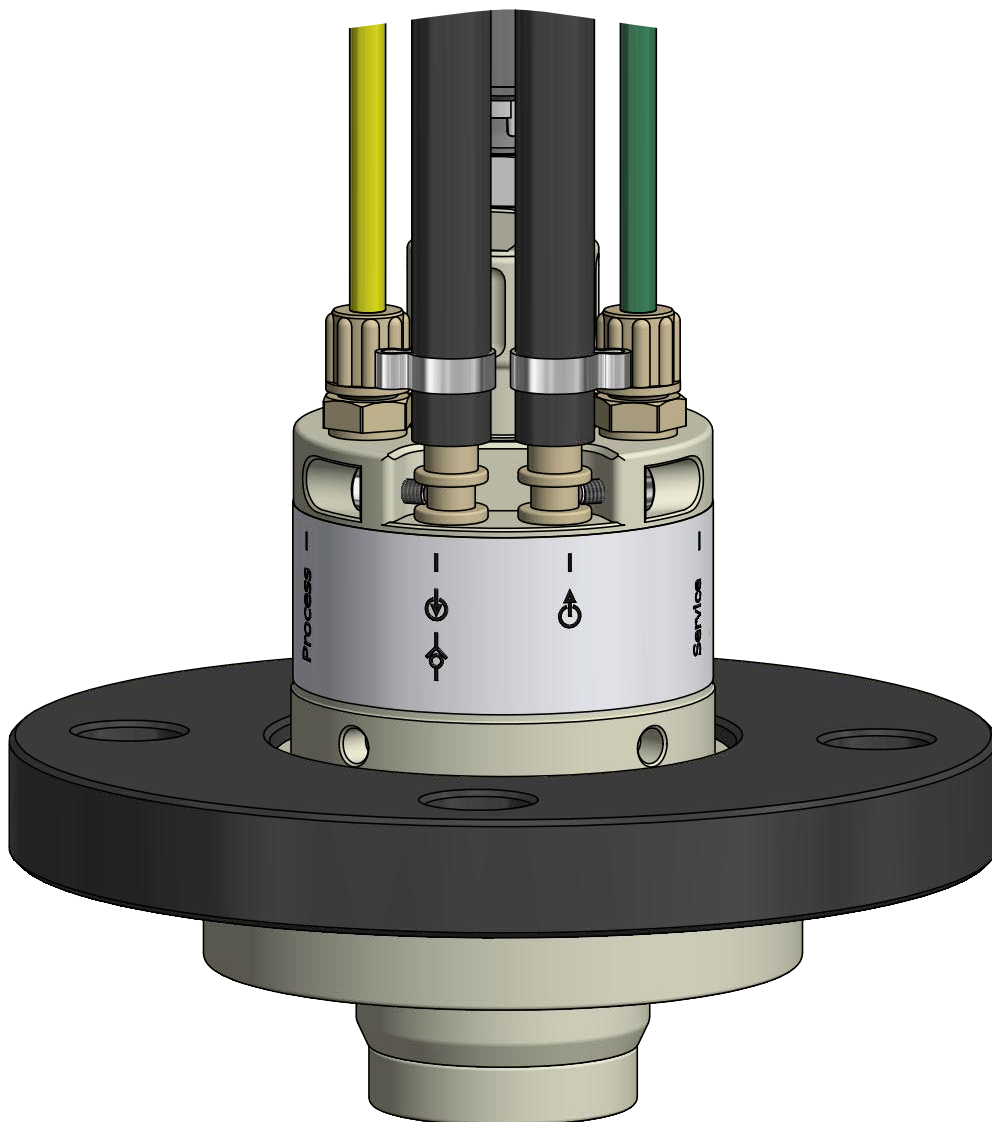


WA111

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.

This document contains the information required to install the product. Further information is available in the User Manual (electronic only). → *knick.de*



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

Table of Contents

1 Safety	5
1.1 Intended Use	5
1.2 Personnel Requirements	5
1.3 Residual Risks	5
1.4 Hazardous Substances	6
1.5 Safety Training	6
1.6 Maintenance and Spare Parts.....	6
2 Product	7
2.1 Package Contents	7
2.2 Product Identification.....	7
2.2.1 Example of a Version	7
2.2.2 Product Code	8
2.3 Nameplates	9
2.4 Symbols and Markings.....	9
2.5 Design and Function.....	10
2.6 Changes for Different Conditions	11
2.7 Service and Process Position.....	12
3 Installation	13
3.1 Retractable Fitting: Installation.....	13
3.2 Inlet and Outlet Hose: Installation	13
3.3 Drive Medium: Installation	15
4 Commissioning	16
5 Operation	17
5.1 Moving into the Service and Process Position.....	17
5.2 Installing and Removing a Sensor	18
5.2.1 Safety Instructions when Installing and Removing Sensors.....	18
5.2.2 Installing and Removing Sensors	18
5.2.3 Cleaning and Rinsing the Sensor.....	19
6 Maintenance	20
6.1 Inspection and Maintenance	20
6.1.1 Inspection and Maintenance Intervals	20
6.1.2 Used and Approved Lubricants.....	20
6.2 Corrective Maintenance	21
6.2.1 Corrective Maintenance Safety Instructions	21
6.2.2 Removing the Check Valve	21
6.2.3 Disconnecting/Connecting the Process Connection from/to the Drive	22
6.2.4 Removing and Installing the Rinsing Chamber.....	24
6.2.5 Removing and Installing the Immersion Tube	26
6.2.6 Seals	27
6.2.7 Knick Repair Service	29
7 Troubleshooting	30

- 8 Decommissioning..... 31**
 - 8.1 Retractable Fitting: Removal..... 31
 - 8.2 Return..... 31
 - 8.3 Disposal..... 31
- 9 Spare Parts, Accessories, and Tools..... 32**
 - 9.1 Accessories..... 32
 - 9.2 Tools..... 32
- 10 Dimension Drawings..... 33**
- 11 Specifications..... 35**
 - Index..... 39**

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 WA111 (the "product") is a retractable fitting for installation in boilers, tanks, and pipes. The product is used to mount sensors for measuring process parameters. The sensor is immersed in the process medium by the WA111. The WA111 is powered pneumatically or water-hydraulically.
→ *Design and Function, p. 10*

Cleaning, calibration, and sensor replacement under process conditions are possible in the service position. Follow these instructions when performing these functions.

The WA111 is designed for solid-electrolyte sensors with the following characteristics:

Solid-electrolyte sensors	Body diameter 12 mm, body length 120 mm, sensor head thread PG 13.5
---------------------------	---------------------------------------------------------------------

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. 35*

Thanks to its modular design, the WA111 can be adapted to changed conditions by the customer.
→ *Changes for Different Conditions, p. 11*

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

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.

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 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 chemicals and ambient temperature can negatively impact the safe operation of the product. Observe the following instructions:

- If using aggressive chemical process media, adjust the inspection and maintenance intervals accordingly. → *Inspection and Maintenance, p. 20*
- Adhering and sticky process media can impact the functionality of the WA111 (e.g., by causing components to stick together). Adjust the inspection and maintenance intervals accordingly.
→ *Inspection and Maintenance, p. 20*

1.4 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

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.

1.5 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.

1.6 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. 20*

Tools and Accessory Tools

Special and accessory tools help maintenance personnel to replace components and wear parts safely and professionally. → *Tools, p. 32*

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.

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.

2 Product

2.1 Package Contents

- WA111 in the version ordered
- User Manual

2.2 Product Identification

The different versions of the WA111 are encoded in a product code.

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

→ *Nameplates, p. 9*

2.2.1 Example of a Version

Retractable fitting		WA111	-	N	1	B	P	C	Ø	B	1	A	W	1	-	Ø	Ø	Ø
Explosion protection	Without approval			N											-			
Sensor	Sensor, Ø 12 mm, with PG 13.5			Ø											-			
Media-wetted seals	EPDM					B									-			
Wetted materials	PP-H/PP-H						P								-			
Immersion tube material	PEEK HD							E							-			
Process connection	Flange, loose, PN10/16, DN 50								B	1	Ø				-			
Immersion tube immersion depth	Short											A			-			
Drive unit	Water-hydraulic												W		-			
Drive/rinse media connection	Free hose connection													1	-			
Special options	None														-	Ø	Ø	Ø

2.2.2 Product Code

Retractable fitting		WA111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Explosion protection	Without approval		N														-
Sensor	Sensor, Ø12 mm, with PG 13.5		Ø														-
Seal material	FKM			A													-
	EPDM			B													-
	FFKM			K													-
Wetted materials ¹⁾	PP-H/PP-H				P												-
	PVDF/PVDF				D												-
Immersion tube material	PEEK HD					E											-
Process connection	Flange, loose, PN10/16, DN 50						B	1	Ø								-
	Flange, loose, PN10/16, DN 65						B	2	Ø								-
	Flange, loose, PN10/16, DN 80						B	3	Ø								-
	Flange, loose, PN10/16, DN 100						B	4	Ø								-
	Flange, loose, ANSI, 150 lbs, 2"						D	1	Ø								-
	Flange, loose, ANSI, 150 lbs, 2.5"						D	2	Ø								-
	Flange, loose, ANSI, 150 lbs, 3"						D	3	Ø								-
	Flange, loose, ANSI, 150 lbs, 4"						D	5	Ø								-
Immersion tube immersion depth	Short									A							-
Drive unit	Pneumatic										P						-
	Water-hydraulic										W						-
Drive/rinse media connection	Free hose connection											1					-
	Free hose connection, stainless steel bracket for strain relief											2					-
Special options	None																- 0 0 0
	Customer-specific special datasheet																- 0 0 F

¹⁾ Material combinations: process-wetted part of drive/process- and rinse-wetted part of rinsing chamber

2.3 Nameplates

The WA111 is identified by a nameplate on the drive.

The information provided on the nameplate varies according to the version of the WA111.



1	Manufacturer's address with designation of origin	5	Manufacturer
2	Safety alert symbol: Observe the product documentation!	6	Product line
3	Product number/serial number/production year and week	7	DataMatrix code (product number/serial number/production year and week)
4	Type (product code)		

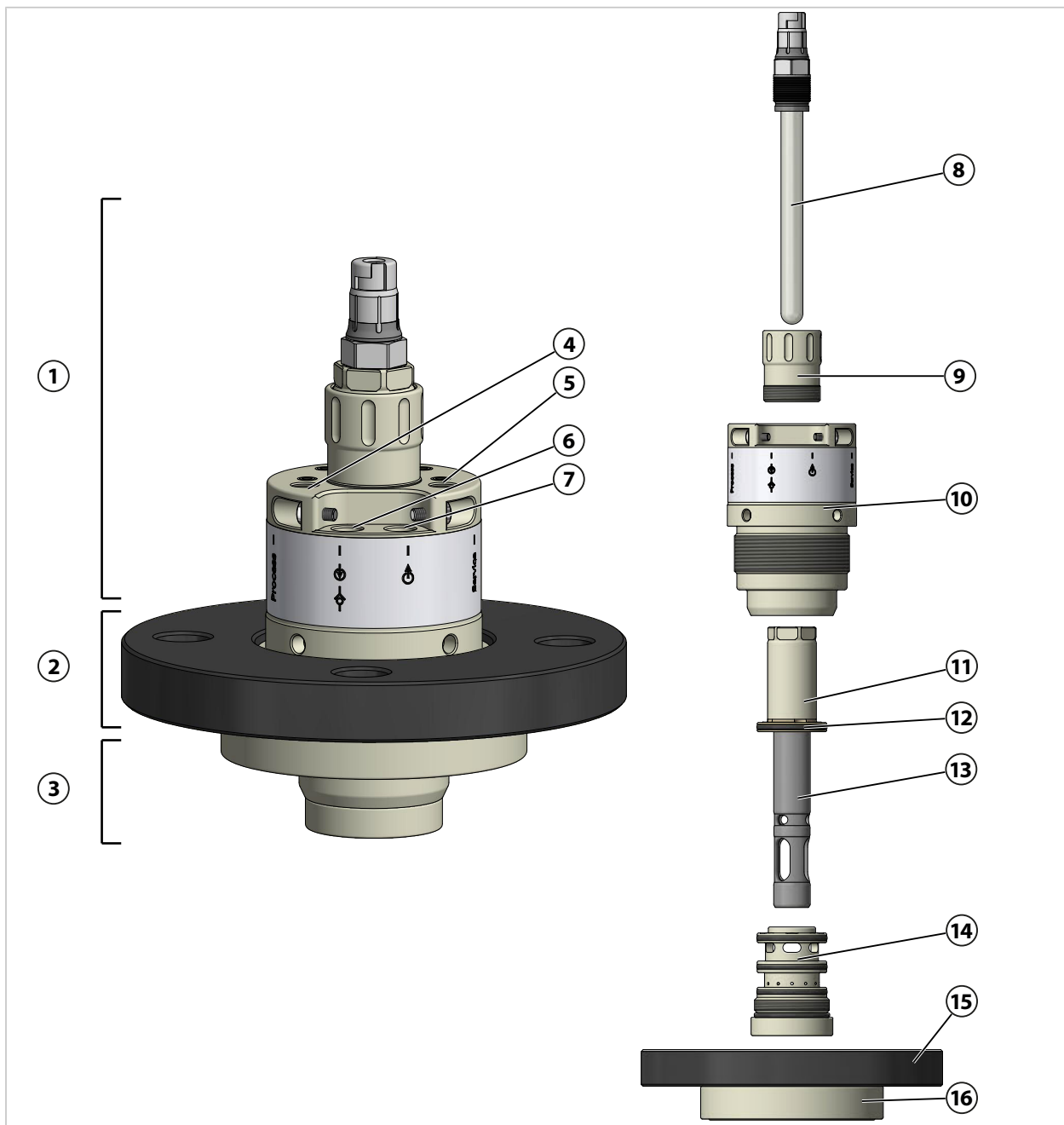
2.4 Symbols and Markings

	Special conditions and danger points! Observe the safety information and instructions on safe use of the product as outlined in the product documentation.
	Outlet for cleaning, rinse, or calibration media.
	Inlet for cleaning, rinse, or calibration media.
	Inlet check valve.
Process	Connection of the drive medium for moving to the process position. → <i>Moving into the Service and Process Position, p. 17</i>
Service	Connection of the drive medium for moving to the service position. → <i>Moving into the Service and Process Position, p. 17</i>

2.5 Design and Function

Retractable Fitting

Note: The figure shows an example version of the WA111. → *Product Code, p. 8*



1 Drive unit/ambient side	9 Protection sleeve
2 Process connection	10 Drive with cylinder
3 Process unit/process side	11 Piston rod with sensor holder
4 Drive medium connection thread process position	12 Piston with O-ring
5 Drive medium connection thread service position	13 Immersion tube
6 Inlet for medium with check valve	14 Rinsing chamber
7 Outlet for medium	15 Process connection (e.g., loose flange)
8 Sensor ¹⁾	16 Flange bushing

¹⁾ Not included in the package contents.

Function

The drive of the WA111 contains a cylinder with a double-acting piston (piston rod with sensor holder and immersion tube **(11)** and **(13)**). Depending on the pressurization of the connection **(4)** or **(5)**, the piston **(12)** is moved with the sensor **(8)** to the service or process position.

→ *Service and Process Position, p. 12*

The piston rod with sensor holder **(11)** is connected to the immersion tube **(13)**.

The openings in the immersion tube **(13)** enable contact between the sensor tip and the process medium when in the process position. In the service position, the immersion tube **(13)** moves through the rinsing chamber **(14)**. The sensor **(8)** can be rinsed or cleaned.

The layout of the openings in the immersion tube **(13)**, in combination with the O-rings, locks the outlet **(7)** of the rinsing chamber **(14)** while the piston rod **(11)** is moved to the process position. This reliably prevents pressurized process medium from escaping from the outlet hose, either in the service or the process position and, in particular, when moving between the two positions.

The inlet **(6)** of the rinsing chamber features a check valve for preventing any retroactive contamination of the pipe network.

Protection from Unintended Movement to the Process Position

If the sensor **(8)** is not present or present but improperly installed, the piston **(12)** does not move to the process position due to guaranteed pressure equalization between the two sides of the piston **(12)**. → *Moving into the Service and Process Position, p. 17*

2.6 Changes for Different Conditions

The WA111 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 → *Product Code, p. 8*
- Replacement of process-wetted components with other material characteristics
→ *Maintenance, p. 20*

Any changes may result in deviations between the information on the nameplate and the actual version of the WA111. 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 WA111 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. 29*

2.7 Service and Process Position

The WA111 can assume two positions (service or process position).

Note: The WA111 only disconnects the sensor in service position.

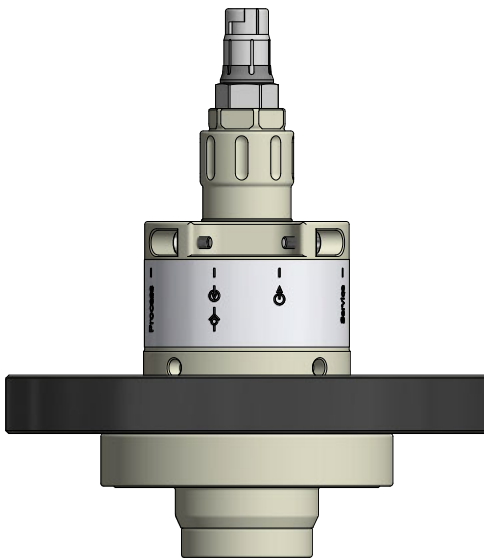
Service Position (SERVICE Limit Position)

- The piston is in the upper cylinder position.
- The sensor tip is immersed in the rinsing chamber.
- The sensor tip is not in contact with the process medium.
- The sensor can be installed, removed, and, as necessary, cleaned under process conditions.
- In the service position, the sensor can be cleaned by adding a rinse medium to the rinsing chamber. When using an electro-pneumatic controller, a pH sensor can be automatically calibrated by adding calibration fluid.

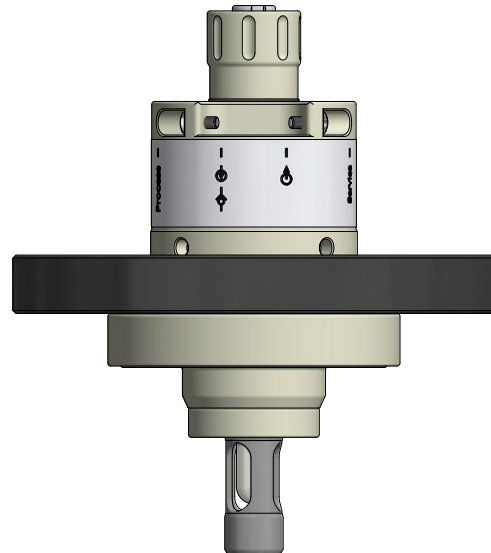
Process Position (PROCESS Limit Position)

- The piston is in the lower cylinder position.
- The sensor tip is retracted from the calibration chamber.
- The sensor tip is in contact with the process medium.
- The desired process parameters can be measured.

Service position



Process position

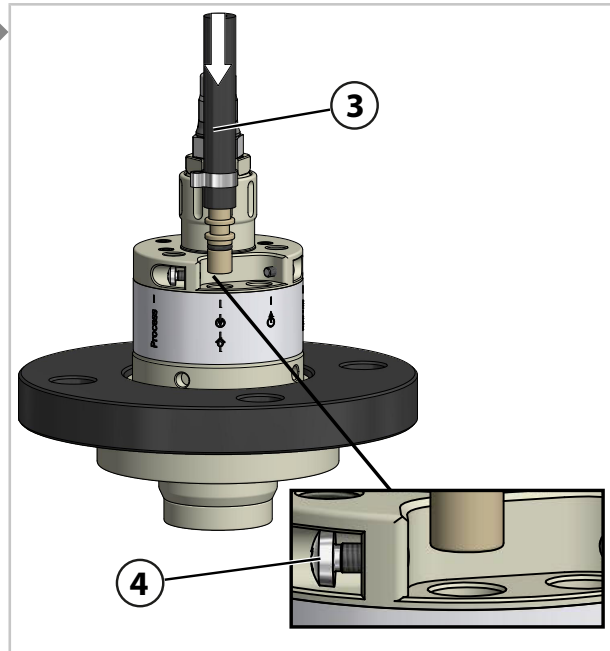
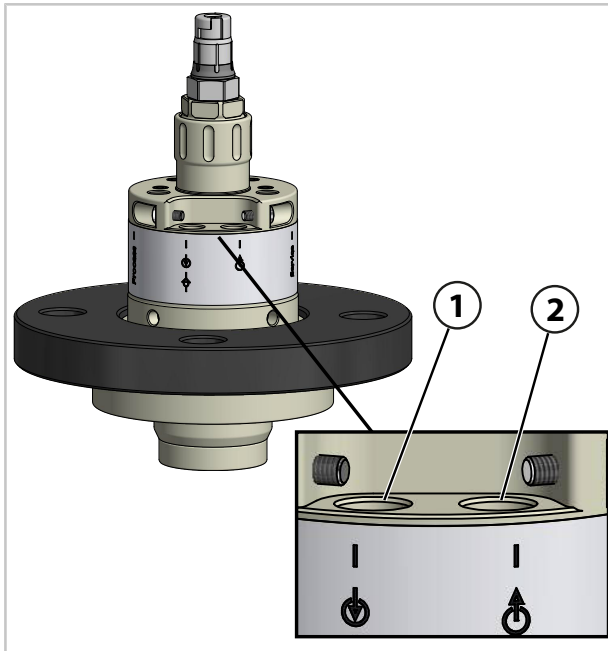


3 Installation

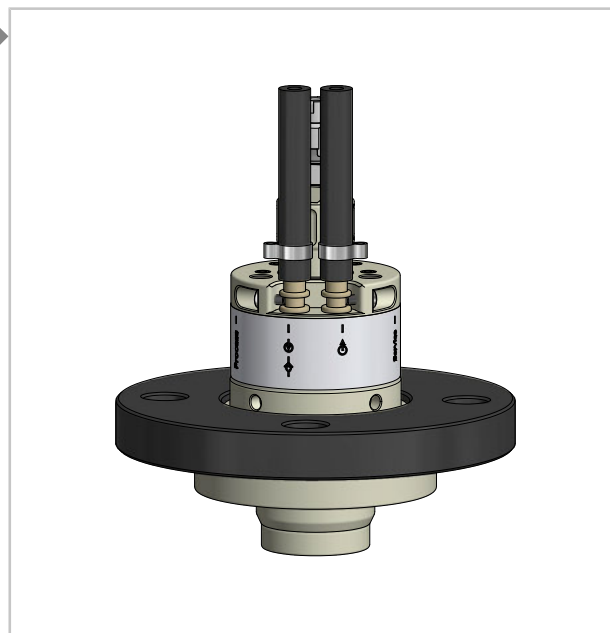
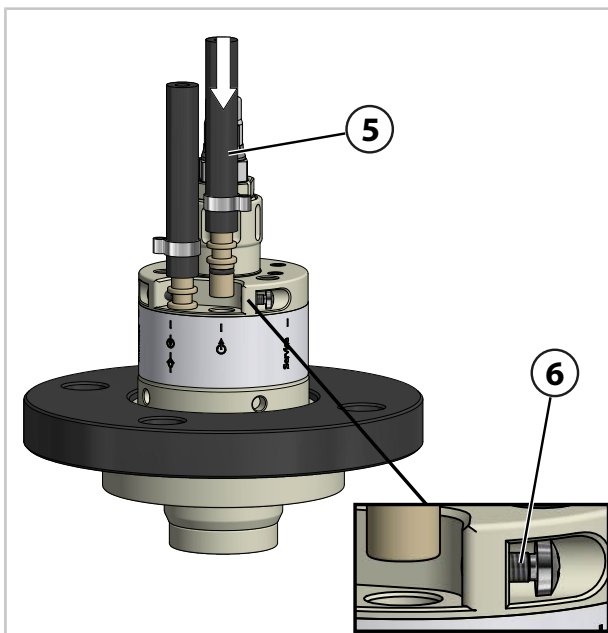
3.1 Retractable Fitting: Installation

01. Check to ensure that the WA111 package contents are complete. → *Package Contents, p. 7*
02. Check the WA111 for damage.
03. Fasten the WA111 with process connection to the connection point, e.g., the tank.
 - ✓ WA111 is fastened to the process.

3.2 Inlet and Outlet Hose: Installation



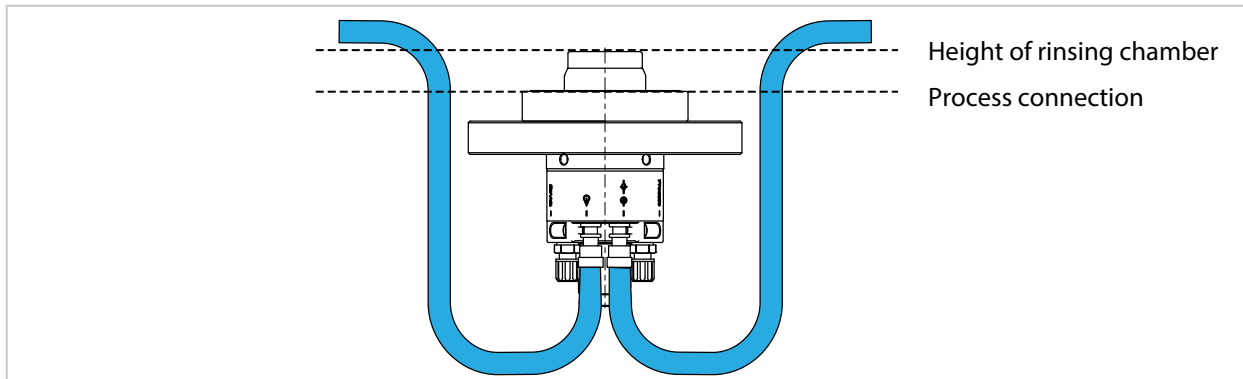
01. Loosen the screw **(4)** and push the inlet hose DN 6 **(3)** fully into the opening **(1)**.
02. Tighten the screw **(4)**.



03. Loosen the screw **(6)** and push the inlet hose DN 6 **(5)** fully into the opening **(2)**.
04. Tighten the screw **(6)**.
 - ✓ The inlet and outlet are installed.

180° Installation Angle

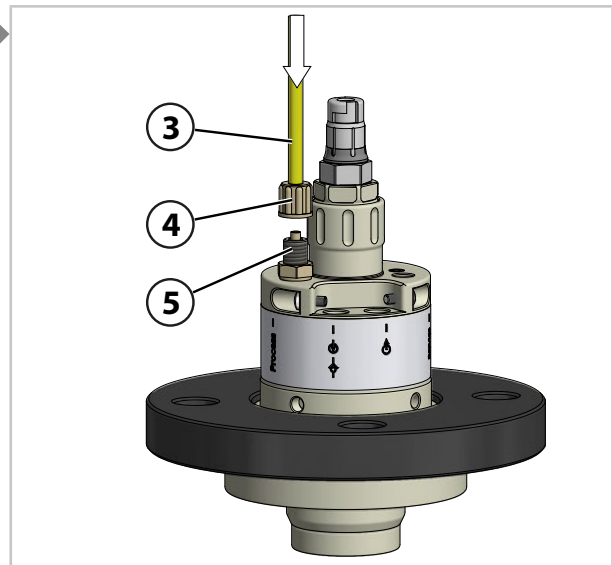
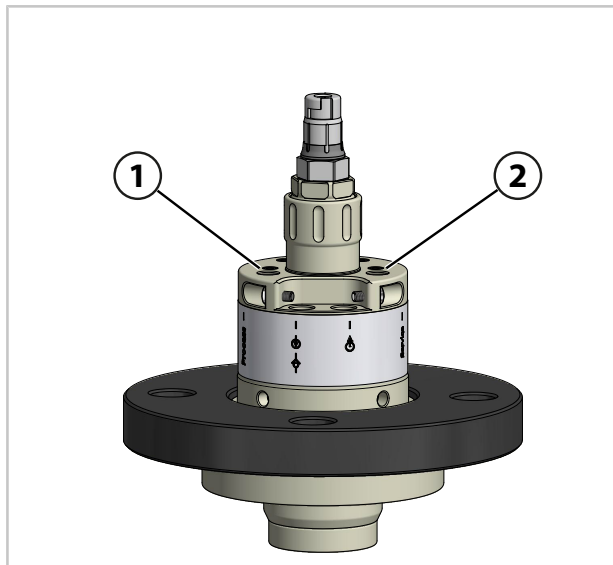
If installing the WA111 at 180° (i.e., upside down), lay the outlet hose in an arc above the level of the rinsing chamber so that gravity prevents the rinsing chamber from draining.



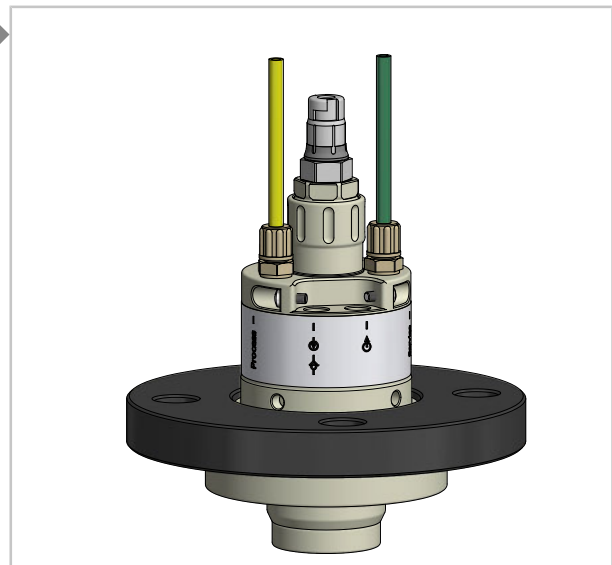
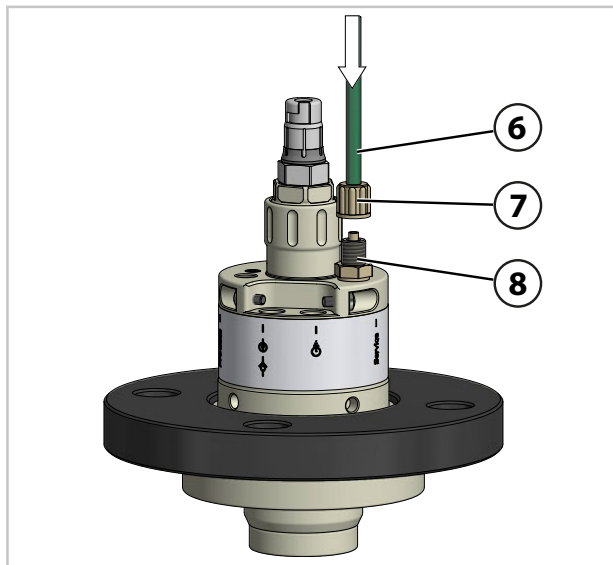
3.3 Drive Medium: Installation

Note: The drive media connection hoses have different colors.

- Process connection hose: yellow
- Service connection hose: green



01. Tightly screw the hose coupling **(5)** into the opening **(1)**.
02. Push the process position connection hose **(3)** fully into the hose coupling **(5)** and tighten the coupling nut **(4)**.



03. Tightly screw the hose coupling **(8)** into the opening **(2)**.
 04. Push the service position connection hose **(6)** fully into the hose coupling **(8)** and tighten the coupling nut **(7)**.
- ✓ The drive medium connection is installed.

4 Commissioning

⚠ WARNING! If the WA111 fitting is damaged or improperly installed, process medium, potentially containing hazardous substances, may escape. 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 WA111. → *Retractable Fitting: Installation, p. 13*
02. Install the inlet and outlet hose. → *Inlet and Outlet Hose: Installation, p. 13*
03. Install the connection hoses for the drive medium. → *Drive Medium: Installation, p. 15*
04. Mount the sensor. → *Installing and Removing a Sensor, p. 18*
05. Check if the process connection is securely fastened.
06. Move the WA111 to the process and service positions.
 - *Moving into the Service and Process Position, p. 17*
 - ✓ The WA111 is ready for operation.

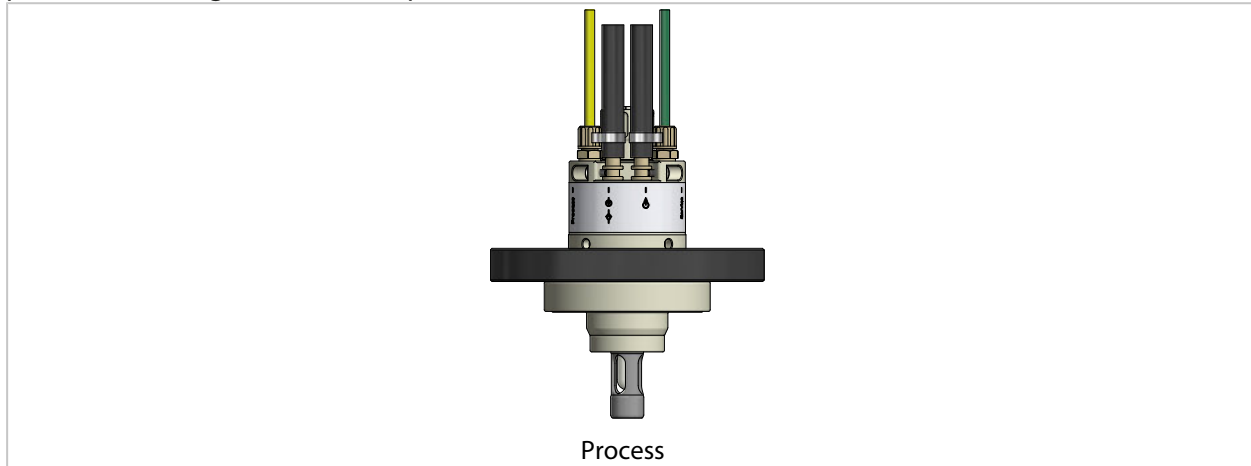
5 Operation

5.1 Moving into the Service and Process Position

Note: When used as intended, the WA111 can only be moved if the sensor is mounted.

Moving into Process Position

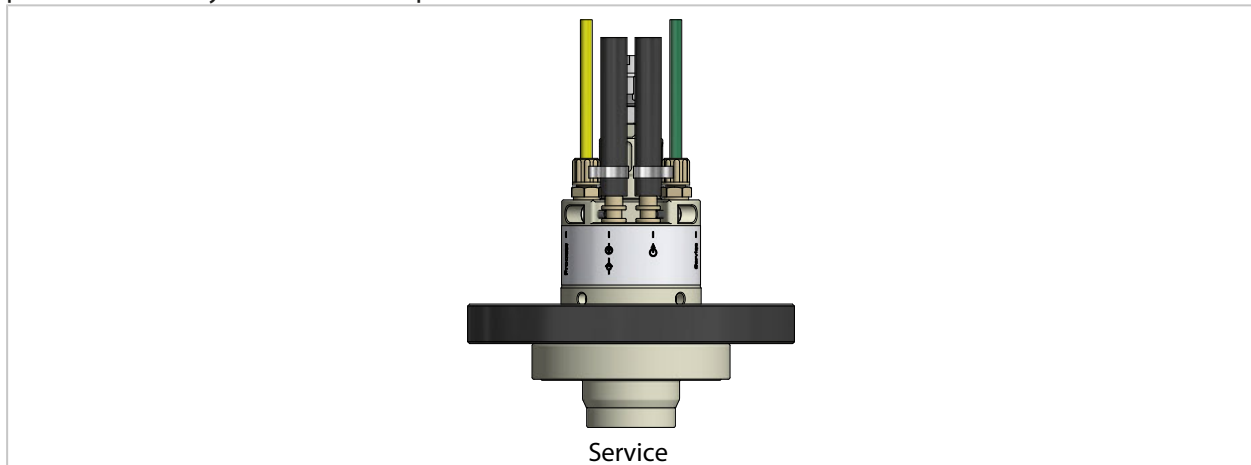
Moving into the process position is triggered by pressurization with drive medium. The yellow hose is pressurized. The green hose is depressurized.



01. Install the sensor. → *Installing and Removing a Sensor, p. 18*
02. Move the WA111 into the process position.
 - ✓ Sensor tip is in the process.

Moving into Service Position

Moving into the service position is triggered by pressurization with drive medium. The green hose is pressurized. The yellow hose is depressurized.



01. Move the WA111 into the service position.
 - ✓ Sensor tip is in the rinsing chamber.

5.2 Installing and Removing a Sensor

5.2.1 Safety Instructions when Installing and Removing Sensors

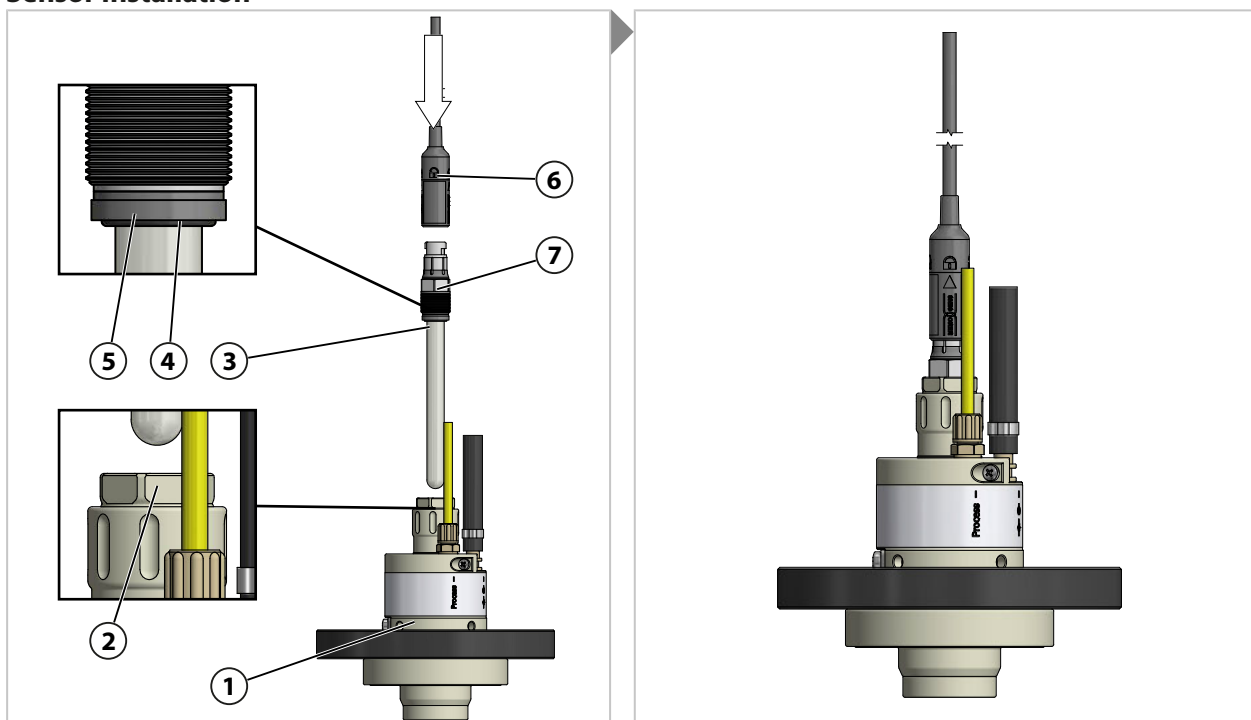
⚠ WARNING! Process medium, potentially containing hazardous substances, may escape from the WA111. Only replace the sensor in the service position. Secure the WA111 against unintended restart. Follow the safety instructions. → *Safety, p. 5*

⚠ 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 outlet is used to discharge trapped rinse medium and must not be closed. By moving the WA111 to the limit positions, pressurized process medium may enter the rinsing chamber. When the outlet is closed, this process medium may be pressurized and splash out during a sensor replacement. → *Design and Function, p. 10*

5.2.2 Installing and Removing Sensors

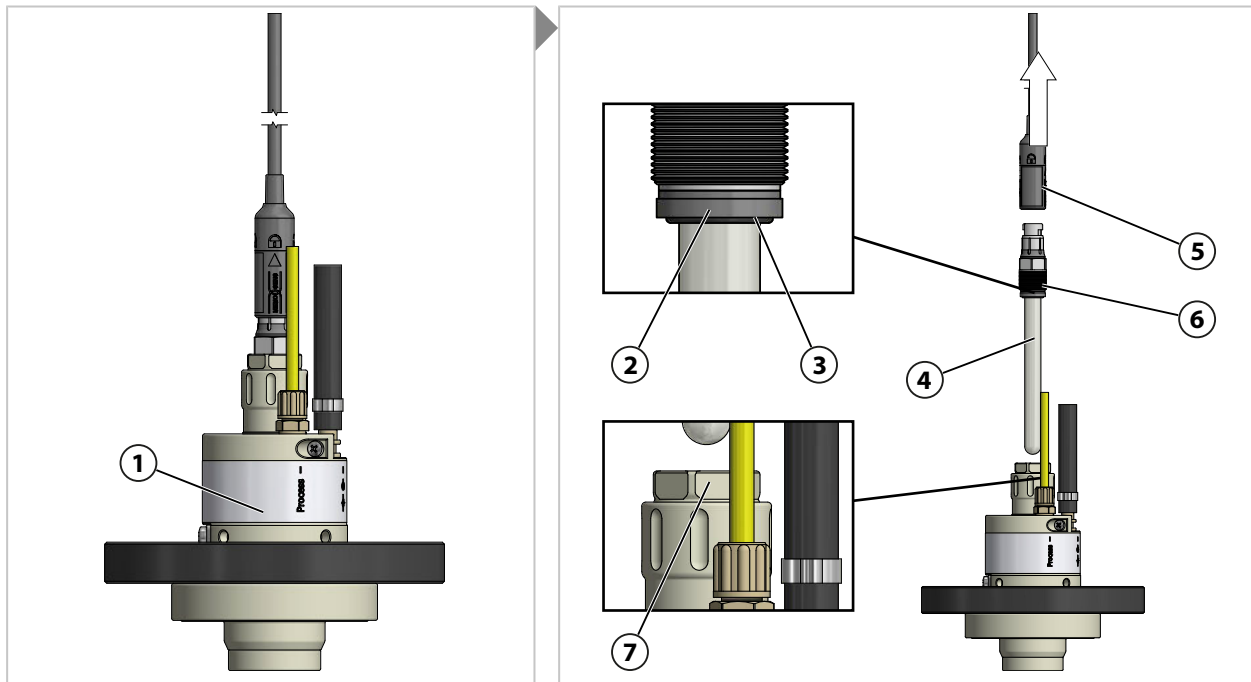
Sensor Installation



01. The WA111 **(1)** is in the service position.
02. Check the washer **(5)** and O-ring **(4)** of the sensor **(3)** for correct positioning and damage, and replace them if necessary.
03. Push the sensor **(3)** into the WA111 **(1)**.
04. Hold the piston rod with sensor holder **(2)** (A/F 24) with a suitable tool and tighten the sensor head **(7)** (A/F 19) with 1 ... 3 Nm. Recommended tool: ZU0647 sensor spanning wrench
→ *Accessories, p. 32*
05. Connect the sensor cable **(6)** to the sensor **(3)**.
✓ The sensor is installed.

Note: The arc length of the sensor cable must be sufficient to allow the cable to move freely during the stroke movement of the WA111.

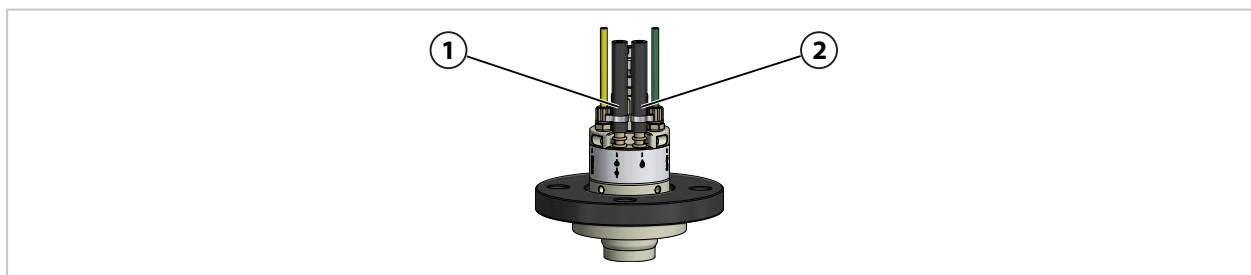
Sensor Removal



01. The WA111 (1) is in the service position.
02. As necessary, rinse or clean the sensor (4) in the service position.
03. Disconnect the sensor cable (5) from the sensor (4).
04. Hold the piston rod with sensor holder (7) (A/F 24) with a suitable tool and loosen the sensor head (6) (A/F 19). Recommended tool: ZU0647 sensor spanning wrench. → *Accessories, p. 32*
05. Pull the sensor (4) out of the WA111 (1).
06. Check the compression ring (2) and O-ring (3) on the sensor (4) for presence and damage, and replace them if necessary.
07. If the sensor glass is broken, check the immersion tube seal for damage and replace it if necessary.
✓ The sensor is removed.

5.2.3 Cleaning and Rinsing the Sensor

Note: Only clean or rinse the sensor while in the service position, when it is sealed from the process.



01. Move the WA111 into the service position. → *Moving into the Service and Process Position, p. 17*
02. Supply the cleaning or rinse medium to the WA111 via the inlet hose (1).
03. Perform cleaning or rinsing in line with operational requirements.
04. As necessary, move to the process position. → *Moving into the Service and Process Position, p. 17*
✓ The sensor is clean/rinsed.

Note: Always keep the outlet hose (2) open.

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 days/ weeks	Move the WA111 into the service position and observe the outlet. If the product is not tight, process medium will escape from the outlet hose. → <i>Troubleshooting, p. 30</i> As necessary, replace process-wetted and dynamically loaded O-rings. → <i>Seals, p. 27</i>
After 6 – 12 months ²⁾	Repeat the steps carried out during the first inspection.
After 10,000 – 20,000 strokes	Replacing the process-wetted and dynamically loaded O-rings is recommended. → <i>Seals, p. 27</i>
After 2 years	In particular if using chemically aggressive cleaners, check the rinse-wetted O-rings and replace them if necessary. → <i>Seals, p. 27</i> Maintenance of the dynamically loaded O-rings by re-greasing. → <i>Seals, p. 27</i>

6.1.2 Used and Approved Lubricants

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 used as a special version at the customer's express request.

Seal Material	Used and Approved Lubricants		
	Syntheso Glep 1 (silicone-free)	Beruglide L ³⁾ (silicone-free)	Paraliq GTE 703 ⁴⁾ (containing silicone)
FKM	+	+	+
FFKM	+	+	+
EPDM	+	+	+

¹⁾ The stated intervals are general recommendations based on Knick's experience. The actual intervals are dependent on the specific application for which the WA111 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

6.2 Corrective Maintenance

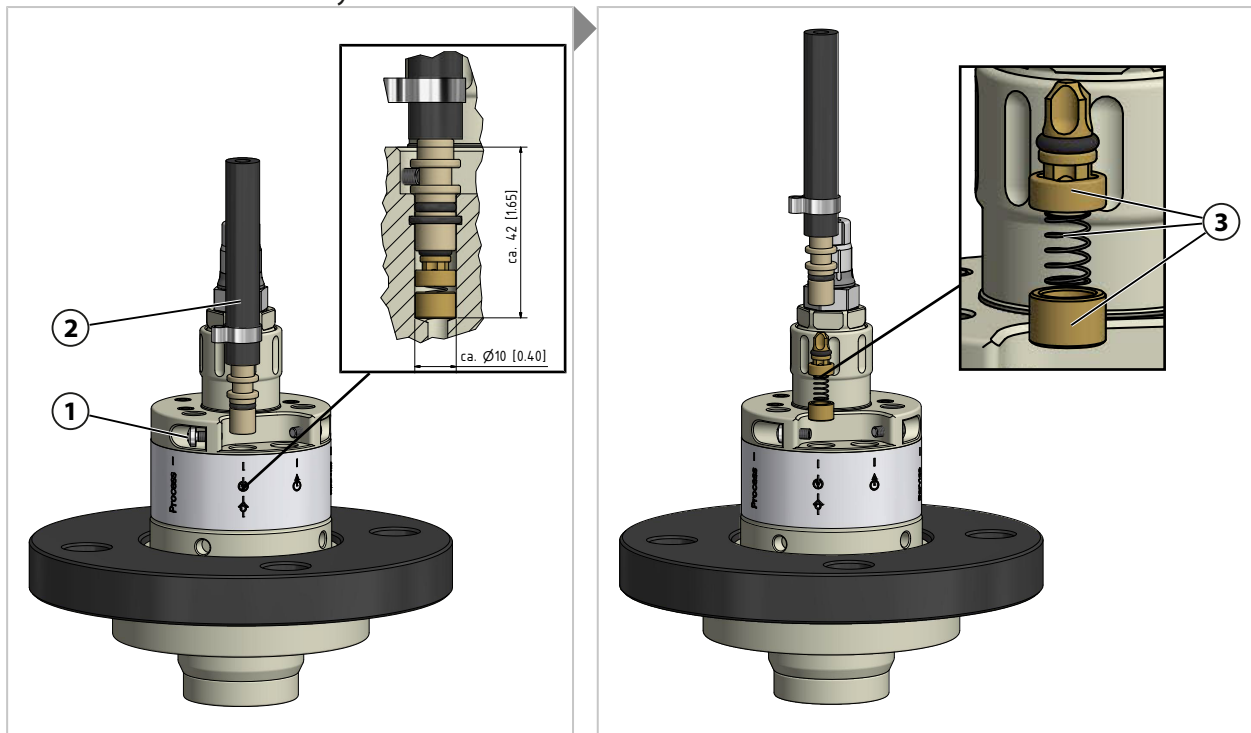
6.2.1 Corrective Maintenance Safety Instructions

▲ WARNING! Process medium, potentially containing hazardous substances, may escape from the WA111. 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.

6.2.2 Removing the Check Valve

The check valve must be removed in order to check the inlet channel inside the WA111 for contamination and clean it if necessary.



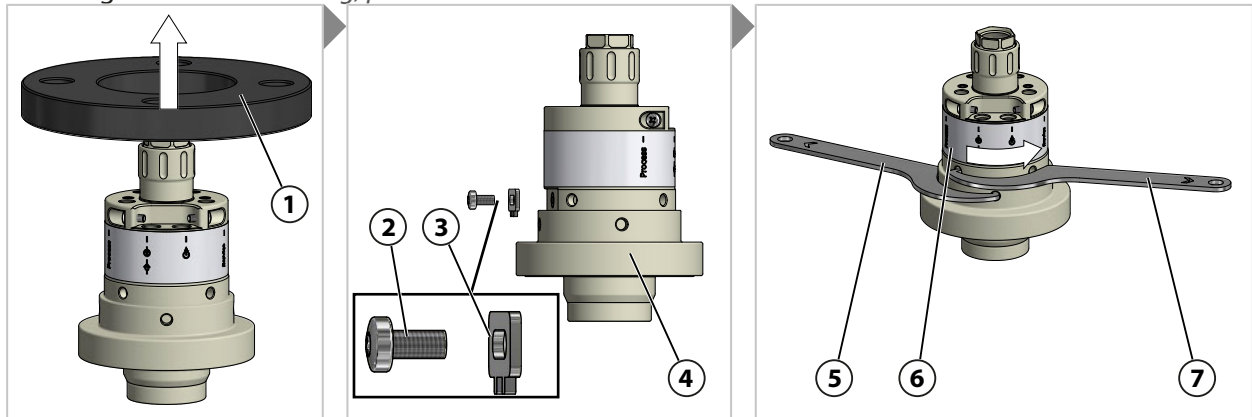
NOTICE! Store small parts safely for later installation.

01. Move the WA111 into the service position. → *Moving into the Service and Process Position, p. 17*
02. Secure the WA111 against unintended movement.
03. Shut off the inlet.
04. As necessary, remove the sensor. → *Installing and Removing a Sensor, p. 18*
05. Loosen the screw **(1)**.
06. Pull out the inlet hose DN 6 **(2)**.
07. Remove the check valve **(3)** using a suitable tool.
08. As necessary, replace the O-ring. → *Seals, p. 27*
09. As necessary, clean and reinsert the check valve **(3)**.
10. Install the inlet hose DN 6 **(2)**. → *Inlet and Outlet Hose: Installation, p. 13*
11. Tighten the screw **(1)**.
12. Put the WA111 into operation. → *Commissioning, p. 16*
 ✓ The check valve has been maintained.

6.2.3 Disconnecting/Connecting the Process Connection from/to the Drive

Disconnecting the Process Connection from the Drive

Note: The drive unit needs to be removed for procedures such as maintenance, cleaning, or troubleshooting. → *Troubleshooting, p. 30*



01. Move the WA111 into the service position. → *Moving into the Service and Process Position, p. 17*

02. Depressurize the process and drain it to below the installation level of the WA111.

03. Shut off and remove the drive media. → *Drive Medium: Installation, p. 15*

04. Shut off and remove the outlet and inlet hoses. → *Inlet and Outlet Hose: Installation, p. 13*

05. Remove the sensor. → *Installing and Removing a Sensor, p. 18*

Note: Use the ZU1155 tool set to dismount the sensor properly. → *Tools, p. 32*

06. Disconnect the WA111 from the process.

07. Pull the loose flange (1) off the flange bushing (4).

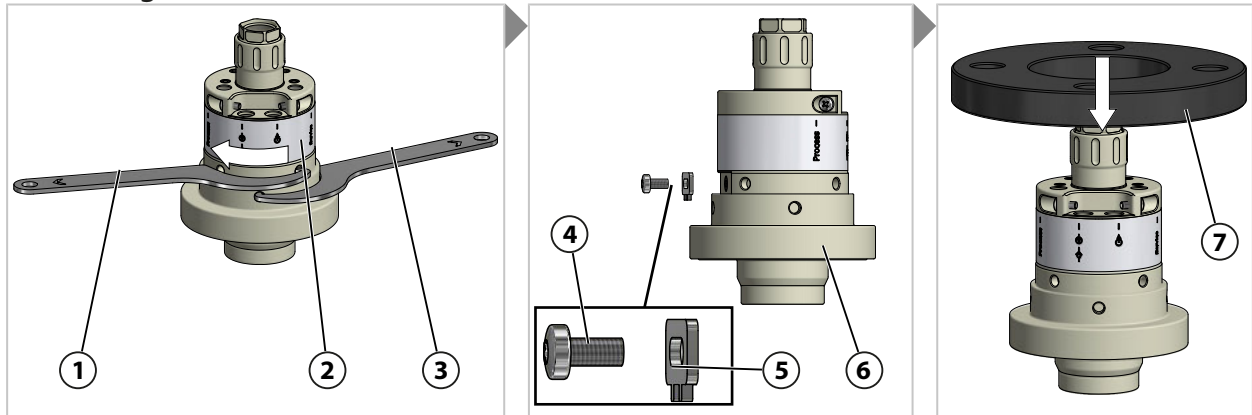
08. Loosen and remove the screw (2) and locking device (3).

09. Using hook wrenches (5) and (7), fasten the drive (6) and flange bushing (4) and remove the coupling.

10. Unscrew the flange bushing (4) from the drive (6).

✓ The process connection is disconnected from the drive.

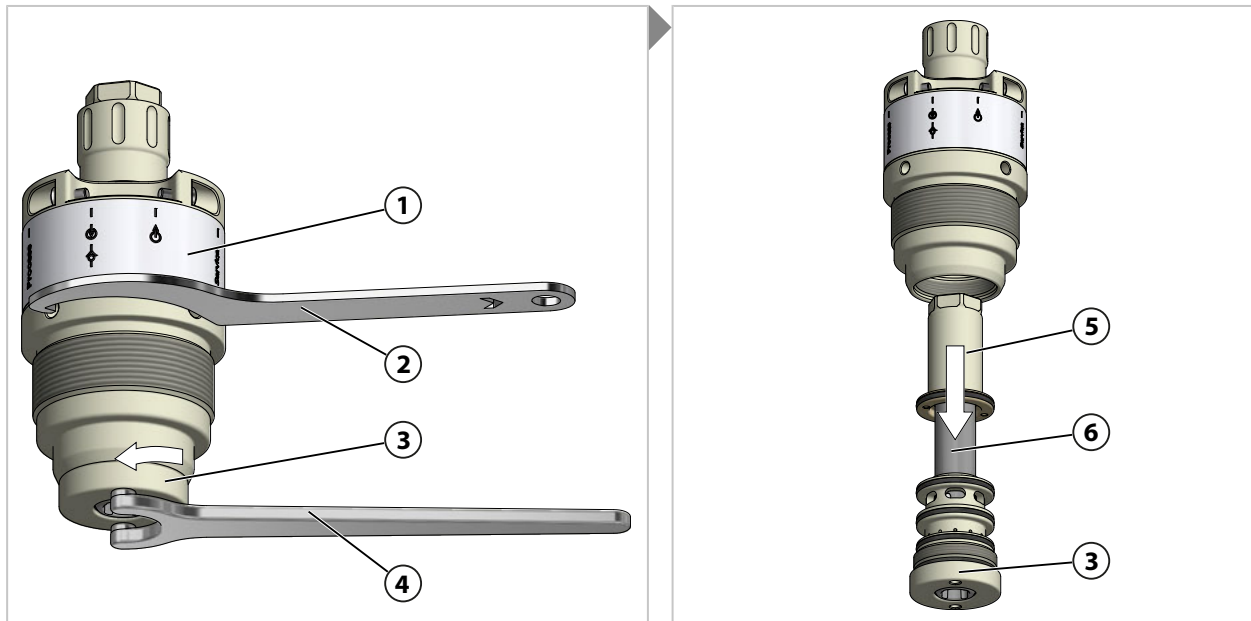
Connecting the Process Connection to the Drive



01. Screw the flange bushing **(6)** to the drive **(2)**.
02. Using hook wrenches **(1)** and **(3)**, fasten the drive **(2)** and flange bushing **(6)** and screw the coupling tight.
03. Using the screw **(4)** and locking device **(5)**, secure the flange bushing **(6)** on the drive **(2)**.
04. Fit the loose flange **(7)** on the flange bushing.
05. Attach the WA111 to the process.
06. Install the sensor. → *Installing and Removing a Sensor, p. 18*
07. Install the outlet and inlet hoses. → *Inlet and Outlet Hose: Installation, p. 13*
08. Install the media connections. → *Drive Medium: Installation, p. 15*
09. Put the WA111 into operation. → *Commissioning, p. 16*
 ✓ The process connection is connected to the drive.

6.2.4 Removing and Installing the Rinsing Chamber

Note: The rinsing chamber needs to be removed for procedures such as maintenance, cleaning, or troubleshooting. → *Troubleshooting, p. 30*



Removal

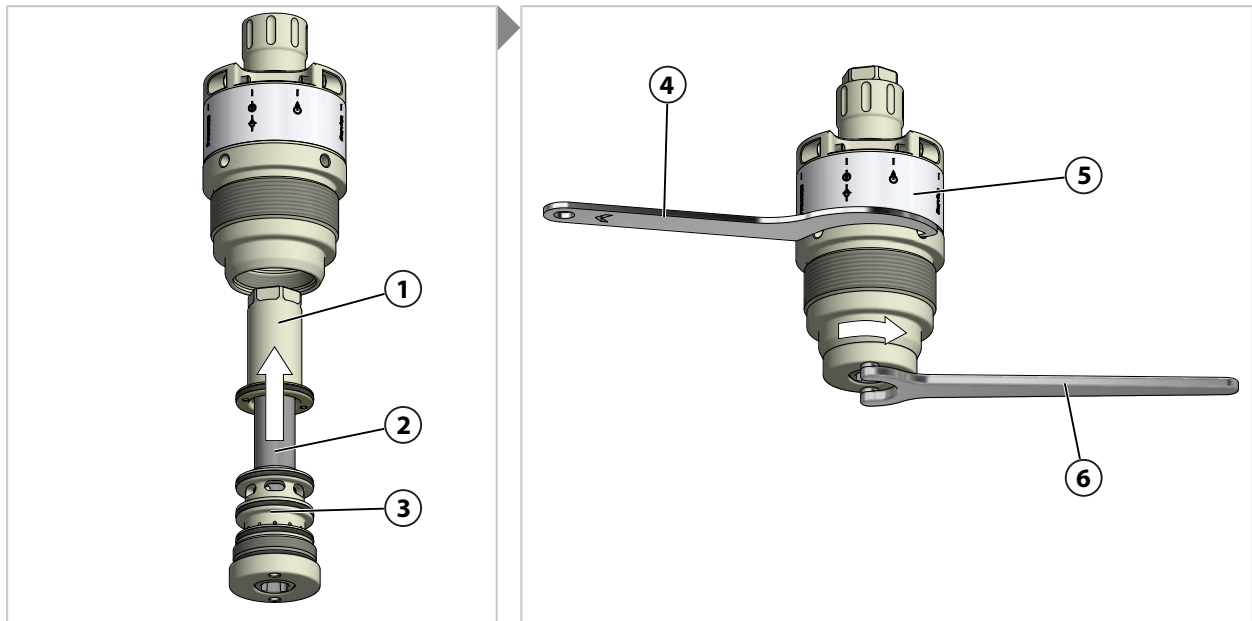
01. Move the WA111 into the service position. → *Moving into the Service and Process Position, p. 17*
02. Depressurize the process and drain it to below the installation level of the WA111.
03. Shut off and remove the drive media. → *Drive Medium: Installation, p. 15*
04. Shut off and remove the outlet and inlet hoses. → *Inlet and Outlet Hose: Installation, p. 13*
05. Disconnect the WA111 from the process.
06. As necessary, remove the drive.
→ *Disconnecting/Connecting the Process Connection from/to the Drive, p. 22*
07. Fasten the drive (1) with the hook wrench (2). Recommended tool: ZU1155 tool set
→ *Accessories, p. 32*
08. Using the face pin spanner wrench (4), loosen the coupling at the bottom of the rinsing chamber (3). Recommended tool: ZU1155 tool set → *Accessories, p. 32*
09. Pull out the rinsing chamber (3) by hand.
✓ The rinsing chamber is removed.

Note: Dirt deposits during operation and the gasket materials used may result in the need to apply considerable force to release the rinsing chamber (3). A combination of rotating and sudden pull movements is recommended.

Note: The seals between the immersion tube (6) and the rinsing chamber (3) create a friction contact. In normal cases, this causes the drive components (piston rod with sensor holder (5) and immersion tube (6)) to also be pulled out.

Installation

NOTICE! A loosened screw joint between the piston rod and the immersion tube may cause process medium, potentially containing hazardous substances, to escape from the WA111. Prior to every installation, fully tighten the screw joint. → *Removing and Installing the Immersion Tube, p. 26*

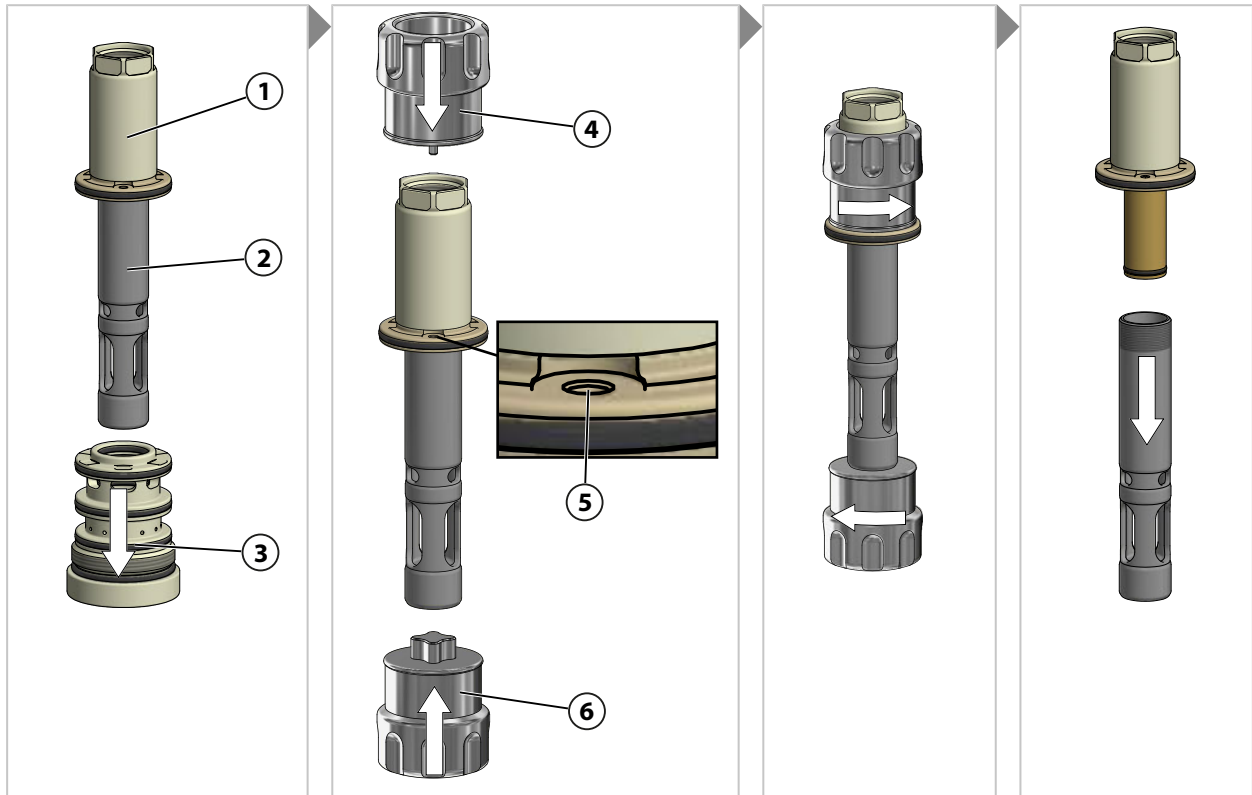


01. Fully tighten the screw joint between the piston rod **(1)** and the immersion tube **(2)**.
Recommended tool: ZU1155 tool set → *Accessories, p. 32*
02. Push the rinsing chamber **(3)** with the piston rod **(1)** and immersion tube **(2)** into the drive **(4)**.
03. Fasten the drive **(5)** with the hook wrench **(4)**. Recommended tool: ZU1155 tool set
→ *Accessories, p. 32*
04. Using the face pin spanner wrench **(6)**, fully tighten the rinsing chamber. Recommended tool:
ZU1155 tool set → *Accessories, p. 32*
05. As necessary, connect the process connection to the drive.
→ *Disconnecting/Connecting the Process Connection from/to the Drive, p. 22*
06. Put the WA111 into operation. → *Commissioning, p. 16*
✓ The rinsing chamber is installed and the WA111 is ready for operation.

6.2.5 Removing and Installing the Immersion Tube

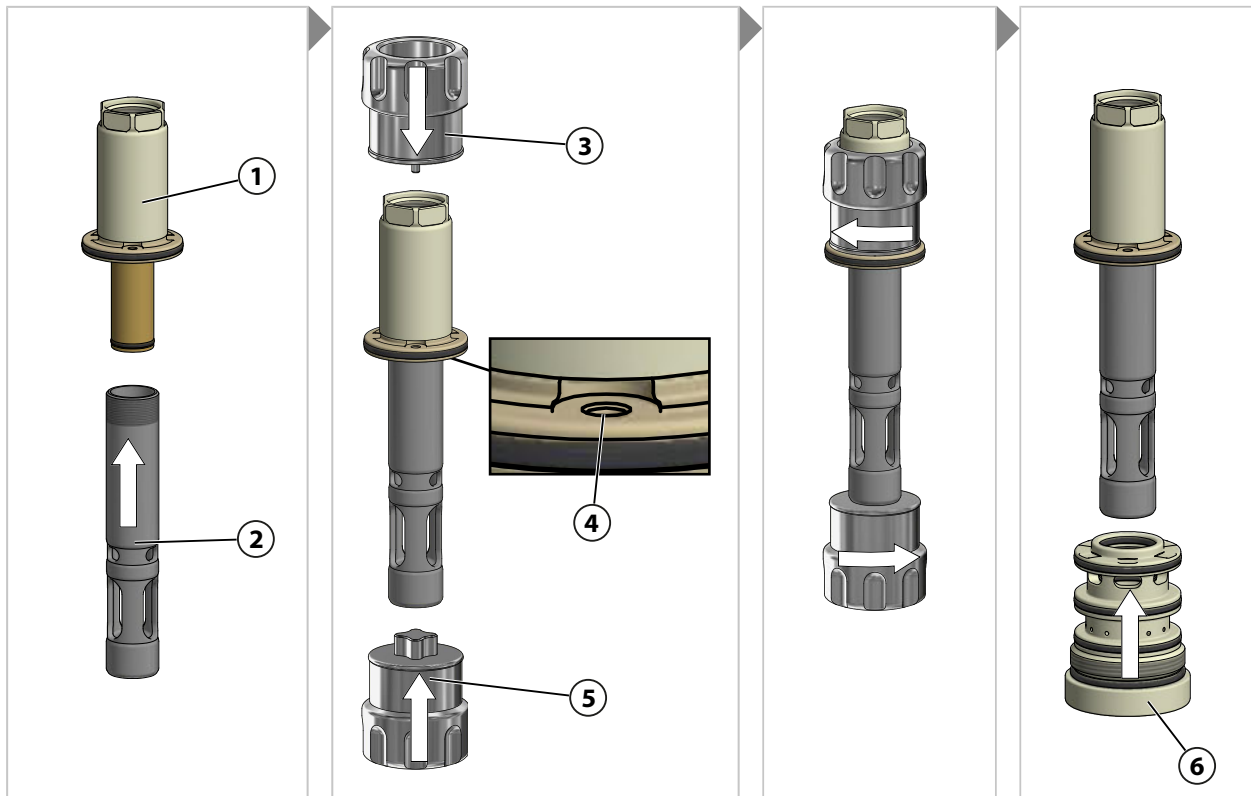
Note: The immersion tube needs to be removed for procedures such as maintenance, cleaning, or troubleshooting. → *Troubleshooting, p. 30*

Removal



01. Remove the rinsing chamber **(3)** with the piston rod **(1)** and immersion tube **(2)**.
→ *Removing and Installing the Rinsing Chamber, p. 24*
02. Pull the rinsing chamber **(3)** down off the immersion tube **(2)**.
03. Insert the face pin spanner wrench **(6)** into the openings of the immersion tube **(2)**.
Recommended tool: ZU1155 tool set → *Accessories, p. 32*
04. Insert the face pin spanner wrench **(4)** into the openings **(5)** of the piston **(1)**. Recommended tool:
ZU1155 tool set → *Accessories, p. 32*
05. Turn the face pin spanner wrench **(6)** against the face pin spanner wrench **(4)** and loosen the coupling.
06. Unscrew the immersion tube **(2)**.
✓ The immersion tube is removed.

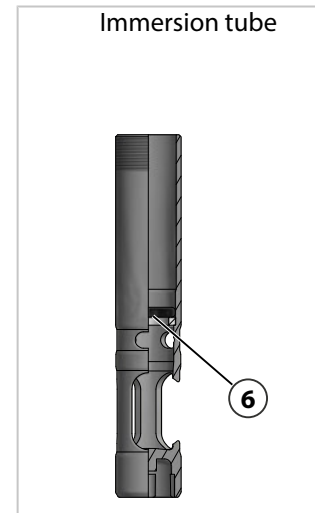
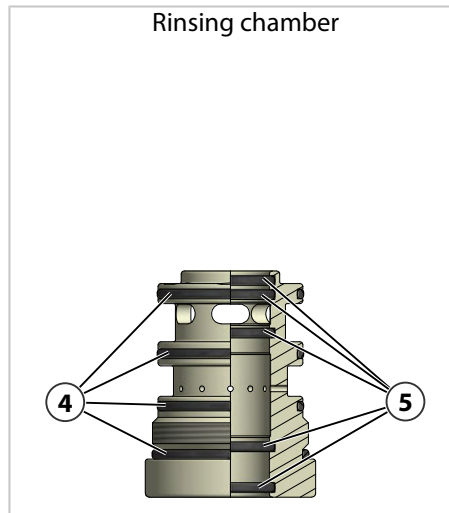
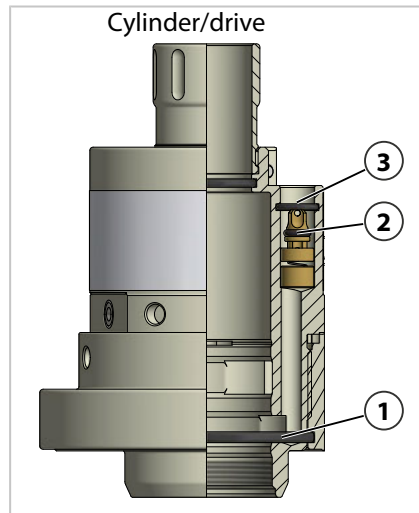
Installation



01. Screw the immersion tube **(2)** into the piston rod **(1)**.
02. Insert the face pin spanner wrench **(3)** into the openings **(4)** of the piston **(1)**. Recommended tool: ZU1155 tool set → *Accessories, p. 32*
03. Insert the face pin spanner wrench **(5)** into the opening of the immersion tube **(2)**. Recommended tool: ZU1155 tool set → *Accessories, p. 32*
04. Turn the face pin spanner wrench **(3)** against the face pin spanner wrench **(5)** and fully tighten the immersion tube **(2)**.
05. Push the rinsing chamber **(6)** onto the immersion tube **(2)**.
06. Install the rinsing chamber in the drive. → *Removing and Installing the Rinsing Chamber, p. 24*
 ✓ The immersion tube is installed.

6.2.6 Seals

Note: Replace the process media wetted and drive media wetted O-rings in accordance with the inspection and maintenance intervals. → *Inspection and Maintenance, p. 20*

Process Media Wetted:

1 O-ring 60 x 2.5 mm

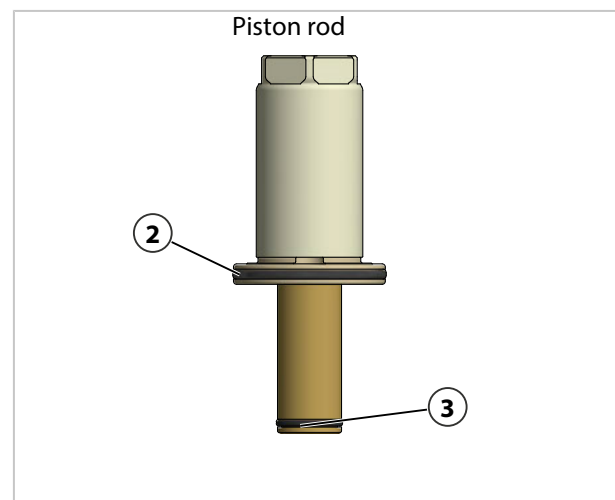
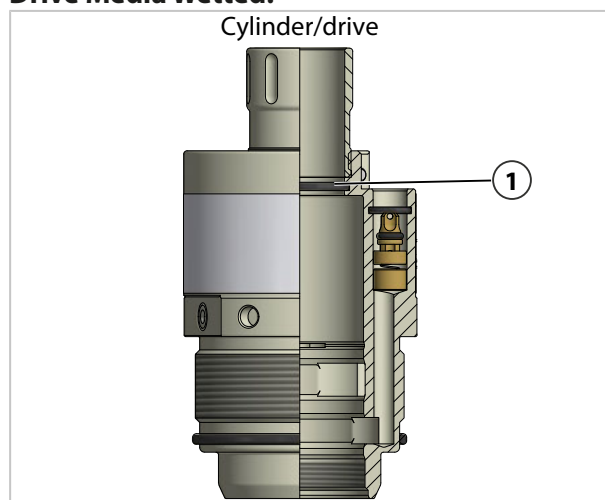
2 O-ring 4 x 2 mm

3 O-ring 10 x 1.5 mm

4 O-ring 33 x 2 mm

5 O-ring 20 x 2 mm (dynamically loaded)

6 O-ring 11.91 x 2.62 mm

Drive Media Wetted:

1 O-ring 27 x 2 mm (dynamically loaded)

2 O-ring 33 x 2 mm (dynamically loaded)

3 O-ring 13 x 1.5 mm

Replacing the O-Rings

01. Remove the drive. → *Disconnecting/Connecting the Process Connection from/to the Drive, p. 22*
02. Remove the rinsing chamber, piston rod, and immersion tube.
 - *Removing and Installing the Rinsing Chamber, p. 24*
 - *Removing and Installing the Immersion Tube, p. 26*
03. Replace the O-rings.
04. Install the rinsing chamber, piston rod, and immersion tube.
 - *Removing and Installing the Rinsing Chamber, p. 24*
 - *Removing and Installing the Immersion Tube, p. 26*
05. Install the drive. → *Disconnecting/Connecting the Process Connection from/to the Drive, p. 22*
 ✓ The O-rings have been replaced.

6.2.7 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.

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 constantly escapes from the outlet hose.	Rinsing chamber O-rings damaged or missing.	Replace the O-rings. → <i>Seals, p. 27</i> Send the WA111 to your local contact for repair. → <i>knick.de</i>
Sensor glass shattered.	Mechanical impact on the sensor glass (e.g., by process medium).	Replace faulty sensor. → <i>Installing and Removing a Sensor, p. 18.</i> Remove any glass splinters from the WA111. Check immersion tube seal and replace if necessary. → <i>Seals, p. 27.</i>
WA111 does not move.	Dynamically loaded O- rings damaged or missing.	Check the O-rings. Replace if necessary. → <i>Seals, p. 27</i>
	No sensor installed (extension protection effective).	Install the sensor. → <i>Installing and Removing a Sensor, p. 18</i>
	Drive pressure too low.	Check the drive pressure. Increase it if necessary. → <i>Specifications, p. 35</i>

Further troubleshooting support can be obtained from → support@knick.de.

See also

→ *Knick Repair Service, p. 29*

8 Decommissioning

8.1 Retractable Fitting: Removal

▲ WARNING! Process or rinse medium, potentially containing hazardous substances, may escape from the WA111 or the process port. Follow the safety instructions. → *Safety, p. 5*

01. Drain process medium to below the installation level of the WA111.
02. Move the WA111 into the service position.
03. Disconnect the supply of drive medium (water or compressed air).
04. Disconnect the supply of rinse medium.
05. Remove the sensor. → *Installing and Removing a Sensor, p. 18*
06. Remove the inlet and outlet hoses. → *Inlet and Outlet Hose: Installation, p. 13*
07. Remove the drive medium connection hoses. → *Drive Medium: Installation, p. 15*
08. Remove process connection.
09. Remove the WA111 from the connection point.
10. Seal off the connection point appropriately.
 - ✓ WA111 has been decommissioned.

8.2 Return

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

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

The WA111 can contain various materials, depending on the version concerned. → *Product Code, p. 8*

9 Spare Parts, Accessories, and Tools

9.1 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.

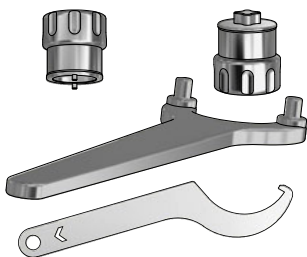
Check valve		RV01	-	-	-	-	-
Housing material, valve body	Stainless steel 1.4404			H			
	PEEK			E			
Seal material	FKM				A		
	EPDM				B		
	FFKM				C		
	FKM-FDA				F		
	EPDM-FDA				E		
	FFKM-FDA				H		
Inlet connection, female thread	G $\frac{1}{4}$ "					4	
	G $\frac{1}{8}$ "					8	
Outlet connection, male thread	G $\frac{1}{4}$ "						4
	G $\frac{1}{8}$ "						8

9.2 Tools



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).



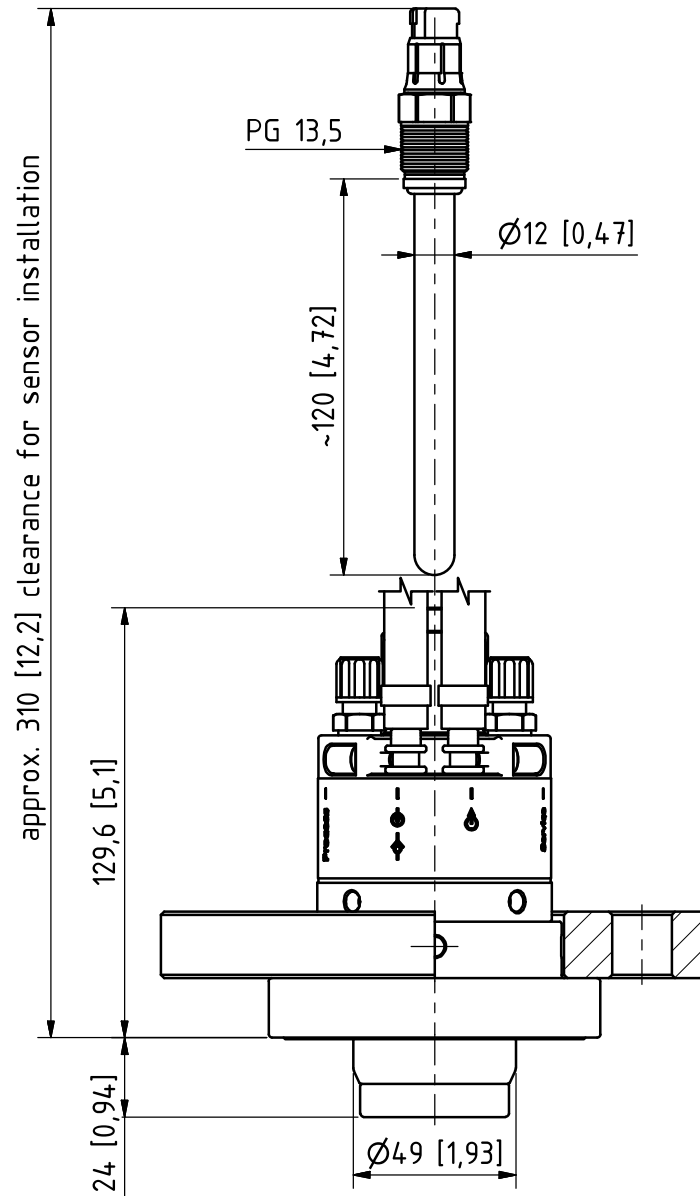
ZU1155 Tool Set

This tool set is suitable for maintenance work on the product. It makes it easy to install and remove components for repair.

10 Dimension Drawings

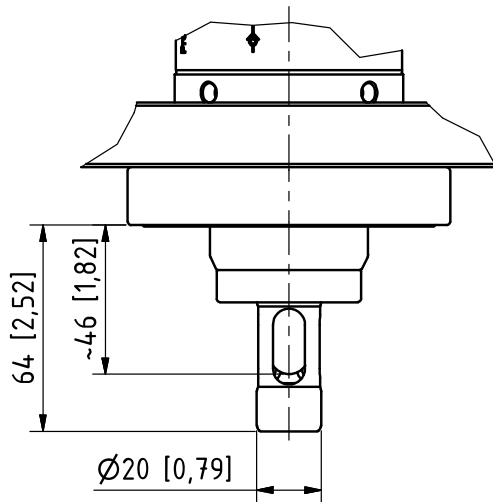
Retractable Fitting for Solid-Electrolyte Sensor, Short Immersion Depth

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



Immersion Depth in Process Position

Flange, loose, PN10/16, DN 50 ... DN 100, ANSI, 150 lbs, 2" ... 4"



11 Specifications

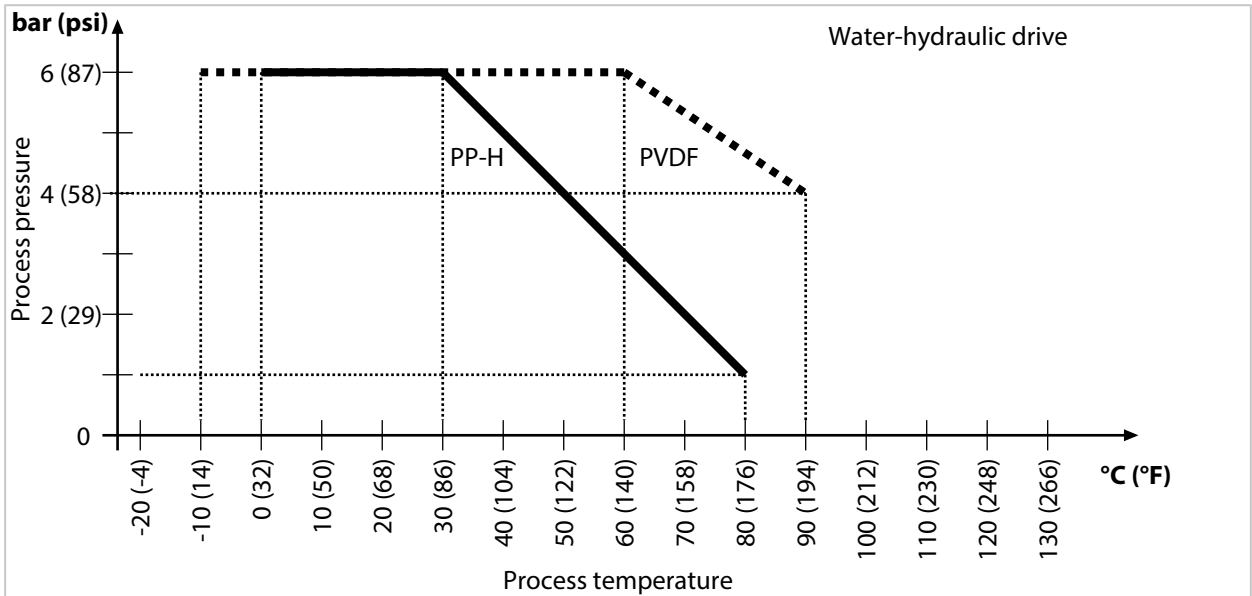
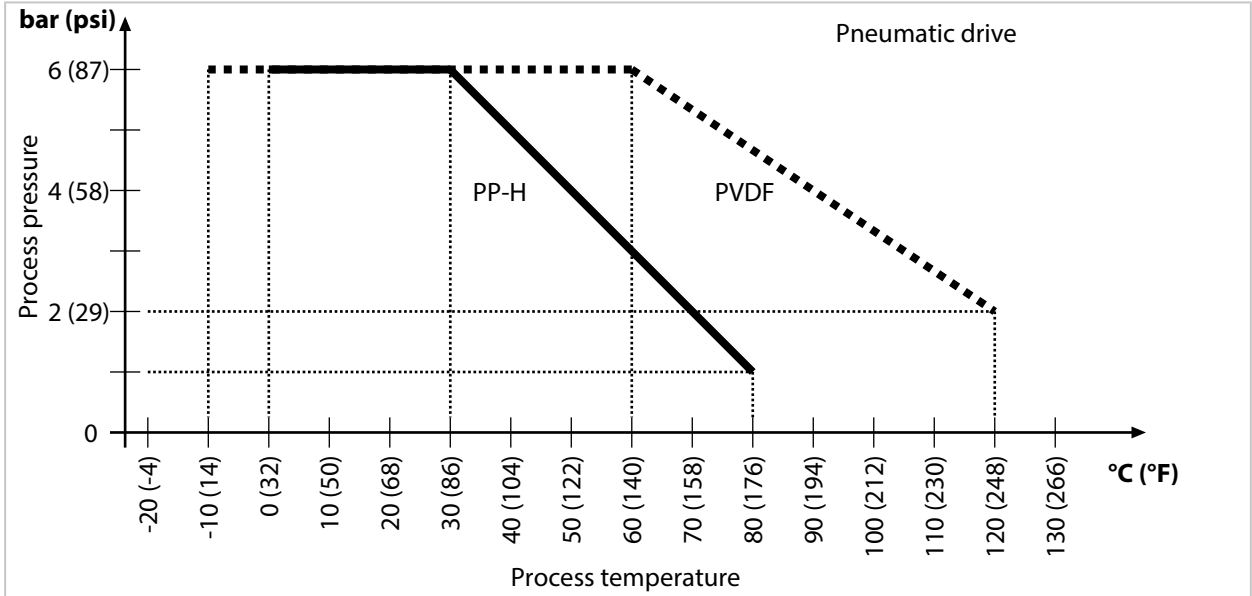
Permissible process pressure/process temperature → *Pressure/Temperature Diagram, p. 37*

Pneumatic drive type	
Material: PP-H	
0 ... 30 °C (32 ... 86 °F)	6 bar (90 psi)
30 ... 80 °C (86 ... 176 °F)	Falling linearly to 1 bar (14.5 psi)
Material: PVDF	
-10 ... 60 °C (14 ... 140 °F)	6 bar (90 psi)
60 ... 120 °C (140 ... 248 °F)	Falling linearly to 2 bar (29 psi)
Water-hydraulic drive type	
Material: PP-H	
5 ... 30 °C (41 ... 86 °F)	6 bar (90 psi)
30 ... 80 °C (86 ... 176 °F)	Falling linearly to 1 bar (14.5 psi)
Material: PVDF	
5 ... 60 °C (41 ... 140 °F)	6 bar (90 psi)
60 ... 90 °C (140 ... 194 °F)	Falling linearly to 4 bar (58 psi)
Permissible transient pressure/temperature (testing)	
5 ... 30 °C (41 ... 86 °F), max. 60 min, drive in SERVICE position	16 bar (232 psi)
Ambient temperature	
Pneumatic drive type	
Material: PP-H	-5 ... 70 °C (23 ... 158 °F)
Material: PVDF	-15 ... 70 °C (5 ... 158 °F)
Water-hydraulic drive type	
Material: PP-H	5 ... 70 °C (41 ... 158 °F)
Material: PVDF	5 ... 70 °C (41 ... 158 °F)
Transport / storage temperature	-10 ... 70 °C (14 ... 158 °F)
Drive pressure, minimum	4 ... 8 bar (58 ... 116 psi) and ≥ process pressure
Compressed air quality for pneumatic drive type	
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)
Water quality	Filtered 100 µm

Permissible rinsing pressure/rinse medium temperature

Material: PP-H	
5 ... 80 °C (41 ... 176 °F)	8 bar (116 psi)
Material: PVDF	
5 ... 90 °C (41 ... 194 °F)	8 bar (116 psi)
Rinsing inlet	Hose DN 6 (EPDM, check valve in inlet)
Rinsing outlet	Hose DN 6 (EPDM, gated)
Process-wetted materials	
Fitting housing	→ <i>Product Code, p. 8</i>
Immersion tube	→ <i>Product Code, p. 8</i>
Seal material	EPDM / FKM / FFKM
Rinsing	PEEK, Hastelloy 2.4610
Degree of protection according to EN 60529	IP66
Sensors	→ <i>Product Code, p. 8</i>
Process connection	→ <i>Product Code, p. 8</i>
Immersion depths/dimensions	→ <i>Dimension Drawings, p. 33</i>
Weight	Depending on material and version. More information is available from Knick or your local contacts.

Pressure/Temperature Diagram



Abbreviations

A/F	Width across flats
ANSI	American National Standards Institute
DN	Diamètre nominal (nominal size)
EPDM	Ethylene propylene diene monomer rubber
FDA	U.S. Food and Drug Administration
FFKM	Perfluoro rubber
FKM	Fluoro rubber
IP	International Protection / Ingress Protection
ISO	International Organization for Standardization
PEEK	Polyether ether ketone
PEEK HD	High-density polyether ether ketone
PG	Panzergewinde
PP-H	Polypropylene homopolymer

Index

A

Accessories	32
Ambient temperature	35

C

Causes, malfunctions	30
Changes, retractable fitting	11
Cleaning	19
Coding, product code	8
Commissioning	16
Connection point	13
Cylinder	10

D

Declaration of decontamination	31
Declaration of no objection	31
Decommissioning	31
Degree of protection against dust and humidity	36
Dimension drawings	33
Dimensions	33
Disposal	31
Drive media	
Installation	15
Drive unit	
Removal	22

E

Environmental damage	5
Environmental factors	5
Error elimination	30

F

First inspection	20
------------------	----

G

Genuine spare parts	6
---------------------	---

H

Hazard assessment	6
Hazardous substances	6

I

Immersion tube	10
Inspection	20
Functional tests	20
Inspection intervals	20
Installation	13
Drive media	15
Immersion tube	27
Retractable fitting	13
Rinsing chamber	25
Sensor	18
Installation, retractable fitting	13
Intended Use	5
Introductory safety chapter	2
IP degree of protection	36

L

Lubricants, approved	21
----------------------	----

M

Maintenance	20
Lubricants	21
Maintenance intervals	20
Malfunction states	30
Markings	9
Model code	7
Model designation	8
Modifications	11

N

Notes on safety information	2
-----------------------------	---

O

Order code	7
------------	---

P

Package contents	7
Permissible modifications	11
Personnel requirements	5
Piston rod	10
Positioning, nameplate	9
Pressure dew point	35
Preventive maintenance	6
Process connection	
Change	11
Process position	12
Moving into process position	17
Process pressure, permissible	35
Process temperature	35
Process-wetted materials	36
Product code	
Coding	7
Example	7
Property damage	5

Q

Qualified personnel	5
Quality class, compressed air	35
Quality of compressed air	35

R

Remedies, malfunctions	30
Removal	
Immersion tube	26
Rinsing chamber	24
Sensor	19
Removal, retractable fitting	31
Repair Service	29
Residual risks	5
Retractable fitting	
Changes	11
Return form	31
Returns	31
Rinse medium, temperature	36
Rinsing	19
Inlet	36
Outlet	36
Rinsing chamber	10
Rinsing pressure, permissible	36
Risk assessment	5

S

Safety chapter	5
Safety data sheets	6
Safety instructions	2
Seals	27
Sensor	
Cleaning	19
Glass breakage	30
Installation	18
Removal	19
Rinsing	19
Spanning wrench	32
Sensor types, permissible	5
Service position	12
Moving into service position	17
Supplemental directives	2
Symbols and markings	9

T

Tools	
Accessory tools	32
Safety	6
Troubleshooting	30

V

Versions	7
----------	---

W

Warnings	2
Weight	36



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Translation of the original instructions
Copyright 2023 • Subject to change
Version 1 • This document was published on January 09, 2023.
The latest documents are available for download on our
website under the corresponding product description.

TA-809.000-KNEN01



101016