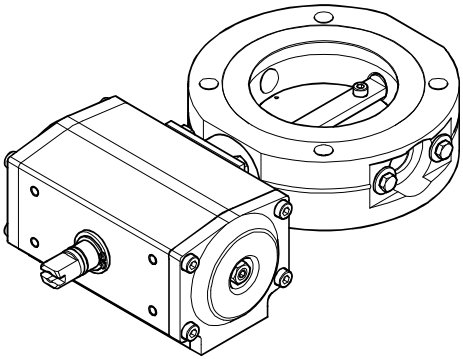
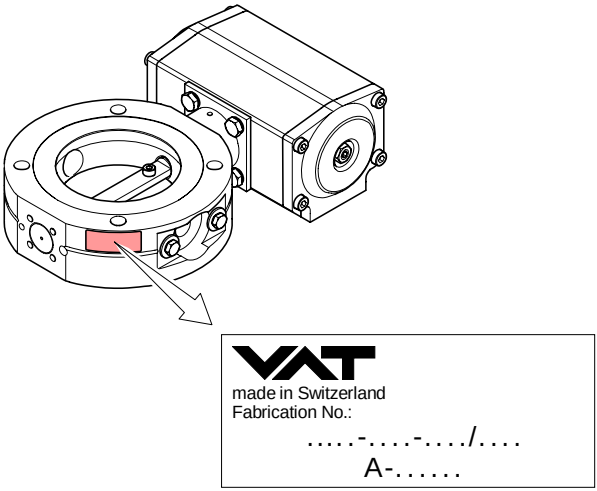
Butterfly valve

pneumatically actuated
21036-PE14-000.
21036-PE..-ABA.



Product Identification

In all communications with VAT, please specify the information on the product nameplate. For convenient reference copy that information into the space provided below:



Validity

This document applies to products with part numbers:

21036-PE14-000.	
21036-PE14-ABA.	
21036-PE24-ABA.	(with position indicator)
21036-PE44-ABA.	(with position indicator with pilot valve 24 VDC)

The part number (PN) can be taken from the product nameplate.

If not indicated otherwise in the legends, the illustrations in this document correspond to the valve 21036-PE14-000.. They apply to the 21036-PE.4-ABA.. by analogy.

We reserve the right to make technical changes without prior notice.

All dimensions in mm.

Intended Use

The Butterfly Valves 21036-PE14-000. and 21036-PE.4-ABA.. are pneumatically actuated valves for high vacuum applications.

Functional Principle

The valve is opened and closed by the rotary motion of the pneumatic actuator.

Description

The valves have stainless steel housings. The 21036-PE14-000. has radially arranged small flange connections for the bypass line, gauge and/or vent valve. This type allows for installing the actuator assembly on the opposite side of the valve if required.

A position indicator providing electrical signals for the two final positions of the valve plate as well as a pilot valve for electropneumatic actuation of the valve are available as accessories.

Contents

For cross-references within this document, the symbol (→ 🗎 XY) is used.

1 Safety

1.1 Symbols Used

DANGER

Information on preventing any kind of physical injury.

WARNING

Information on preventing extensive equipment and environmental damage.

Caution

Information on correct handling or use. Disregard can lead to malfunctions or minor equipment damage.

1.2 Personnel Qualifications

Skilled personnel

All work described in this document may only be carried out by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

1.3 General Safety Instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used.
  Consider possible reactions between the materials (→ 🗎 8) and the process media.
- Adhere to the applicable regulations and take the necessary precautions for all work you are going to do and consider the safety instructions in this document.
- Before beginning to work, find out whether any vacuum components are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Communicate the safety instructions to all other users.

1.4 Liability and Warranty

VAT assumes no liability and the warranty becomes null and void if the end-user or third parties

- disregard the information in this document
- use the product in a non-conforming manner
- make any kind of interventions (modifications, alterations etc.) on the product
- use the product with accessories not listed in the corresponding product documentation.

The end-user assumes the responsibility in conjunction with the process media used.

Failures due to contamination or wear and tear, as well as expendable parts (e.g. seals), are not covered by the warranty.

2 Technical Data

2.1 Butterfly Valves

	21036-PE14-000.	21036-PE.4-ABA..
Vacuum connections		
Axially arranged vacuum connections	DN 063 ISO-F	
Radially arranged vacuum connections	DN 16 ISO-KF DN 10 ISO-KF	– –
Mounting orientation	any	
Cycles to first maintenance	1'000'000 [1)]	
Tightness	1×10^{-9} mbar l/s	
Conductance for air Molecular flow	350 l/s	400 l/s
Pressure range in either direction	10^{-8} mbar … 4 bar	
Pressure difference in either direction	4 bar	
Actuator Functional principle Initial position	 double action rotary drive closed	
Compressed air supply Compressed air connection (NAMUR) Compressed air pressure Purity classes Air cylinder volume Opening time Closing time	 2× G1/8 4 … 6 bar overpressure 2 4 1 (ISO 8573-1) 250 cm^3 200 ms (at 6 bar overpressure) 150 ms (at 6 bar overpressure)	
Ambiance temperature	+5 … 40 °C	
Bakeout temperature Housing Actuator	 150 °C 80 °C	
Materials Housing, shaft, valve plate Seals	 stainless steel 1.4301 FPM	
Weight	≈3.8 kg	≈3.5 kg

2.2 Pilot Valve (Accessory)

[1)] Tested at Δp = 1 bar under clean conditions. If the valve is operated under harsh or dirty conditions, it should be cleaned / maintained before the specified service time to maintenance has been reached.

Nominal voltage Part number	586579 586580 586581 586582	230 VAC / 50 Hz 115 VAC / 60 Hz 24 VAC / 50 Hz 24 VDC
Valve type		5/2-way pneumatic valve with NAMUR flange connection
Version		normally closed
Power connection		cable socket
Degree of protection		IP65
Pickup power		5.7 VA
Holding power DC voltage AV voltage		 2.5 W 2.0 W
Duty cycle		100% (i.e. continuous duty possible)
Compressed air pressure Purity classes Nominal width Compressed air connection		≤10 bar 2 4 1 (ISO 8573-1) 4 mm 1× G1/4, 2× G1/8
Temperatures Ambiance Operation (continuous duty)		 –25 … +65 °C +75 °C
Weight (without solenoid coil)		0.25 kg

Accessories → 67.

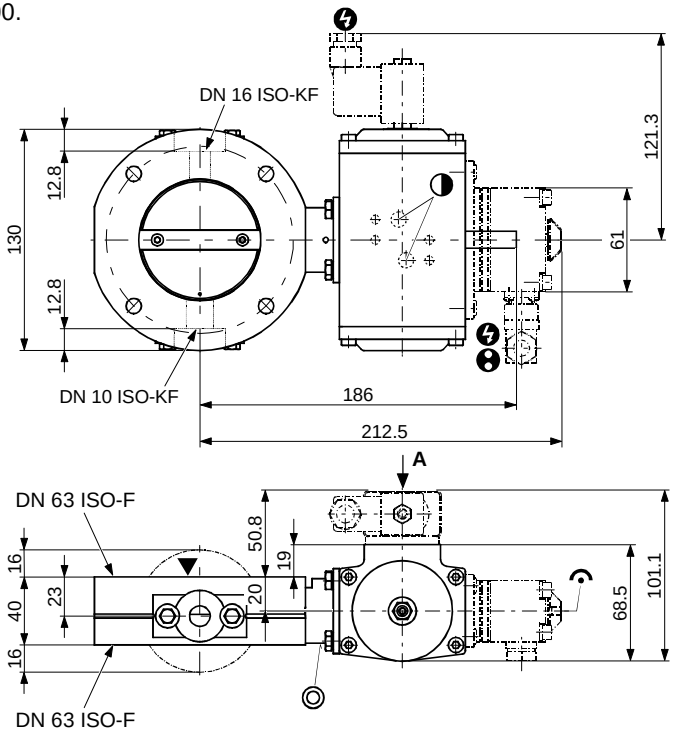
2.3 Position Indicator (Accessory)

Supply voltage	250 VAC, 1 A
Mounting orientation	any
Electrical connection	plug M12, 4 poles, DIN EN 61076--2-101
Cable	ø6 … 8 mm, 0.75 mm^2
Degree of protection	IP65
Materials Housing Screws	 PET GF30 stainless steel A2
Temperatures Ambiance Operation	 –20 … +90 °C –20 … +85 °C
Weight Without plug With plug	 106 g 130 g

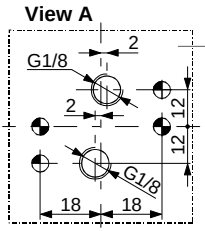
Accessories → 67.

2.4 Dimensions [mm]

21036-PE14-000.



Compressed air connection



NAMUR flange connection

Threaded tapped hole for code pin (M5×8)

Threaded tapped hole for mounting the pilot valve (M5×8)

Power connection

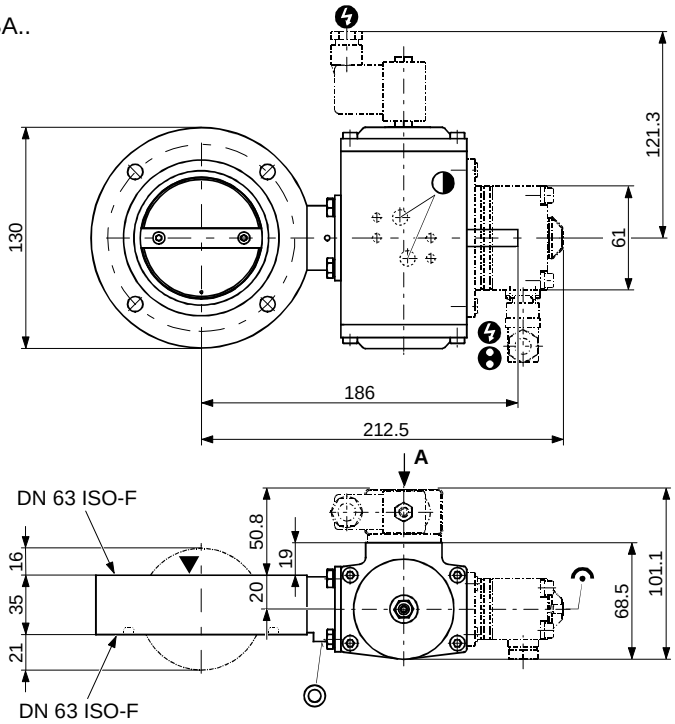
Connection for connection

Visual position indicator

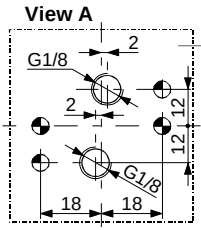
Valve seat side

Leak detection opening

21036-PE.4-ABA..



Compressed air connection



NAMUR flange connection

Threaded tapped hole for code pin (M5×8)

Threaded tapped hole for mounting the pilot valve (M5×8)

Power connection

Connection for connection

Visual position indicator

Valve seat side

Leak detection opening

3 Installation

DANGER

DANGER: overpressure in the vacuum system >2.5 bar

KF flange connections with elastomer seals (e.g. O-rings) cannot withstand such pressures. Process media can thus leak and possibly damage your health.

Use O-rings provided with an outer centering ring.

Caution

Caution: vacuum component

Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Caution

Caution: dirt sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

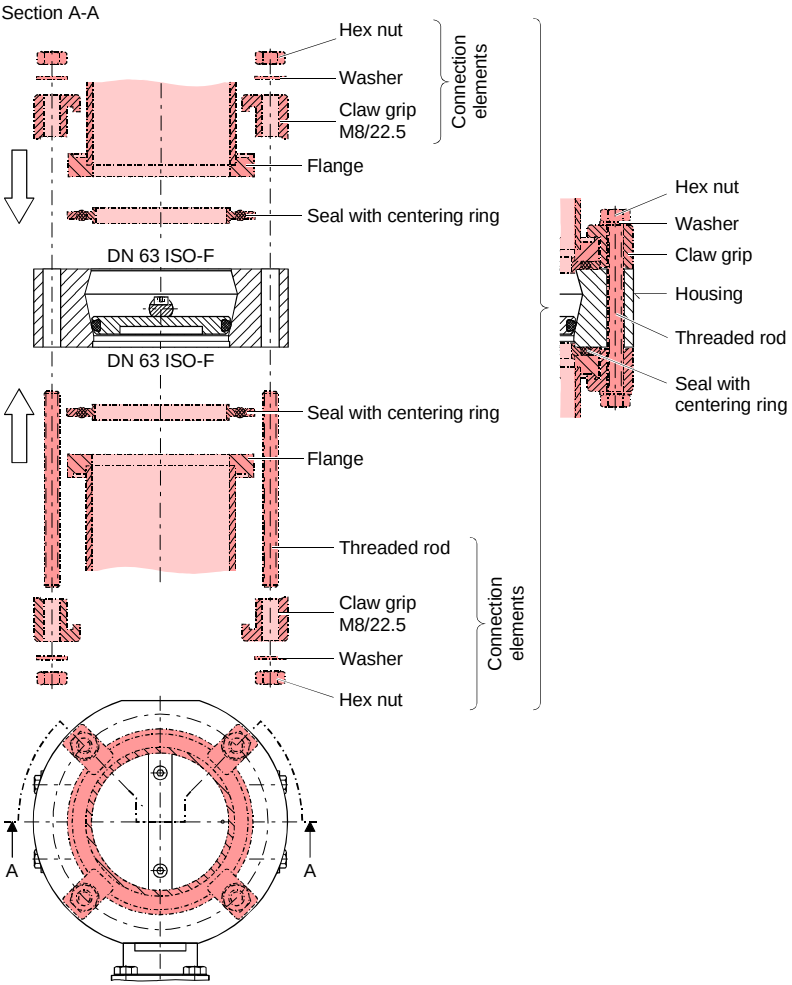
Always wear clean, lint-free gloves and use clean tools when working in this area.

3.1 Accessibility of the Actuator

The actuator assembly of the 21036-PE14-000. can be installed on the opposite side of the valve if this improves the accessibility of the actuator (→ 🗎 42).

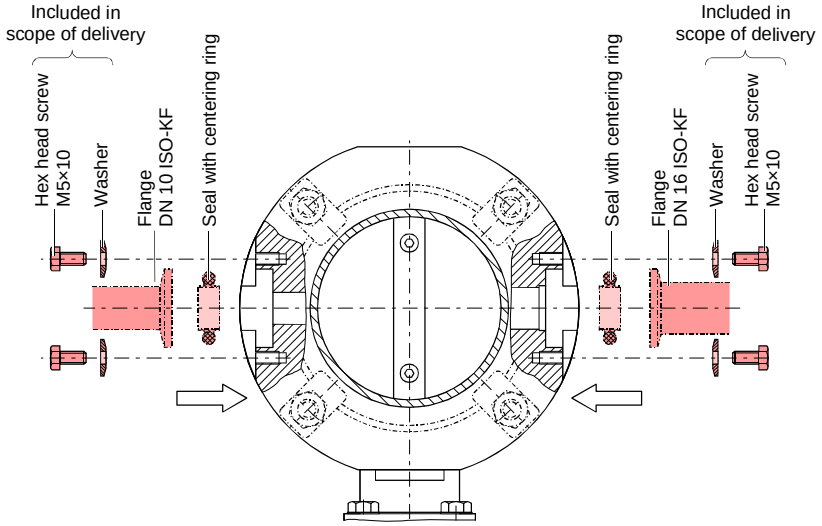
3.2 Vacuum Connections of the 21036-PE14-000.

Axially arranged vacuum connections



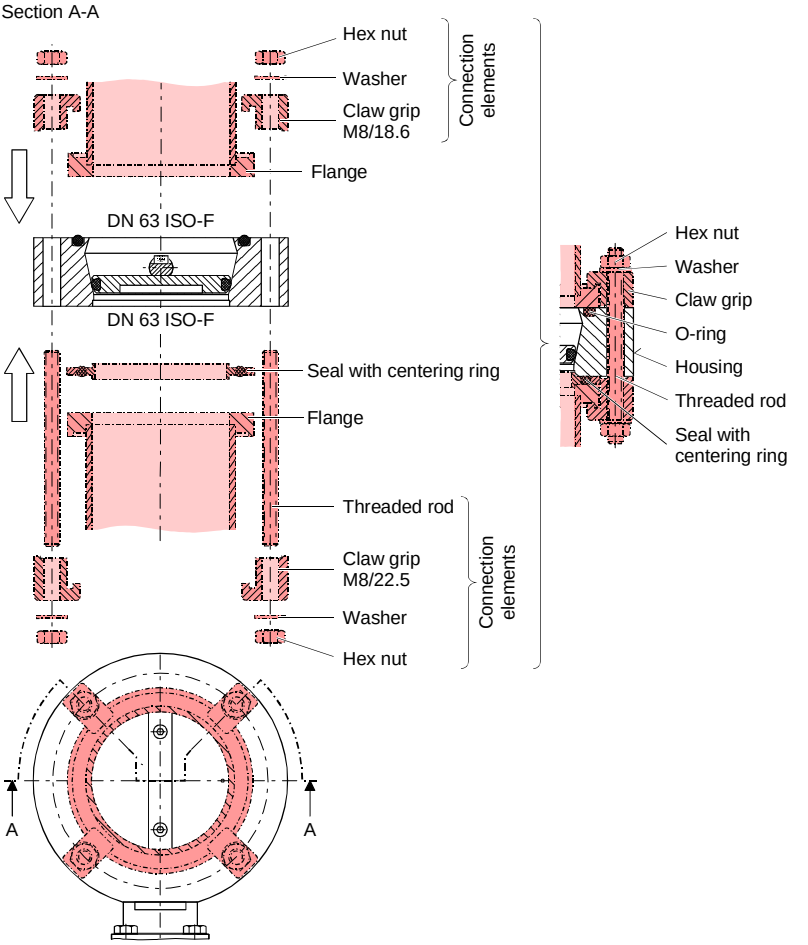
Connection elements → 🗎 67.

Radially arranged
vacuum connections



Cover the small flange connections that are not used with blanking flanges of the corresponding nominal diameter.

3.3 Vacuum Connections of the 21036-PE.4-ABA..



Connection elements → 67.

3.4 Compressed Air Connections

DANGER

DANGER: moving parts

When the product is connected to the supply media, parts can start moving. Moving parts can catch parts of the body and cause injuries.

The connection to the compressed air supply may only be established if

- the compressed air line is not pressurized
- the product is installed in a vacuum system or
- the moving parts are protected to avoid accidental contact.

DANGER

DANGER: compressed air

Unprofessionally handling compressed air can cause physical injury.

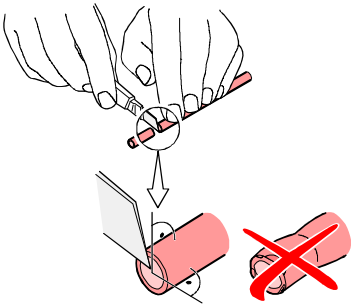
Adhere to the relevant regulations and take the necessary precautions when handling compressed air.

Specifications for the plastic tube:

- OD 6 mm, ID 4 mm
- bursting pressure ≥10 bar (overpressure)
- material: PA soft or PU

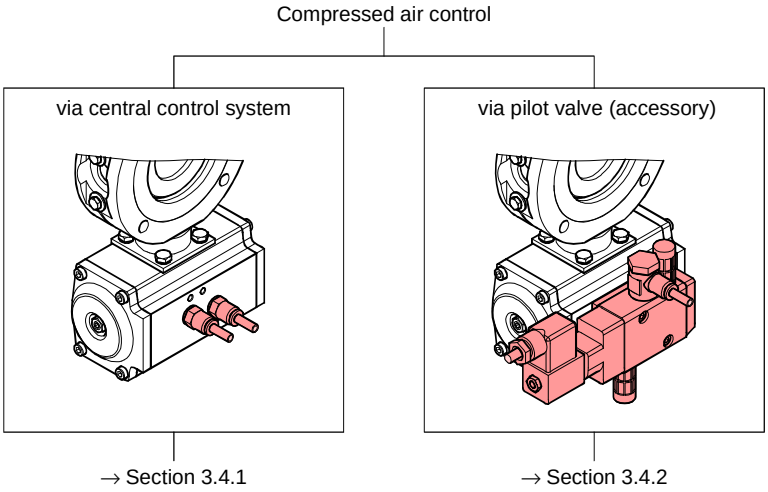
To ensure leak tightness:

- cut the plastic tube orthogonally
- make sure the outside of the plastic tube is not damaged



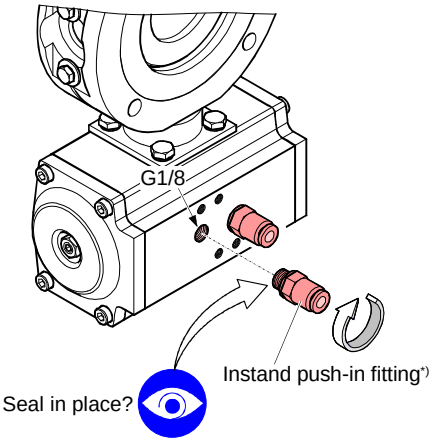
The compressed air must meet the following specifications:

- Purity classes 2 4 1 (ISO 8573-1)
- 4 … 8 bar (overpressure)



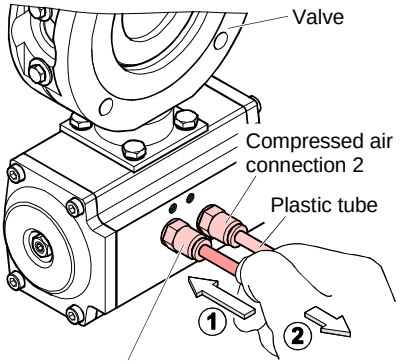
3.4.1 For Central Compressed Air Control System

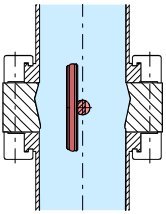
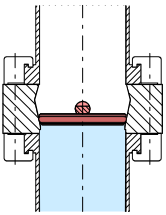
❶ Screw in the instant push-in fittings.



*) To be provided by the end-user

❷ Push the plastic tubes into the instant push-in fittings until the stop position is reached and check for correct mounting by slightly pulling.



	Butterfly valve
Compressed air admitted via connection 4	**open** 
Compressed air admitted via connection 2	**closed** 

3.4.2 For Pilot Valve (Accessory)

3.4.2.1 Voltage Rating

Accessories → 🗎 67.

Caution

Caution: Supply voltage

A wrong supply voltage can destroy the product.

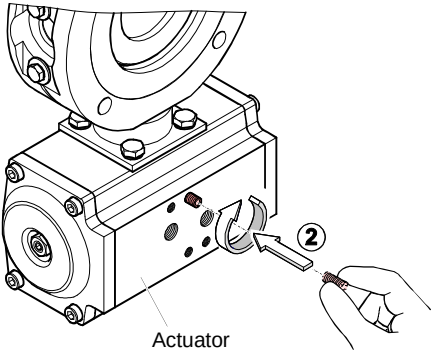
The supply voltage must correspond to the voltage rating of the product (→ solenoid coil). If it does not, please contact your local VAT service center.

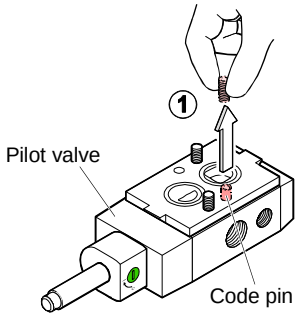
3.4.2.2 Pilot Valve

Screwing the pilot valve to the actuator

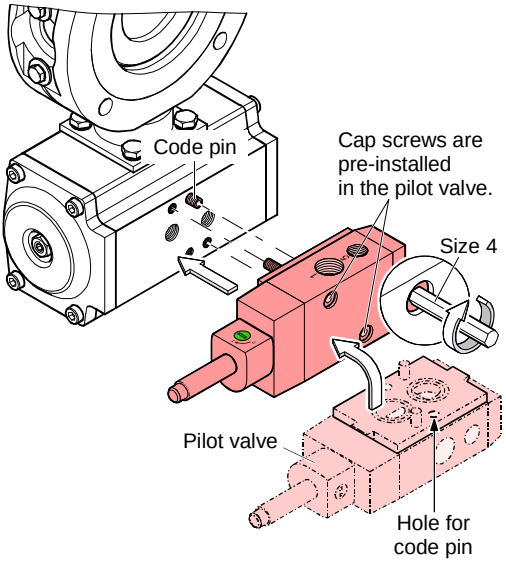
❶ Pull the code pin out of the pilot valve and manually screw it into the actuator until the stop position is reached.

The code pin is now positioned in such a way that the de-energized state of the pilot valve corresponds with the initial position of the actuator (= Butterfly valve "closed").



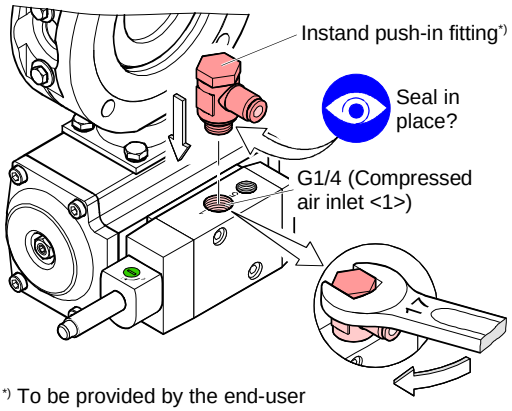


❷ Place the pilot valve on the actuator and tighten the screws.



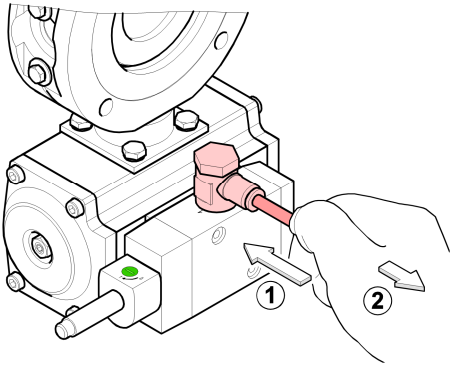
Connecting the compressed air inlet

❸ Screw the instant push-in fitting into compressed air inlet <1>.



*) To be provided by the end-user

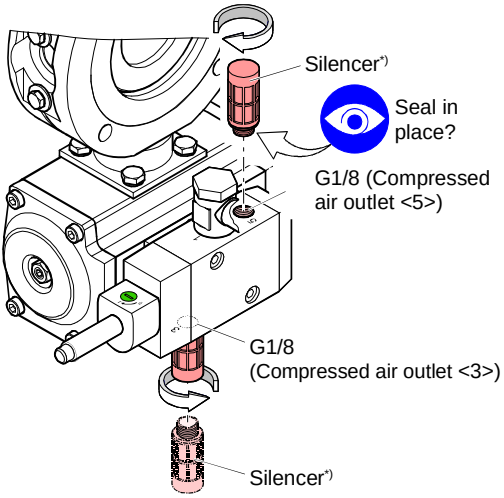
❹ Push the plastic tube into the instant push-in fitting until the stop position is reached and check for correct mounting by slightly pulling.



Connecting the compressed air outlets

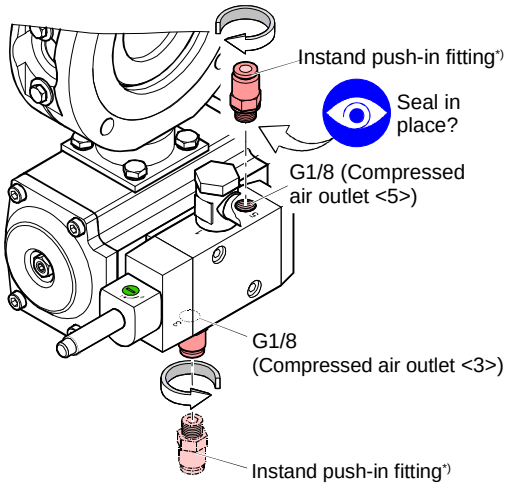
If required ...

❺ ... close compressed air outlets <3> and <5> with silencers, ...



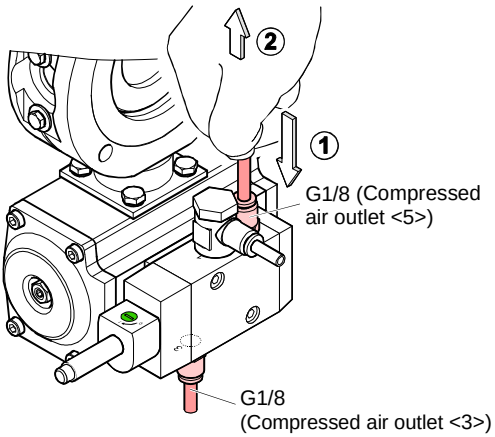
*) To be provided by the end-user

... or screw in instant push-in fittings for the return lines of the compressed air ...



*) To be provided by the end-user

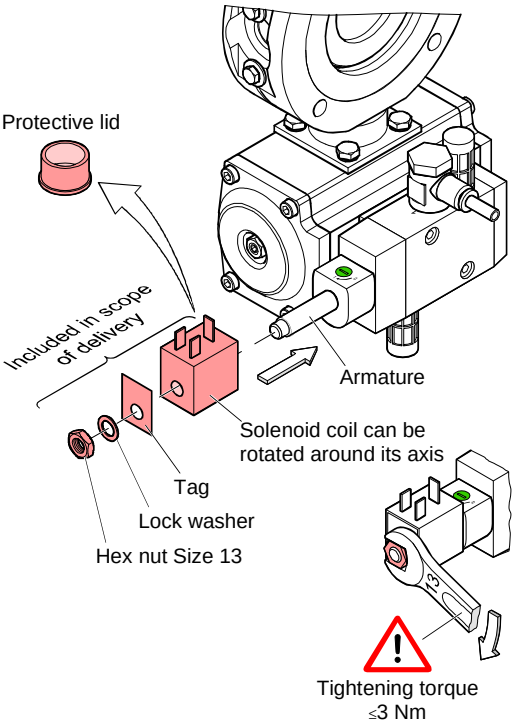
… and push the plastic tubes into the instant push-in fittings until the mechanical stop is reached and check for correct mounting by slightly pulling.



3.4.2.3 Power Connection

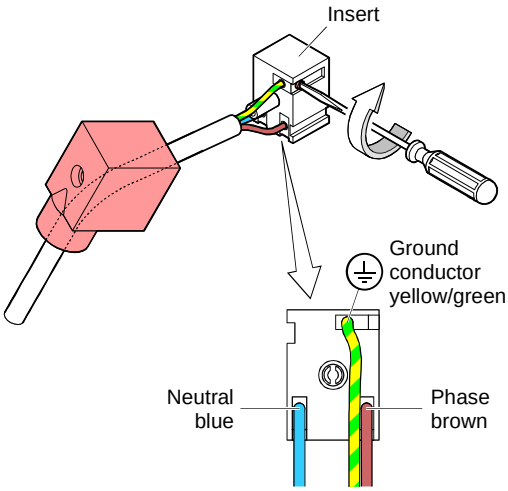
Mounting the solenoid coil

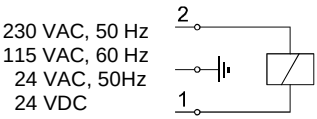
❶ Remove the protective lid.
Slide the solenoid coil, tag and lock washer on the armature and fix them with the hex nut.



Preparing the cable socket

❷ Prepare the cable socket.





The polarity need not be taken into consideration in the 24 VDC version.
For safety reasons, we recommend connecting the ground conductor also in the 24 VDC version.

Connecting the cable socket to the solenoid coil

❸ Mount the seal, plug in the cable socket, and secure it with the screw.

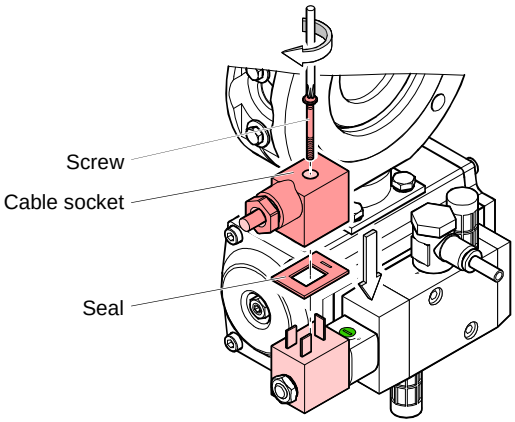
DANGER

DANGER: mains voltage (supply voltage)

Incorrectly grounded products can be extremely hazardous in the event of a fault.

Use only a 3-conductor power cable (supply cable) with protective ground. The power connector may only be plugged into a socket with a protective ground. The protection must not be nullified by an extension cable without protective ground.

Before connecting or disconnecting the product, turn off the control system.



3.5 Position Indicator (Accessory)

Accessories → 🗎 67.

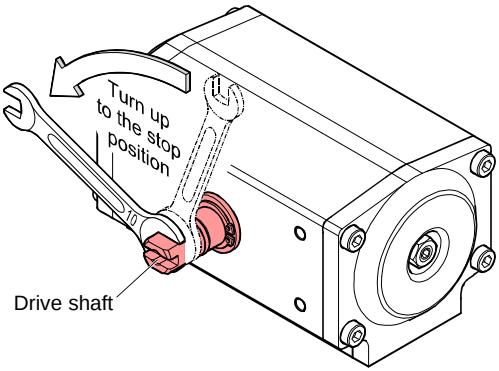
The position indicator signals that the valve plate has reached one of its final positions (open or closed).

Precondition

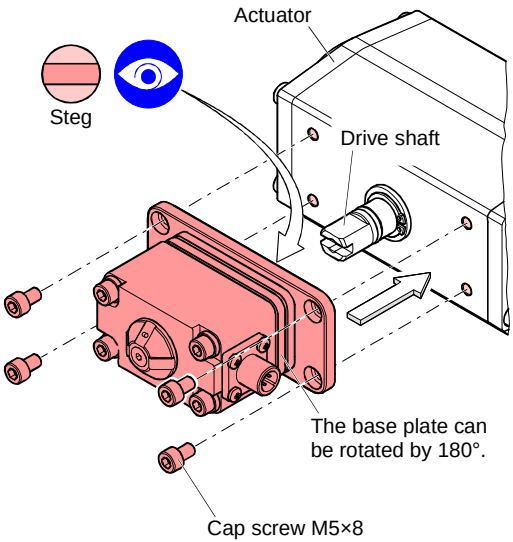
Butterfly valve closed.

This is achieved by

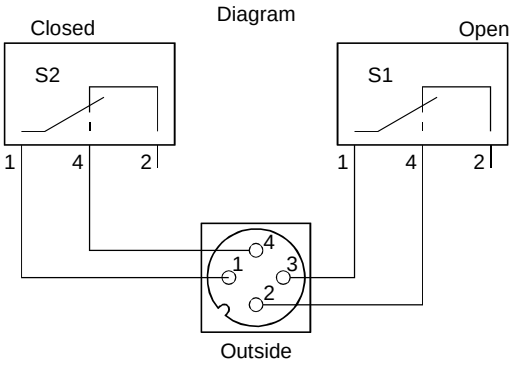
- admitting compressed air to the actuator (→ 🗎 32) or ...
- ... turning the drive shaft counter-clockwise until the stop position is reached.



❶ Slide the base plate of the position indicator on the drive shaft and mount it to the actuator with four cap screws.



❷ Make a cable according to the following diagram.



❸ Plug in the cable socket and secure it with the coupling ring.

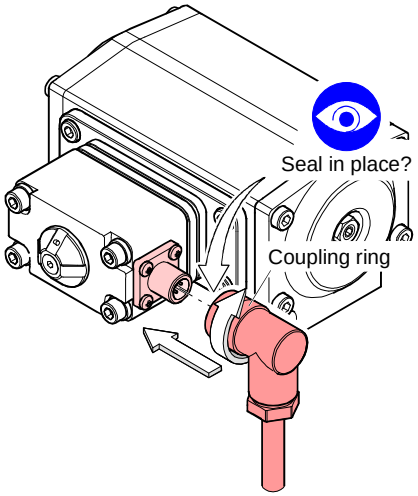
DANGER

DANGER: mains voltage (supply voltage)

Incorrectly grounded products can be extremely hazardous in the event of a fault.

Use only a 5-conductor power cable (supply cable) with protective ground. The power connector may only be plugged into a socket with a protective ground. The protection must not be nullified by an extension cable without protective ground.

Before connecting or disconnecting the product, turn off the control system.

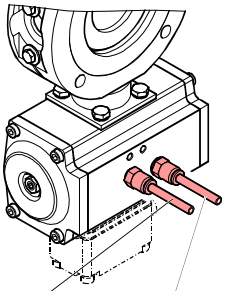
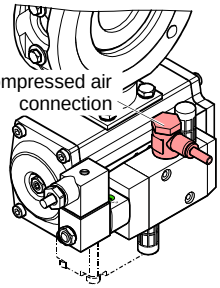
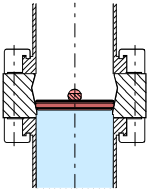
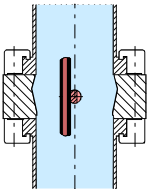


4 Operation

The product is ready for operation as soon as it has been installed.

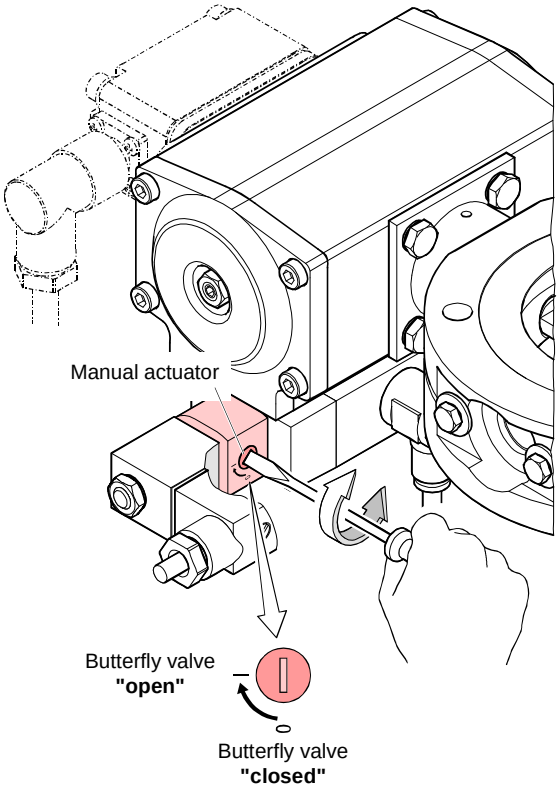
If the valve is operated under harsh or dirty conditions, it should be cleaned / maintained before the specified service time to maintenance (→ "Technical Data") has been reached.

Normal operation

Butterfly valve	Compressed air control by control system		Compressed air control by pilot valve	
	 Compressed air connection 4	Compressed air connection 2	 Compressed air connection	Nominal voltage
closed 	no compressed air admitted	compressed air admitted	compressed air admitted	no voltage supplied
open 	compressed air admitted	no compressed air admitted	compressed air admitted	voltage supplied

Power failure

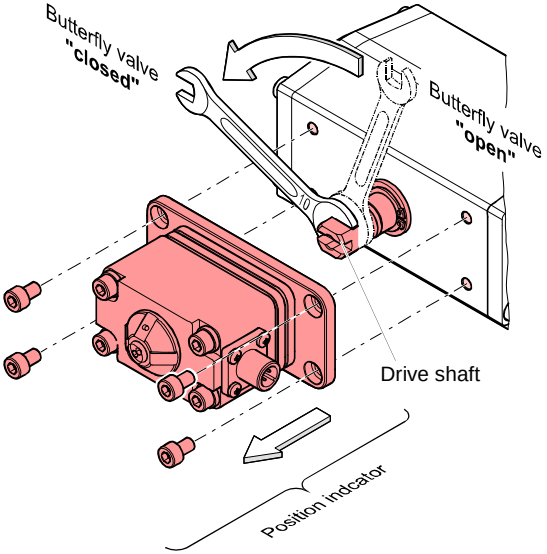
Butterfly valves controlled by the standard pilot valve (→ Accessories) close in the event of a power failure. If such failure occurs and compressed air is admitted, they can be opened and closed via the manual actuator.



Compressed air failure

In the event of a compressed air failure, the valve plate remains in an undefined position if it was moving. If such failure occurs, manually turn the drive shaft to open or close the Butterfly valve.

Precondition: Position indicator removed.



Power and compressed air failure

In the event of a power and compressed air failure, the valve plate remains in an undefined position if it was moving. If such failure occurs, manually turn the drive shaft to open or close the Butterfly valve (→ illustration above).

5 Deinstallation

Preconditions

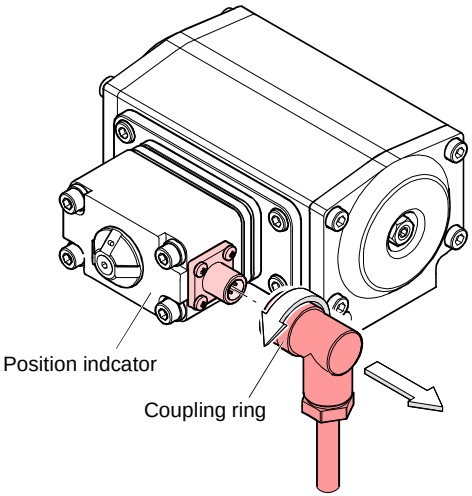
- Butterfly valve closed
- Vacuum system vented

5.1 Power Connections

Before connecting or disconnecting the product, turn off the control system.

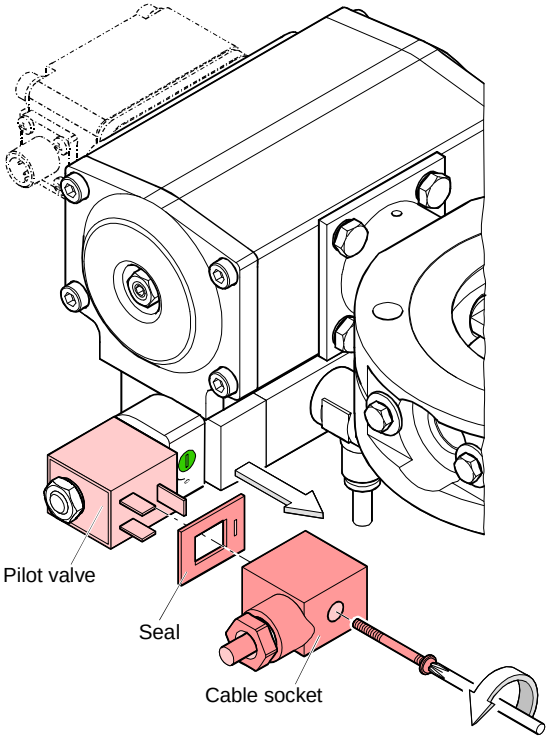
Position indicator

Unfasten the coupling ring and pull out the cable socket.



Pilot valve

Unlock the cable socket and pull it out.



5.2 Compressed Air Connections

DANGER

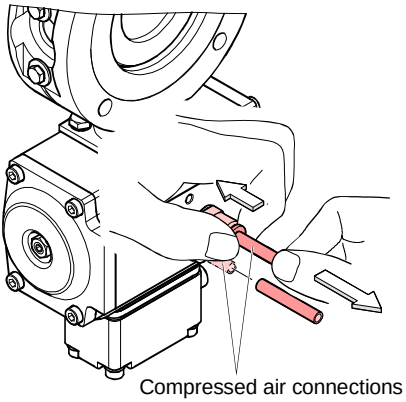
DANGER: compressed air

Physical injury can result if a pressurized compressed air line is disconnected.

Before doing any work, turn off the compressed air supply and relieve the compressed air lines.

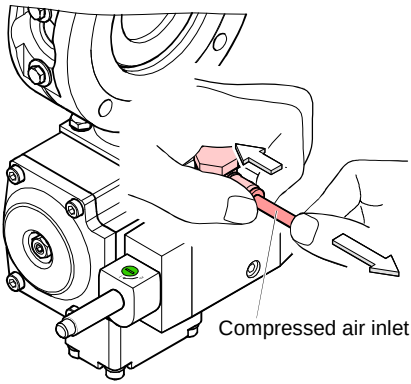
Central compressed air system

Press the ring towards the valve and pull out the plastic tube.

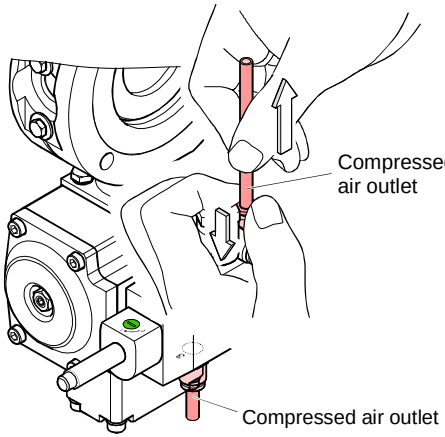


Pilot valve

❶ Press the ring towards the valve and pull out the plastic tube.



❷ Press the rings of the compressed air outlets towards the valve and pull out the plastic tubes.



Silencers that have been installed instead of instant push-in fittings need not be removed.

5.3 Vacuum Connections

DANGER

DANGER: contaminated parts

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Caution

Caution: vacuum component

Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Caution

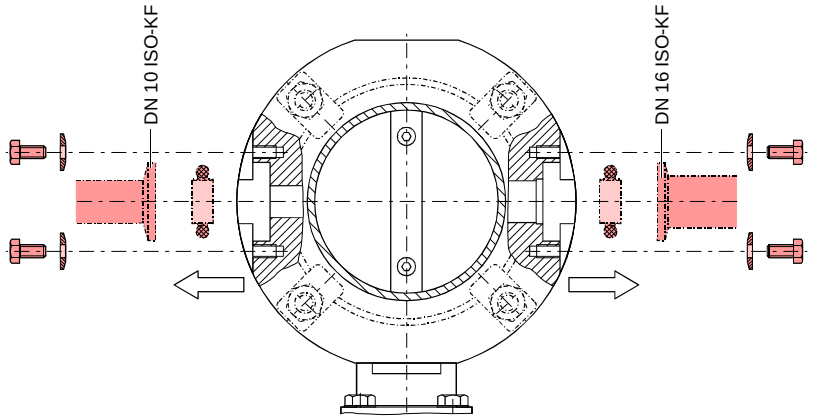
Caution: dirt sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

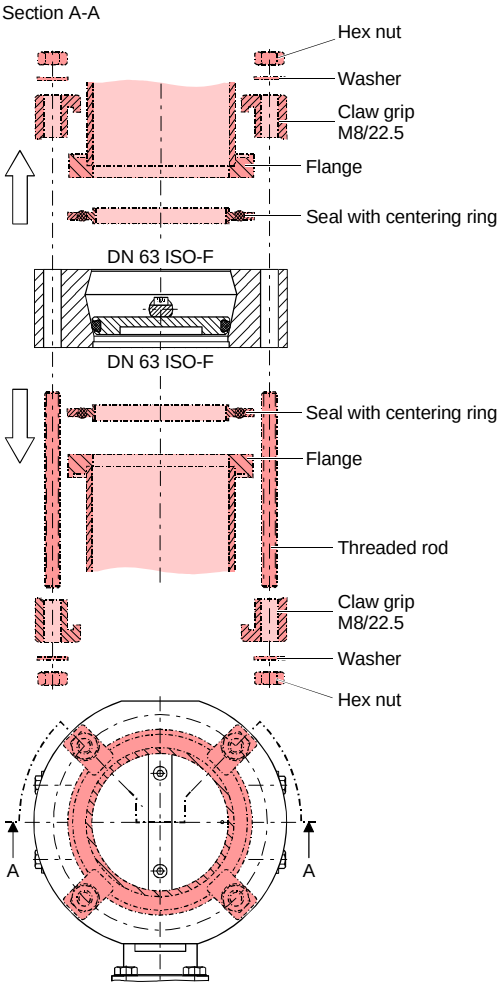
Always wear clean, lint-free gloves and use clean tools when working in this area.

5.3.1 21036-PE14-000.

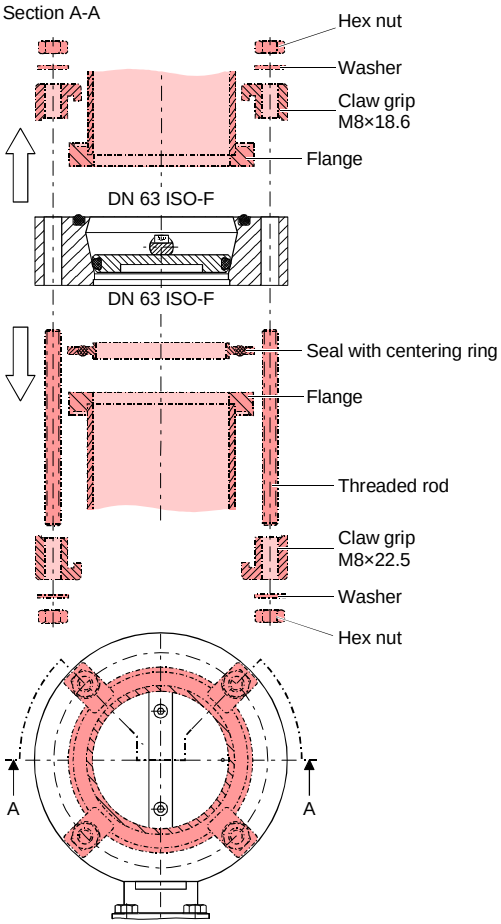
Radially arranged
vacuum connections



Axially arranged
vacuum connections



5.3.2 21036-PE.4-ABA..



6 Maintenance/Repair

DANGER

DANGER: contaminated parts

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Caution

Caution: vacuum component

Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

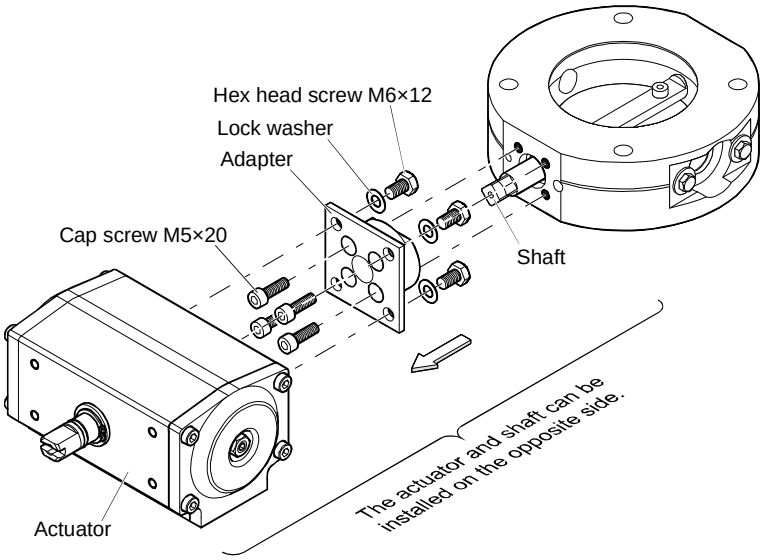
6.1 Disassembling the 21036-PE14-000.

In the following illustrations, the valve is shown without accessories.

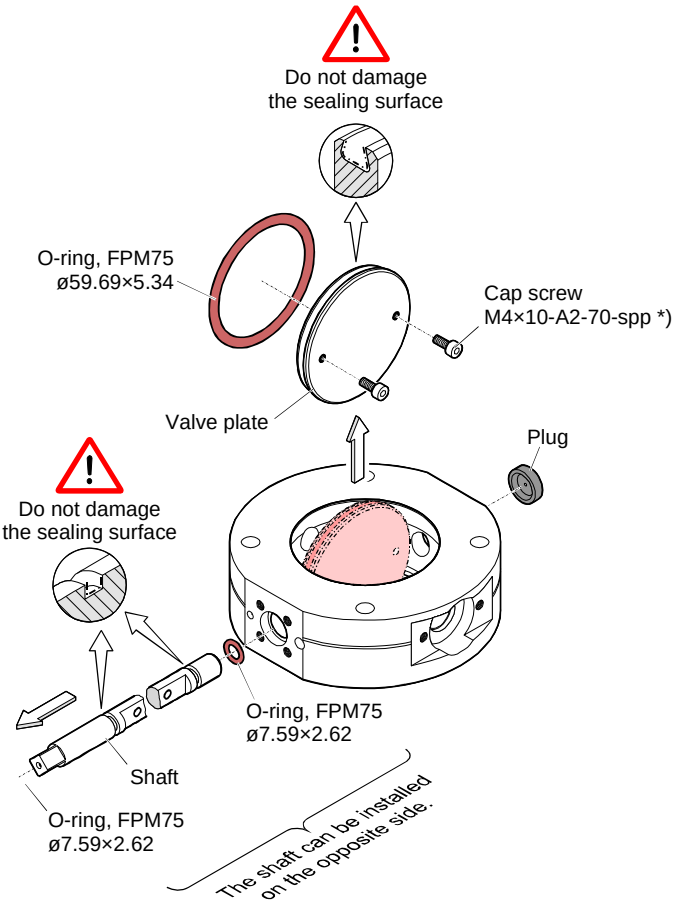
Precondition

Valve deinstalled (→ 🗎 35).

Disconnecting the
actuator and adapter



Deinstalling the valve plate, shaft and O-rings



*) The cap screws are secured with spp (stepstop®) and thus difficult to loosen.

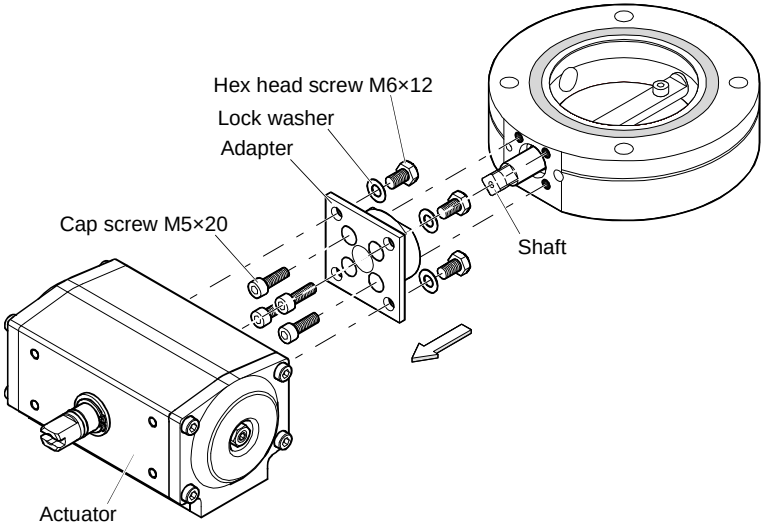
6.2 Disassembling the 21036-PE.4-ABA..

In the following illustrations, the valve is shown without accessories.

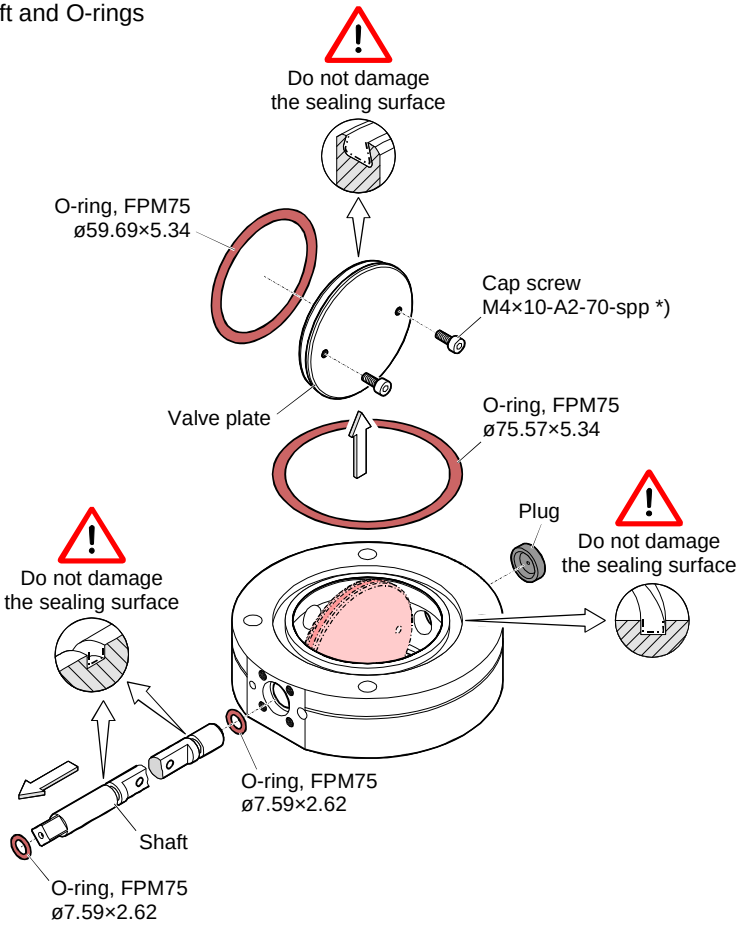
Precondition

Valve deinstalled (→ 🗎 35).

Disconnecting the actuator and adapter



Deinstalling the valve plate, shaft and O-rings



*) The cap screws are secured with spp (stepstop®) and thus difficult to loosen.

6.3 Cleaning the Valve

DANGER

DANGER: cleaning agents

Cleaning agents can be detrimental to health and environment.

Adhere to the relevant regulations and take the necessary precautions when handling cleaning agents and disposing of them. Consider possible reactions with the product materials (→ 🗎 8).

Procedure

- Carefully clean the parts with a grease solving, non-scouring cleaner.
- After cleaning, the parts should preferably be rinsed with alcohol and subsequently heated to ≈50 °C in an oven or with an industrial blower.
- Carefully clean the sealing surfaces with a lint-free cloth moistened with alcohol. Allow them to dry.
- Wipe the seals with a lint-free cloth slightly moistened with vacuum oil.

6.4 Reassembling the Valve

Caution

Caution: vacuum component

Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Caution

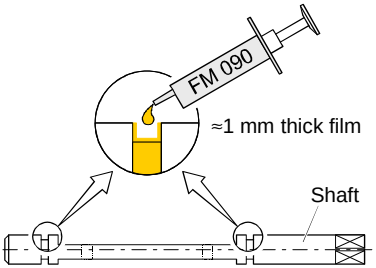
Caution: dirt sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

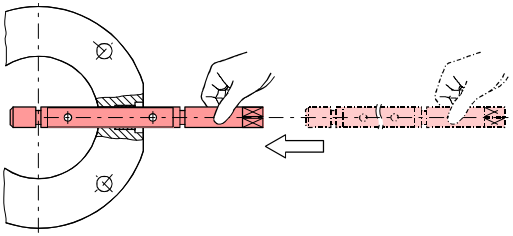
Always wear clean, lint-free gloves and use clean tools when working in this area.

Mounting the O-rings and installing the shaft

❶ Lubricate the sealing groove with high vacuum lubricant FM 090 (Accessories → 🗎 67).



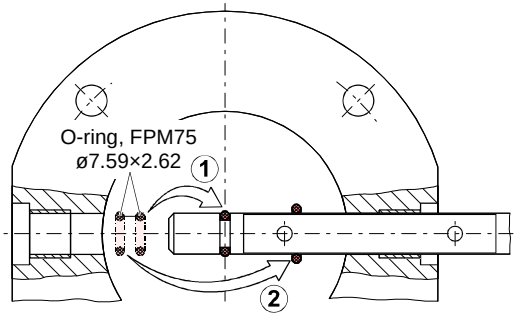
❷ Carefully insert the shaft into the housing.



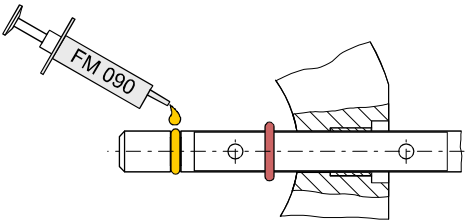
❸ Slide one O–ring from the inside of the housing onto the shaft and insert it level into the groove without twisting it.

Slide the second O–ring over the first one.

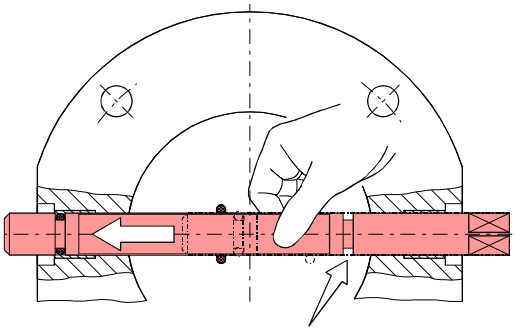
We recommend using new O–rings (Spare parts → 🗎 68).



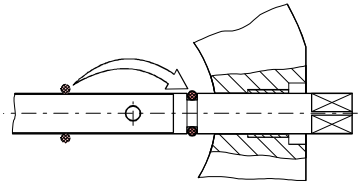
❹ Lubricate the visible surface of the O–ring that has been inserted into the groove with high vacuum lubricant FM 090.



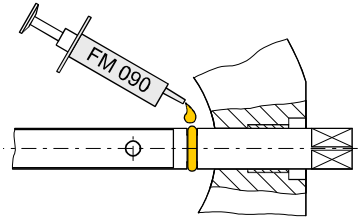
❺ Push the shaft in further until the second groove is visible.



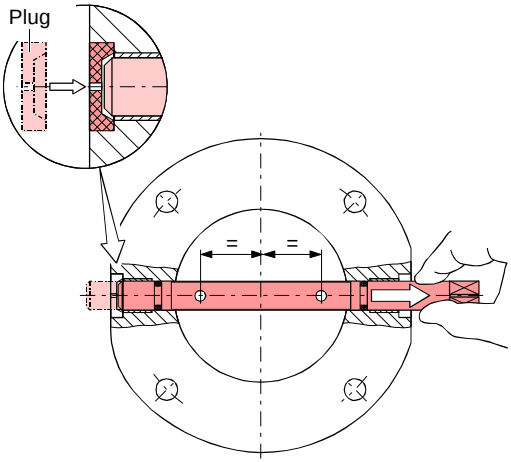
❻ Insert the second O–ring level into the groove without twisting it.



❼ Lubricate the visible surface of the O-ring that has been inserted into the groove with high vacuum lubricant FM 090.



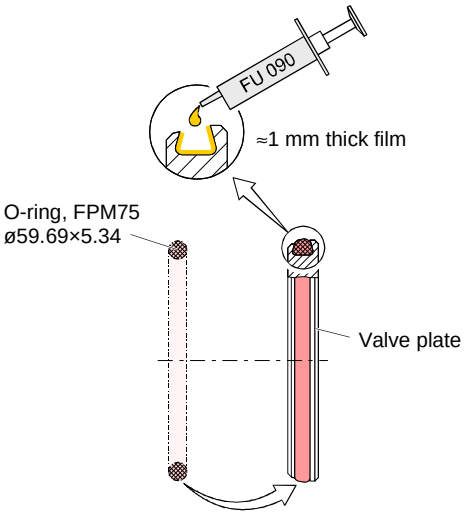
❽ Bring the shaft to the axial position shown in the drawing and insert the plug.



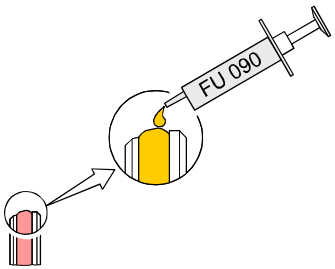
Mounting the O-ring onto the valve plate

❾ Lubricate the sealing groove with high vacuum lubricant FU 090 (Accessories → 🗎 67) and insert the O–ring level into the groove without twisting it.

We recommend using a new O–ring (Spare parts → 🗎 68).

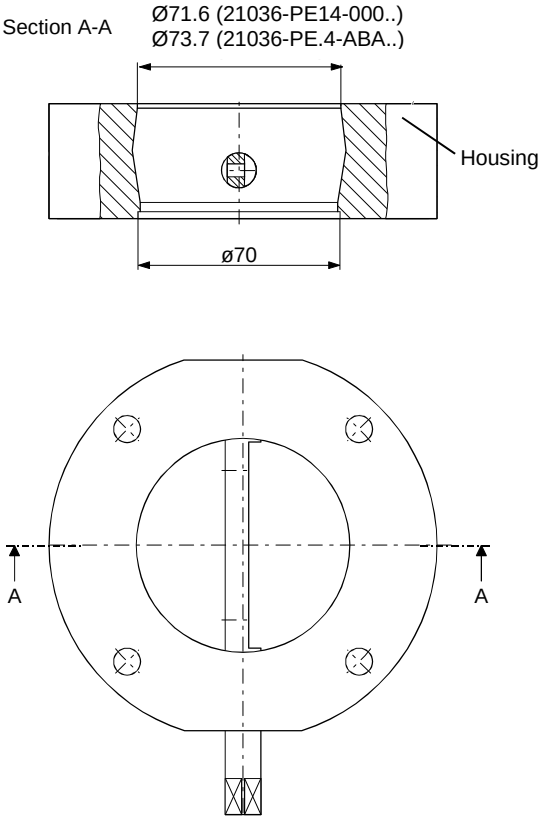


❿ Lubricate the visible surface of the O-ring with high vacuum lubricant FU 090.



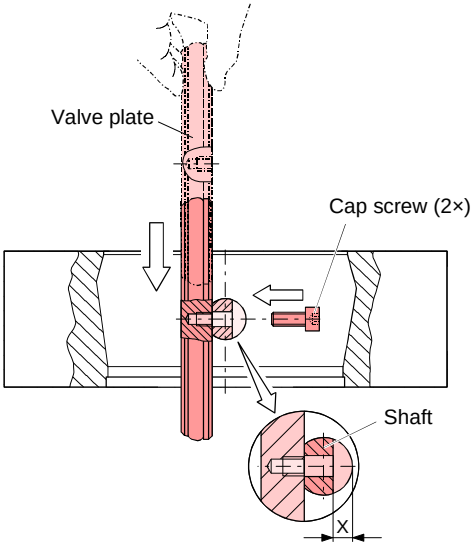
Pre-installing the valve plate

11 Position the housing as shown in the illustration …

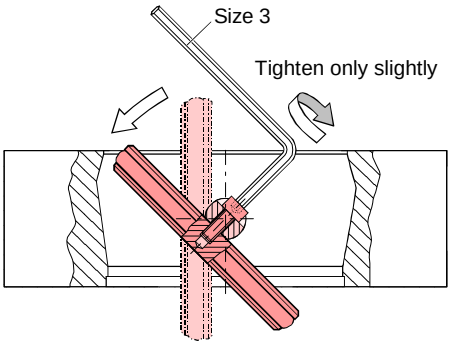


… and carefully insert the valve plate into the housing on the side of milled shaft surface and manually turn in the cap screws.

We recommend using new cap screws (Spare parts → 🗎 68).

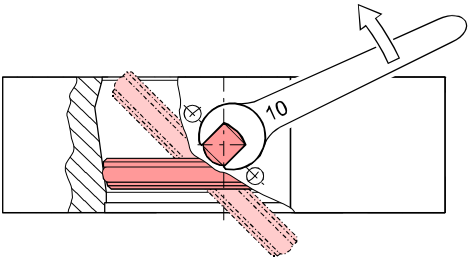


12 Tilt the valve plate by ≈45° and screw it to the shaft.

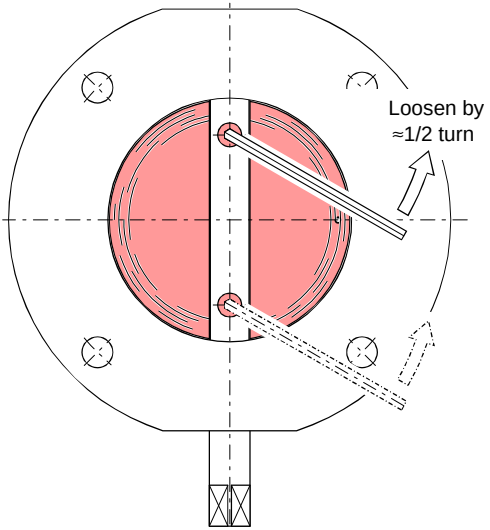


Centering and tightening the valve plate

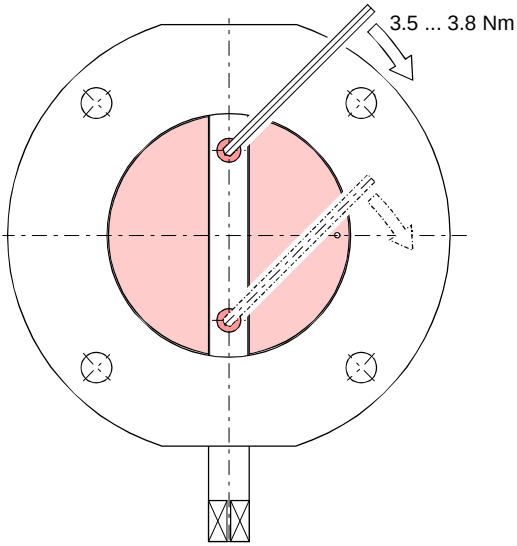
13 Bring the valve plate to the "closed" position by turning the square neck counter-clockwise, e.g. using a wrench.



14 Loosen the cap screws by ≈1/2 turn to allow the valve plate to center itself.

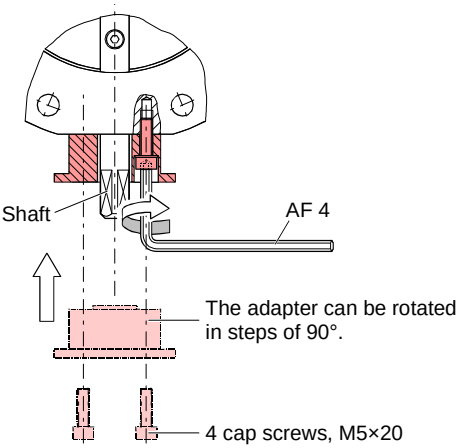


15 Tighten the cap screws to a torque of 3.5 … 3.8 Nm.

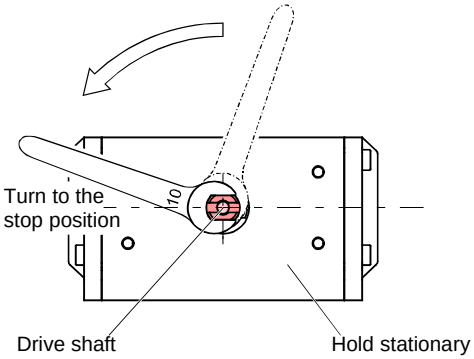


Mounting the actuator

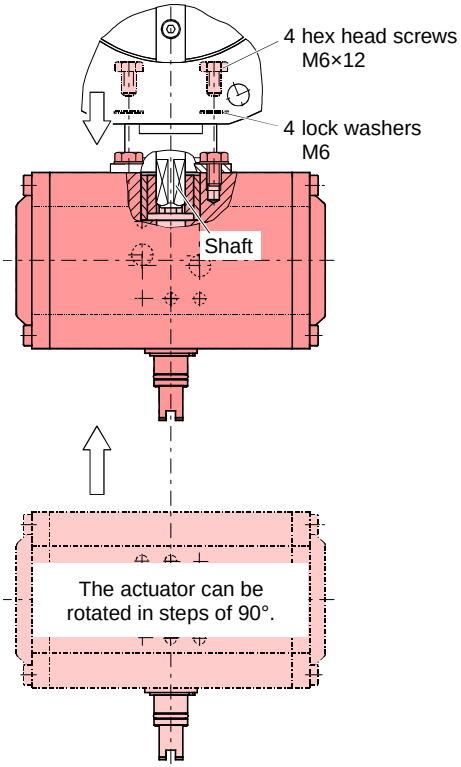
16 Slide the adapter on the shaft and screw it to the housing. Tighten the M5 hex socket cap screws with torque of 4Nm.



17 Make sure the actuator is in its initial position (Butterfly valve "closed"): turn the drive shaft counter-clockwise until the stop position is reached.



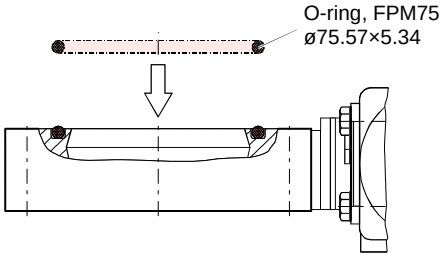
18 Position the actuator on the square neck of the shaft, slide it on the adapter until the stop position is reached, and screw it to the adapter. Tighten the M6 hex head screws with torque of 9Nm.



21036-PE.4-ABA..:
Placing the O-ring in the groove of the housing

19 Insert the O–ring level into the groove without twisting it.

We recommend using a new O–ring (Spare parts → 🗎 68).



6.5 Adjusting the Actuator (Spare Part)

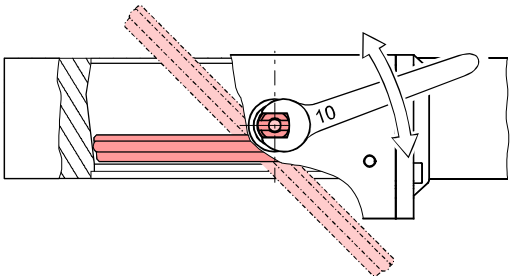
Preconditions

- Valve deinstalled (→ 🗎 35)
- Actuator installed (→ 🗎 56)

Procedure

❶ Perform one switching cycle

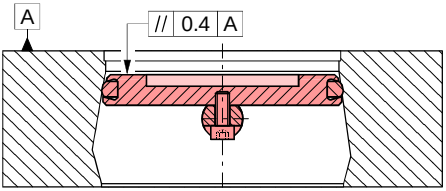
- by admitting compressed air to the actuator, or …
  (Installing pilot valve → 🗎 21)
  (Establishing the compressed air connections → 🗎 17)
  (Establishing the electrical connections → 🗎 26)
- … by manually turning the drive shaft.

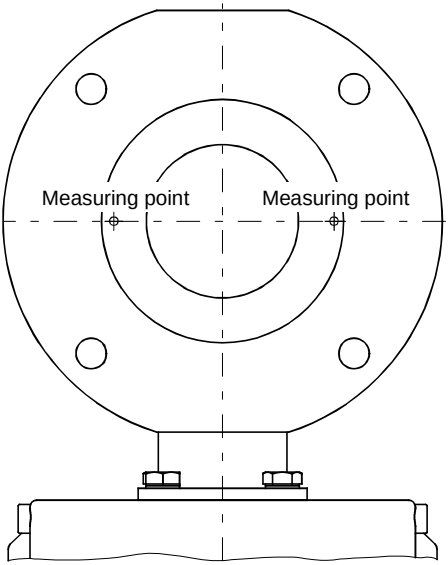


❷ Determine parallelism:

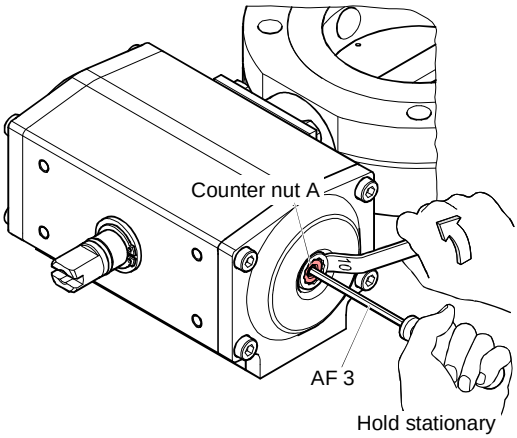
Parallelism ≤0.4 mm: ✓ Adjustment finished

Parallelism >0.4 mm: Go to step ❸

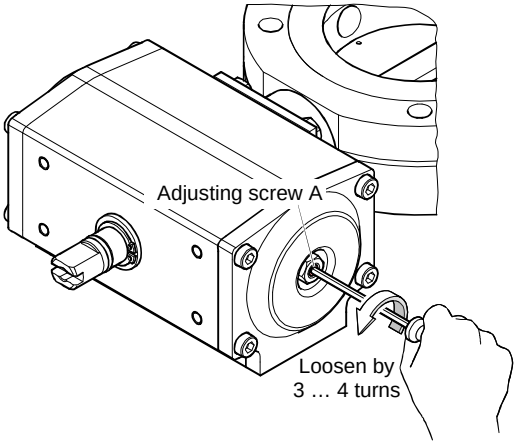




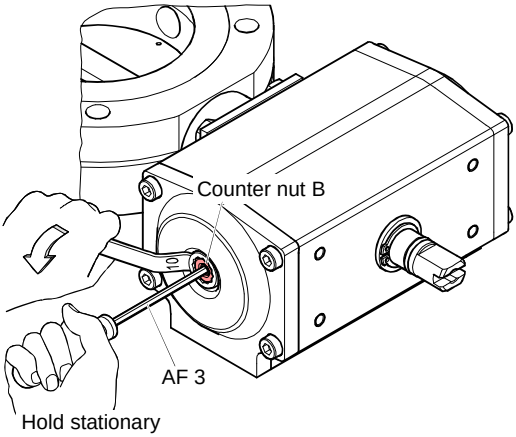
❸ Loosen counter nut A.



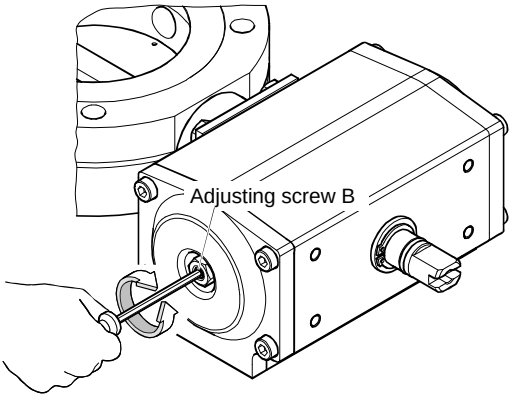
❹ Loosen adjusting screw A by 3 …4 turns.



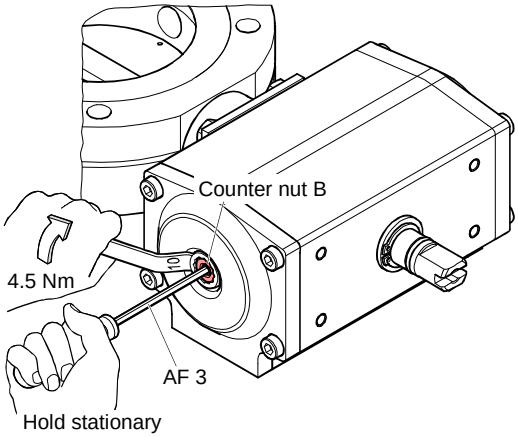
❺ Loosen counter nut B.



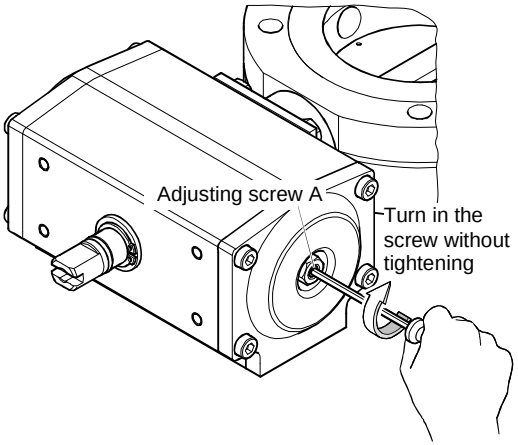
❻ Adjust parallelism of valve plate by turning adjusting screw B.



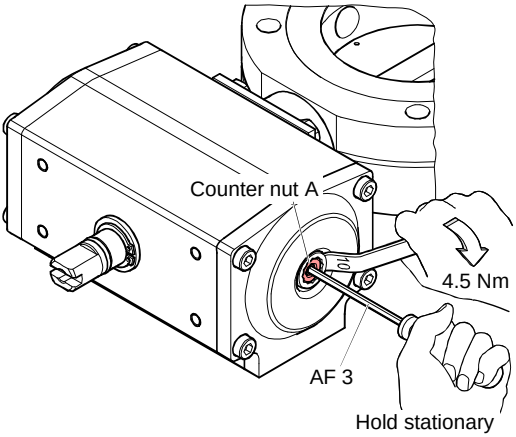
❼ Fasten counter nut B with a torque of 4.5 Nm.



❽ Turn in adjusting screw A to the stop without tightening.



❾ Tighten counter nut A to a torque of 4.5 Nm.

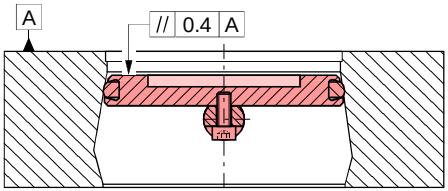


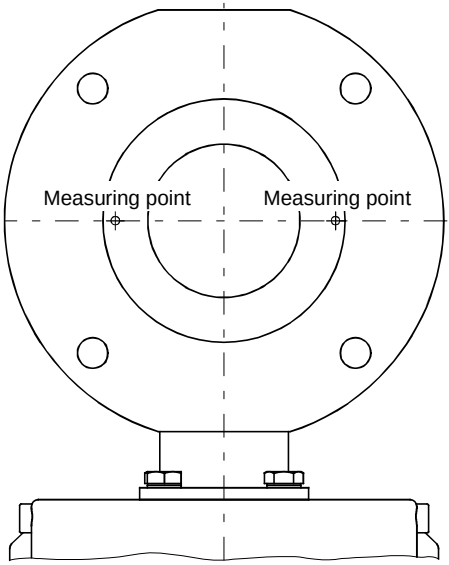
❿ Perform five switching cycles

- by admitting compressed air to the actuator (→ 🗎 32), or ...
- ... by manually turning the drive shaft.

❶ Determine parallelism:

Parallelism ≤0.4 mm: ✓ Adjustment completed
Parallelism >0.4 mm: Repeat adjustment from step ❸.





7 Accessories

Pilot valve

	Ordering number
230 VAC, 50 Hz	586579
115 VAC, 60 Hz	586580
24 VAC, 50 Hz	586581
24 VDC	586582

Further information → 🗎 21.

Position indicator

	Ordering number
Load capacity 230 V, 1 A	587850

Further information → 🗎 29.

Connection elements

	Ordering number
for 21036-PE14-000., comprising 4 threaded rods M8×110 8 claw grips M8/22.5 8 washers 8 hex nuts M8	580672
for 21036-PE.4-ABA.., comprising 4 threaded rods M8×100 4 claw grips M8/22.5 4 claw grips M8/18.6 4 washers 4 hex nuts M8	580683

Further information → 🗎 14 (21036-PE14-000.)
→ 🗎 16 (21036-PE.4-ABA..).

High vacuum lubricant

	Ordering number
FM 090, 30 g	583409
FU 090, 10 g	N-6951-011

8 Spare Parts

Seal kit

	Ordering number
for 21036-PE14-000., comprising 1 O-ring, FPM75, ø59.69×5.34 2 O-rings, FPM75, ø7.59×2.62 2 cap screws, M4×10-A2-70-spp	579965
for 21036-PE.4-ABA.., comprising 1 O-ring, FPM75, ø59.69×5.34 2 O-rings, FPM75, ø7.59×2.62 1 O-ring, FPM75, ø75.57×5.34 2 cap screws, M4×10-A2-70-spp	579980

Actuator

	Ordering number
for 21036-PE14-000./-Z, comprising 1 actuator, 8 bar, 31 Nm	587851

9 Returning the Product

WARNING

WARNING: forwarding contaminated products

Contaminated products (e.g. radioactive, toxic, caustic or biological hazard) can be detrimental to health and environment.

Products returned to VAT should preferably be free of harmful substances. Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a duly completed declaration of contamination. The form can be downloaded from our website www.vatvalve.com.

Products that are not clearly declared as "free of harmful substances" are decontaminated at the expense of the customer.

Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.

10 Disposal

DANGER

DANGER: contaminated parts

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

WARNING

WARNING: substances detrimental to the environment

Products or parts thereof (mechanical and electric components, operating fluids etc.) can be detrimental to the environment.

Dispose of such substances in accordance with the relevant local regulations.

Separating the components

After disassembling the product, separate its components according to the following criteria:

Contaminated components

Contaminated components (radioactive, toxic, caustic, or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and disposed of.

Other components

Such components must be separated according to their materials and recycled.