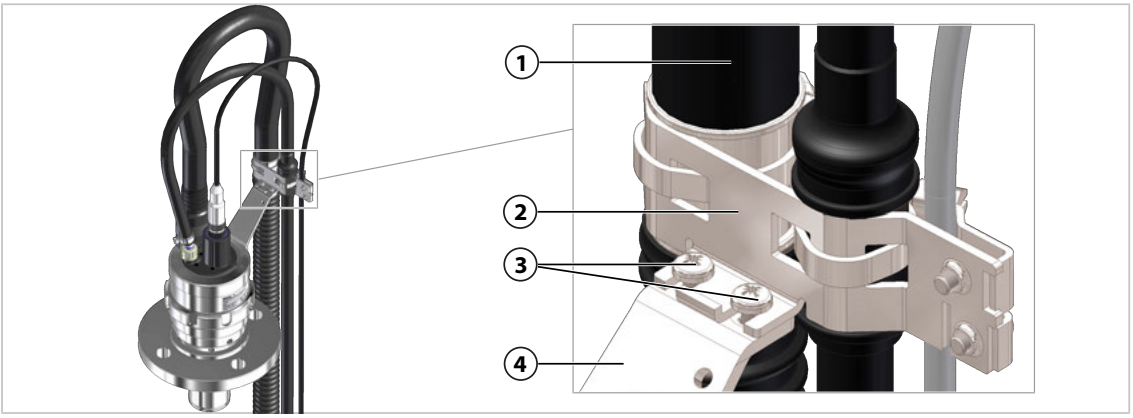
04. Fasten the Ceramat WA153 to the process port using the process connection.
05. Optional: If using the product in explosive atmospheres, connect the metallic parts of the Ceramat WA153 to the plant's equipotential bonding system.

See also

→ *Operation in Explosive Atmospheres, p. 7*
→ *Commissioning, p. 26*

3.3 Media Connection / ZU0631: Installation on Strain Relief Bracket

Note: The figure shows installation on the Ceramat WA153 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 WA153. If necessary, loosen the screws **(3)** a few rotations.
02. Tighten the screws **(3)** using a screwdriver.

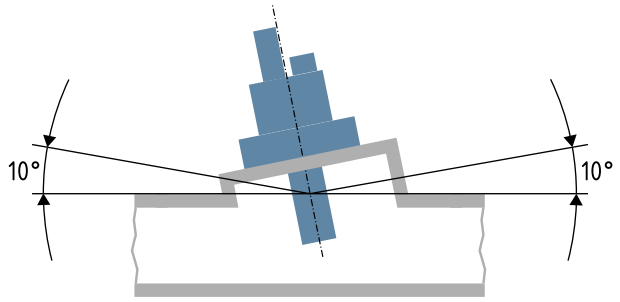
3.4 Outlet

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.

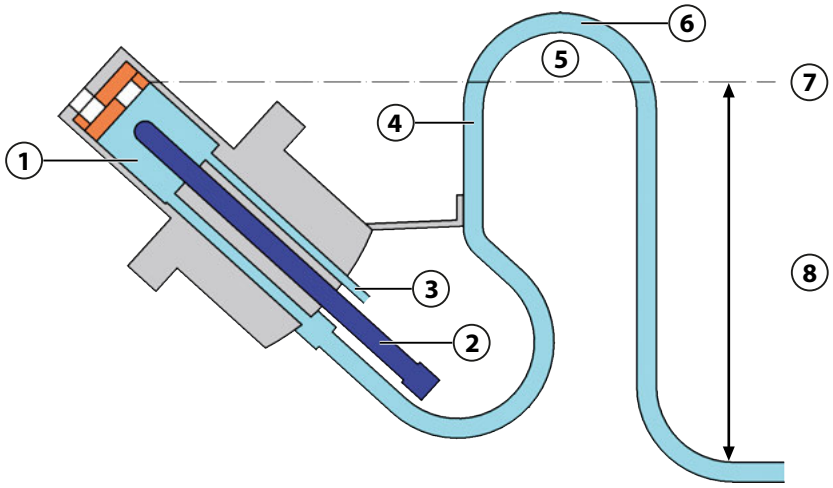
Installation angle up to 10° above the horizontal plane

Install the outlet hose in an arc and fasten it to the strain relief bracket on the Ceramat WA153. 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

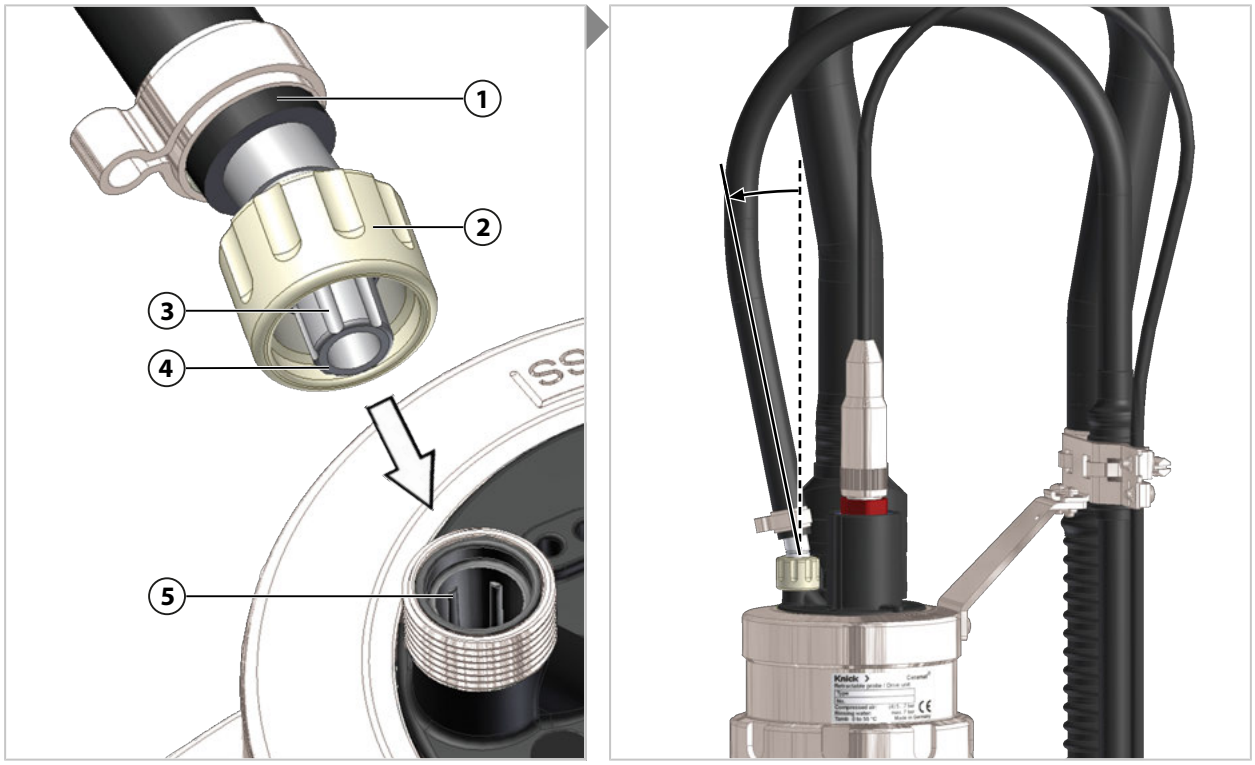
If the Ceramat WA153 is installed at an angle of 360° (i.e., upside-down), install the outlet hose in an arc above the level of the calibration chamber (see figure). This prevents the calibration chamber from leaking due to gravity.



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 WA153. 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 WA153 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

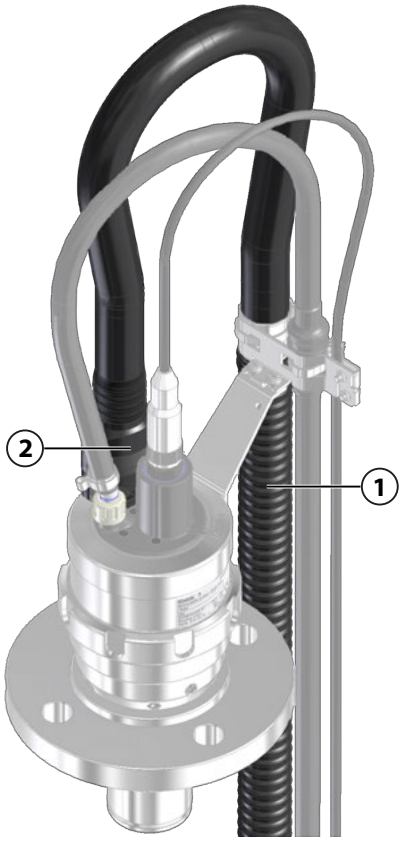
When using a Knick process analysis system, all media cables and the connecting cable for limit signals are combined in one hose, the media connection **(1)**. It is connected to the Ceramat WA153 using a shared connector, the multiplug **(2)**.

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.

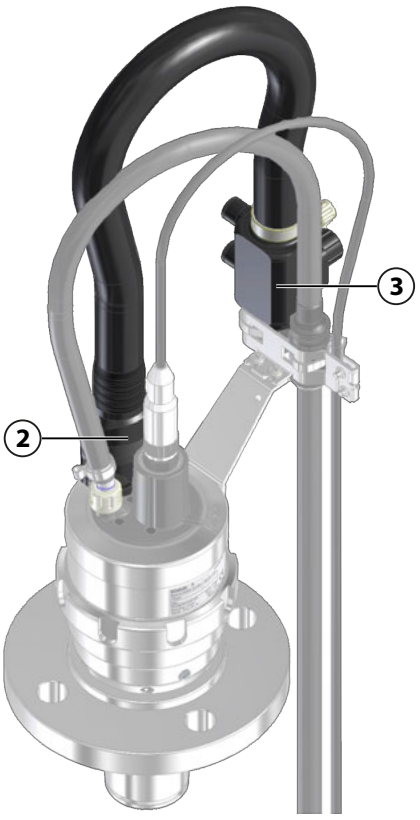
"Standard media connection" for operation without process analysis system

Accessory ZU0631, "Standard media connection" **(3)**, is required for manual control of the Ceramat WA153 with accessory ZU0646, "Pneumatically operated manual control valve" or the process control system (PCS). It is connected to the Ceramat WA153 using a shared connector, 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. 45*



"Media connection" for operation with process analysis system

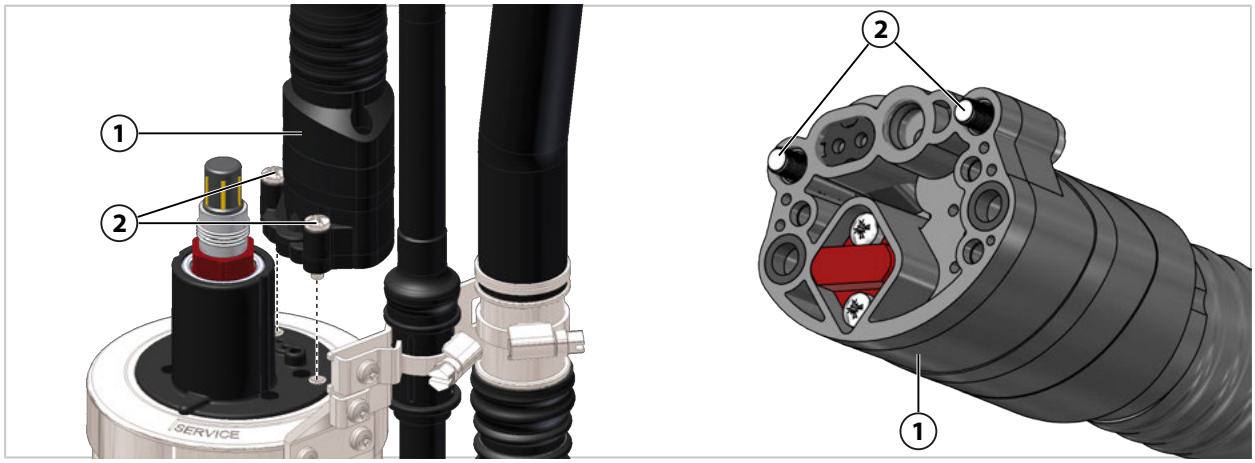


Accessory ZU0631 "Standard media connection" for operation without process analysis system

See also

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

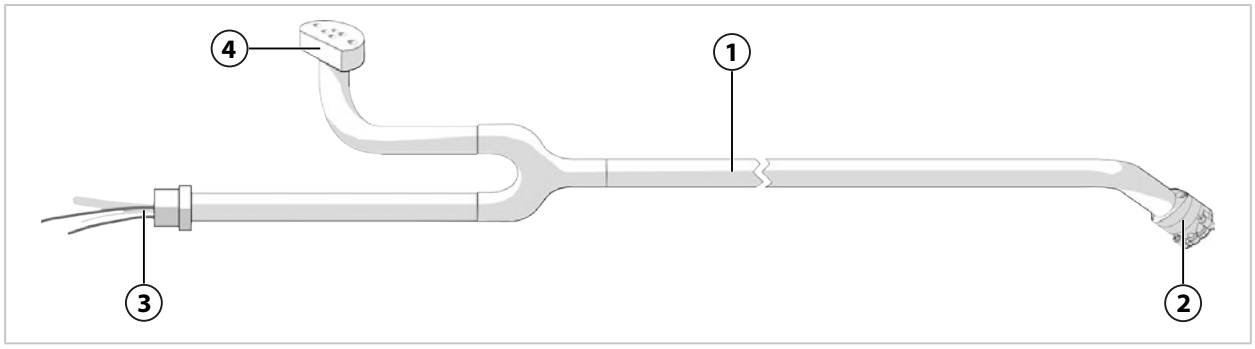
3.5.2 Multiplug: Installation



01. Check the gaskets and O-rings of the multiplug **(1)** for correct positioning and damage, and replace them if necessary. → *Troubleshooting, p. 38*
02. Position and connect the multiplug **(1)** to the Ceramat WA153.
03. Fasten the multiplug **(1)** with two screws **(2)**.

3.5.3 Electro-Pneumatic Controller: Connection

The method of connecting the Ceramat WA153 to the electro-pneumatic controller with media connection is set out in the relevant documentation.



1 Media connection	**3** Electro-pneumatic controller connection
2 Multiplug for connecting the Ceramat WA153	**4** Media adapter connection [1]

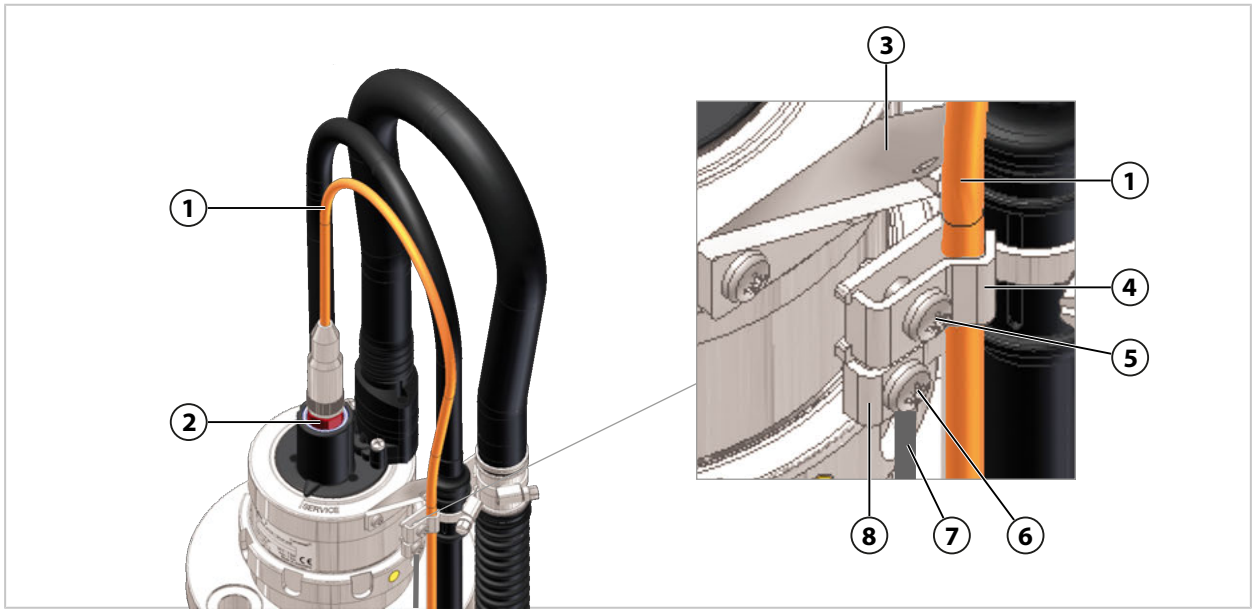
3.5.4 ZU0631 Standard Media Connection: Installation

Note: Accessory ZU0631, "Standard media connection", is only required for operation of the Ceramat WA153 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. 45*

[1] 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. 28*
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 WA153 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 WA153.

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*

4 Commissioning

⚠ WARNING! Process medium may leak from the Ceramat WA153 in the event of damage or improper installation, and may contain hazardous substances. Follow the safety instructions.
→ *Safety, p. 5*

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

01. Install the Ceramat WA153. → *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 Hose: Installation, p. 22*
04. Install the multiplug. → *Multiplug: Installation, p. 24*
05. Install the sensor. → *Installing and Removing a Sensor, p. 28*
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 WA153-X is correctly connected to the plant's equipotential bonding system. → *Operation in Explosive Atmospheres, p. 7*
09. Move the Ceramat WA153 into the process position (PROCESS limit position).
    → *Moving into the Process Position (PROCESS Limit Position), p. 27*
    ✓ The position indicator points to PROCESS.
10. Move the Ceramat WA153 into the service position (SERVICE limit position)
    → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
    ✓ The position indicator points to SERVICE.
11. Check the Ceramat WA153 for leaks under process conditions.[1)]
    ✓ The Ceramat WA153 and connections have no leaks.

[1)] 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*

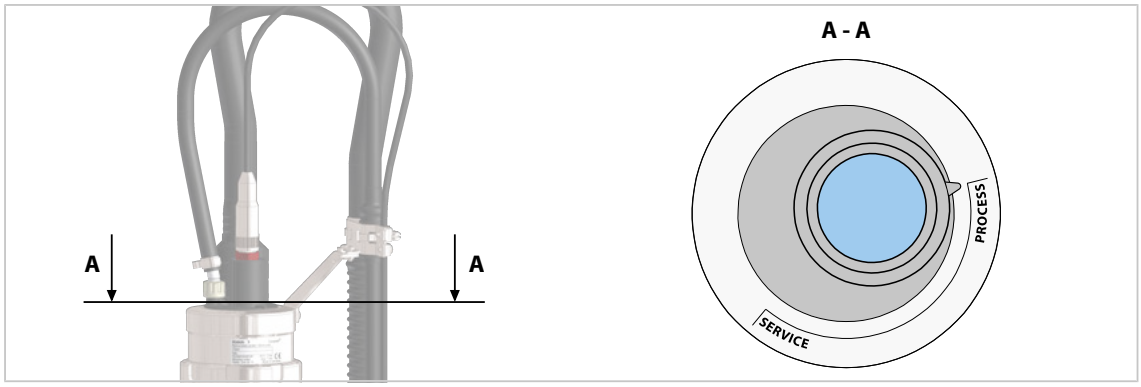
5 Operation

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 WA153. Only move the Ceramat WA153 into the process position (PROCESS limit position) if a sensor is installed. → *Installing and Removing a Sensor, p. 28*

⚠ CAUTION! Risk of crushing injuries to hands and fingers. When moving to the limit positions, the Ceramat WA153 performs a rotary movement (approx. 140°) and a stroke movement (approx. 43 mm). Do not touch the Ceramat WA153 while it is moving to the limit positions.

Note: Movement to the limit positions is triggered differently depending on the installation of the Ceramat WA153: (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*



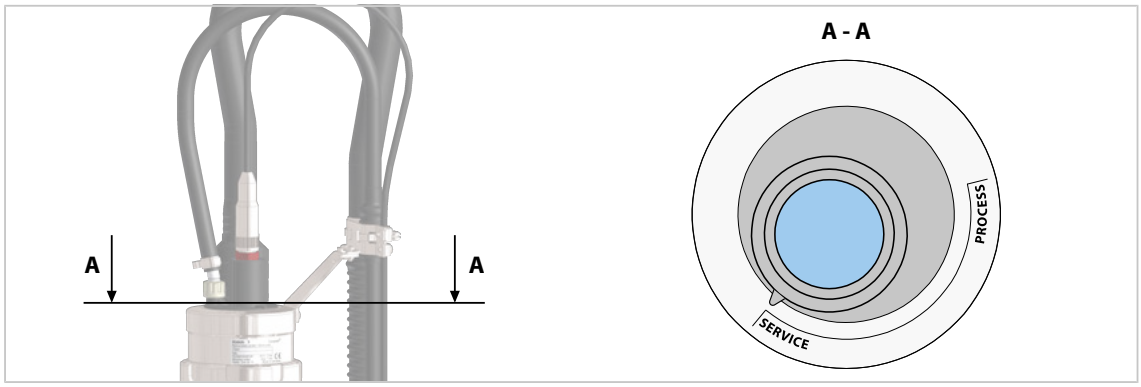
01. Install the sensor. → *Installing and Removing a Sensor, p. 28*
02. Move the Ceramat WA153 into the process position (PROCESS limit position).
    ✓ The position indicator points to PROCESS.

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 WA153 performs a rotary movement (approx. 140°) and a stroke movement (approx. 43 mm). Do not touch the Ceramat WA153 while it is moving to the limit positions.

Note: The Ceramat WA153 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 WA153: (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 WA153 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

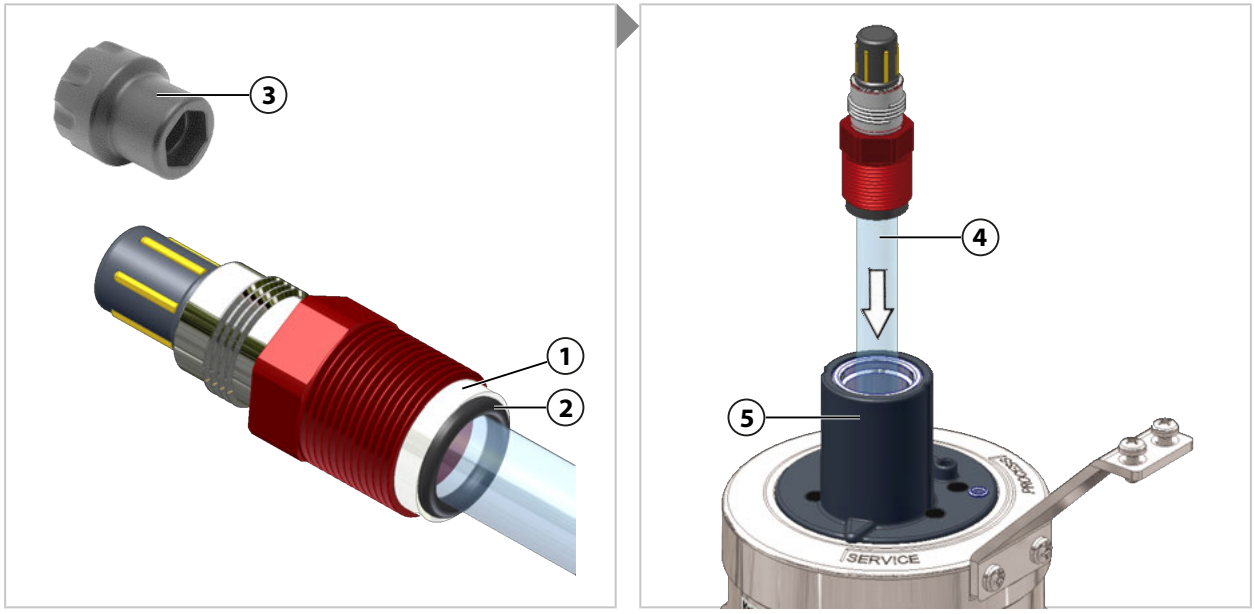
⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the Ceramat WA153. Only replace the sensor in the service position (SERVICE limit position). Secure the Ceramat WA153 from unintentional movement out of the service position (SERVICE limit position). Follow the safety 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 WA153 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 WA153 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

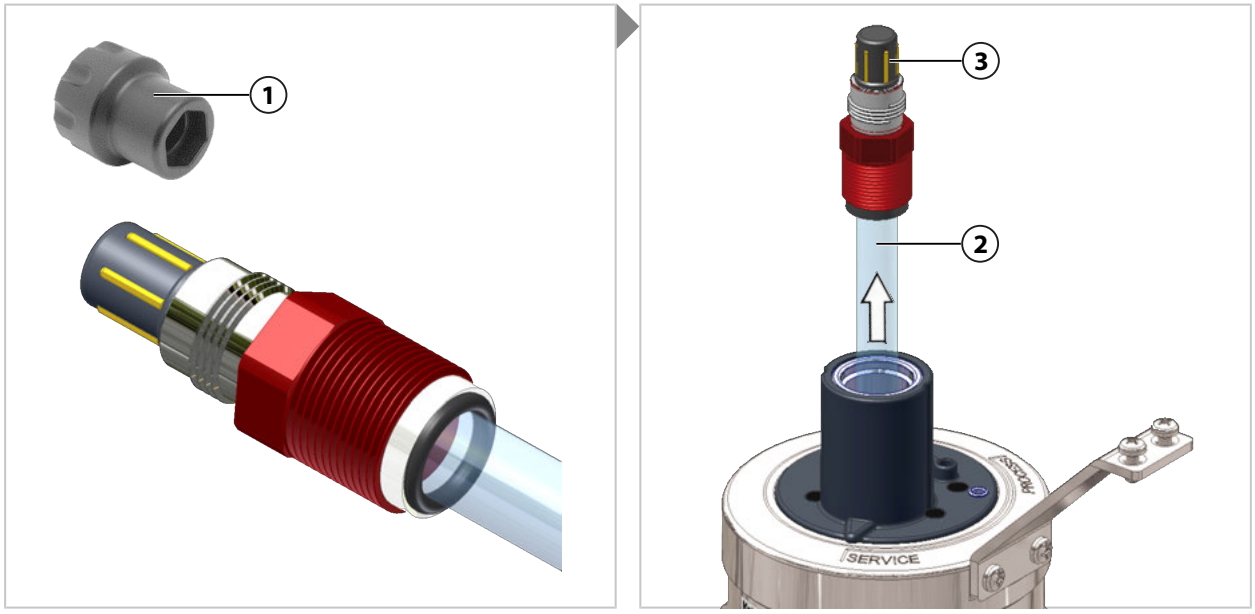


01. Move the Ceramat WA153 into the service position (SERVICE limit position)
    → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
02. Check the outlet for escaping process medium. If process medium escapes: Stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.
    → *Troubleshooting, p. 38*
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 compression ring **(1)** and O-ring **(2)** 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 objects (e.g., compression ring, O-ring). Remove any foreign objects.
07. Push the sensor **(4)** into the Ceramat WA153.
08. Tighten the sensor **(4)** using the spanning wrench **(3)** to max. 3 Nm (A/F 19 mm). Recommended tool: ZU0647 "Sensor spanning wrench" → *Tools, p. 46*
09. Connect the sensor cable. → *Sensor Cable: Installation, p. 25*

5.3.3 Solid-Electrolyte Sensor: Removal

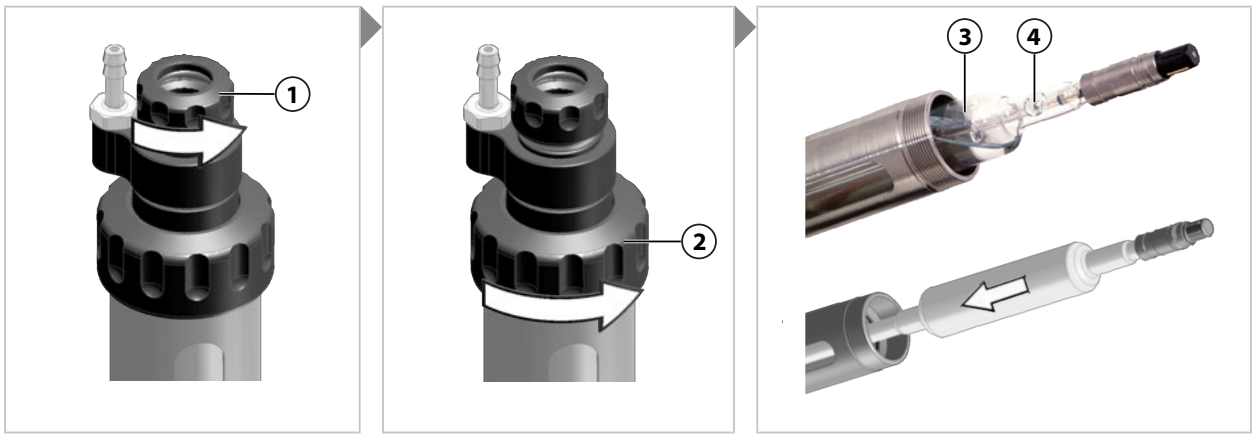
Note: Rinse the sensor prior to removal in order to prevent entrainment of chemically aggressive process medium in the area of the sensor holders.



01. Move the Ceramat WA153 into the service position (SERVICE limit position) → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
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. 38*
03. Disconnect the cable bushing of the sensor cable from the sensor head **(3)**.
04. Release the sensor **(2)** using the spanning wrench **(1)** (A/F 19 mm). Recommended tool: ZU0647 "Sensor spanning wrench" → *Tools, p. 46*
05. Pull the sensor **(2)** out of the Ceramat WA153.
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. 38*

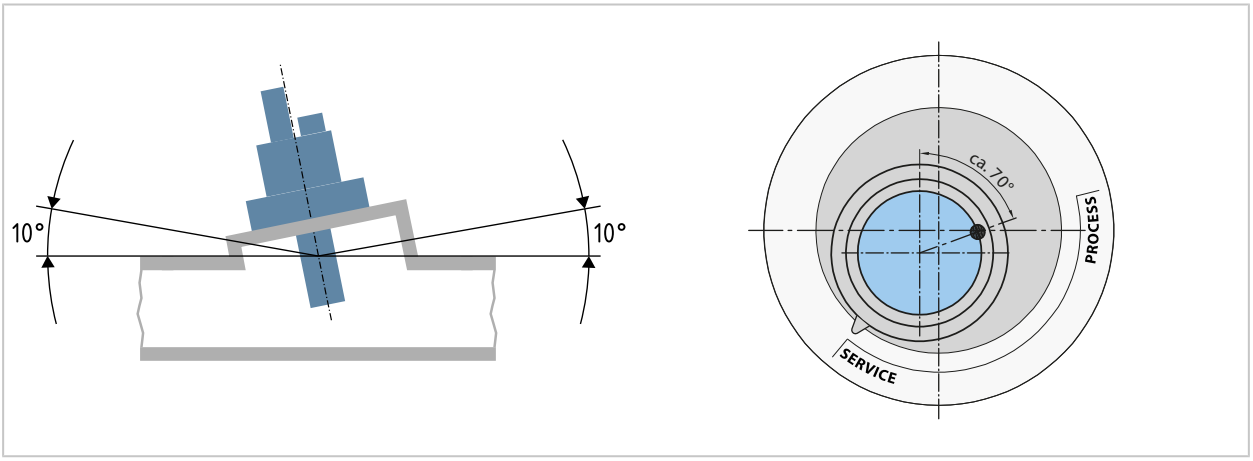
5.3.4 Liquid-Electrolyte Sensor: Installation

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. 45*

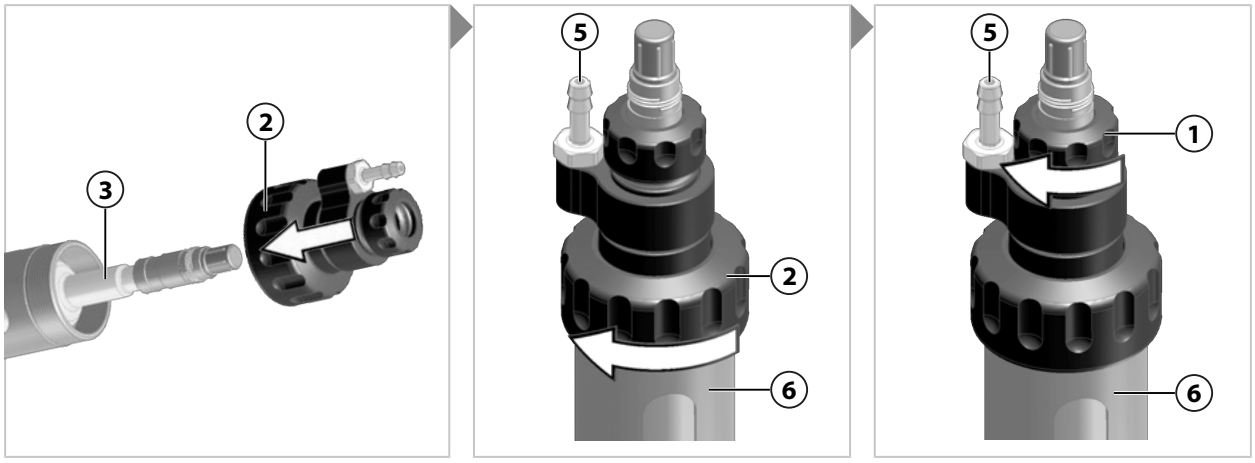


01. Move the Ceramat WA153 into the service position (SERVICE limit position)
→ *Moving into the Service Position (SERVICE Limit Position), p. 27*.
02. Check the outlet for escaping process medium. If process medium escapes: Stop the process (depressurize or drain off the process medium if necessary) and perform troubleshooting.
→ *Troubleshooting, p. 38*
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 WA153 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.



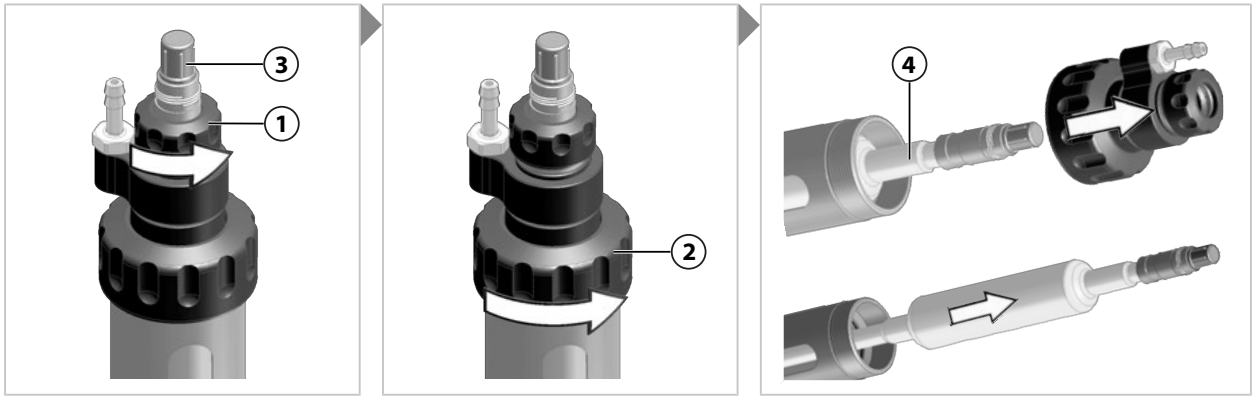
08. Push the sensor **(3)** into the Ceramat WA153.



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. 51*

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 WA153 into the service position (SERVICE limit position) → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
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. 38*
03. Disconnect the cable bushing of the sensor cable from the sensor head **(3)**.
04. Loosen the small coupling nut **(1)** by a few rotations; do not loosen completely.
05. Fully loosen the large coupling nut **(2)** 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. 38*

5.4 Cavity Rinsing

In the service position (SERVICE limit position), the inlet and outlet of the Ceramat WA153 are directly connected to the calibration chamber.

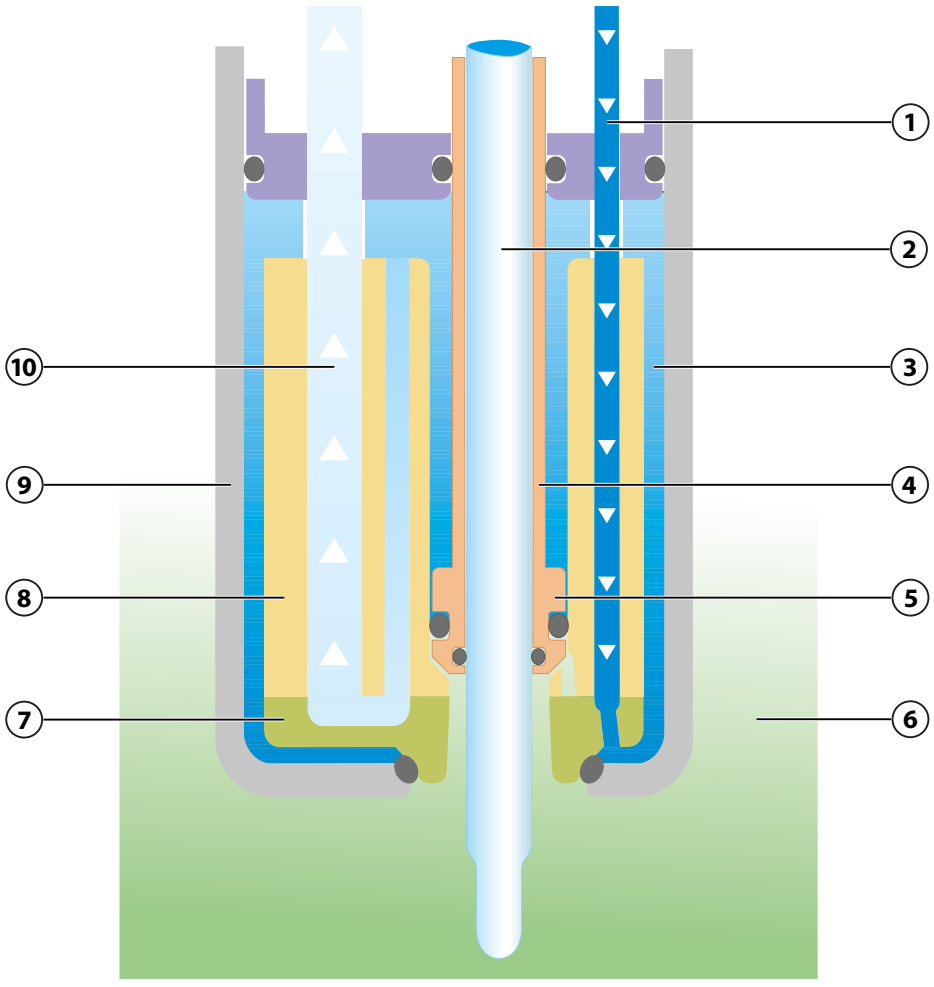
The ceramic rotary slides are installed in the sensor housing and have contact with the process medium. There is a risk that process medium may penetrate the cavities between the ceramic rotary slides and the sensor housing.

In this case, the process medium may be drained off by rinsing the cavities. This helps to keep the Ceramat WA153 in good working condition for longer.

When moving the Ceramat WA153 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 WA153 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[1)]	Work required
First inspection after a few weeks	Move the Ceramat WA153 into the process position (PROCESS limit position). → *Moving into the Process Position (PROCESS Limit Position), p. 27* 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. → *Troubleshooting, p. 38*
	Move the Ceramat WA153 into the service position (SERVICE limit position). → *Moving into the Service Position (SERVICE Limit Position), p. 27* Remove the drive unit. → *Drive Unit: Disassembly, p. 35* Visually inspect the O-rings to check the suitability of the used materials under the prevailing process conditions. If necessary, replace the O-rings. → *Seal Kits, p. 41* Mount the drive unit. → *Drive Unit: Assembly, p. 36*
After 1-2 years, or 30,000 strokes[2)]	Move the Ceramat WA153 into the service position (SERVICE limit position). → *Moving into the Service Position (SERVICE Limit Position), p. 27* Remove the drive unit. → *Drive Unit: Disassembly, p. 35* Visually inspect the dynamically loaded O-ring on the sensor socket and the statically loaded O-rings. If necessary, replace the O-rings. → *Seal Kits, p. 41* As required, check the cavity rinsing function. Mount the drive unit. → *Drive Unit: Assembly, p. 36*
	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. → *knick.de*
After 10 years or 500,000 strokes	Send the Ceramat WA153 to your local contact for full maintenance (replacement of the pneumatic gaskets and lubricants, check of all functions, pressure test, leak test). → *knick.de*

6.1.2 Used and Approved Lubricants

Application	Pharma and food		Chemicals and wastewater
Lubricant	Beruglide L [3)] (silicone-free)	Paraliq GTE 703 [4)] (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.

1) The stated intervals are general recommendations based on Knick's experience. The actual intervals are dependent on the specific application for which the Ceramat WA153 is used.
2) Following successful first inspection and confirmation of the suitability of all materials used, the interval may be lengthened.
3) FDA compliant, NSF-H1 registered
4) FDA compliant, USDA H1 registered

6.1.3 Knick Premium Service

Knick offers individually compiled services tailored to the customer's requirements for inspections and functional tests on the product.

Further information can be found at www.knick.de.

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

Note: The functional test can only be performed with versions of the Ceramat WA153 intended for solid-electrolyte sensors and during operation within a Knick process analysis system.
→ *Safeguards, p. 6*

01. Move the Ceramat WA153 into the service position (SERVICE limit position)
    → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
02. Remove the drive unit. → *Drive Unit: Disassembly, p. 35*
03. Remove the sensor → *Installing and Removing a Sensor, p. 28*
04. Press the service switch on the electro-pneumatic controller.
    ✓ Ceramat WA153 does not move.
    ✓ The process analyzer displays the `Sensor Removed` message.
05. Install the sensor. → *Installing and Removing a Sensor, p. 28*
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 WA153 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. 28*
09. Press the service switch on the electro-pneumatic controller.
    ✓ Ceramat WA153 moves to the process position (PROCESS limit position).
    ✓ The position indicator points to PROCESS.
10. Move the Ceramat WA153 into the service position (SERVICE limit position)
    → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
11. Mount the drive unit. → *Drive Unit: Assembly, p. 36*
12. Repeat the functional test every 12 months. As applicable, adjust the interval to match the specific application for which the Ceramat WA153 is used.

6.2 Corrective Maintenance

6.2.1 Corrective Maintenance Safety Instructions

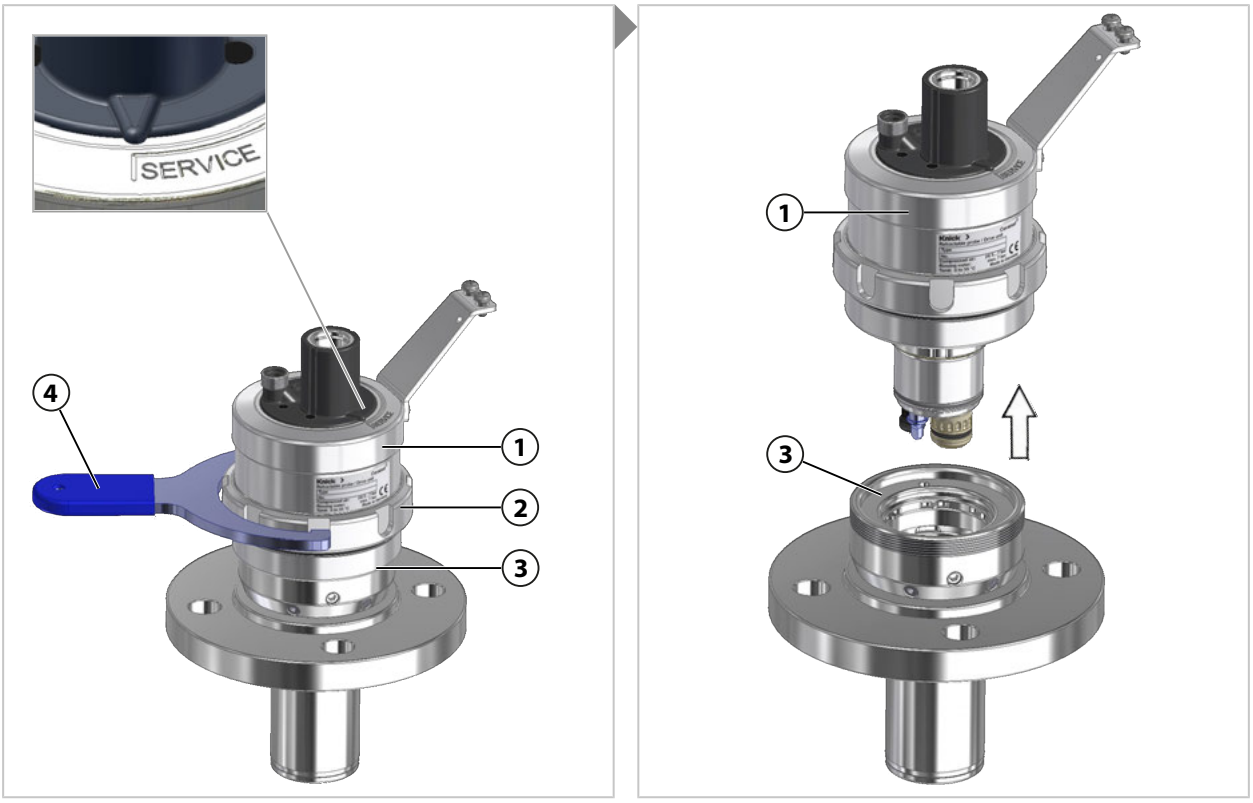
⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the Ceramat WA153. Only perform corrective maintenance in the service position (SERVICE limit position). Disconnect the Ceramat WA153 from all power sources and secure it against accidental reconnection. Follow the 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. 38*

6.2.2 Drive Unit: Disassembly

Note: The drive unit needs to be removed for procedures such as maintenance, cleaning, or troubleshooting. → *Troubleshooting, p. 38*



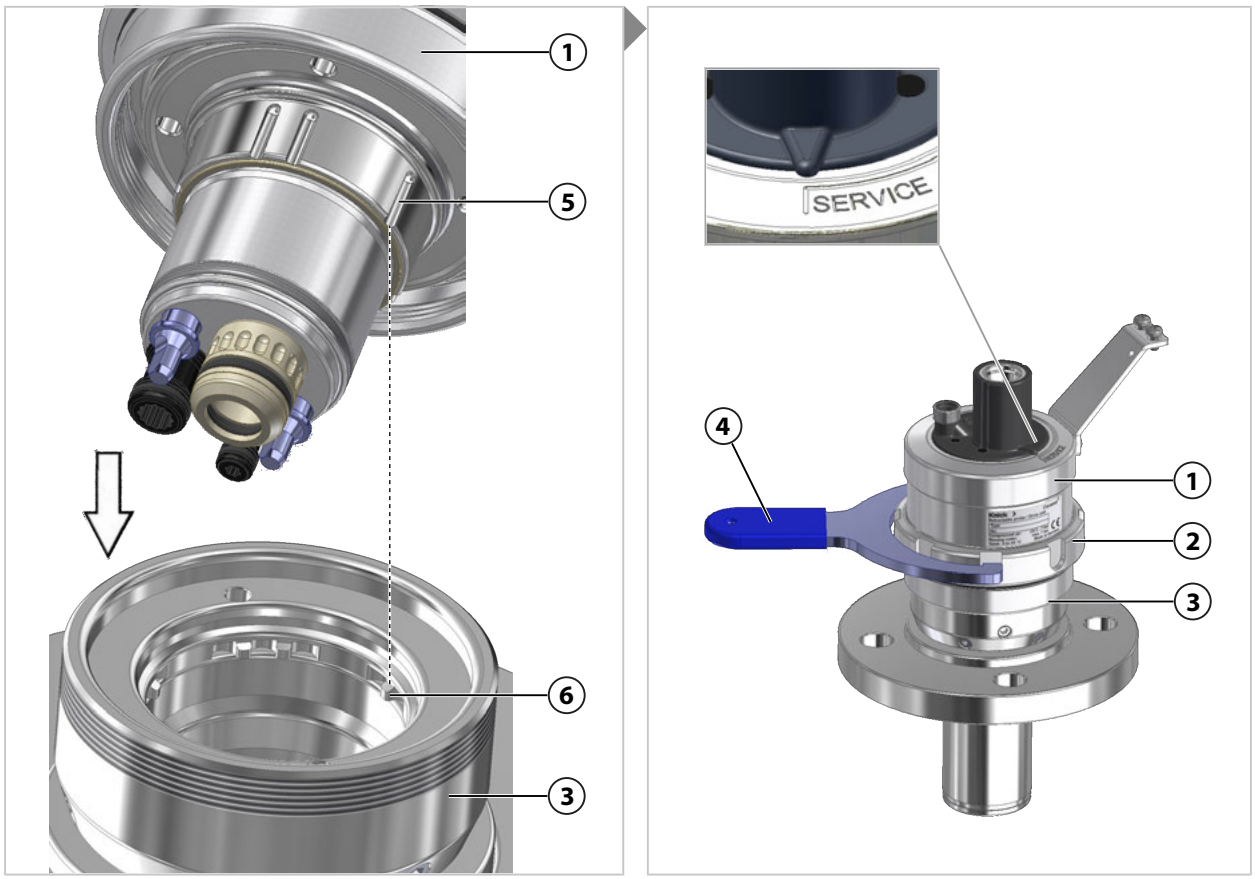
01. Move the Ceramat WA153 into the service position (SERVICE limit position) → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
02. Switch off the compressed air supply and vent the compressed air system.
03. Rinse and, if necessary, blow off the media connections to prevent entrainment 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. 38*
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. 28*

Note: Do not tilt the coupling nut. Recommended tool: ZU0648 "Ceramat spanning wrench". → *Tools, p. 46*

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. 38*
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/PROCESS Limit Positions , 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 **(3)**. In the process, align the guide grooves **(5)** on the drive unit **(1)** so that they engage with the guide ribs **(6)** in the process unit **(3)**.
03. Position the coupling nut **(2)** 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 "Ceramat spanning wrench".
→ *Tools, p. 46*

04. Using the spanning wrench **(4)**, fasten the coupling nut **(2)** clockwise finger tight.
05. As required, install the outlet hose. → *Outlet Hose: Installation, p. 22*
06. As required, install the multiplug. → *Multiplug: Installation, p. 24*
07. As required, install the sensor. → *Installing and Removing a Sensor, p. 28*
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 on the Ceramat WA153 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.

See also
→ *Returns, p. 40*

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 WA153 to your local contact for repair. → *knick.de*
	Faulty sensor housing.	Send the Ceramat WA153 to your local contact for repair. → *knick.de*
Medium escapes from the multiplug's connection point.	Multiplug not installed correctly.	Install the multiplug correctly. → *Multiplug: Installation, p. 24*
	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. → *knick.de*
Ceramat WA153 does not move.	Multiplug not installed correctly.	Install the multiplug correctly. → *Multiplug: Installation, p. 24*
	Sensor not installed correctly.	Install the sensor correctly. → *Installing and Removing a Sensor, p. 28*
	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 WA153 to your local contact for repair. → *knick.de*
	No compressed air supply.	Install the multiplug correctly. → *Multiplug: Installation, p. 24*
		Check the function of the compressed air system.
		Check the function of the electro-pneumatic controller.
		Check the process analyzer for error messages.
Ceramat WA153 does not fully move to the SERVICE or PROCESS limit position.	Faulty drive unit.	Follow the instructions for help. → *Malfunction: Retractable fitting does not fully move to the SERVICE or PROCESS limit position, p. 39*
	No compressed air supply.	Install the multiplug correctly. → *Multiplug: Installation, p. 24*
		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
Compressed air noticeably and audibly escapes underneath the drive unit's coupling nut. [1]	Sensor missing or incorrectly installed.	Install the sensor correctly. → *Installing and Removing a Sensor, p. 28*
		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. → *Installing and Removing a Sensor, p. 28*
		Remove any glass splinters from the sensor holder and the sensor housing. Check the sensor tube gaskets for damage and replace them if necessary. → *Drive Unit: Disassembly, p. 35*
		If required, stop the process (depressurize or drain off the process medium if necessary) and remove the Ceramat WA153. Remove glass splinters from the ceramic rotary slides and check the sensor housing gaskets for damage; replace them if necessary. → *Retractable Fitting: Removal, p. 40*
No or wrong measured value displayed.	Faulty sensor.	Replace the sensor. → *Installing and Removing a Sensor, p. 28*
	Defective plug connection or damaged sensor cable.	Fasten plug connection or replace damaged sensor cable → *Sensor Cable: Installation, p. 25*.
	Process analyzer incorrectly configured.	Correctly configure the process analyzer (see relevant documentation).

Malfunction: Retractable fitting does not fully move to the SERVICE or PROCESS limit position

⚠ **CAUTION! Risk of injury to hands and fingers from the drive unit's rotary movement.** Do not manually turn the drive any further or reach inside the Ceramat WA153.

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. 51*
    ✓ 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 WA153 and send it to your local contact for repair. → *knick.de*

See also
→ *Drive Unit: Disassembly, p. 35*
→ *Knick Repair Service, p. 37*
→ *Retractable Fitting: Removal, p. 40*

[1] 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*

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, possibly containing hazardous substances, can escape from the Ceramat WA153 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 WA153 into the service position (SERVICE limit position) → *Moving into the Service Position (SERVICE Limit Position), p. 27*.
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 WA153.
10. Loosen the process connection.
11. Remove the Ceramat WA153 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 to prevent service employees being exposed to potential hazards. → *Return Form, p. 53*

8.3 Disposal

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

The Ceramat WA153 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 WA153 is a modular system. The correct seal kits required for corrective maintenance depend on the version ordered.

The ordered version of the Ceramat WA153 is encoded in a product code. → *Product Identification, p. 9*

The seal kits for the Ceramat WA153 are also encoded in a product code. The options in the seal kit product code correspond to the options in the product code for the Ceramat WA153.
→ *Example: Seal Kit Product Code, p. 41*

Note: Option 1 (pH sensor ⌀ 12 mm with pressurization) encoded in the Ceramat WA153 product code is integrated in Option 0 of the seal kit product codes.

Three different seal kits are available:

- ZU0988 Seal kit without sensor socket
- ZU0989 Seal kit with sensor socket
- ZU0990 Sensor socket with seals

Note: Further gasket sets are available on request.

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. The O-rings must be greased with the supplied lubricant.

Example: Seal Kit Product Code

The example below shows product code ZU0989-0AH10-000 for the accessory "Seal kit with sensor socket" in relation to the product code of the relevant version of the Ceramat WA153.

Basic device with pneum. drive, stainless steel		**WA153**	**–**	X	**0**	**A**	E	**H**	**1**	**0**	1	0	5	H	B	1	0	**–**	**0**	**0**	**0**
Seal kit with sensor socket		**ZU0989**	**–**		**0**	**A**		**H**	**1**	**0**								**–**	**0**	**0**	**0**
Explosion protection	ATEX Zone 0			X														–			
Sensor	Sensor ⌀ 12 mm with PG 13.5				**0**													–			
Material of seals	FKM					**A**												–			
Sensor protection tube material	PEEK						E											–			
Sensor socket material	1.4404, short protection							**H**	**1**									–			
Scraper for sensor socket	None									**0**								–			
Immersion depth	Immersion depth 105 mm (max.)										1	0	5					–			
Process-wetted material	1.4404													H				–			
Process connection	Flange, loose, 1.4571, PN10/16, DN 50														B	1		–			
Probe guard	None																0	–			
Special version	None																	–	**0**	**0**	**0**

ZU0988 Seal Kit Without Sensor Socket

ZU0988 seal kit contains all O-rings for the selected version. The sensor socket is not included.
→ *Spare Parts, p. 44*

Note: Option 1 (pH sensor ⌀ 12 mm with pressurization) encoded in the Ceramat WA153 product code is integrated in Option 0 of the seal kit product code.

Seal kit without sensor socket		**ZU0988**	–	_	_	_	_	_	–	_	_	_
Sensor	pH sensor ⌀ 12 mm with PG 13.5 or pressurization			0					–			
	Optical sensor ⌀ ½″ (12.7 mm)			2					–			
	Optical sensor ⌀ 12 mm			3					–			
Gasket material	FKM				A				–			
	EPDM				B				–			
	EPDM – FDA				E				–			
	FKM – FDA				F				–			
	FFKM – FDA				H				–			
	FFKM				K				–			
Sensor socket	None					0	0		–			
Scraper for sensor socket	None							0	–			
Special version	None								–	0	0	0

ZU0989 Seal Kit With Sensor Socket

ZU0989 seal kit contains the sensor socket and all O-rings for the selected version.

Note: Option 1 (pH sensor ⌀ 12 mm with pressurization) encoded in the Ceramat WA153 product code is integrated in Option 0 of the seal kit product code.

Seal kit with sensor socket		**ZU0989**	–	_	_	_	_	_	–	_	_	_
Sensor	pH sensor ⌀ 12 mm with PG 13.5 or pressurization			0					–			
	Optical sensor ⌀ ½″ (12.7 mm)			2					–			
	Optical sensor ⌀ 12 mm			3					–			
Gasket material	FKM				A				–			
	EPDM				B				–			
	EPDM – FDA				E				–			
	FKM – FDA				F				–			
	FFKM – FDA				H				–			
	FFKM				K				–			
Sensor socket	Hastelloy C 22, without protection					B	0		–			
	Hastelloy C 22, short protection					B	1		–			
	1.4404, without protection					H	0		–			
	1.4404, short protection					H	1		–			
	1.4404, long protection					H	2		–			
	1.4404, full protection					H	3		–			
	PEEK, without protection					E	0		–			
	Titanium, without protection					T	0		–			
	Titanium, short protection					T	1		–			
Scraper for sensor socket	None							0	–			
	With PEEK, natural							1	–			
Special version	None								–	0	0	0

ZU0990 Sensor Socket With Seals

ZU0990 seal kit contains only the sensor socket and all seals and slide rings installed on it.

Note: Option 1 (pH sensor ⌀ 12 mm with pressurization) encoded in the Ceramat WA153 product code is integrated in Option 0 of the seal kit product code.

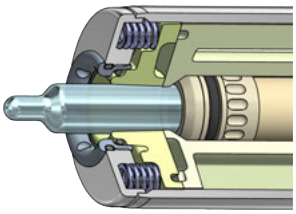
Sensor socket with seals		ZU0990	–	_	_	_	_	_	–	_	_	_
Sensor	pH sensor ⌀ 12 mm with PG 13.5 or pressurization			0					–			
	Optical sensor ⌀ ½" (12.7 mm)			2					–			
	Optical sensor ⌀ 12 mm			3					–			
Gasket material	FKM				A				–			
	EPDM				B				–			
	EPDM – FDA				E				–			
	FKM – FDA				F				–			
	FFKM – FDA				H				–			
	FFKM				K				–			
Sensor socket	Hastelloy C 22, without protection					B	0		–			
	Hastelloy C 22, short protection					B	1		–			
	1.4404, without protection					H	0		–			
	1.4404, short protection					H	1		–			
	1.4404, long protection					H	2		–			
	1.4404, full protection					H	3		–			
	PEEK, without protection					E	0		–			
	Titanium, without protection					T	0		–			
	Titanium, short protection					T	1		–			
Scraper for sensor socket	None							0	–			
	With PEEK, natural							1	–			
Special version	None								–	0	0	0

9.2 Spare Parts

Sensor Sockets

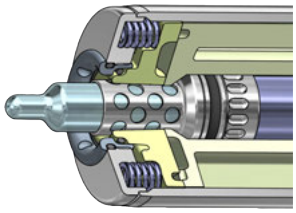
The sensor socket is screwed to the sensor protection tube and seals the sensor from the process. It glides in the ceramic gate. The interface between the sensor socket and the ceramics is also sealed.

All sensor sockets can be selected and ordered via the product code for accessory ZU0990. → *ZU0990 Sensor Socket With Seals, p. 43*



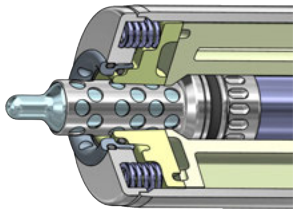
Sensor socket, without protection

This version is suitable for process media that do not tend to cause scaling.



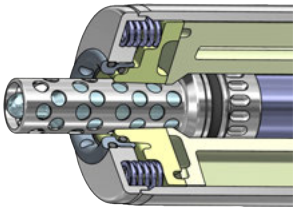
Sensor socket, short protection

This version is suitable for process media that tend to cause minor brittle scaling.



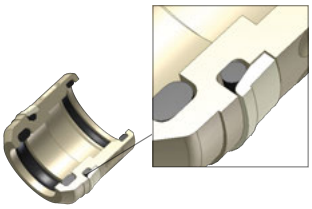
Sensor socket, long protection

This version is suitable for process media that tend to cause more significant brittle scaling. With its extended length, any thicker scaling is clear when moving into the process. The sensor is thus better protected from mechanical impacts.



Sensor socket, full protection

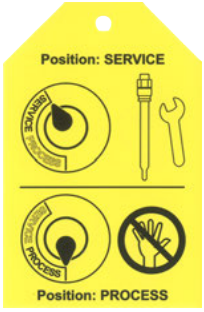
This version encloses the full length of the sensor. This protects it, including the sensor tip, from mechanical impacts. In addition, this sensor socket also protects from any particles when using flowing process media.



Sensor socket with PEEK scraper

This version features a PEEK scraper and is recommended for adherent or sticky media, as well as particles in the process medium. The sensor socket can be selected and ordered via the product code for accessories ZU0989 "Seal kit with sensor socket" and ZU0990 "Sensor socket with seals". → *Seal Kits, p. 41*

Safety Label



The safety label contains information on safely installing and removing solid-electrolyte sensors. → *Installing and Removing a Sensor, p. 28*

Damaged or lost safety labels will be replaced on request.

9.3 Accessories

ZU0631 Standard Media Connection

Connection kit for manual operation of the Ceramat WA153 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 WA153 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 WA153. A check valve is integrated in the adapter's media connection.

The adapter is installed between the Ceramat WA153 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 WA153 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 WA153 for liquid-electrolyte sensors.

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

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

ZU0953 is an elastic connection between the permanent piping (solid ¼" pipes) and the moving parts of the Ceramat WA153.

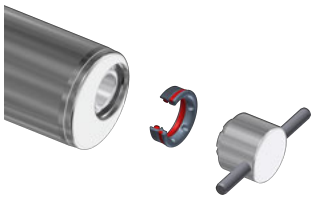
9.4 Tools

ZU0648 Spanning Wrench

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

ZU0647 Sensor Spanning Wrench

ZU0647 "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).



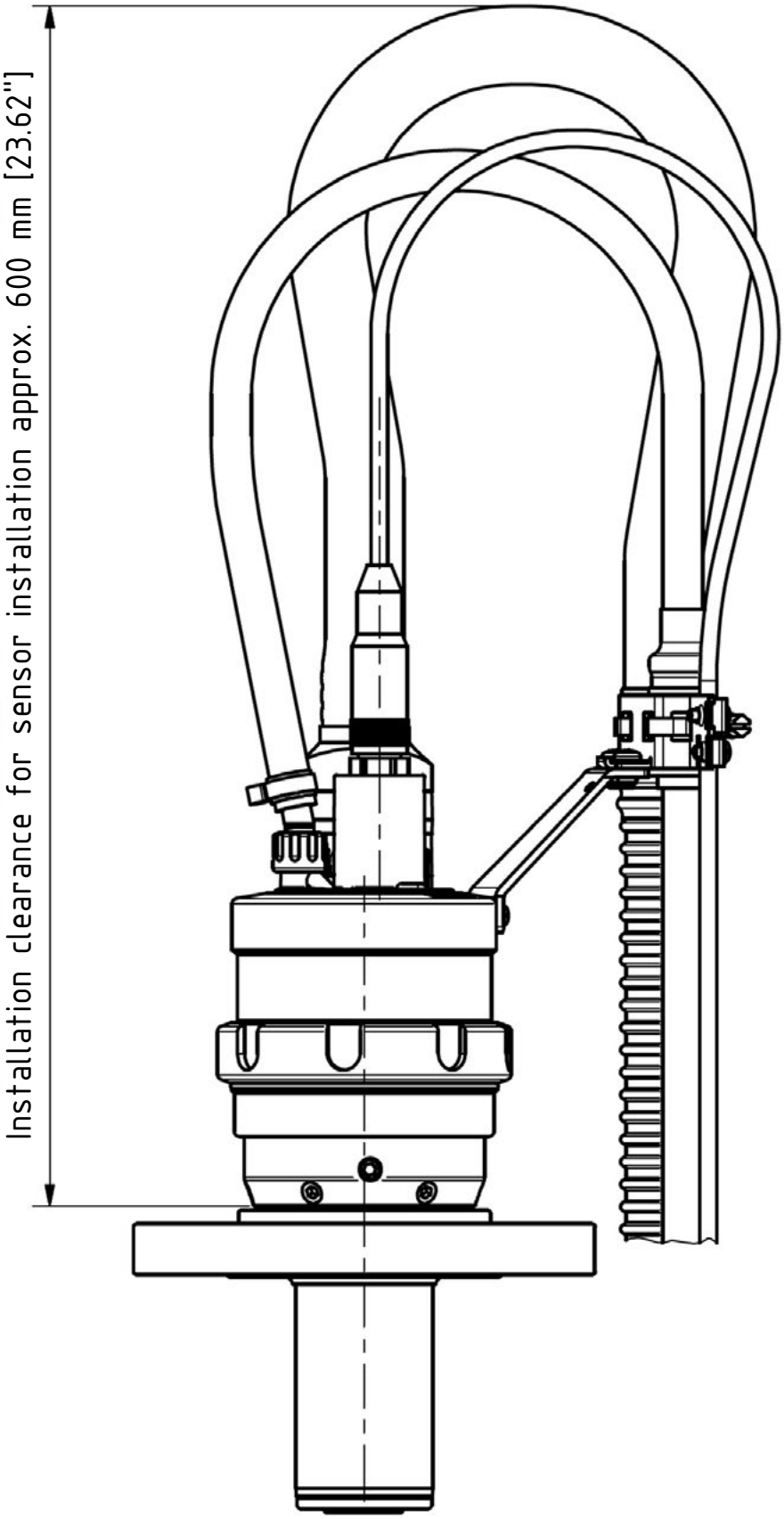
ZU0999 Spanning Wrench

On versions of the Ceramat WA153 without sensor protection, the spanning wrench is used to install and remove the sealing ring (e.g., to check the O-rings of the sealing ring and replace them if necessary).

10 Dimension Drawings

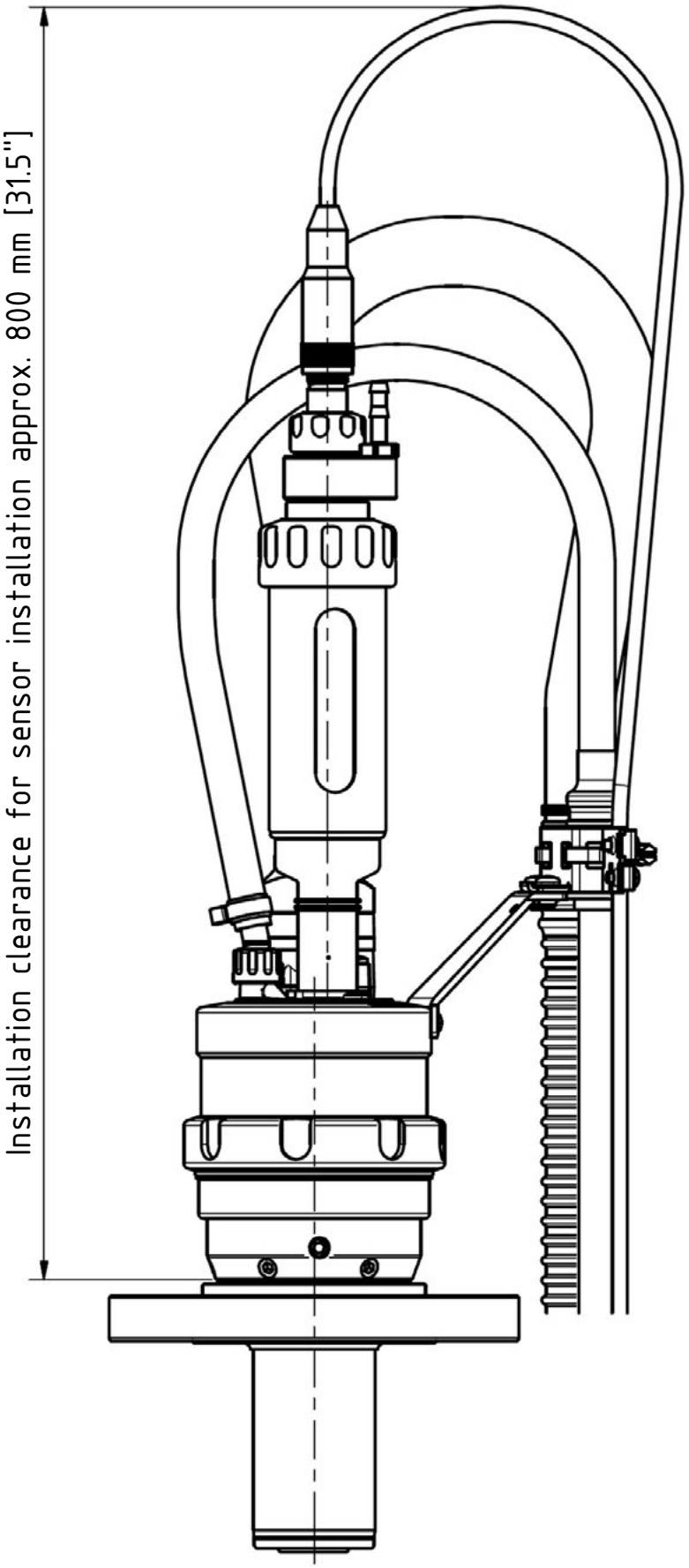
Retractable fitting for solid-electrolyte sensor

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

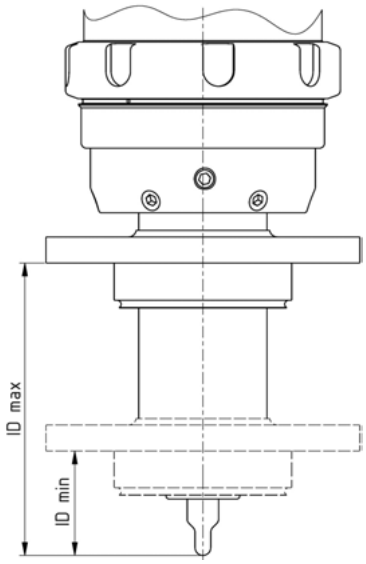


Retractable fitting for liquid-electrolyte sensor

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

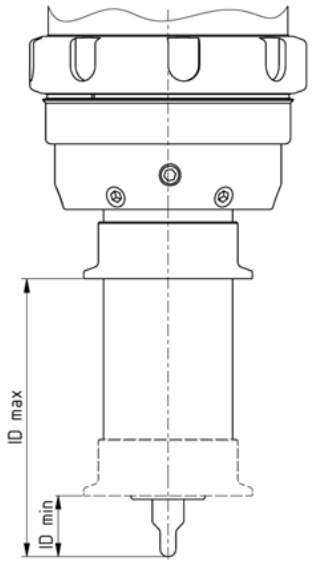


Process connections (extract from product line)



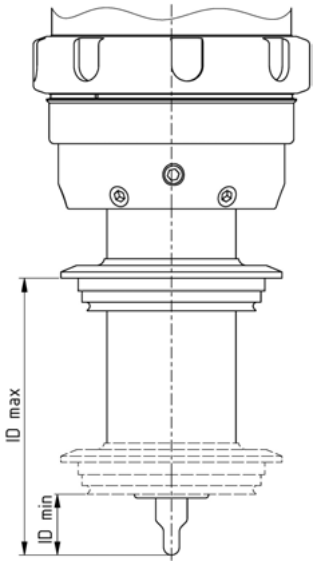
BioControl DN65

Max. immersion depth (ID) = 105 mm (4.14″)
Min. immersion depth (ID) = 40 mm (1.57″)



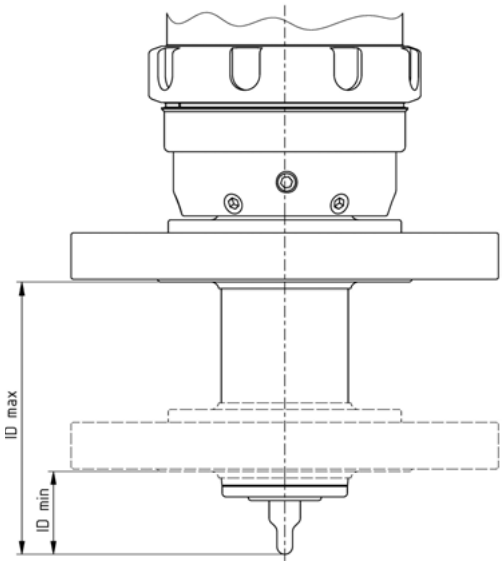
Tri-Clamp 2.5″

Max. immersion depth (ID) =105 mm (4.14″)
Min. immersion depth (ID) = 23 mm (0.91″)



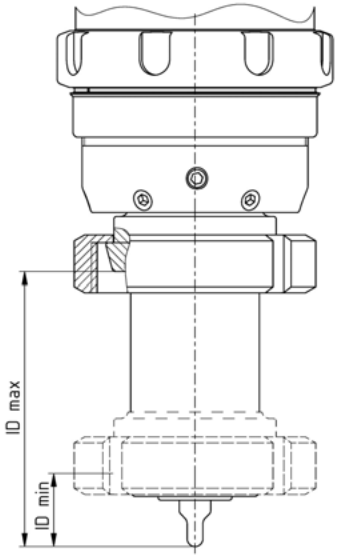
Varivent

Max. immersion depth (ID) =105 mm (4.14″)
Min. immersion depth (ID) = 23 mm (0.91″)



Flange

Max. immersion depth (ID) =105 mm (4.14″)
Min. immersion depth (ID) = 32 mm (1.26″)



Dairy pipe

Max. immersion depth (ID) =105 mm (4.14″)
Min. immersion depth (ID) = 28 mm (1.10″)

11 Specifications

Permissible process pressure and temperature during movement	10 bar at 0…140 °C (150 psi at 32…284 °F)
Permissible process pressure and temperature when static in service position	16 bar at 0…40 °C (230 psi at 32…104 °F)
Permissible rinsing pressure and temperature	6 bar at 5…60 °C (90 psi at 41…140 °F) with accessory ZU0654 / ZU0655 "Adapter for additional media" up to 135 °C (275 °F) → *Accessories, p. 45*
Permissible pressure for sensor control	4…7 bar (58…101.5 psi)
	Required control pressure dependent on process pressure:

Control pressure	**Process pressure**
5 bar (72.5 psi)	7 bar (101.5 psi)
6 bar (90 psi)	8 bar (116 psi)
7 bar (101.5 psi)	10 bar (150 psi)

Ambient temperature	-10…70 °C (14…158 °F)
Protection	IP66
Sensors	→ *Product Code, p. 10*
Process connections	→ *Product Code, p. 10*
Immersion depths / dimensions	→ *Dimension Drawings, p. 47*
Wetted materials	→ *Product Code, p. 10*
Quality of compressed air	
Standard	according to ISO 8573-1:2001
Quality class	3.3.3 or 3.4.3
Solid contaminants	3 (max. 5 µm, max. 5 mg/m^3)
Water content for temperatures > 15 °C (59 °F)	Class 4, pressure dew point 3 °C (37.4 °F) or lower
Water content for temperatures 5…15 °C (41…59 °F)	Class 3, pressure dew point -20 °C (-4 °F) or lower
Oil content	Class 3 (max. 1 mg/m^3)
Connections	
Outlet	Coupling for media connection outlet hose → *Outlet, p. 21*
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 of max. 7 bar (101.5 psi)
For compressed air, rinse and calibration media (retractable fitting control air)	For Unical multiplug
Weight	Depending on material and version. Please contact Knick or your designated sales representative for detailed information.

Appendix

→ Return Form, p. 53

Return Form

Declaration of potential hazards in the enclosed products from exposure to hazardous substances* or mixtures
** Classification preferably according to CLP regulation*

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 80 191-241): .....

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

Company: .....
Address: .....
Contact: ..... Tel./Email: .....

Information on the product:

Product name: .....

Serial number: .....

Included accessories: .....

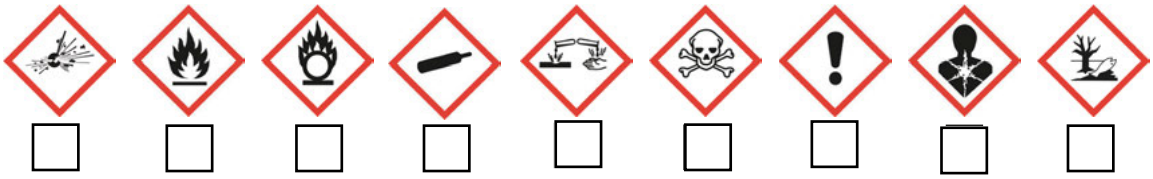
☐ The product being returned is new/unused.

☐ The product has not been exposed to hazardous substances or mixtures.

☐ The product has been exposed to hazardous substances or mixtures.

State the classification of the hazardous substance, as applicable together with the hazard statements (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: .....

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Abbreviations

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)
EU	European Union
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 Arnheim)
LED	Light-emitting diode
DN	Nominal size
PCS	Process control system
A/F	Width across flats

Glossary

CE Marking

Manufacturer's declaration, in accordance with EU Regulation 765/2008, that the product is in conformity with the applicable requirements set out in the European Union harmonization legislation providing for its affixing.

Corrective Maintenance

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

Hazard

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

Inspection

Measures for determining and assessing the actual condition of an item under review, including determining the causes of wear and deriving the necessary steps for future use.

Maintenance

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

Preventive Maintenance

Measures for maintaining the target condition […] and delaying the reduction of the available wear margin of an item under review.

Risk

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

Risk Assessment

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

Index

O

P

Q

R

S

T

U

V

W

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Translation of the original instructions

Version 5 • This document was published on March 16, 2021.
The latest documents are available for download on our
website under the corresponding product description.

TA-203.100-KNEN05

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