bürkert
FLUID CONTROL SYSTEMS

MAN 1000716773 EN Version: B Status: RL (released | freigegeben) printed: 22.10.2026

Type 8682

Control head

Operating Instructions

Pioneers of Flow.

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1 About this document

The instructions are an important part of the product and instruct the user on safe installation and operation. The notes and instructions in this set of instructions are mandatory for the use of the product.

- Please read the safety section in full and follow the instructions before using the product for the first time.
- Before working on the product, read and observe the relevant sections of the instructions.
- Store the instructions and keep them to hand for reference, and pass them on to the next user.
- Please contact the Bürkert sales department with any questions.

Further information concerning the product at Products.

- Enter the article number from the type label in the search bar.

The illustrations in these instructions may differ from the product, depending on the variant.

1.1 Symbols

DANGER!

Warns of a danger that leads to death or serious injuries.

WARNING!

Warns of a danger that can lead to death or serious injuries.

CAUTION!

Warns of a danger that can lead to minor injuries.

NOTICE!

Warns of property damage on the product or the installation.

Indicates important additional information, tips and recommendations.

Refers to information in this document or in other documents.

- Indicates a step to be carried out.

✓ Indicates a result.

Menu Indicates a software user-interface text.

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1.2 Terms and abbreviations

The terms and abbreviations are used in this document to refer to following definitions.

Device	Control head type 8682
Ex area	Potentially explosive atmosphere
Ex approval	Approval for potentially explosive atmosphere

1.3 Manufacturer and contact addresses

Manufacturer

Bürkert Fluid Control Systems
Christian-Bürkert-Str. 13–17
74653 Ingelfingen
GERMANY

Contact addresses

The contact addresses are available at .

Need more information or additional products?

- Explore the full range of products on our eShop.

Service and Support

Contact Bürkert Service directly.

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2 Safety

2.1 Intended use

The device has been designed in accordance with chapter Technical data [▶ 25] **for:**

- Use as a control unit for pneumatically operated process valves
- Recording process valve switching positions and their feedback visually and/or to a higher-level programmable logic controller

Prerequisites for safe and trouble-free operation are proper transport, storage, installation, commissioning, operation and maintenance.

The instructions are part of the device. The device is intended exclusively for use within the scope of these instructions. Uses of the device that are not described in these instructions, the contractual documents or the type label can lead to severe personal injury or death, damage to the device or property and dangers for the surrounding area or the environment.

- ▸ Only trained and qualified personnel may install, operate and maintain the device. See qualification of persons in Safety instructions [▶ 9]
- ▸ Use the device only in conjunction with third-party devices and components recommended or approved the manufacturer.
- ▸ Only use devices that are approved for this type of potentially explosive atmosphere. These devices are labelled with the ATEX label on the type label. When using, always observe the details on the type label and the instructions for the potentially explosive atmosphere included in the scope of delivery for the device.
- ▸ Device can be used indoors and outdoors.
- ▸ Device can be used in wet environments.
- ▸ Protect device from environmental influences (e.g. UV radiation, vapours).

2.2 Safety instructions

Qualification of personnel working with the device

Improper use of the device can lead to serious personal injury or death. To avoid accidents when working with the device, the following minimum requirements must be met:

- ▸ Understand the instructions and implement the information contained therein accordingly.
- ▸ Detect and avoid dangers when working on the device.
- ▸ Safely carry out work on the device within the scope of these instructions.

Responsibility of the operator

The operator is responsible for ensuring compliance with local safety regulations, including regulations concerning personnel.

- ▸ Comply with the generally recognized rules of technology.
- ▸ Install the device in accordance with the regulations applicable in the country.
- ▸ Hazards resulting from the location where the device is used must be preventable through appropriate operating instructions provided by the operator.

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Changes and other modifications, spare parts and accessories

Changes to the device, incorrect installation or use of non-approved devices or components create hazards that can lead to accidents and injuries.

- Do not make any changes to the device.
- Do not mechanically load the device.
- Observe the operating instructions of the device or component used.
- Use the device only in conjunction with devices and components recommended or approved by the manufacturer.

Spare parts and accessories that do not meet the manufacturer's requirements may impair the operational safety of the device and cause accidents.

- To ensure operational safety, use only original parts from the manufacturer.

Operation only after proper transport, storage, installation, commissioning, or maintenance

Improper transport, storage, installation, commissioning, or maintenance jeopardises the operational safety of the device and can cause accidents. This can lead to serious personal injury or death.

- Observe all values and limits specified in these instructions to ensure the device's safety and functionality.
- Only carry out work described in these instructions.
- Only carry out work using suitable tools.
- All other work must be carried out by the manufacturer only.

Technical limit values and media

Non-compliance with technical limit values or unsuitable media can damage the device and lead to leaks. This can cause accidents and seriously injure or kill people.

- Comply with limit values. See Technical data [▶ 25] and information on the type label.
- Only feed media into the media ports that are listed in the chapter Technical data [▶ 25].
- Observe the safety data sheet for the media used.

Power supply requirements

- Power the device using one of the following measures and connect the existing inputs and outputs accordingly:
- Limited Energy Circuit (LEC) in accordance with UL/EN 61010-1
- Limited Power Source (LPS) in accordance with IEC 60950
- SELV/PELV with Overcurrent Protection, design complies with UL/EN 61010-1

Medium under pressure

Medium under pressure can seriously injure people. In the event of overpressure or pressure surges, the device or lines can burst. Pneumatic lines that are defective or not securely fastened can come loose and swing around.

- Before working on the device or system, switch off the pressure. Vent or empty the lines.
- Adhere to the permitted pressure ranges of the medium.
- Comply with the permitted temperature ranges of the medium.

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Contaminated pilot air

The control exhaust air of the device can be contaminated with lubricants and damage the health of people and the environment.

- Dissipate control exhaust air appropriately.
- Wear appropriate personal protective equipment when working near the device.

If exhaust air from other processes is used to generate compressed air for the device, seals may be destroyed by the media contained in the exhaust air and cause medium to escape.

- Only use fresh air for generating compressed air for the device.

Electric shock due to electrical components

Touching live parts can result in severe electric shock.

- Switch off voltage before working on the device or system. Secure against reactivation.
- Adhere to any applicable accident prevention and safety regulations for electrical devices.

Electrostatically sensitive components and assemblies

The device contains electronic components that are susceptible to the effects of electrostatic discharging (ESD). Components that come into contact with electrostatically charged persons or objects are at risk. In the worst case scenario, these components will be destroyed immediately or fail after start-up.

- Meet the requirements specified by EN 61340-5-1 to minimise or avoid the possibility of damage caused by a sudden electrostatic discharge.
- Do not touch electronic components when the supply voltage is connected.

Permanent magnet

The target for position detection contains a neodymium permanent magnet.

Permanent magnets generate a magnetic field that can damage or destroy electronic or mechanical components (e.g. pacemakers, data carriers, credit cards, electronic devices).

- People with pacemakers must not expose themselves to magnetic fields.

Permanent magnets are brittle and can cause bruising or splinters in the event of a collision, which can pose a health hazard and damage the permanent magnet.

- Do not remove the permanent magnet from the plastic casing.
- When handling multiple loose target parts, ensure there is sufficient distance between them.

Working on the device

Working on the device before it has been powered down, unauthorised switching-on or unmonitored start-up of the system can cause accidents. This can lead to serious personal injury or death.

- Only work on the device when it is not in use.
- Ensure that the device or system cannot be switched on unintentionally.
- Do not open electrical appliances in a damp environment.
- Following an interruption, restart the process in a controlled manner. Observe the following sequence:
  1. Switch on supply voltage or pneumatic supply.
  2. Pressurise the device with the medium.

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3 Product description

The device is designed for the decentralised automation of pneumatic process valves and is installed directly on the control unit.

3.1 Product overview

Device for single-acting actuators: 1x 3/2-way pilot valve

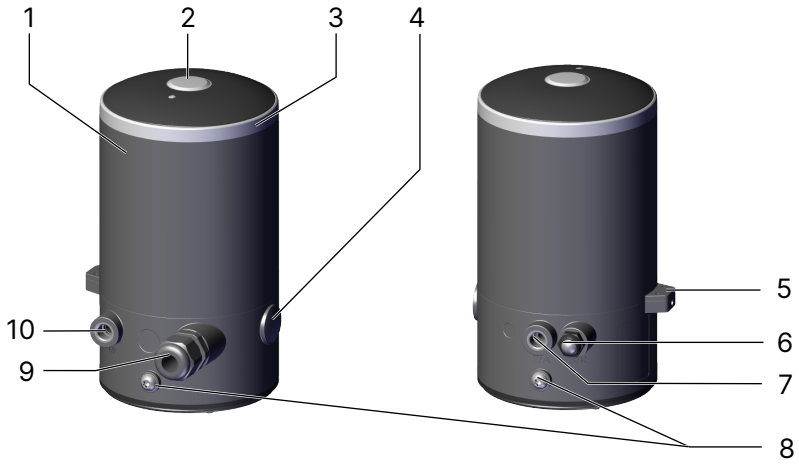

Fig. 1: Design

1	Housing hood	2	Status indicator
3	Position indicator	4	Pressure compensation element and pressure-relief valve
5	Sealing lug	6	Exhaust air port with silencer
7	Working port	8	Fastening screw
9	Electrical connection (example)	10	Compressed air port

Pilot valve: 3/2-way valve (NC), normally closed, pilot air outlet 1/A relieved

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Device for double-acting actuators: 1x 5/2-way pilot valve

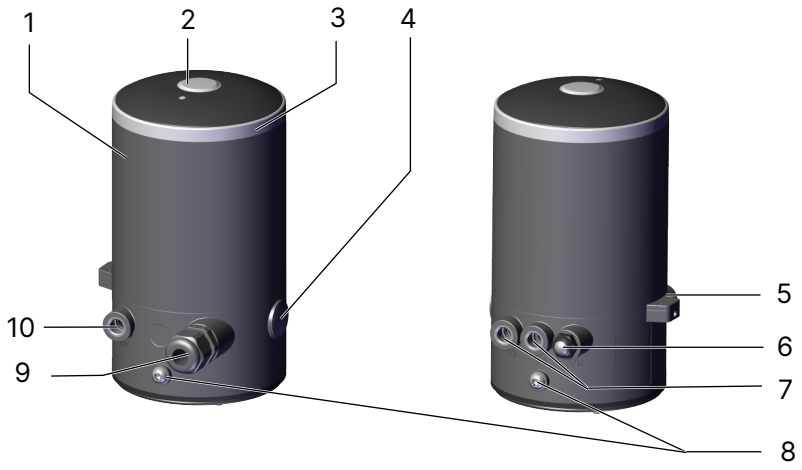

Fig. 2: Design

1	Housing hood	2	Status indicator
3	Position indicator	4	Pressure compensation element and pressure-relief valve
5	Sealing lug	6	Exhaust air port with silencer
7	Working port	8	Fastening screw
9	Electrical connection (example)	10	Compressed air port

Pilot valve: 5/2-way valve, in rest position pilot air outlet 2/B pressurised, pilot air outlet 4/A relieved

Position feedback indicator: without pilot valve

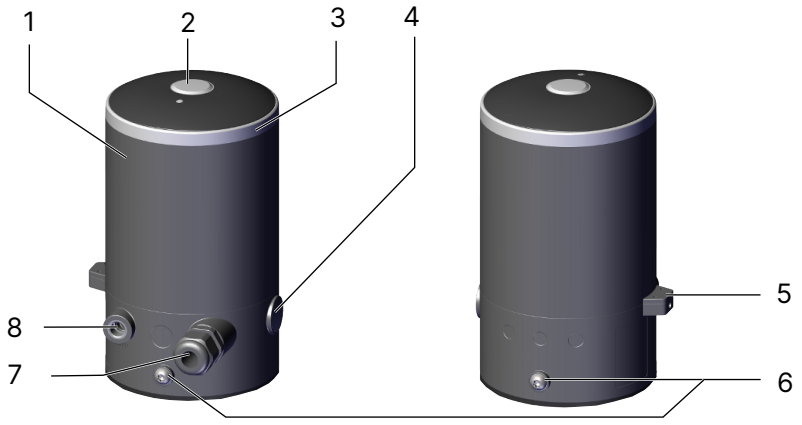

Fig. 3: Design

1	Housing hood	2	Status indicator
3	Position indicator	4	Pressure compensation element and pressure-relief valve
5	Sealing lug	6	Fastening screw
7	Electrical connection	8	Port closed with stopper

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3.2 Product identification

3.2.1 Type label

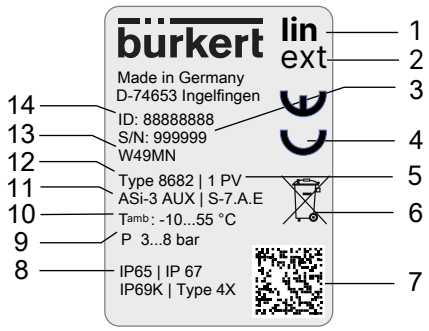

Fig. 4: Type label

1	Type of position sensor (lin = linear, rot = rotary)	2	Air routing of working port (ext = external, int = internal)
3	Serial number	4	CE marking
5	Number of pilot valves	6	Indication for disposal
7	Data matrix code: order number, serial number, link to the instructions	8	Degree of protection
9	Operating pressure	10	Ambient temperature
11	Variant	12	Type
13	Manufacture code	14	Article number

3.2.2 Icons and labelling on the device

Device for single-acting actuators: 1x 3/2-way pilot valve

1/P	Compressed air connection
2/A	Working port
3/R	Exhaust air port

Device for double-acting actuators: 1x 5/2-way pilot valve

1/P	Compressed air connection
2/B	Working port
4/A	Working port
3/R	Exhaust air port

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Labelling inside, cover top:

1, 2, 3, 4	Labelling of keys and LEDs
	Exhaust air throttle

Labelling inside, valve adapter:

R	Exhaust air throttle

Labelling inside, circuit board cover:

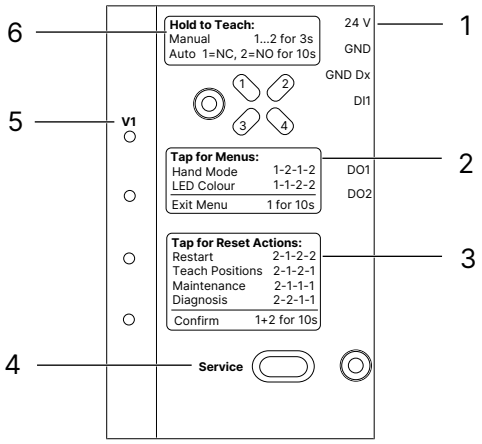

Fig. 5: Labelling

1	Terminal labelling (example)	2	Numeric codes for menu functions
3	Numeric codes for reset functions	4	Service interface
5	Pilot valve LED	6	Start teach functions

3.3 Display elements

3.3.1 Status indicator

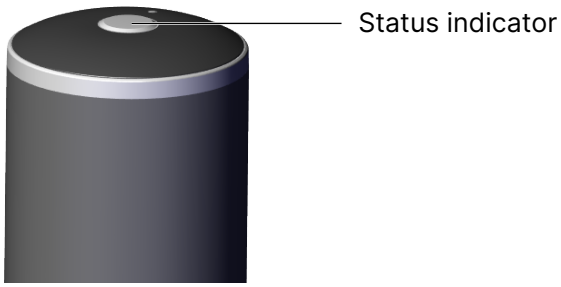

Fig. 6: Status indicator

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The status indicator shows the state of the device.
The following operation modes can be set for the status indicator using the Bürkert Communicator software (see Set status indicator [▶ 101]):

- NAMUR operation mode
- LED off

Factory setting: NAMUR operation mode

3.3.1.1 NAMUR operation mode

The status indicator shows the status of the device and its peripherals, based on NAMUR recommendation 107 (NE 107).

If various alerts are present, the status indicator always shines in the colour of the highest prioritised alert (red = outage = highest priority).

Colour	Colour code	Status signal	Description
Red	5	Failure	Output signals are invalid due to a malfunction in the device or its peripherals.
Orange	4	Check function	Work is being carried out on the device, which means that normal operation is temporarily not possible.
Yellow	3	Out of specification	The environmental or process conditions for the device are outside the specified range. Internal device diagnosis indicate problems in the device or process characteristics.
blue	2	Maintenance required	The device is in normal operation, although a function is briefly restricted. ▸ Service device
Green	1	Diagnosis active	Device is running faultlessly, diagnosis are active.

Tab. 1: Status indicator according to NE 107

3.3.1.2 LED off

Displays in: LED off

- Status indicator does not light up.

3.3.2 Position indicator

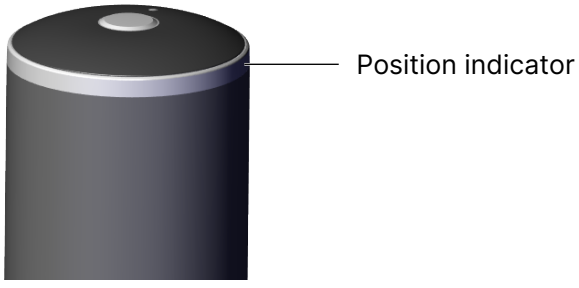

Fig. 7: Position indicator

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The position indicator (RGB LED) displays the valve positions using colours that can be set using the internal keys or the Bürkert Communicator software.

Factory setting:

Valve position	Colour	Backlight mode
S1	Green	is lit
S2	Yellow	is lit

Tab. 2: Colours of the position indicator

Note:
Ex works, the position indicator flashes slowly in white (1 Hz): the teach-in operation is active and awaiting execution.
Once the teach function has been successfully completed, the position indicator lights up in the set colours.

3.3.3 LED indicators for operation (internal)

Variant without communication or with IO-Link:

The status indicator and feedback LEDs (LED 1...4) light up according to the operation performed.
The pilot valve LED indicates the switching position of the pilot valve.

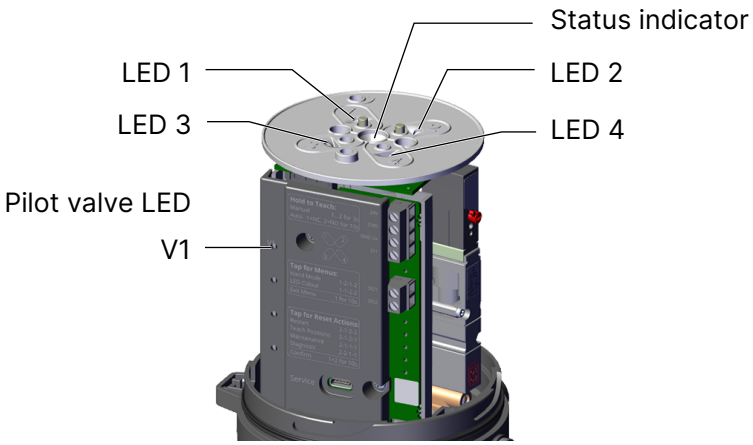

Fig. 8: Internal display elements

LED		Description indicator
Pilot valve LED yellow		Lights up yellow: pilot valve V1 is actuated (on)
LED 1...4, RGB		Light up, flash, are off, depending on the operation performed
Status indicator, RGB		Lit up (NAMUR), flashing (operating menu or function), off, depending on the operating mode

Tab. 3: Display elements

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Variant with AS-Interface:

The status indicator and feedback LEDs (LED 1...4) light up according to the operation performed. The pilot valve LED indicates the switching position of the pilot valve. The PWR LED and FAULT LED light up according to the ASi status.

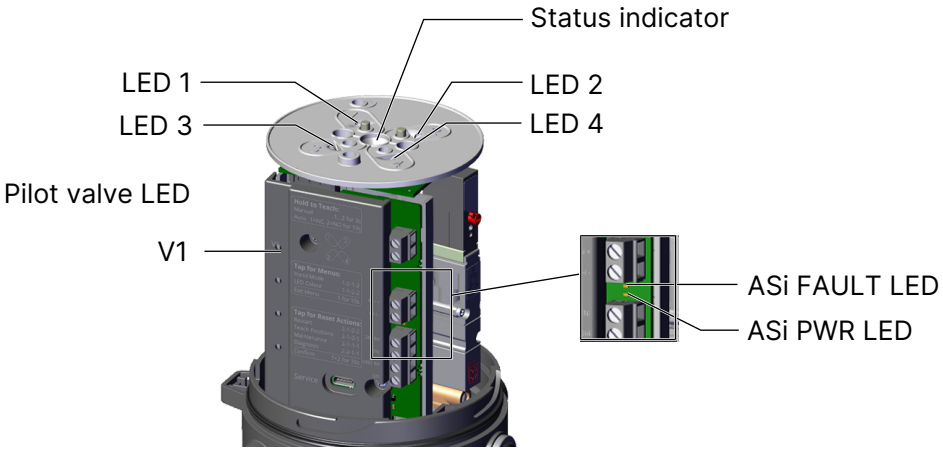

Fig. 9: Internal display elements

LED		Description indicator
Pilot valve LED yellow		Lights up yellow: pilot valve V1 is actuated (on)
LED 1...4, RGB		Light up, flash, are off, depending on the operation performed
Status indicator, RGB		Lit up (NAMUR), flashing (operating menu or function), off, depending on the operating mode

Tab. 4: Display elements

ASi PWR LED green		Indicator of ASi power
ASi FAULT LED red		Indicator of ASi errors

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Indicator of bus status LEDs

ASi PWR LED green		ASi FAULT LED red		
○	Off	○	Off	POWER OFF
●	Lights up green	○	Off	OK
●	Lights up green	●	Lights up red	No data traffic (expired Watch-dog at slave address does not equal 0)
✳	Flashes green	●	Lights up red	Slave address equal to 0
●	Lights up green	✳	Flashes red	Device error with slave reset
✳	Flashes green	✳	Flashes red	Device error (peripheral error[1)])

Tab. 5: Indicator of bus status LEDs

3.4 Operating elements

This chapter provides an overview of the operating elements. The descriptions of the functions can be found in the relevant chapters.

Keys

Keys 1 and 2 are used for operation. The keys are under the housing hood.

You can switch into menus using a numeric code, which is entered using the keys:
for example, changing to the LED menu is done with the numeric code 1-1-2-2
pressing the keys only briefly, <3 s per digit of the numeric code.

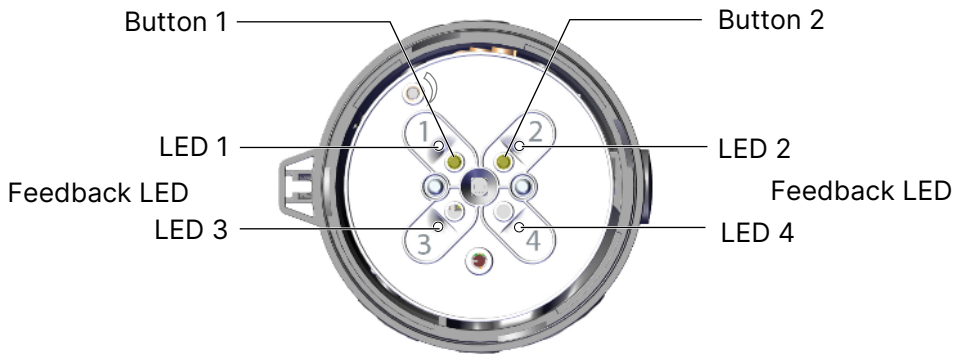

Fig. 10: Operating elements

1) The device is in an error state.
Possible causes: error with the teach function, alarm limits exceeded, internal device error. For further details, connect the device to the Bürkert Communicator (see operating instructions) or contact the Bürkert Service.

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Key	Description of function
1	Press and release within 3...10 s: Start manual teach function 1 for position S1 Press and release >10 s: Start automatic teach function 1 for positions S1 and S2
2	Press and release within 3...10 s: Start manual teach function 2 for position S2 Press and release >10 s: Start automatic teach function 2 for positions S1 and S2

Tab. 6: Key functions

Numeric code	Description of function
1-2-1-2	Switch to MANUAL operating state and the manual menu: • enable or disable pilot valve • Executing the manual teach functions for the end positions
1-1-2-2	Switch to the LED menu: setting the colours and light frequencies of the position indicator for the respective end position ranges
2-1-2-2	Switch to reset function: restart the device
2-1-1-2	Switch to reset function: factory reset
2-1-2-1	Switch to reset function: teach reset
2-1-1-1	Switch to reset function: maintenance reset
2-2-1-1	Switch to reset function: diagnostics reset

Tab. 7: Key functions

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Manual override of pilot valves

The pilot valves can be switched manually for start-up, servicing or in the event of an electrical energy failure. The pilot valves are located under the housing hood.

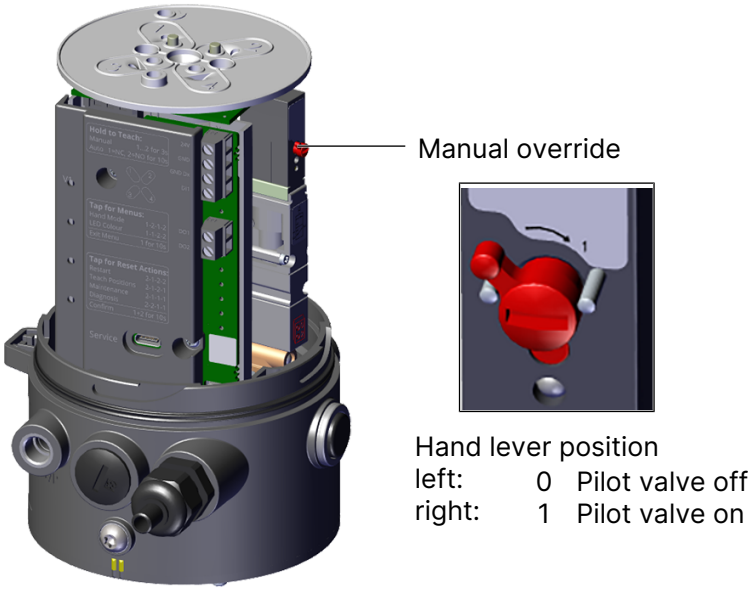

Fig. 11: Manual override

Throttle screw for adjusting the flow or actuation speed

The throttle screw on the pilot valve adjusts the air supply and removal for the working ports and thus the opening and closing speed of the process valve.

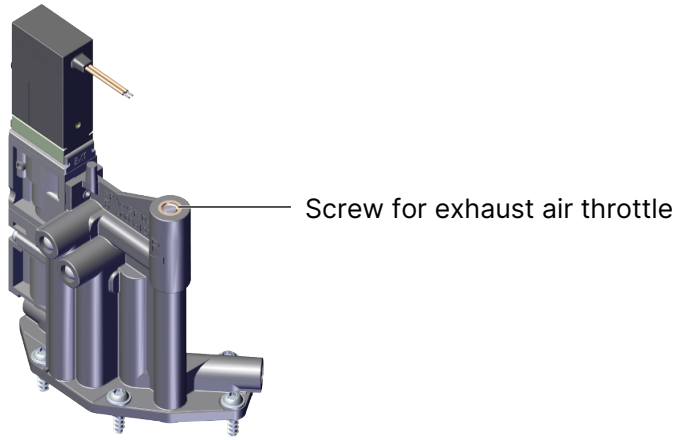

Fig. 12: Throttle screw

3.5 Functionality

3.5.1 How it works

The valve position is detected using a contactless position sensor and a special permanent magnet (target) attached to the valve spindle of the process valve.

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Depending on the variant, the device controls single-acting or double-acting actuators or can be used as a position feedback indicator without a pilot valve.

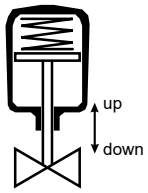
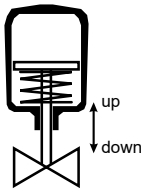
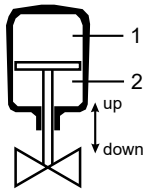
Pilot valves can be switched manually using mechanical or electrical control.

Indicator of valve position with coloured LEDs.

Indicator of device status with coloured LED.

3.5.1.1 Safety end position

Safety end positions after failure of the electrical or pneumatic auxiliary power:

Actuator type	Name	Safety end position after failure of auxiliary power	
		electronic	pneumatic
	single-acting Control function A	down	down
	single-acting Control function B	up	up
	double-acting Control function I	down: port chamber 1 up: port chamber 2	not defined

Tab. 8: Safety end position

Behaviour of pilot valves after failure of bus communication (AS-Interface or IO-Link):

All pilot valve outputs are switched to a programmable safety position. Factory setting: pilot valves "de-energised".

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3.5.2 Software functions

Control functions

Function name and description	Information
SAFEPOS Parameters for the safety position In case of definable critical operating states, the actuator moves to the selectable safety end position	See SAFEPOS: setting parameters for the safety end position [▶ 74]
TEACH.AUTO Automatic teach function One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With TEACH.AUTO, the device performs all the necessary steps automatically	See TEACH.AUTO: start automatic teach function [▶ 76]
TEACH.MANU Manual teach function One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With the TEACH.MANU, the end positions must be taught in manually	See TEACH.MANU: start manual teach function [▶ 77]
TEACH.IN.OP Autom. teach-in during operation One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. The TEACH.IN.OP is used to teach the terminals in parallel during normal operation	Enabled upon delivery. See TEACH.IN.OP: enable/disable teach-in-operation function [▶ 78]
X.CONTROL Parameters for positioning This function contains all adjustable parameters for positioning	See X.CONTROL: set parameter for positioning [▶ 79]
FEEDBACK.LED Parameters for the feedback LED The feedback LED visually indicates the end positions	See FEEDBACK.LED: Set colours and backlight mode of the position indicator [▶ 80]

Tab. 9: Control functions

Diagnostic functions

Diagnostic functions ex works:

Function name and description	Information
TEMP.MONITOR Temperature monitoring Diagnostic function for monitoring the temperature	See TEMP.MONITOR: read temperature values and set warning limits [▶ 85]
VOLT.MONITOR Supply voltage monitoring Diagnostic function for monitoring the supply voltage	See VOLT.MONITOR: read voltage values and set warning limits [▶ 85]

Tab. 10: Diagnostic functions

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Additional diagnostic functions that can be enabled:

Function name and description	Information
SWITCH.CHECK Switching monitoring This diagnostic function monitors whether the actuator is in a different end position within an adjustable time after starting the switching process. A movement without switching is also monitored	See SWITCH.CHECK: monitor the switching movement of the actuator (switch monitoring) [▶ 86]
SWITCH.TIME Switching time monitoring This diagnostics function is used for switching time monitoring. A switching operation starts with the change of the setpoint and ends with the entry into the end position tolerance range	See SWITCH.TIME: monitor switching time [▶ 87]
SEAL.MONITOR Monitoring sealing position This diagnostic function monitors the sealing position. If the sealing position changes, the valve may no longer close tightly	See SEAL.MONITOR: monitor sealed position [▶ 89]
RAPID.MOVE Monitoring rapid movements This diagnostic function monitors sudden, rapid, unintended valve movements that could cause the valve to flow	See RAPID.MOVE: monitoring sudden movements [▶ 91]
COMMON Cross-functional parameters This function contains common cross-functional parameters	Is automatically enabled with the SWITCH.CHECK or SWITCH.TIME functions. See

Tab. 11: Diagnostic functions

Maintenance functions

Additional maintenance functions that can be enabled:

Function name and description	Information
SERVICE.TIME Totalizer for operating duration The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See SERVICE.TIME: set totaliser for operating duration [▶ 95]
TRAVEL.ACCU Totalizer for covered distance The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See TRAVEL.ACCU: recording the distance travelled by the actuator movement [▶ 96]
CYCLE.COUNTER Totalizer for valve cycles The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See CYCLE.COUNTER: setting totaliser for pilot valve cycles [▶ 97]

Tab. 12: Maintenance functions

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4 Technical data

4.1 Standards and directives

This product complies with the legal requirements applicable at the time of placing on the market and has been developed and tested in accordance with the relevant European directives/regulations and harmonized standards. The conformity is documented and, if necessary, supported by evidence. The EU Declaration of Conformity can be found behind the respective type on the home page country.burkert.com

4.2 Operating conditions

Storage temperature	–20...+65 °C
Ambient temperature	–10...+55 °C Variant without pilot valve: –10...+60 °C
Relative air humidity	Max. 90% at 55 °C (no condensation)
Altitude	Up to 2000 m above sea level
Degree of pollution	Degree 2 according to UL/EN 61010-1
Degree of protection (EN 60529 / IEC 60529)	IP65, IP67[2)]
Degree of protection (ISO 20653)	IP69K[2)]
Degree of protection (CSA C22.2 No. 94.2:20 / UL50E	Type 4X[2)]

4.3 Pneumatic data

Pilot valve air flow rate	Restricted delivery condition: $_{QN}$ = 110 l/min (for venting) Maximum typical flow: $_{QN}$ = 200 l/min (for aeration) (Q_N value as defined at an absolute pressure drop from 7 to 6 bar)

Media

Medium pressure	3...8 bar
Medium temperature	–10...+50 °C
Medium	Neutral gases, air Compressed air quality according to ISO 8573-1:

2) With correctly connected cables or plugs and sockets and in compliance with the exhaust air concept in chapter Pneumatic connection [▶ 39].

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Compressed air quality:	
Dust content class 7	Particle size max. 40 µm, particle density max. 10 mg/m³
Water content class 3	Max. pressure dew point -20 °C or min. 10 °C below the lowest operating temperature
Oil content class X	max. 25 mg/m³

Connection

Connection	Threaded connection G 1/8

4.4 Electrical data

4.4.1 Electrical data, no communication

Protection class	III according to DIN EN 61140 (VDE 0140-1)
Operating voltage	24 V ⎓ ±25%, max. residual ripple 10%
Power consumption or power requirement	Max. 2 W, internal power loss Max. 5 W, from the power supply unit (including external loads on the digital outputs)
Communication software	Bürkert Communicator

Current consumption

The maximum current consumption is composed of the following partial currents for the respective load cases and is calculated as follows:

Max. current consumption	Basic current with maximum LED backlight (colour white) + current load for a switched pilot valve[3)] + current load for one active digital output (typically, one digital output is always active)
Basic current with maximum LED backlight	Max. 60 mA @18 V⎓, typically 50 mA @24 V ⎓
Current load for a switched pilot valve[3)] After power reduction	+ max. 25 mA @18 V⎓, typically 20 mA @24 V ⎓
Current load for an active digital output for end position feedback	+ max.$_{load}$ of the externally applied load (see maximum current output of the digital outputs; typical load for a connected digital input of a PLC is 4...6 mA, max. 100 mA)

Example calculation of the maximum total current for designing the Type 8682 power supply:
A pilot valve is enabled, one digital output is active with an external load of 10 mA (e.g. PLC input), the supply voltage at the device is approx. 20 V due to the voltage drop on the supply line:

3) Switching capacity per pilot valve max. 0.9 W for 200 ms after switching on, then 0.6 W power reduction from 200 ms after switching on.

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	60 mA	Basic current at 18 V
	+ 25 mA	Current load after power reduction: one pilot valve at 18 V
	+ 10 mA	Load on an active digital output
Total current =	95 mA	

Connection

Power supply and signals	Cable gland M16 x 1.5 SW22 with dummy plug (clamping range 5...10 mm) with screw-type terminals for cable cross-section 0.14...1.5 mm^2

or

Power supply and signals	Cable gland M16 x 1.5 SW19 (clamping range 2...6 mm) with cable (length: 10 cm or 80 cm) and circular plug-in connector M12 x 1, 5-pin
Communication interface	USB-C service interface

Digital output

Number, type	2 x 24 V⎓ relative to GND operating voltage, PNP (standard, variant with NPN)
Current output	Max. 100 mA per output, short-circuit proof
Output voltage	0 signal ≤ GND + 1 V and 1 signal ≥ operating voltage – 1 V

Digital input

Pilot valve control

Number, type	1 x 24 V⎓ relative to GND operating voltage, PNP (standard, variant with NPN)
input current	Max. 1 mA @30 V ⎓
Input voltage	0 signal = 0...5 V ⎓ 1 signal = 15...30 V ⎓

4.4.2 Electrical data, AS-Interface

Protection class	III according to DIN EN 61140 (VDE 0140-1)
Power consumption or power requirement including max. load on an active digital output	Max. 3 W internal power loss
Watchdog function:	Integrated
Communication software	Bürkert Communicator

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Connection

Supply	Cable gland M16 x 1.5 SW19 (clamping range 2...6 mm) with cable (length from cable bushing: 80 cm) and circular plug-in connector M12x1, 4-pin
Communication interface	USB-C service interface[4]

Operating voltage

System supply AS interface (Pin 1+3)	Via AS interface power supply unit with 26.5 V...31.6 V according to specification ⎓ Accepted input voltage range at the device terminals 21...31.6 V ⎓
Variant with external actuator supply (AUX Power):	
actuator supply (AUX Power) (pin 2+4)	+24 V ⎓ ±25% max. residual ripple 10% The actuator supply must be galvanically isolated from the system supply according to IEC 60664, and for electrical safety according to SELV from IEC 61010-2-201.

Current consumption

The maximum current consumption is composed of the following partial currents for the respective load cases and is calculated as follows:

Max. current consumption	Basic current with maximum LED backlight (colour white) + current load for a switched pilot valve[5]
Variant without external actuator supply:	
Basic current with maximum LED backlight	Max. 80 mA @21 V⎓, typically 70 mA @26.5 V⎓
Current load for a switched pilot valve[5] After power reduction	+ max. 25 mA @21 V⎓, typically 20 mA @26.5 V ⎓
Variant with external actuator supply (AUX Power):	
System supply (Pin 1+3)	Max. 80 mA @21 V⎓, typically 70 mA @26.5 V ⎓

Example calculation of the maximum total current for designing the Type 8682 power supply:
1 pilot valve enabled, bus-powered AS-i3 variant (device powered entirely by AS-Interface), supply voltage at the device is approx. 27 V due to voltage drop on the supply line:

4) A device connected to the USB-C service interface (e.g. a laptop) must have a power supply that is electrically isolated from the ASi power supply unit.

5) Switching capacity per pilot valve max. 0.9 W for 200 ms after switching on, then 0.6 W power reduction from 200 ms after switching on.

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	70 mA	Basic current at 26.5 V
	+ 20 mA	Current load after power reduction 1 pilot valve at 26.5 V
Total current =	90 mA	
Actuator supply (Pin 2+4)	Current load for 1 switched pilot valve[5)] Max. 40 mA @18 V ⎓	

4.4.3 Electrical data, IO-Link

Protection class	III according to DIN EN 61140 (VDE 0140-1)
Communication software	Bürkert Communicator
Power consumption	Max. 3 W

Connection

Supply	Cable gland M16 x 1.5 SW19 (clamping range 2...6 mm) with cable (length from cable bushing: 80 cm) and circular plug-in connector
Supply, IO-Link	Port Class A: circular plug-in connector M12 x 1, 4-pin
Supply, IO link	Port Class B: circular plug-in connector M12 x 1, 5-pin
Communication interface	USB-C service interface

Operating voltage

	For UL approval: control circuit according to NEC Class 2
System supply (Pin 1+3)	24 V ⎓ ±25% (in accordance with specification)
Variant with external actuator supply, port class B only:	
Actuator supply (Pin 2+5)	24 V ⎓ ±25% (in accordance with specification) Actuator supply is galvanically isolated from the system supply iaccording to IEC 60664, and for electrical safety according to SELV from IEC 61010-2-201.

Current consumption

The maximum current consumption is composed of the following partial currents for the respective load cases and calculated as follows:

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Max. current consumption	Basic current with maximum LED backlight (colour white) + current load for a switched pilot valve[6)]
Variant without external actuator supply, only port class A:	
Basic current system supply with maximum LED backlight	Max. 60 mA @18 V⎓, typically 45 mA @24 V ⎓
Current load for 1 switched pilot valve[6)] After power reduction	+ max. 30 mA @18 V⎓, typically 22 mA @24 V ⎓
Variant with external actuator supply, port class B only:	
Basic current system supply with maximum LED backlight	Max. 60 mA @18 V⎓, typically 45 mA @24 V ⎓
Basic current actuator supply	Max. 15 mA @18...30 V ⎓
Current load for 1 switched pilot valve[6)] After power reduction	+ max. 35 mA @18 V⎓, typically 25 mA @24 V ⎓

Example calculation of the maximum total current for designing the Type 8682 power supply:
1 pilot valve enabled, IO-Link port class A variant (device supplied entirely from IO-Link system supply), supply voltage at the device is approx. 20 V due to voltage drop on the supply line:

	60 mA	Basic current at 18 V
	+ 30 mA	Current load after power reduction 1 pilot valve at 18 V
Total current =	90 mA	

4.5 Mechanical data

Dimensions	Refer to data sheet
Weight	Approx. 0.7 kg

Position sensor

Stroke range	Linear position sensor: 0...86 mm
Angular range	Rotary position sensor: 0...359°
Resolution	Linear position sensor: ≤ 0.03 mm
Resolution	Rotary position sensor: ≤ 0.2°
Total error	Linear position sensor: ±0.5 mm over a total stroke of 86 mm
Total error	Rotary position sensor: ±2° over a 360° angular range
Target	Permanent magnet

6) Switching capacity per pilot valve max. 0.9 W for 200 ms after switching on, then 0.6 W power reduction from 200 ms after switching on.

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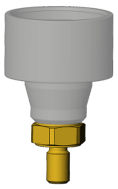
Black target for linear position sensor



White target for rotary position sensor

Materials

Housing	PPE-PS, PPS, PC, stainless steel
	Inside: PA6, ABS
	Seal: EPDM (inside: NBR)
	External screw: stainless steel
Target	POM, brass and neodymium permanent magnet (NdFeB)
Cable gland	PA, seal: NBR
Circular plug	Stainless steel, seal: EPDM, FKM

4.6 Communication

4.6.1 IO-Link

Port class	A	B
IO-Link revision	1.1	
Supply	via IO-Link (M12 x 1, 5-pin, A-coded)	
SIO mode	No	
IODD file	See internet	
VendorID	0x0078, 120	
DeviceID	see IODD file	
ProductID	See IODD file	
transmission speed	COM3 (230.4 kbit/s)	
PD input bits	52	
PD output bits	8	
M-sequence cap.	0x0D	
Min. cycle time	12 ms	
Data storage	Yes	
Max. line length	20 m	

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5 Installation

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

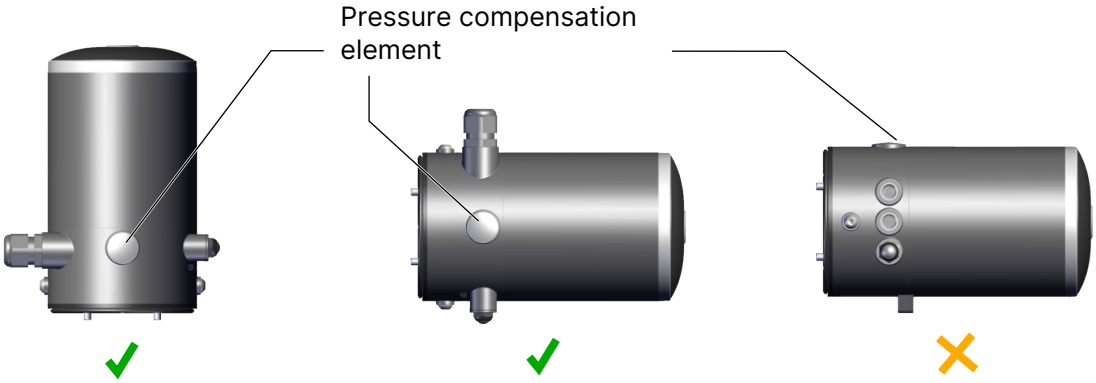
5.1 Install the device

Required parts

- Suitable adapter kit Type KK01, consisting of:
  - Specific guide element for the process valve
  - Specific switch spindle
- Included parts (assembly set):
  - Target for linear movement or rotary movement (packed inside the device)
  - Base plate
  - Washer
  - 4 fastening screws and lock washers
  - Required seals
- Silicone grease for lubricating the seals (recommended: OKS 1110-3 silicone grease)

Installation instructions

- To ensure the effectiveness of the pressure compensation element and prevent moisture from accumulating inside the device, observe the following installation position:



- Install the device so that no dust layer thicker than 5 mm can form, or clean the device regularly.

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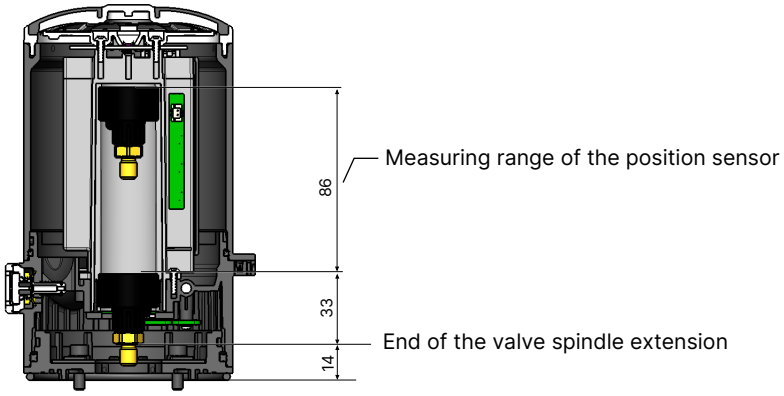


Fig. 13: Linear target position, reference dimensions

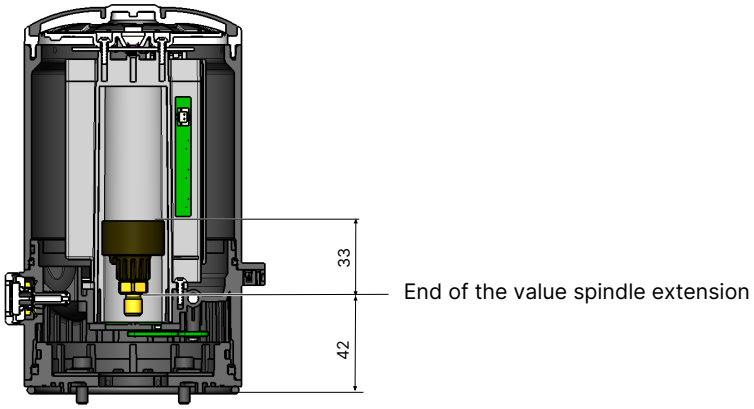
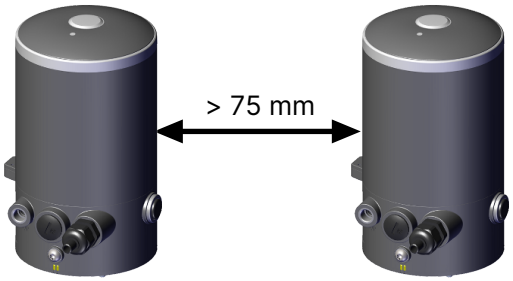


Fig. 14: Rotary target position, reference dimension

- Devices with rotary position sensor:
  NOTICE! Magnetic interference caused by the target magnet: When installing the system, maintain a minimum distance of 75 mm from the nearest device with the same rotary position sensor.



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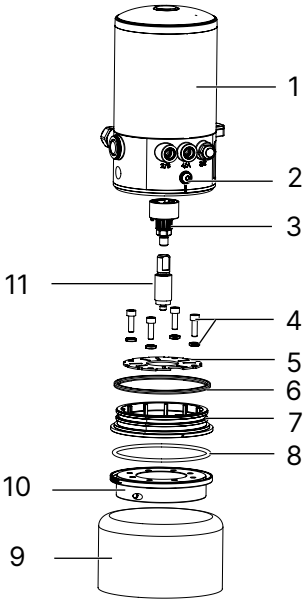

Fig. 15: Installing the device

Assembly kit: 3...8
Adapter kit: 10 and 11

Procedure:

- Mount the target (3) on the switch spindle (11), observing the reference dimensions (tightening torque: 7±0.5 Nm).
- Mount the switch spindle (11) with target (3) on the spindle or spindle adapter of the process valve (9), observing the reference dimensions and tightening torques of the process valve manufacturer.
- Fasten guide element (10) to the process valve (9). Ensure correct centring and sealing conditions. See the corresponding guide element instructions (Type KK01).
- Check position of sealing ring (8).
- Mount the base plate (7) and plain washer (5) on the guide element (10) with 4 fastening screws and lock washers (4) and tighten them in a crosswise pattern (tightening torque: max. 1.5 Nm).
- Check the position of the O-ring (6).
- Loosen locking screws (2) on the device (1) (TX25).
- Place the device (1) onto the base plate (7) (infinitely adjustable through 360°).
- Secure the device using the 2 locking screws (2), tightening torque: 1.5±0.5 Nm.
- If applicable: Fit lead seal to prevent tool-free opening.

5.2 Open and close the device

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

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NOTICE!

Impairment of IP protection in the event of improper handling

- Do not use excessive force to open or close (e.g. by hitting).
- Do not contaminate seals when removing.

Fig. 16: Open and close the device

Opening the device

- Remove lead seal when housing is locked.
- Turn the housing hood approx. 45° anticlockwise when viewed from above and pull it upwards.

Closing the device

- Clean the sealing surface and seal if necessary, and lightly lubricate with silicone grease.
- Place the housing hood onto the lower part so that the internal tabs are positioned over the fastening grooves and the sealing tabs are almost aligned. Press the housing hood fully over the seal of the lower part.
- Turn the housing hood clockwise until it audibly engages (or until the sealing lugs are aligned).
- If applicable: Fit lead seal to prevent tool-free opening.

5.3 Align the device

If necessary, realign the device, especially if the spatial conditions do not allow for the pneumatic lines to be installed properly. This might also be required for operational aspects (accessibility of the manual override) and because of electrical connection possibilities.

NOTICE! Devices with internal air duct cannot be aligned.

- Loosen the locking screws slightly until the device can be rotated.
- Rotate the device until the desired alignment has been achieved.
- Secure the device using the 2 locking screws, tightening torque: 2.5±0.5 Nm.

5.4 Install the device with internal air duct

Required parts

- Suitable adapter kit Type KK01, consisting of:
  – Specific mounting flange for the process valve

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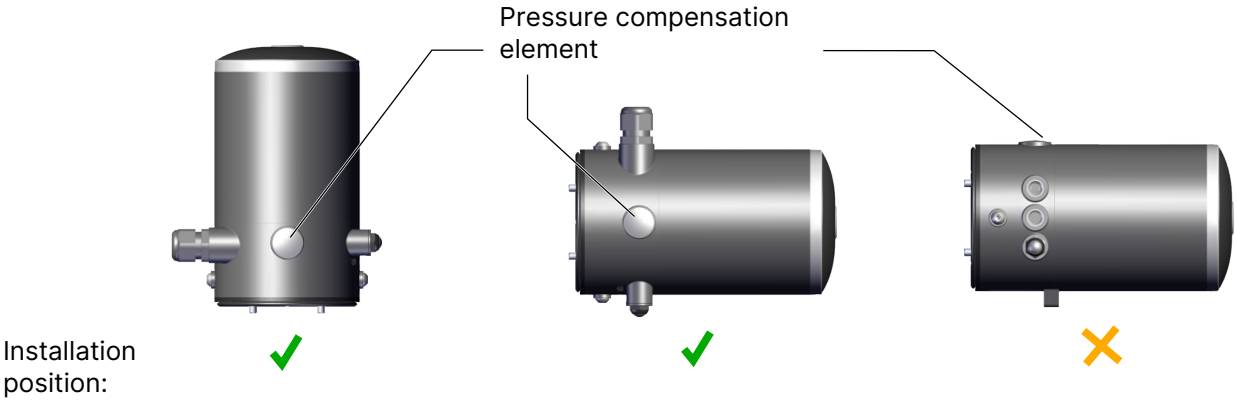
  - Specific valve spindle extension
- Included parts:
  - Target for linear movement or rotary movement (packed inside the device)
  - Base plate
  - Washer
  - 4 fastening screws and lock washers
  - Required seals
- Silicone grease for lubricating the seals (recommended: OKS 1110-3 silicone grease)

Installation instructions

▸ To ensure the effectiveness of the pressure compensation element and prevent moisture from accumulating inside the device, observe the following installation position:



▸ Install the device so that no dust layer thicker than 5 mm can form, or clean the device regularly.

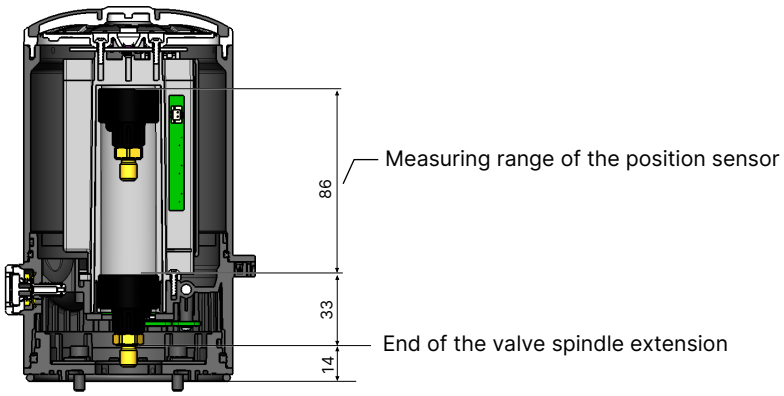


Fig. 17: Linear target position, reference dimensions

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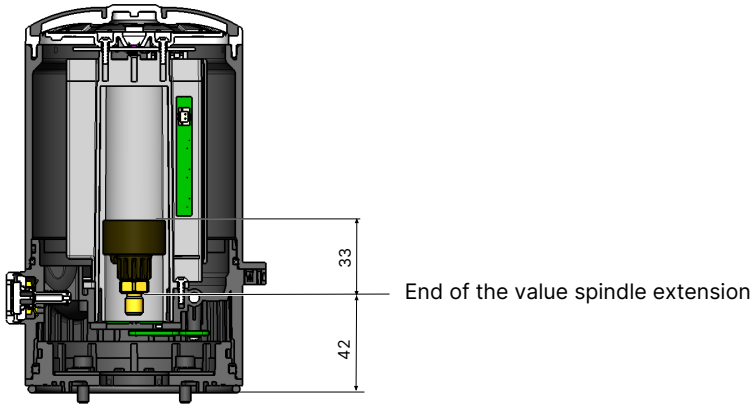

Fig. 18: Rotary target position, reference dimension

- Devices with rotary position sensor:
  NOTICE! Magnetic interference caused by the target magnet: When installing the system, maintain a minimum distance of 75 mm from the nearest device with the same rotary position sensor.

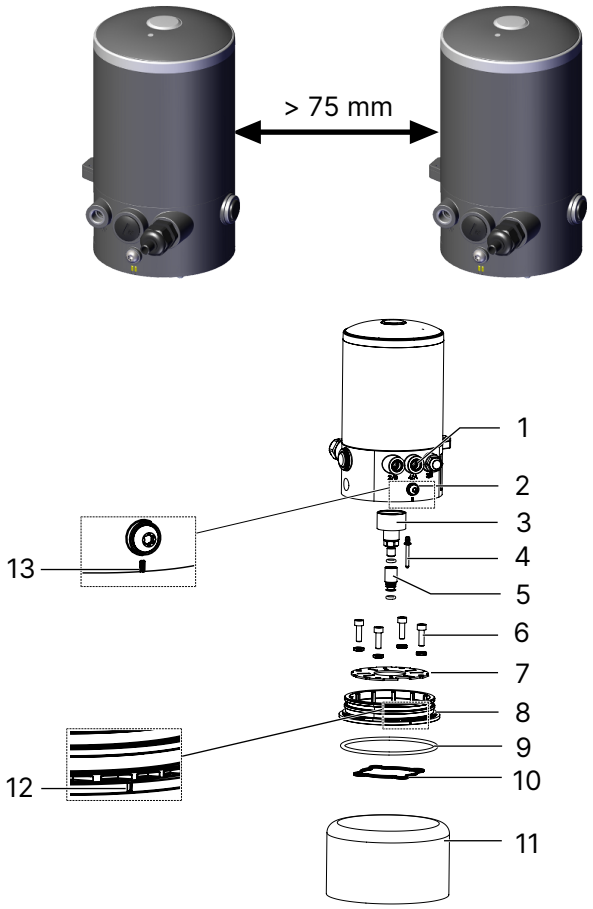

Fig. 19: Installing the device

Procedure:

- Mount the target (3) on the switch spindle (5) of the process valve (11), observing the reference dimensions (tightening torque: 7 ± 0.5 Nm).

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- Mount the switch spindle (5) with target (3) on the spindle or spindle adapter of the process valve (11), observing the reference dimensions of the process valve manufacturer.
- Check the valve seat of the sealing ring (9) and the seal of the internal air duct (10).
- The position of the alignment mark (12) on the base plate (8) determines the alignment of the device (alignment mark (13)):
  Place the base plate (8) onto the process valve (can be rotated 4 times by 90°).
- Mount the base plate (8) and plain washer (7) on the process valve (11) with 4 fastening screws and lock washers (6) and tighten them in a crosswise pattern (tightening torque: max. 1.5 Nm).
- Loosen locking screws (2) on the device.
- Place the device on the base plate (8):
  - Align the alignment marks (12 and 13) on the device and the base plate (8) with one another.
  - Insert the alignment pin (4) into the hole provided for this purpose in the base plate (8).
- Secure the device using the 2 safety screws (2), tightening torque: 1.5 ± 0.5 Nm.
- Seal the 2/A or 4/A (1) working port with a sealing plug.

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6 Pneumatic connection

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

6.1 Connect the device pneumatically

Information regarding installation:

- No back pressure should build up as a result of installation.
- Keep the supply pressure at least 0.5...1 bar above the pressure required to move the actuator to its end position.
- **CAUTION! To ensure IP protection and prevent moisture from entering the device, observe one of the following measures (exhaust air concept):**
  - Design the exhaust air port so that no liquid or dirt can enter the device, e.g. by means of a downward-facing connection piece
  - Fit an exhaust air line to the exhaust air port and lead it to a dry place.

Information on hose pipes:

WARNING!

Risk of injury from connection of unsuitable hoses

Inappropriate hoses can come loose and swing around.

- Use only hoses which are authorised for the indicated pressure and medium temperature range.
- Observe the data sheet specifications from the hose manufacturers.

- Select an approved hose with sufficient cross-section: use an outer diameter of Ø6 mm (or 1/4") or 8 mm (or 5/16") (tolerance +0.05/−0.1 mm).
- Only cut hose pipes using suitable tools.
- Dimension hose pipes so that the hose ends do not create any stress in the push-in connectors.
- When using an exhaust air line: dimension the length so that a Q_N value > 620 l/min is achieved.

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Device for single-acting actuators: 1x 3/2-way pilot valve

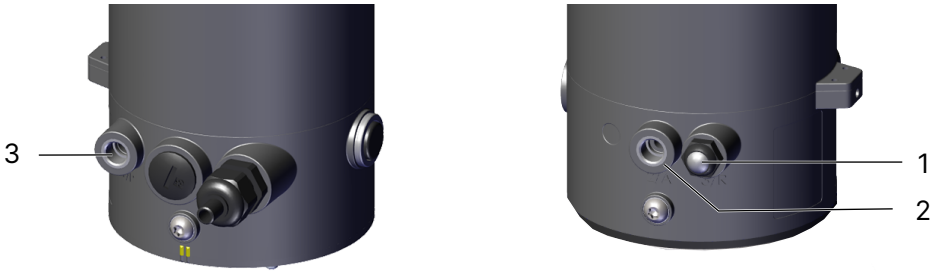

Fig. 20: Connect the device pneumatically

1	Exhaust air port (3/R) with silencer	2	Working port (2/A)
3	Compressed air connection (1/P)		

- If necessary, realign the device.
- Observe exhaust air concept.
- Connect the pressure supply to 1/P.
- Connect working port 2/A to the process valve (see fluid circuit diagram).

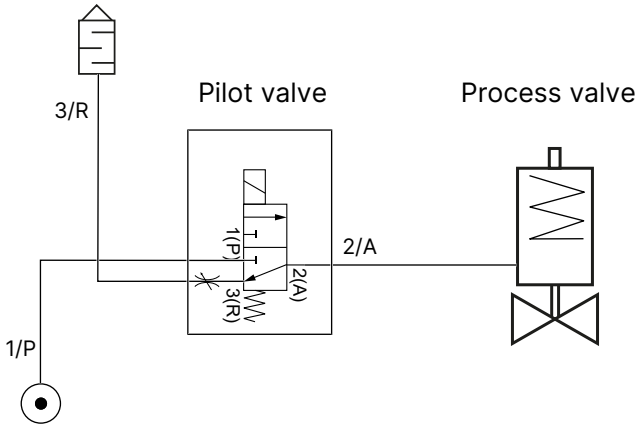

Fig. 21: Fluid diagram

Device for double-acting actuators: 1x 5/2-way pilot valve

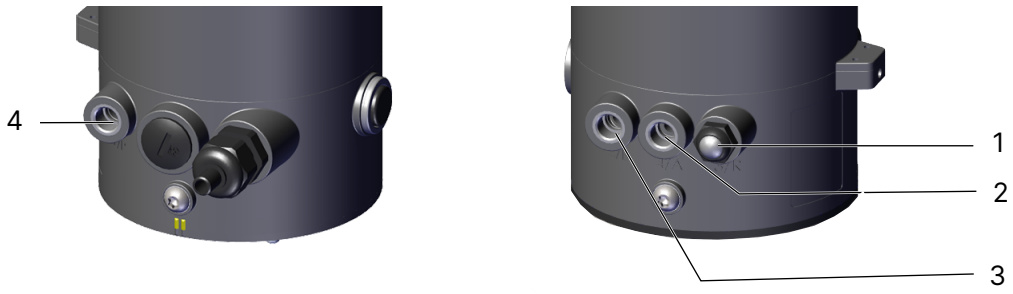

Fig. 22: Connect the device pneumatically

1	Exhaust air port (3/R) with silencer	2	Working port (4/A)
3	Working port (2/B)	4	Compressed air connection (1/P)

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- If necessary, realign the device.
- Observe exhaust air concept.
- Connect the pressure supply to 1/P.
- Connect working port 4/A and 2/B to the process valve (see fluid circuit diagram).

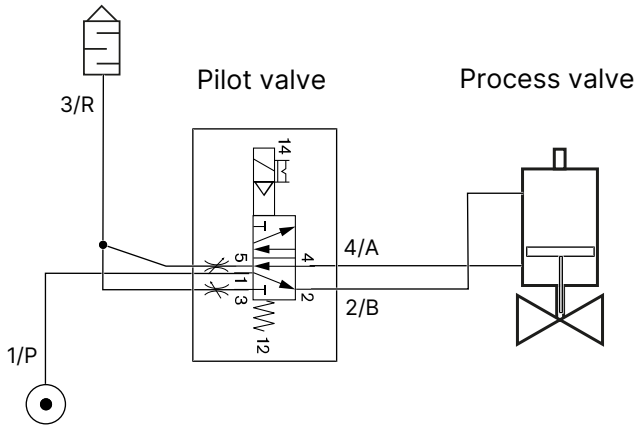

Fig. 23: Fluid diagram

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7 Electrical connection

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

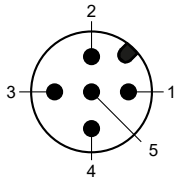
Service and support

- For further information, technical advice and support, contact Bürkert service.

7.1 Connect electrically, without communication

7.1.1 Electrical connection: device with circular plug-in connector

Devices with pilot valve

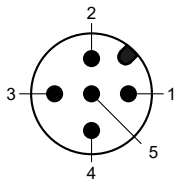


Pin	Wire colour [7]	Name	Pin assignment
1	brown	Operating voltage +	+24 V DC
2	white	Digital output 2, Feedback valve position S2 (relative to GND)	DO2+ (S2)
3	blue	Operating voltage GND	GND
4	black	Digital output 1, Feedback valve position S1 (relative to GND)	DO1+ (S1)
5	grey	Digital input 1, Pilot valve control V1 (relative to GND)	DI1+ (Y1)

Tab. 13: Pin assignment, M12 x 1 circular plug, 5-pin

7) The colours indicated refer to the 5-pin cable internally installed.

Position feedback indicators

	Pin	Wire colour [7]	Name	Pin assignment
	1	brown	Operating voltage +	+24 V DC
	2	white	Digital output 2, Feedback valve position S2 (relative to GND)	DO2+ (S2)
	3	blue	Operating voltage GND	GND
	4	black	Digital output 1, Feedback valve position S1 (relative to GND)	DO1+ (S1)
	5	grey	N.C.	Not used

Tab. 14: Pin assignment, M12 x 1 circular plug, 5-pin

7.1.2 Electrical connection: device with cable gland

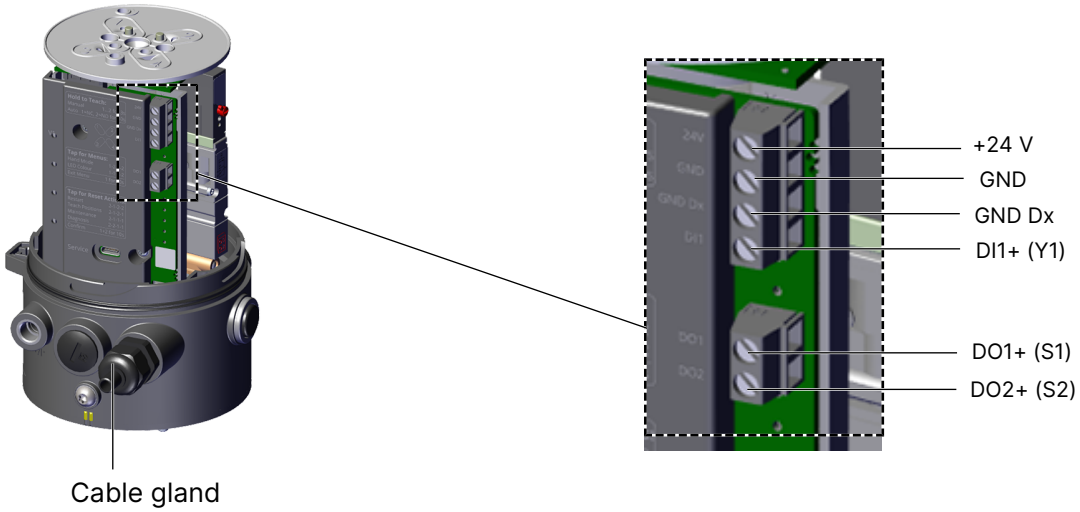


Fig. 24: Connection terminals

- Open device.
- Remove the cable sheath accordingly (flush with the inner end of the cable gland).
- Pass the cable through the cable gland.
- Lay the wires on the right-hand side of the PCB.
- If wire end ferrules are used, then use wire end ferrules without collars.
- Connect wires (see table).
- To prevent pinching at the housing hood, shorten and route any unused wires.
- Check for and remove any dirt from the seal.
- Check that the seal is correctly positioned in the housing hood.

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NOTICE! Damage or malfunction can result from the ingress of dirt and moisture.

- Tighten the cable gland union nut according to the cable size used or tighten the dummy plug (tightening torque approx. 1.5 Nm).
- Close device.

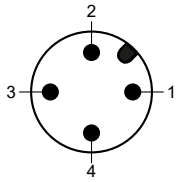
Operating voltage

Terminal	Name
+24 V	Operating voltage +24 V DC
GND	Operating voltage for GND
GND Dx	If required: GND control signals[8)]

Control signals

Terminal	Name
DI1+ (Y1)	Digital input 1 Control unit of pilot valve V1 (relative to GND)
DO1+ (S1)	Digital output 1 Feedback valve position S1 (relative to GND)
DO2+ (S2)	Digital output 2 Feedback valve position S2 (relative to GND)

7.2 Connect electrically, AS-Interface



Pin	Name	Pin assignment
1	ASi +	Bus line AS-Interface +
2	AUX –	Actuator supply – (optional, only connect for variants with separate actuator supply (AUX Power))
3	ASi –	Bus line AS-Interface –
4	AUX +	Actuator supply + (optional, only connect for variants with separate actuator supply (AUX Power))

Tab. 15: Pin assignment, circular plug M12 x 1, 4-pin

Maximum length of the bus line

The complete network for AS-Interface may be a maximum of 100 m long (without terminating resistor and without repeater). All AS-interface lines of an AS-interface string must be considered for the design, i.e. even the drop lines to the individual slaves and the cabling inside the device.

8) If the operating voltage and the control signals are supplied from different power supplies, additionally connect this GND Dx connection to establish the correct GND reference for the signals.

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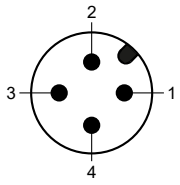
Cable length on the device	Calculated cable length for design
approx. 0.1 m	0.3 m
approx. 0.8 m	1.0 m

Tab. 16: Calculated cable length

Example of the length of the AS-Interface flat cable for 62 devices with a cable length of 0.1 m:
100 m – (62 × 0.3 m) = 81.4 m

7.3 Connect electrically, IO-Link

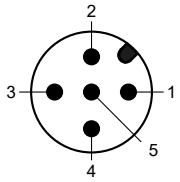
IO-Link Port Class A



Pin	Name	Pin assignment	
1	L+	24 V DC	System supply
2	I/Q	N.C.	Not used
3	L–	0 V (GND)	System supply
4	C/Q	IO-Link	Communication

Tab. 17: Pin assignment, circular plug M12 x 1, 4-pin

IO-Link, Port Class B



Pin	Description	Assignment	
1	L+	24 V DC	System power supply
2	P24	24 V DC	Extra power supply
3	L–	0 V (GND)	System power supply
4	C/Q	IO-Link	Communication
5	N24	0 V (GND)	Extra power supply

Tab. 18: Pin assignment, circular plug M12 x 1, 5 pin

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8 Commissioning

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

8.1 Commission the device

Start-up can be carried out on site at the device (limited functions) or using the Bürkert Communicator.

A teach function must be performed for initial start-up.
The teach-in-operation function is enabled ex works. It is performed after the pilot valve has been switched on for the first time and teaches and stores the end positions.

With the Bürkert Communicator, initial start-up can be carried out conveniently using a start-up wizard or individual functions.

Device status and indicators after the supply voltage has been switched on:
The teach-in-operation function is enabled ex works and, until the first switching operation has been carried out correctly, displays the device state “out of specification” and the position indicator lights up white in a slow chase (1 Hz).

The following start-up functions are available:

Key:

1	Required for initial start-up
2	Adjustable on the device on-site
3	Adjustable with Bürkert Communicator

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Function	Description	1	2	3
Local control lock	The device is locked for local control directly on the device	Can	No	Yes
Name and location	Configuration of name and location	Can	No	Yes
SAFEPOS Parameters for the safety position	In case of definable critical operating states, the actuator moves to the selectable safety end position	Can[9)]	No	Yes
Teach functions:		Must	Yes	Yes
TEACH.AUTO Automatic teach function	End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With TEACH.AUTO, the device performs all the necessary steps automatically			
TEACH.MANU Manual teach function	End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With the TEACH.MANU, the end positions must be taught in manually			
TEACH.IN.OP Autom. teach-in during operation	End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. The TEACH.IN.OP is used to teach the terminals in parallel during normal operation		No	
X.CONTROL Parameters for positioning	This function contains all adjustable parameters for positioning • Feedback signal from the end positions • Tolerance range for the end positions • Proximity switch type (NO or NC)	Can[9)]	No	Yes
FEEDBACK.LED Parameters for the feedback LED	The feedback LED visually indicates the end positions • Colour and lighting mode of the feedback LEDs • Brightness of the feedback LEDs	Can[9)]	Yes	Yes

9) Note the default setting.

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Activation of add. diagnostic functions		Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there	Can	No	Yes
	SWITCH.CHECK Switching monitoring	This diagnostic function monitors whether the actuator is in a different end position within an adjustable time after starting the switching process. A movement without switching is also monitored	Can	No	Yes
	SWITCH.TIME Switching time monitoring	This diagnostics function is used for switching time monitoring. A switching operation starts with the change of the setpoint and ends with the entry into the end position tolerance range	Can	No	Yes
	SEAL.MONITOR Monitoring sealing position	This diagnostic function monitors the sealing position. If the sealing position changes, the valve may no longer close tightly	Can	No	Yes
	RAPID.MOVE Monitoring rapid movements	This diagnostic function monitors sudden, rapid, unintended valve movements that could cause the valve to flow	Can	No	Yes
Activation of add. maintenance functions		Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there	Can	No	Yes
	SERVICE.TIME Totalizer for operating duration	The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	Can	No	Yes
	TRAVEL.ACCU Totalizer for covered distance	The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	Can	No	Yes
	CYCLE.COUNTER Totalizer for valve cycles	The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	Can	No	Yes

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8.2 Teach function: determine and save end positions

The 2 valve positions of the process valve can be programmed and reported to the controller via 2 discrete feedback signals from the internal contactless position sensor.

The valve positions are reported back within an adjustable tolerance range (see X.CONTROL: set parameter for positioning [▶ 79]).

If a teach function has been initiated and is still in progress (position indicator (LEDs 1...4) lights up in a fast chase (2 Hz)), a second teach function cannot be started: wait until the current teach function has finished or cancels with an error message.

The following teach functions can be enabled or started:

Teach function	Description	Start/enable	
		On site at the device	Bürkert Communicator
TEACH.MANU Manual teach function	For devices without a pilot valve or if the end position is to be approached manually.	Yes	Yes
TEACH.AUTO Automatic teach function	If the end positions are to be approached automatically by the respective automatic teach function.	Yes	Yes
TEACH.IN.OP Autom. teach-in during operation	Is (ex works or if enabled) carried out automatically during the first switching operation	No	Yes

The states of the respective teach functions can be displayed in the Bürkert Communicator (see menu **Explanation of states** in the respective teach functions).

8.2.1 Start manual teach function on the device

With the manual teach functions, the user manually moves the valve to the required positions and starts the corresponding manual teach function, e.g. for devices without a pilot valve (position feedback only).

The manual teach function can be started in an AUTOMATIC or MANUAL operating state.

Manual teach function	Description for process valves	Start with key
1	Manual teaching of end position S1 (main stroke)	1
2	Manual teaching of end position S2 (main stroke)	2

Tab. 19: Manual teach functions

Recommended assignment for devices with pilot valve:

Manual teach function	Pilot valve V1 for process valves	Valve position
1	Inactive Working output vented	End position S1
2	Active Working output aerated	End position S2

Tab. 20: Assignment

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Prerequisites:

- The device is mounted on the process valve.
- The supply voltage is connected.
- The compressed air supply is connected.
- To determine the correct reference conditions, set the pilot pressure according to the operating conditions.
- The device is not in MANUAL, TEACH, SAFEPOS or PILOT.VALVE.OFF operating state.
- Enable the user to switch the process valve.

Start manual teach function in the AUTOMATIC operating state

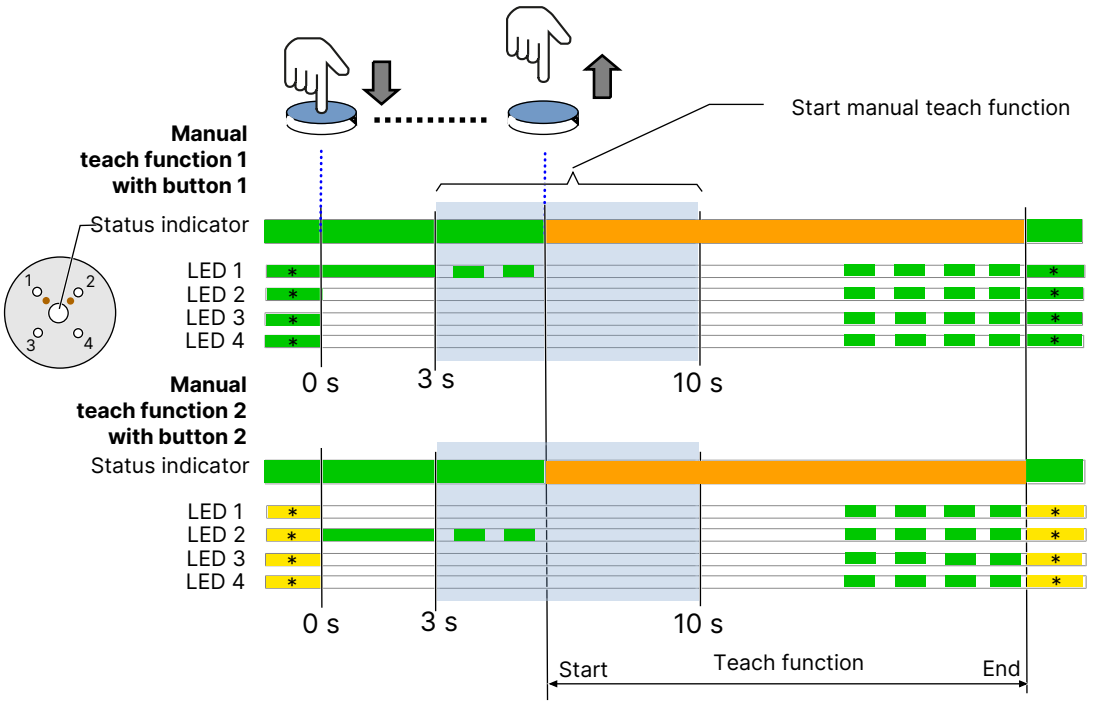

Fig. 25: Manual teach function, AUTOMATIC

▸ Open device.

Teach end position S1:

▸ Move the process valve to the de-energised end position.

▸ Press key 1 for end position S1 for >3 s (<10 s). When LED 1 flashes green, release the key.

✓ LEDs 1...4 light up white in a rapid chase (2 Hz): the teach function is in progress.

✓ LEDs 1...4 flash green (4x). Valve position S1 has been taught.

Teach end position S2:

▸ Move the process valve to the actuated end position.

▸ Press key 2 for end position S2 for >3 s (<10 s). When LED 2 flashes green, release the key.

✓ LEDs 1...4 light up white in a rapid chase (2 Hz): the teach function is in progress.

✓ LEDs 1...4 flash green (4x). Valve position S2 has been taught.

▸ Close device.

✓ The valve positions have been taught.

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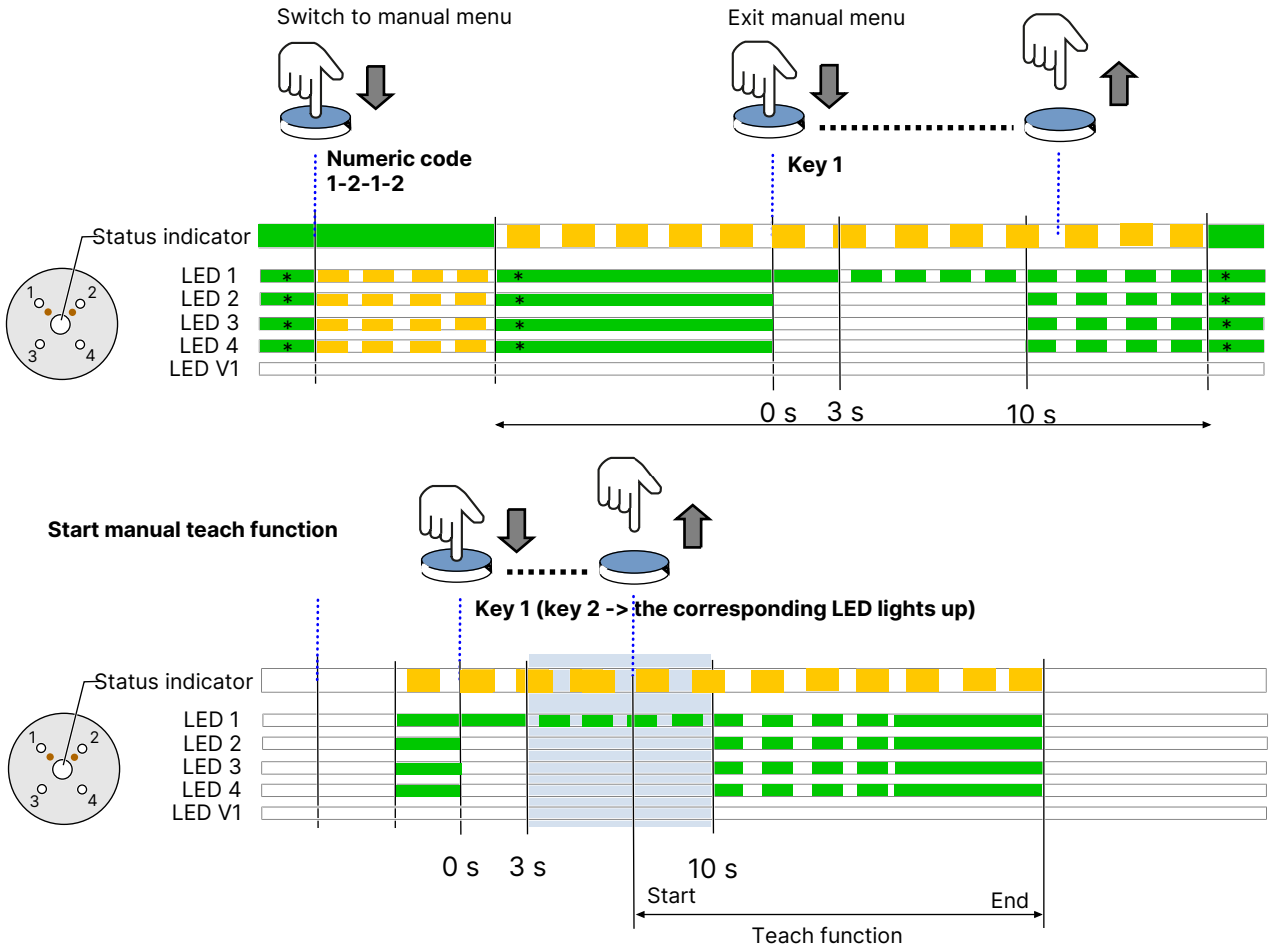
Error: If there is an error during the teach function, the LEDs 1...4 flash red (4x). The newly taught valve positions are discarded, i.e. the previously existing valve positions are retained, and a change is made to the AUTOMATIC operating state. The status indicator lights up red.

Start manual teach function in the MANUAL operating state



* Colour depends on valve position and colour setting

Fig. 26: Manual teach function, MANUAL

- Open device.
- Switch to the MANUAL operating state.

Teach end position S1:

- Move the process valve to the de-energised end position.
- Press key 1 for end position S1 for >3 s (<10 s). When LED 1 flashes green, release the key.
  ✓ LEDs 1...4 flash green (4x). Valve position S1 has been taught.

Teach end position S2:

- Move the process valve to the actuated end position.
- Press key 2 for end position S2 for >3 s (<10 s). When LED 2 flashes green, release the key.
  ✓ LEDs 1...4 flash green (4x). Valve position S2 has been taught.
- Switch to the AUTOMATIC operating state.

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▸ Close device.

✓ The valve positions have been taught.

Error: If there is an error during the teach function, the LEDs 1...4 flash red (4x). The newly taught valve positions are discarded, i.e. the previously existing valve positions are retained, and a change is made to the AUTOMATIC operating state. The status indicator lights up red.

8.2.2 Start the automatic teach function on the device

The valve positions are automatically taught using the automatic teach functions.

Automatic teach function	Description for process valves	Start with key
1	Automatic teaching of end positions S1 and S2 (main stroke) 2-position valves NC (normally closed)	1
2	Automatic teaching of end positions S2 and S1 (inverse main stroke) 2-position valves NO (normally open)	2

Tab. 21: Automatic teach functions

Prerequisites:

- The device is mounted on the process valve.
- The supply voltage is connected.
- The compressed air supply is connected.
- To determine the correct reference conditions, set the pilot pressure according to the operating conditions.
- The device is not in MANUAL, TEACH, SAFEPOS or PILOT.VALVE.OFF operating state.

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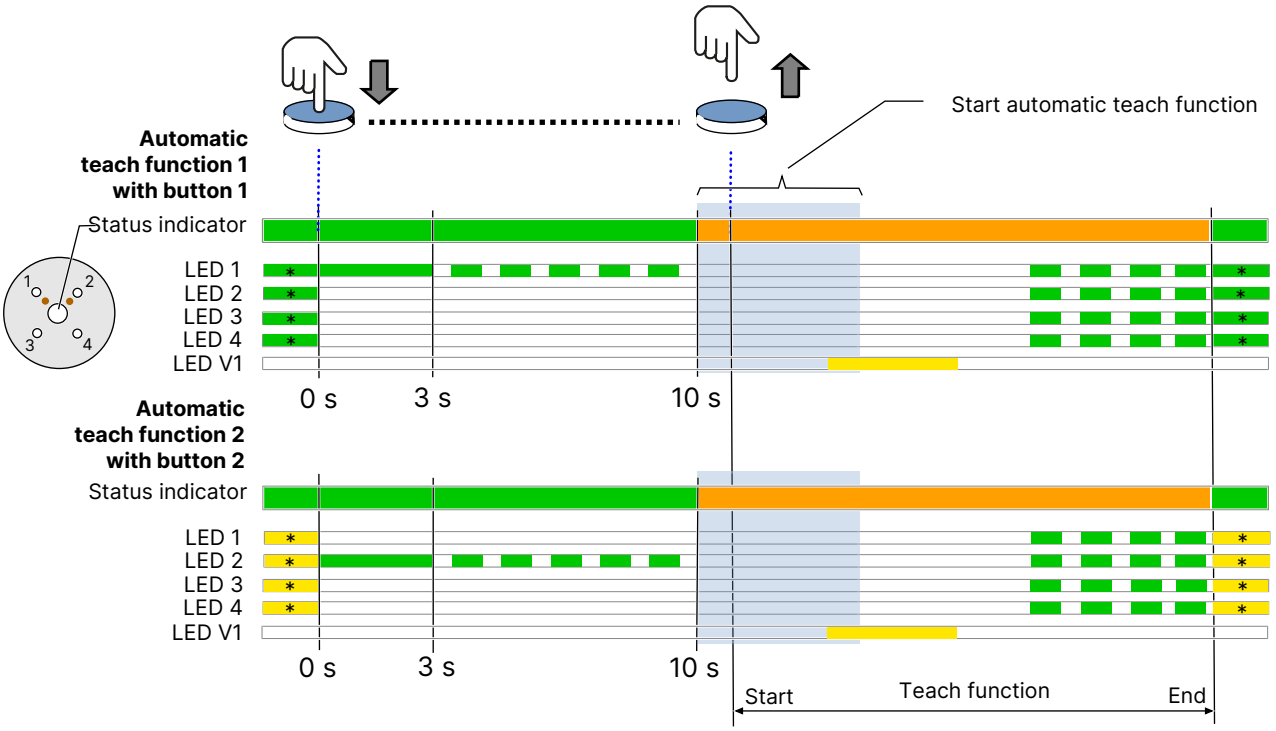

* Colour depends on valve position and colour setting

Fig. 27: Automatic teach function

- ▸ Open device.
- ▸ Key 1 for automatic teach function 1 or key 2 for automatic teach function 2
  Press for > 10 s. When the corresponding LED goes out, release the key.
  - ✓ LEDs 1...4 light up white in a rapid chase (2 Hz): the teach function is in progress.
    The automatic teach function automatically moves the pneumatic actuator and saves the respective end positions.
    If LEDs 1...4 flash green, the teach function has been successfully completed.
- ▸ If necessary, move the process valve to the de-energised end position.
- ▸ Close device.

✓ The valve positions have been taught.

Error: If there is an error during the teach function, the LEDs 1...4 flash red (4x). The newly taught valve positions are discarded, i.e. the previously existing valve positions are retained, and a change is made to the AUTOMATIC operating state. The status indicator lights up red.

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Sequence of the automatic teach function 1

Sequence	LED displays	Status indicator
Process valve is closed (actuator is disabled)	LEDs 1...4 light up white in a slow chase (1 Hz) or in the colour corresponding to the current valve position [10)]	lights up green or yellow[10)]
▸ Press key 1 for >10 s: Release key 1 when LED 1 is off and the status indicator is yellow.	LED 1: 1...3 s: lights up green, 4...10 s: flashes green, >10 s: off	
Teach function 1 starts	LEDs 1...4 light up white in a rapid chase (2 Hz)	lights up orange
Valve position S1 is taught	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Pilot valve V1 is switched: process valve opens (actuator is enabled)	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Waiting time 10 s*	Pilot valve LED V1 lights up yellow	
Process valve is open (actuator is enabled)		
Valve position S2 is taught		
Pilot valve V1 is switched: process valve closes (actuator is disabled again)*	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Teach function 1 successful	LEDs 1...4 flash green (4x)	
Teach function 1 is finished	LEDs 1...4 light up green	lights up green
Error:		
* Timeout after 60 s: Teach function unsuccessful	LEDs 1...4 flash red (4x)	lights up orange
Teach function is exited	LEDs 1...4 light up according to the valve position	lights up red

Tab. 22: Teach function 1

10) Depending on whether the device is still in its ex works state or has already been put into service.

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Sequence of the automatic teach function 2

Sequence	LED displays	Status indicator
Process valve is open (actuator is disabled)	LEDs 1...4 light up white in a slow chase (1 Hz) or in the colour corresponding to the current valve position[10)]	lights up green or yellow[10)]
▸ Press key 2 for >10 s: Release key 2 when LED 2 is off and the status indicator is yellow.	LED 2: 1...3 s: lights up green, 4...10 s: flashes green, >10 s: off	
Teach function 2 starts	LEDs 1...4 light up white in a rapid chase (2 Hz)	lights up orange
Valve position S1 is taught	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Pilot valve V1 is switched: process valve closes (actuator is enabled)	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Waiting time 10 s*	Pilot valve LED V1 lights up yellow	
Process valve is closed (actuator is enabled)		
Valve position S2 is taught		
Pilot valve V1 is switched: process valve opens (actuator is disabled again)*	LEDs 1...4 light up white in a rapid chase (2 Hz)	
Teach function 2 successful	LEDs 1...4 flash green (4x)	
Teach function 2 is finished	LEDs 1...4 light up green	lights up green
Error:		
* Timeout after 60 s: Teach function unsuccessful	LEDs 1...4 flash red (4x)	lights up orange
Teach function is exited	LEDs 1...4 light up according to the valve position	lights up red

Tab. 23: Teach function 2

8.2.3 Teach-in-operation function

The teach-in-operation function can be used if the device is to carry out the end positions of the main stroke of the process valve automatically during normal operation (one single time when the control unit is switched on for the first time).

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This function is enabled ex works and, until the first switching operation has been carried out correctly, reports the device state as “Out of specification”; the position indicator lights up white in a slow chase (1 Hz), but the device is fully operational and does not yet output end positions via its digital outputs.

Process description:

1. The device waits for the pilot valve to switch for the first time, displays “Out of specification” and the position indicator glows white in a slow chase (1 Hz).
2. When the pilot valve V1 is first switched for the main stroke, the first end position 2 (S2) is determined.
   The position indicator lights up white in a rapid chase (2 Hz)
3. After the pilot valve V1 is switched off, the process valve returns to end position 1 and position 1 (S1) of the main stroke is determined.
4. The process valve must remain in both end positions for at least 1 second before the end position is determined.
5. Both end positions are saved and the device state “Out of specification” is withdrawn.
6. The activation of this function is reset
7. The position indicator displays the preset colour for the end position.

Note:
The activation of this function is also reset if one of the other two teach functions (automatic or manual teach function) was carried out before the first switching.
This function only teaches the end positions of the main stroke. If the end positions of the seat strokes are also to be taught, they must be taught separately using the manual teach function.

8.3 Initiate start-up with Bürkert Communicator

Start-up with the Bürkert Communicator can be carried out using the start-up wizard or by selecting individual functions.

- Connect the device to the “Bürkert Communicator”, see Connect the device to the Bürkert Communicator [▶ 70] and Connect USB-C service interface [▶ 71]

Set up with the start-up wizard:

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Initial start-up activities		This menu contains all the necessary activities for initial commissioning. Further functions are contained in the menus for the control functions, diagnostic functions and maintenance functions
> Set up with assistant	A wizard starts up.	

Tab. 24: Menutree start-up wizard

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Set up with functions:

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Initial start-up activities		This menu contains all the necessary activities for initial commissioning. Further functions are contained in the menus for the control functions, diagnostic functions and maintenance functions
> Set up with assistant	A wizard starts up.	
> Local control lock		The device is locked for local control directly on the device
> Name and location		Configuration of name and location
> SAFEPOS Parameters for the safety position		In case of definable critical operating states, the actuator moves to the selectable safety end position
> TEACH.AUTO Automatic teach function		End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With TEACH.AUTO, the device performs all the necessary steps automatically
> TEACH.MANU Manual teach function		End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With the TEACH.MANU, the end positions must be taught in manually

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Menu or function	Values or description	
	> TEACH.IN.OP Autom. teach-in during operation	End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. The TEACH.IN.OP is used to teach the terminals in parallel during normal operation
	> X.CONTROL Parameters for positioning	This function contains all adjustable parameters for positioning
	> FEEDBACK.LED Parameters for the feedback LED	The feedback LED visually indicates the end positions
	> Activation of add. diagnostic functions	Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there
	> Activation of add. maintenance functions	Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there

Tab. 25: Menutree functions for start-up

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9 Settings and operating on the device

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

9.1 Operating functions

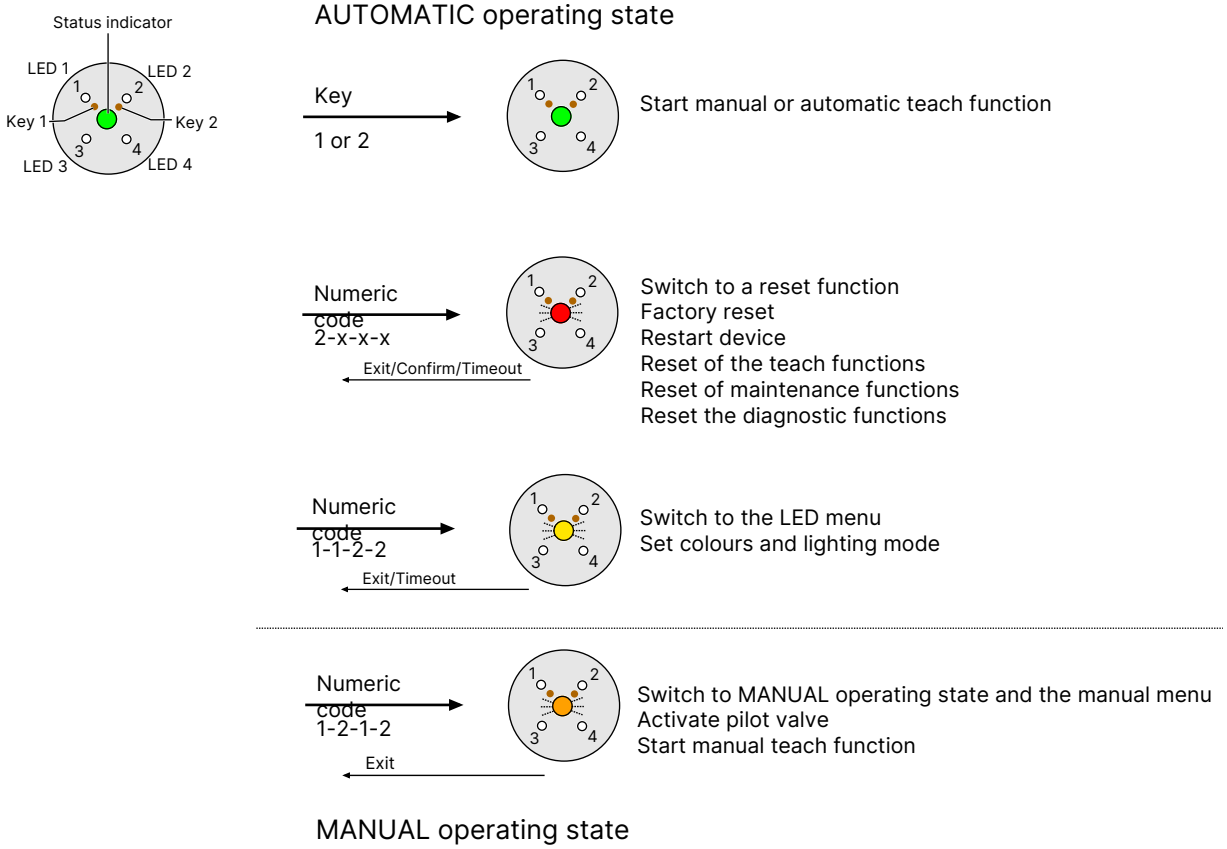

Fig. 28: Operating overview

9.2 Set colours and backlight mode of the position indicator

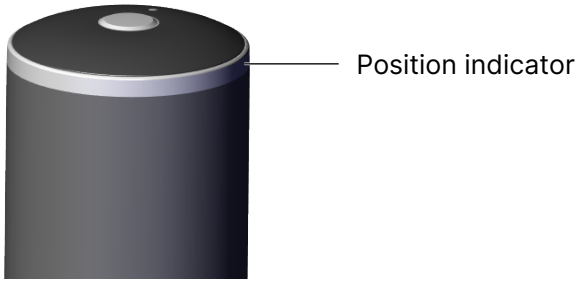

Fig. 29: Position indicator

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The colours of the position indicator can be set:

- Using the keys on the device
- With the Bürkert Communicator, see Set colours and backlight mode of the position indicator (connection via USB-C service interface)

Factory setting:

Valve position	Colour	Backlight mode
S1	Green	continuous illumination
S2	Yellow	continuous illumination

Tab. 26: Factory setting position indicator

Set colours using keys on the device

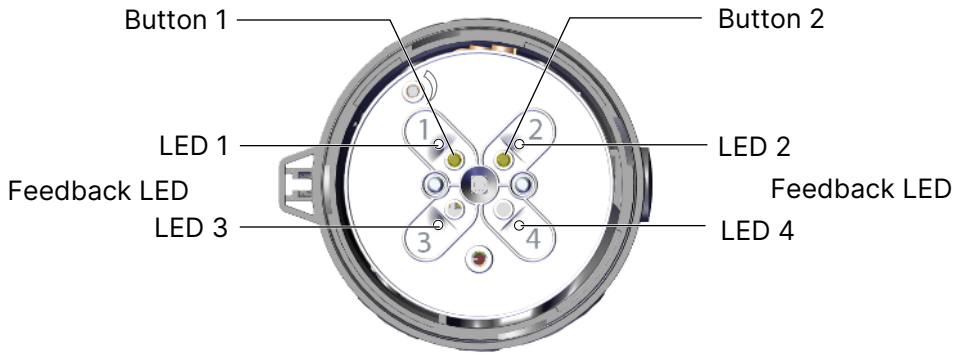

Fig. 30: Keys

✓ Supply voltage is connected.

▸ Open device.

▸ Enter the numeric code for colour setting: 1-1-2-2

✓ Switch to the LED menu: LEDs 1...4 flash yellow (4x), the status indicator flashes yellow.
If the numeric code is incorrect, LEDs 1...4 flash red (4x).

▸ Press key 1 briefly: the colour for end position S1 is set (green > blue > yellow > orange > red > pink > turquoise > white > ignore).
Press key 1 for >3 seconds: backlight mode for end position S1 is set (slow flashing > fast flashing > continuous illumination)

▸ Press key 2 briefly: the colour for end position S2 is set (green > blue > yellow > orange > red > pink > turquoise > white).
Press key 2 for >3 seconds: backlight mode for end position S2 is set (slow flashing > fast flashing > continuous illumination).

▸ Exit LED menu:
Press key 1 for >10 s or
after 60 s, the menu will be exited without any key being pressed.

▸ Close device.

✓ The set colours and backlight mode are displayed.

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9.3 Switch pilot valve manually

The pilot valve can be switched manually as follows:

- With mechanical manual override
- In the manual menu with the electric manual override key 1)
- With the Bürkert Communicator (connection via USB-C service interface)

The priority list for manual operation: mechanical manual override > electrical manual override > manual operating state in the Bürkert Communicator

Switch the pilot valve with mechanical manual override:

for start-up, service purposes or in the event of an electrical energy failure

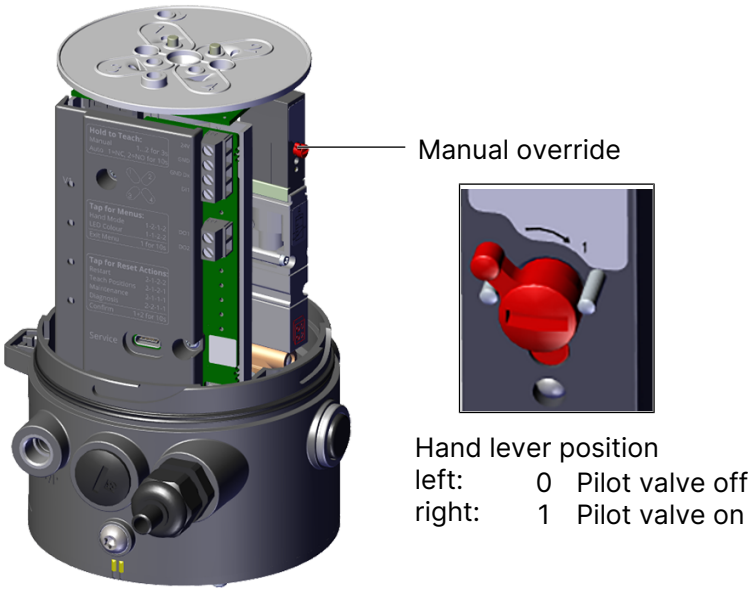

Fig. 31: Mechanical manual override

WARNING! Danger due to pneumatic actuator operation and opening or closing the process valve.

- ▸ Open device.

Hand lever position left: 0, pilot valve off

Hand lever position right: 1, pilot valve on

- ▸ **NOTICE! For proper open-loop control mode:** Turn the hand lever to the left: 0, pilot valve off
- ▸ Close device.

Switch the pilot valve with electric manual override (key 1) to the manual menu:

WARNING! Danger due to pneumatic actuator operation and opening or closing the process valve.

- ▸ Open device.
- ▸ Enter the numeric code for the manual menu: 1-2-1-2

  ✓ Switch to the manual menu: LEDs 1...4 flash orange (4x), the status indicator flashes orange.
  If the numeric code is incorrect, LEDs 1...4 flash red (4x).
- ▸ Press key 1 briefly: pilot valve switches (on), LED V1 lights up.
- ▸ Press key 1 briefly: pilot valve switches (off), LED V1 does not light up.
- ▸ Exit manual mode: press key 1 >10 s until LEDs 1...4 flash green.

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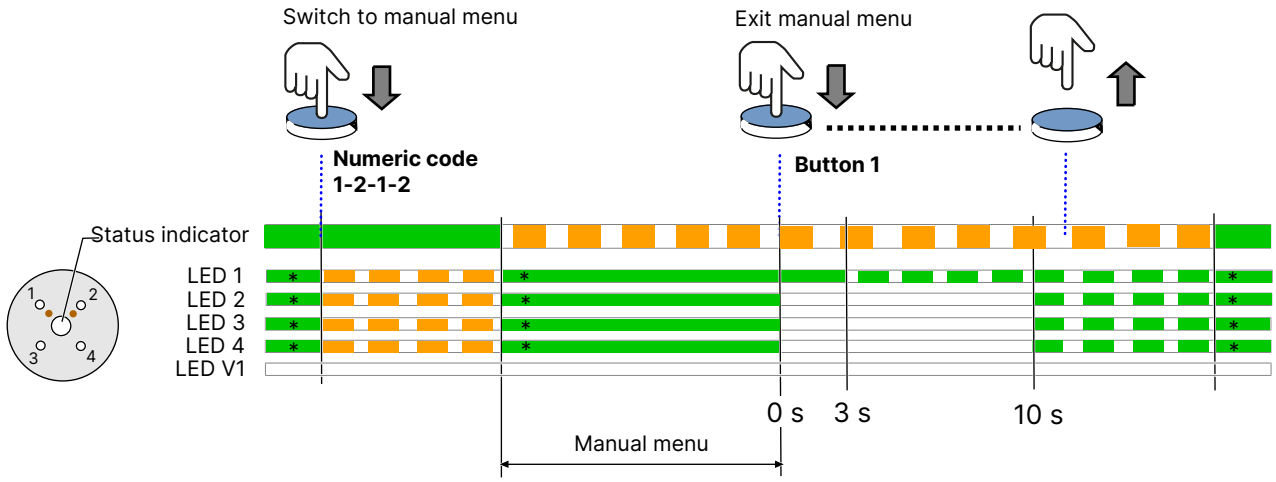
▸ Close device.

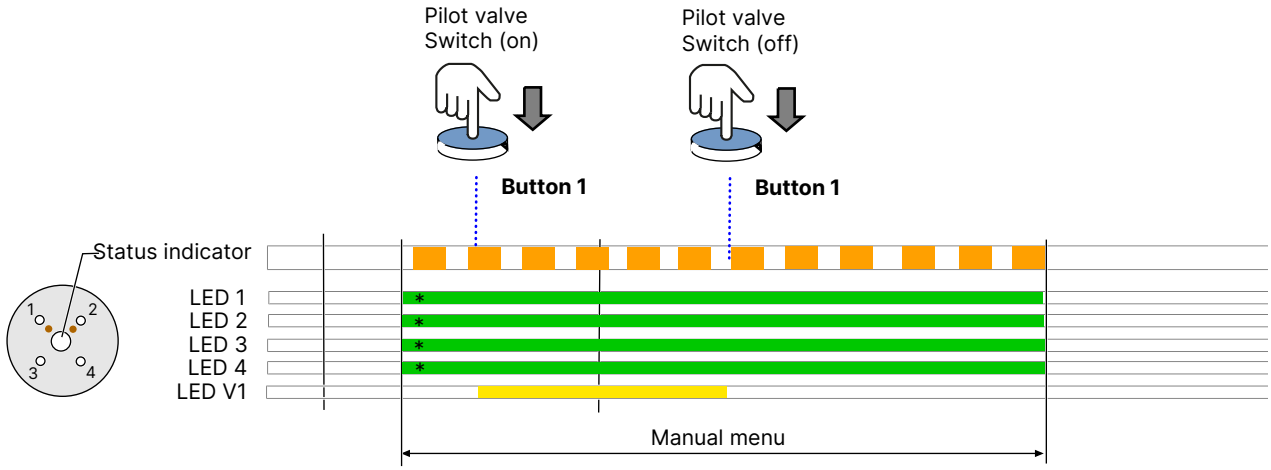
Change manual menu, exit manual menu



* Colour depends on valve position and colour setting

Fig. 32: Manual menu, change

Function switch pilot valve



* Colour depends on valve position and colour setting

Fig. 33: Manual menu, switch pilot valve, example: pilot valve V1

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9.4 Start reset functions

Start the reset functions:

Reset function	Description	Start with numeric code
Reboot	The device will restart.	2-1-2-2
Factory setting	The device is reset to factory settings.	2-1-1-2
Teach reset	The end positions taught are reset to the factory settings.	2-1-2-1
Maintenance reset	The display values of all maintenance functions are reset (e.g. totaliser values, no parameter).	2-1-1-1
Diagnostics reset	The display values of all diagnostic functions are reset (e.g. measured values or number of events, no parameter).	2-2-1-1

Tab. 27: Reset functions

- ▸ Open device.
- ▸ Enter the numeric code for the desired reset function (see table above).
  - ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- ▸ Confirm reset function: press buttons 1 and 2 simultaneously (for > 10 seconds) until LEDs 1...4 flash green (4x).
  - ✓ The reset function is terminated and the device returns to the AUTOMATIC operating state.
- ▸ Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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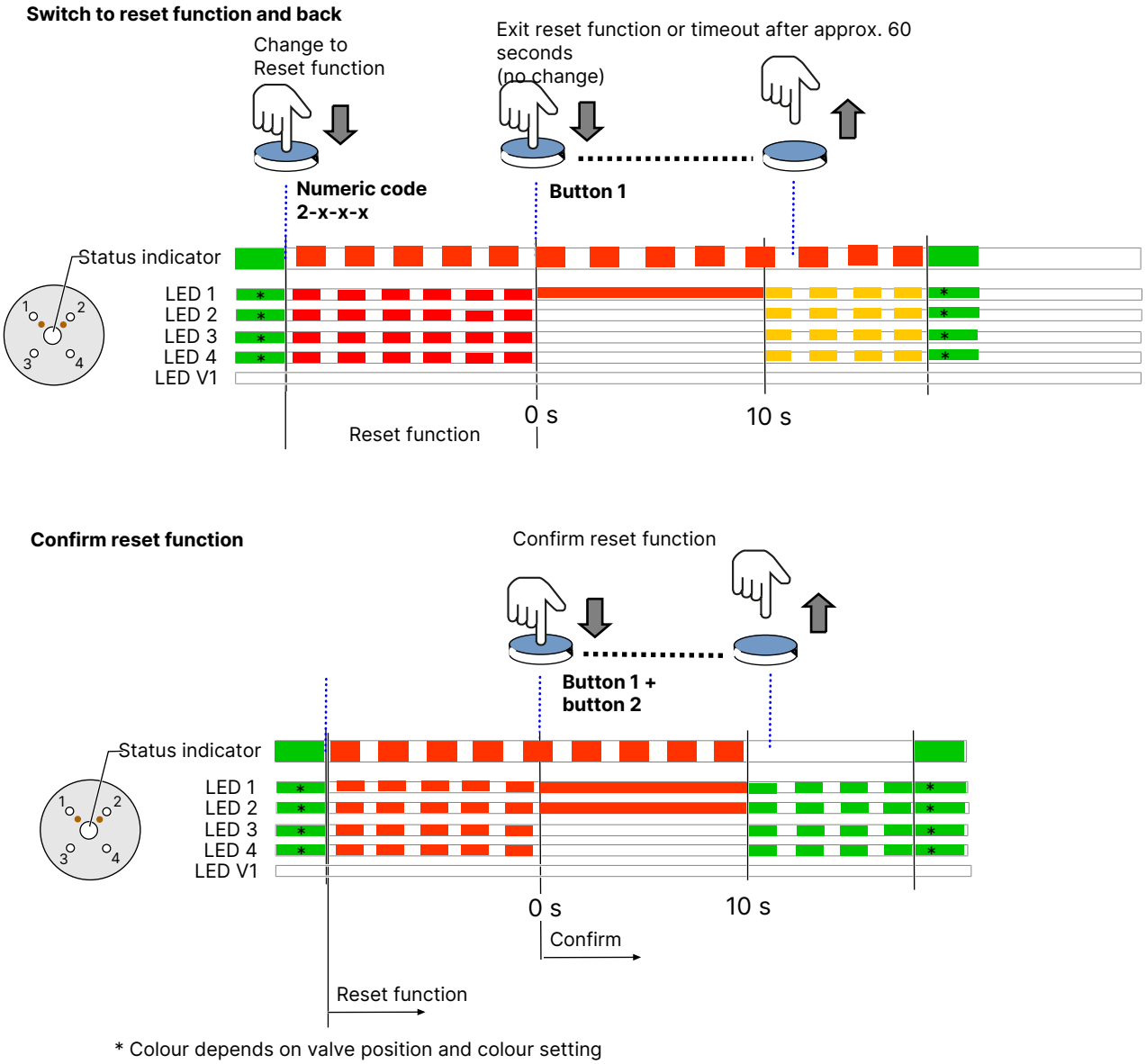

Fig. 34: Switch to reset function and back, confirm reset function

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9.4.1 Restart device

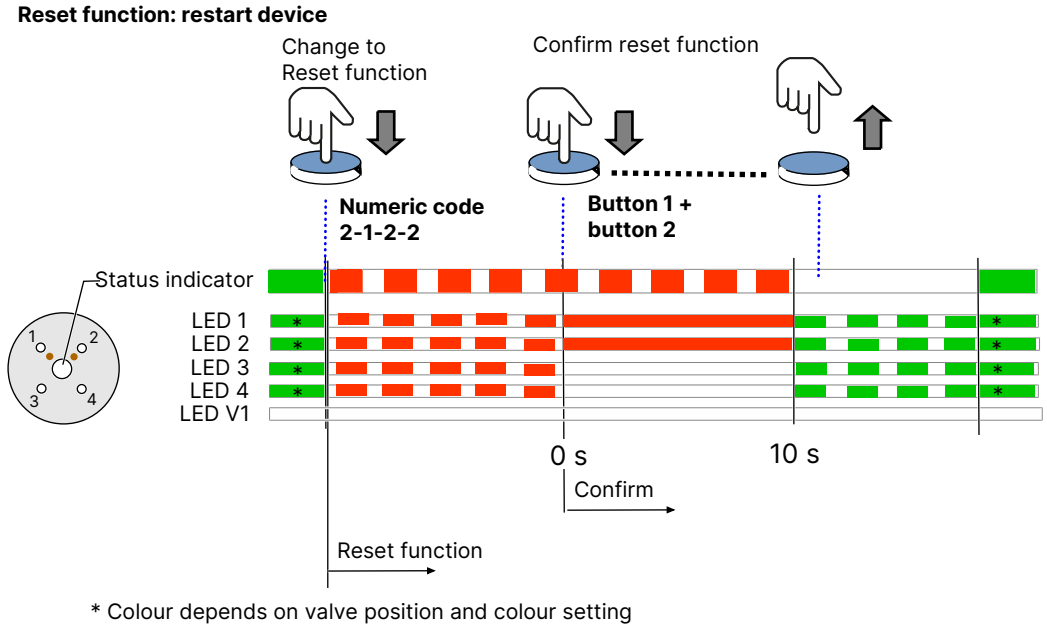

Fig. 35: Restart device

- Open device.
- Enter the numeric code for the reset function: 2-1-2-2

  ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- Confirm reset function: press buttons 1 and 2 simultaneously (for > 10 seconds) until LEDs 1...4 flash green (4x).

  ✓ The device has restarted and is back in the AUTOMATIC operating state.
- Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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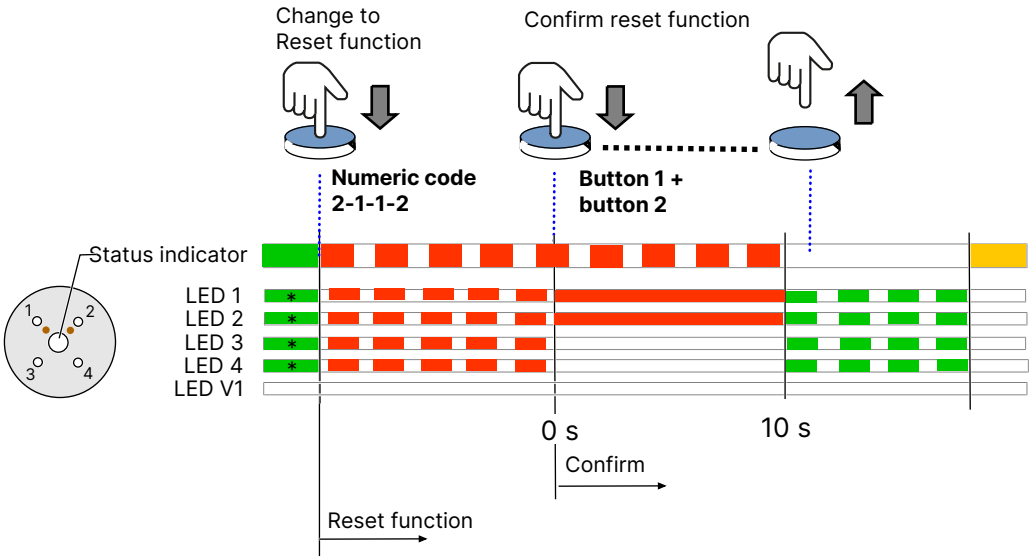
9.4.2 Reset device to factory settings

Reset function: reset device to factory setting



* Colour depends on valve position and colour setting

Fig. 36: Reset device to factory setting.

- Open device.
- Enter the numeric code for the reset function: 2-1-1-2

  ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- Confirm reset function: press buttons 1 and 2 simultaneously (for > 10 seconds) until LEDs 1...4 flash green (4x).

  ✓ The device has restarted and is back in the AUTOMATIC operating state.
- Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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9.4.3 Reset teach function

The end positions taught are reset to the factory settings.

Reset function: reset teach function

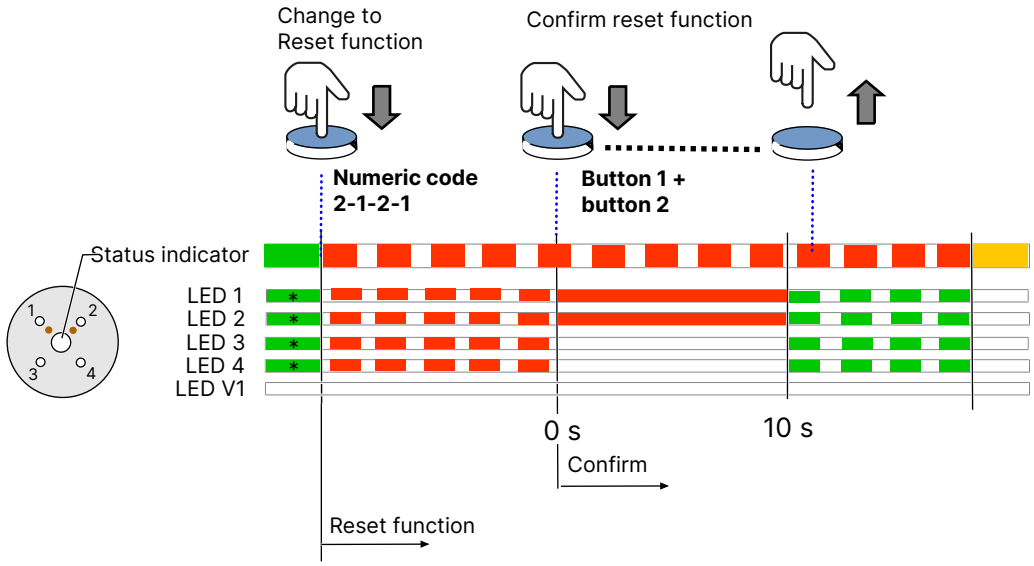

Fig. 37: Reset teach function

- Open device.
- Enter the numeric code for the reset function: 2-1-2-1

  ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- Confirm reset function: press keys 1 and 2 simultaneously (for > 10 s) until LEDs 1...4 flash green (4x).

  ✓ The device has restarted and is back in the AUTOMATIC operating state.
- Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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9.4.4 Reset maintenance functions

The display values of all maintenance functions are reset (e.g. totaliser values, no parameter).

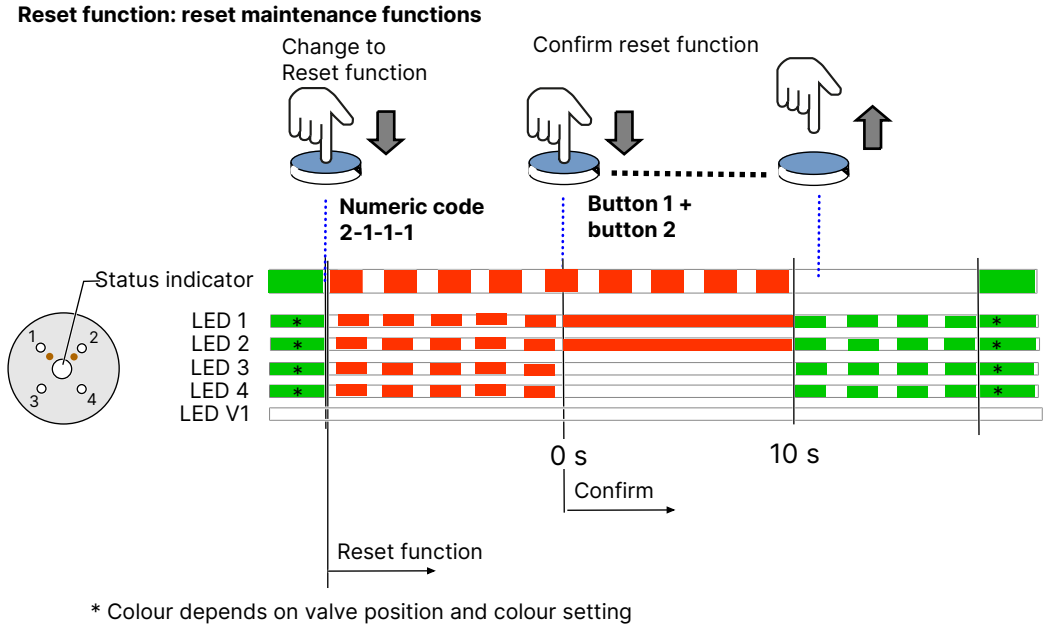

Fig. 38: Reset maintenance functions

- Open device.
- Enter the numeric code for the reset function: 2-1-1-1

  ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- Confirm reset function: press keys 1 and 2 simultaneously (for > 10 s) until LEDs 1...4 flash green (4x).

  ✓ The device has restarted and is back in the AUTOMATIC operating state.
- Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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9.4.5 Reset diagnostic functions

The display values of all diagnostic functions are reset (e.g. measured values or number of events, no parameter).

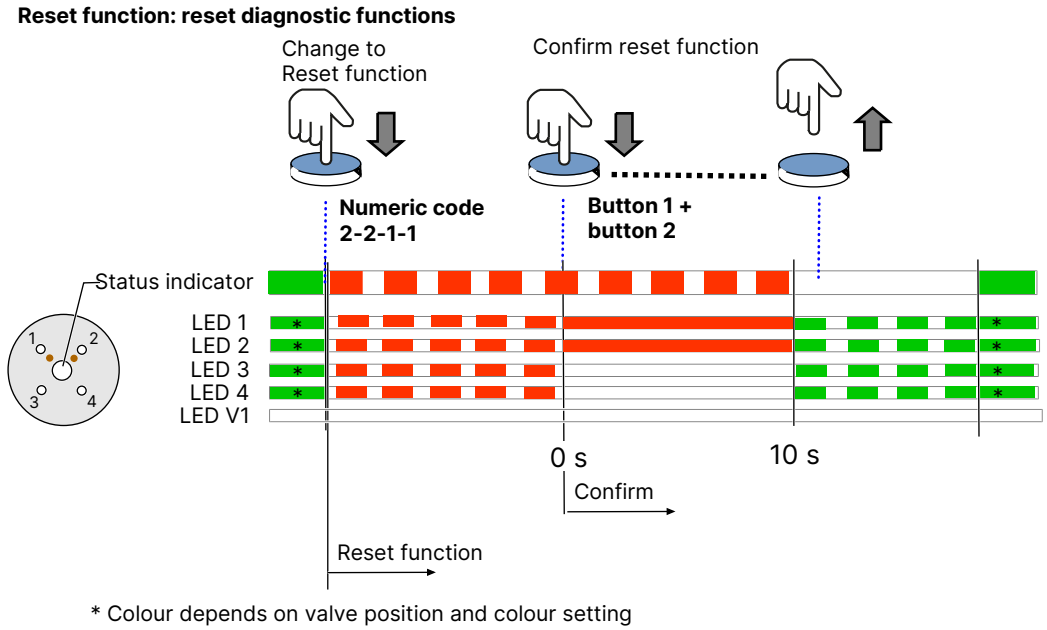

Fig. 39: Reset diagnostic functions

- Open device.
- Enter the numeric code for the reset function: 2-2-1-1

  ✓ Switch to reset function: LEDs 1...4 and the status indicator flash red (while the reset function is running).
- Confirm reset function: press keys 1 and 2 simultaneously (for > 10 s) until LEDs 1...4 flash green (4x).

  ✓ The device has restarted and is back in the AUTOMATIC operating state.
- Close device.

If the wrong numeric code is entered for the reset function, LEDs 1...4 flash red (4x) and the device remains in the AUTOMATIC operating state.

After a timeout of approx. 60 seconds, LEDs 1...4 flash yellow (4x) and the reset function is exited without any changes.

To exit the reset function without making any changes, press button 1 for >10 seconds until LEDs 1...4 flash yellow (4x).

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10 Configuration with Bürkert Communicator

Service and support

- For further information, technical advice and support, contact Bürkert service.

10.1 General

The Bürkert Communicator software for communication with Bürkert devices enables convenient setting and monitoring of application-specific parameters.

The Bürkert Communicator software can be downloaded free of charge from country.burkert.com.

This chapter describes the basic operation of the Bürkert Communicator.
Detailed information on operating the Bürkert Communicator can be found in the software operating instructions under country.burkert.com.

10.2 Connect the device to the Bürkert Communicator

Options for connecting the device to the Bürkert Communicator:

- With a büS stick

Connecting with a büS stick:

Required components (see accessories):

- Communication software: Bürkert Communicator for PC
- USB-C to USB-A or USB-C cable

To connect the device to the Bürkert Communicator:

- Install Bürkert Communicator on a PC.
  Note: do not connect the device to the PC during installation.
- **NOTICE! The USB-C port on the PC must be electrically isolated from the device's power supply unit (run the PC on battery power or use a USB isolator).**
  Use the USB cable to establish the connection between device and PC. For the USB-C service interface on the device, see the following chapter.
- Start Bürkert Communicator.

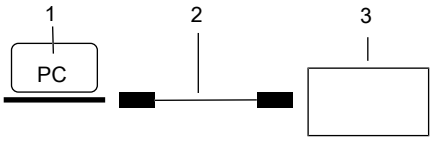

Fig. 40: Connection

1	PC	2	USB-A to USB-C or USB-C to USB-C cable
3	Device		

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Adding the interface:

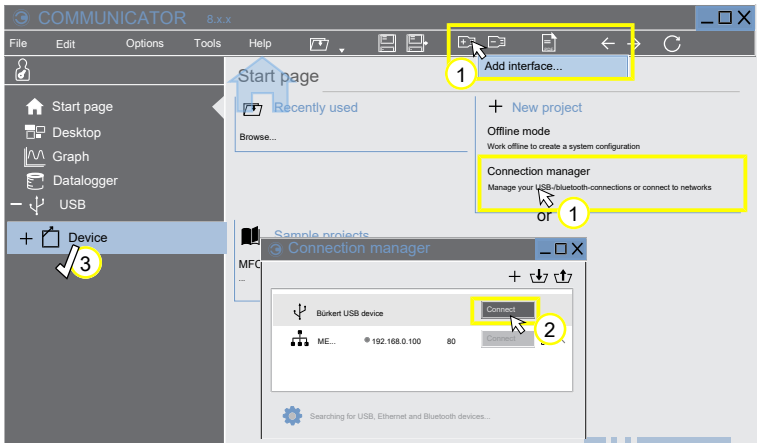
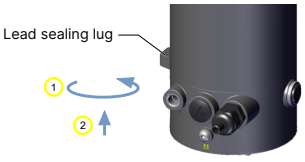


Fig. 41: Adding the interface

- ▸ 1. Add interface... or Connection manager
- ▸ 2. Connect
- ✓ 3. The device is now connected to Bürkert Communicator and appears in the navigation area.

10.2.1 Connect USB-C service interface

Open device:



- ▸ Remove lead seal when body is locked.

WARNING! Impairment of IP protection in the event of improper handling

- ▸ Do not use excessive force to open or close (e.g. by hitting).
- ▸ Turn the housing hood approx. 1.5 cm anticlockwise when viewed from above and pull it upwards.
- ▸ Do not contaminate seals when removing.

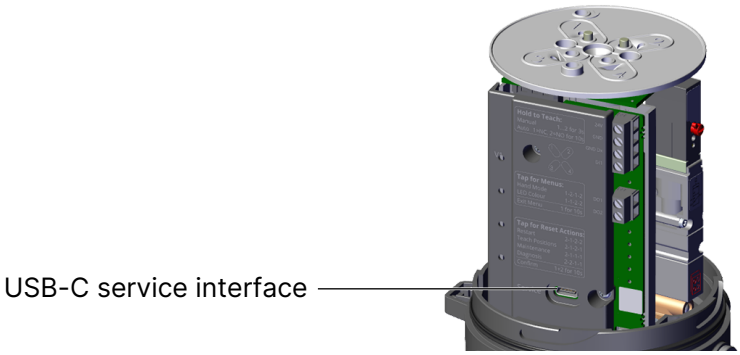


Fig. 42: USB-C service interface

- ▸ Plug the USB-C connector into the USB-C service interface.

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10.3 Bürkert Communicator user interface

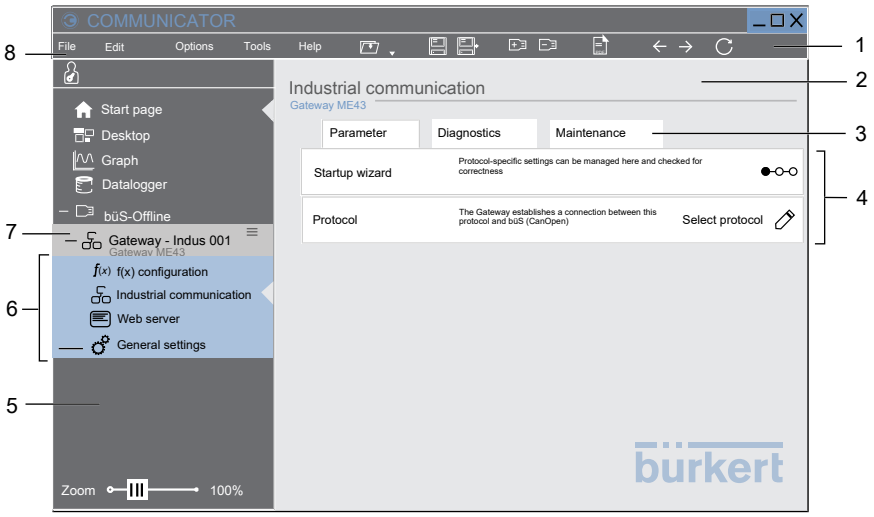

Fig. 43: User interface (example)

1	Toolbar	2	Application area
3	Detailed view	4	Menu
5	Navigation area	6	Device menu
7	Device (connected)	8	Menu bar

10.4 User levels in the Bürkert Communicator

After installation of the Bürkert Communicator, password protection is disabled. The set user level is the level of the installer.

NOTICE!

Security risk due to standard passwords.

Unauthorised persons can log in to the web server and make changes to the system.

- Please change standard passwords.

To enable password protection and change the default password, see Enable or disable password protection, change user password in the operating instructions.

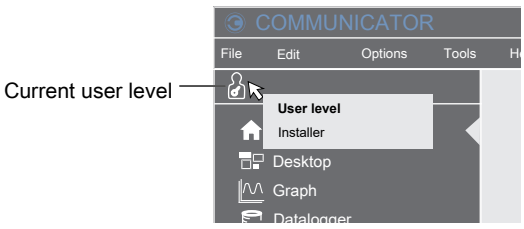

Fig. 44: User level

If password protection is enabled, functions can only be used with the corresponding user level. Some functions are then not visible in the “User” and “Advanced user” user levels, or are identified with a .

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The minimum user level is described in the descriptions for each function.

User levels:

Symbol	User level	Description
	User	Standard user, read authorisation, can change a few values. No password
	Advanced user	Can change certain values and perform simple calibrations. Default password: 5678 (can be changed by the installer)
	Installer	Has all authorisations for operating the Bürkert Communicator. Default password: 1946 (can be changed by the installer)
	Bürkert	Only for Bürkert employees

Tab. 28: User levels

10.5 Control functions

Control functions are functions that affect the positioning or movement to an end position of the process valve (actuator).

The following control functions can be set using the Bürkert Communicator:

Control functions ex works:

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Function name and description	Information
SAFEPOS Parameters for the safety position In case of definable critical operating states, the actuator moves to the selectable safety end position	See SAFEPOS: setting parameters for the safety end position [▶ 74]
TEACH.AUTO Automatic teach function One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With TEACH.AUTO, the device performs all the necessary steps automatically	See TEACH.AUTO: start automatic teach function [▶ 76]
TEACH.MANU Manual teach function One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With the TEACH.MANU, the end positions must be taught in manually	See TEACH.MANU: start manual teach function [▶ 77]
TEACH.IN.OP Autom. teach-in during operation One of the 3 teach functions required for start-up. End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. The TEACH.IN.OP is used to teach the terminals in parallel during normal operation	Enabled upon delivery. See TEACH.IN.OP: enable/disable teach-in-operation function [▶ 78]
X.CONTROL Parameters for positioning This function contains all adjustable parameters for positioning	See X.CONTROL: set parameter for positioning [▶ 79]
FEEDBACK.LED Parameters for the feedback LED The feedback LED visually indicates the end positions	See FEEDBACK.LED: Set colours and backlight mode of the position indicator [▶ 80]

Tab. 29: Control functions

10.5.1 SAFEPOS: setting parameters for the safety end position

The following parameters can be set with this function:

- the state of the pilot valve when the safety end position is triggered
- the triggers of the safety end position

User level: installer

Factory setting:
State of pilot valve 1: Off
Safety end position triggers: , Communication error[11)]

11) Only for variants with communication.

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> SAFEPOS Parameters for the safety position		In case of definable critical operating states, the actuator moves to the selectable safety end position
> State of pilot valve 1		The state of pilot valve defines the state when the safety end position is triggered
> State of pilot valve 2		The state of pilot valve defines the state when the safety end position is triggered
> Safety end position triggers	Internal error Communication error[11)] Position sensor error Temperature error	
> Currently triggered	No Yes	

Tab. 30: Menutree

Description of the errors as triggers:

Internal error	Internal errors are critical errors. The device may not work correctly. Contact the Bürkert Service
Position sensor error	Position sensor errors are critical errors. The device cannot work correctly. Check whether the position sensor is still correctly mounted
Temperature error	This is a TEMP.MONITOR error. The device may be operating outside the temperature operating limits. If the device operates permanently within this range, it may be damaged. Increase or reduce the temperature
Communication error [11)]	In the event of a communication error, the device does not receive a setpoint. Check the communication. If this trigger is inactive, the last setpoint is retained in the event of a communication error

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10.5.2 TEACH.AUTO: start automatic teach function

The following functions are available:

- Start teach function
- Read state and taught end positions of the teach function

User level: installer

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> TEACH.AUTO Automatic teach function		End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With TEACH.AUTO, the device performs all the necessary steps automatically
> Start automatic teach function 1	A wizard starts up	Automatic teach-in of the main stroke (end position S1, end position S2)
> Start automatic teach function 2	A wizard starts up	Automatic teach-in of the inverse main stroke (end position S2, end position S1)
> Start automatic teach function 3	A wizard starts up	Automatic teach-in of the main stroke with one seat lift (end position S1, end position S2, end position S3)
> Start automatic teach function 4	A wizard starts up	Automatic teach-in of the main stroke with 2 seat lifts (end position S1, end position S2, end position S3, end position S4)
> State	Ready, Initialisation,...	
> Explanation of states	A wizard starts up	
> End position S1 is taught in (main stroke)	No Yes	

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Menu or function	Values or description	
> End position S1 (main stroke)		Value
> End position S2 is taught in (main stroke)	No Yes	
> End position S2 (main stroke)		Value

Tab. 31: Menutree

10.5.3 TEACH.MANU: start manual teach function

The following functions are available:

- Start teach function
- Read state and taught end positions of the teach function

User level: installer

Factory setting:

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> TEACH.MANU Manual teach function		End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. With the TEACH.MANU, the end positions must be taught in manually
> Start manual teach function 1	A wizard starts up.	Manual teach-in of end position S1 (main stroke)
> Start manual teach function 2	A wizard starts up.	Manual teach-in of end position S2 (main stroke)
> Start manual teach function 3	A wizard starts up.	Manual teach-in of end position S3 (seat lift)
> Start manual teach function 4	A wizard starts up.	Manual teach-in of end position S4 (seat lift)

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Menu or function	Values or description	
> State	Ready, Initialisation,...	
> Explanation of states	A wizard starts up.	
> End position S1 is taught in (main stroke)	No Yes	
> End position S1 (main stroke)		Value
> End position S2 is taught in (main stroke)	No Yes	
> End position S2 (main stroke)		Value

Tab. 32: Menutree

10.5.4 TEACH.IN.OP: enable/disable teach-in-operation function

The following functions are available:

- Enable/disable teach function
- Read state and taught end positions of the teach function

User level: installer

Factory setting: Enable autostart of Teach-In-Operation: Yes

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> TEACH.IN.OP Autom. teach-in during operation		End positions that do not have proximity switch feedback should be taught in. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP. The TEACH.IN.OP is used to teach the terminals in parallel during normal operation

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Menu or function	Values or description	
> End positions to be taught	End positions S1 and S2 (main stroke) End position S3 (seat lift) End position S4 (seat lift)	End positions that are taught within the Teach-In-Operation (Note: End position S1 and S2 are always taught-in)
> Enable autostart of Teach-In-Operation	Yes No	Teach-in end position in parallel during normal operation
> State	Ready, Initialisation, ...	
> Explanation of states	A wizard starts up.	
> End position S1 is taught in (main stroke)	No Yes	
> End position S1 (main stroke)		Value
> End position S2 is taught in (main stroke)	No Yes	
> End position S2 (main stroke)		Value

Tab. 33: Menutree

10.5.5 X.CONTROL: set parameter for positioning

The following parameters can be set with this function:

- Set tolerance range for taught end positions

User level: installer

Factory setting:
End position S1 positive tolerance: +3 mm or +10°
End position S1 negative tolerance–3 mm or –10°
End position S2 positive tolerance: +3 mm or +10°
End position S2 negative tolerance–3 mm or –10°

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator

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Menu or function	Values or description
> X.CONTROL Parameters for positioning	This function contains all adjustable parameters for positioning
> End position S1 positive tolerance	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> End position S1 negative tolerance	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> End position S2 positive tolerance	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> End position S2 negative tolerance	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached

Tab. 34: Menutree

10.5.6 FEEDBACK.LED: Set colours and backlight mode of the position indicator

The following parameters can be set with this function:

- Set the colour, backlight mode and brightness of the feedback LEDs for the position indicator

User level: installer

Factory setting:
End position S1 LED color: Green
End position S2 LED color: Yellow
End position S1 LED lighting mode: Permanent lighting
End position S2 LED lighting mode: Permanent lighting
Feedback LED brightness: 100%

Menu or function	Values or description
Device	
> Device operation	
> Parameter	

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Menu or function	Values or description	
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> FEEDBACK.LED Parameters for the feedback LED		The feedback LED visually indicates the end positions
> End position S1 LED color	Ignore White Green Blue Yellow Orange Red Pink Teal	Selection of the color for the feedback LED
> End position S2 LED color	Ignore White Green Blue Yellow Orange Red Pink Teal	Selection of the color for the feedback LED
> End position S1 LED lighting mode	Permanent lighting Slow blinking Fast blinking	Selection of the lighting mode for the feedback LED
> End position S2 LED lighting mode	Permanent lighting Slow blinking Fast blinking	Selection of the lighting mode for the feedback LED
> Feedback LED brightness	100%	

Tab. 35: Menutree

10.5.7 Reset values of the teach function

This function can be used to reset all teach function values determined.

User level: installer

Menu or function	Values or description
Device	

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Menu or function	Values or description	
> Device operation		
> Diagnostics		
> Resetting teach function values	A wizard starts up.	Resetting the values determined in the TEACH.AUTO, TEACH.MANU and TEACH.IN.OP teach functions

Tab. 36: Menutree diagnostic function

10.6 Diagnostic functions

Diagnostic functions are functions that relate to monitoring the device and its functions.

The following diagnostic functions can be set using the Bürkert Communicator:

Diagnostic functions ex works:

Function name and description	Information
TEMP.MONITOR Temperature monitoring Diagnostic function for monitoring the temperature	See TEMP.MONITOR: read temperature values and set warning limits [▶ 85]
VOLT.MONITOR Supply voltage monitoring Diagnostic function for monitoring the supply voltage	See VOLT.MONITOR: read voltage values and set warning limits [▶ 85]

Tab. 37: Diagnostic functions

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Additional diagnostic functions that can be enabled:

Function name and description	Information
SWITCH.CHECK Switching monitoring This diagnostic function monitors whether the actuator is in a different end position within an adjustable time after starting the switching process. A movement without switching is also monitored	See SWITCH.CHECK: monitor the switching movement of the actuator (switch monitoring) [▶ 86]
SWITCH.TIME Switching time monitoring This diagnostics function is used for switching time monitoring. A switching operation starts with the change of the setpoint and ends with the entry into the end position tolerance range	See SWITCH.TIME: monitor switching time [▶ 87]
SEAL.MONITOR Monitoring sealing position This diagnostic function monitors the sealing position. If the sealing position changes, the valve may no longer close tightly	See SEAL.MONITOR: monitor sealed position [▶ 89]
RAPID.MOVE Monitoring rapid movements This diagnostic function monitors sudden, rapid, unintended valve movements that could cause the valve to flow	See RAPID.MOVE: monitoring sudden movements [▶ 91]
COMMON Cross-functional parameters This function contains common cross-functional parameters	Is automatically enabled with the SWITCH.CHECK or SWITCH.TIME functions. See

Tab. 38: Diagnostic functions

10.6.1 Enable or disable additional diagnostic functions:

This function enables additional diagnostic functions, which then appear in the menu **Diagnostic functions** and can be set.

User level: installer

Factory setting: **No**

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Menu or function	Values or description
Device	
> Device operation	
> Parameter	
> Diagnostic functions	Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> Activation of add. diagnostic functions	Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there
> SWITCH.CHECK Switching monitoring	This diagnostic function monitors whether the actuator is in a different end position within an adjustable time after starting the switching process. A movement without switching is also monitored
> SWITCH.TIME Switching time monitoring	This diagnostics function is used for switching time monitoring. A switching operation starts with the change of the setpoint and ends with the entry into the end position tolerance range
> SEAL.MONITOR Monitoring sealing position	This diagnostic function monitors the sealing position. If the sealing position changes, the valve may no longer close tightly
> RAPID.MOVE Monitoring rapid movements	This diagnostic function monitors sudden, rapid, unintended valve movements that could cause the valve to flow

Tab. 39: Menutree diagnostic function

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10.6.2 TEMP.MONITOR: read temperature values and set warning limits

The following values can be read or set using this function:

- Reading temperature values: current device temperature, maximum and minimum device temperature measured
- Reading alarm limits: error messages and the hysteresis value for the device temperature
- Setting alarm limits: warnings for device temperature

User level: installer

Factory setting:
Alarm limit Warning high: 78.0°C
Alarm limit Warning low: –12.0 °C

Menu or function	Values or description
Device	
> Device operation	
> Parameter	
> Diagnostic functions	Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> TEMP.MONITOR Temperature monitoring	Diagnostic function for monitoring the temperature
> Device temperature	
> Max. measured temperature	
> Min. measured temperature	
> Alarm limit Error high	
> Alarm limit Error low	
> Alarm limit Warning high	
> Alarm limit Warning low	
> Alarm limit Hysteresis	

Tab. 40: Menutree diagnostic function

10.6.3 VOLT.MONITOR: read voltage values and set warning limits

The following values can be read or set using this function:

- read voltage values: device supply voltage, maximum and minimum device supply voltage measured, actuator supply voltage
- Read alarm limits: error messages and the hysteresis value for the device supply voltage
- Read alarm limits: error messages for the actuator supply voltage
- Set alarm limits: warning messages for the device supply voltage

User level: installer

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Factory setting:
Device alarm limit Warning high: 31.6 V
Device alarm limit Warning low: 17.5 V

Menu or function	Values or description
Device	
> Device operation	
> Parameter	
> Diagnostic functions	Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> VOLT.MONITOR Supply voltage monitoring	Diagnostic function for monitoring the supply voltage
> Device supply voltage	
> Actuator supply voltage	
> Max. device supply voltage	
> Min. device supply voltage	
> Device alarm limit Error high	
> Device alarm limit Error low	
> Device alarm limit Warning high	
> Device alarm limit Warning low	
> Device alarm limit Hysteresis	
> Actuator alarm limit Error high	
> Actuator alarm limit Error low	

Tab. 41: Menutree diagnostic function

10.6.4 SWITCH.CHECK: monitor the switching movement of the actuator (switch monitoring)

After activating the function in the menu Activation of add. diagnostic functions, you can set the maximum time required by the actuator to travel between the 2 end positions. If this time is exceeded, an error message is displayed. In addition, the function monitors whether an end position is left without switching.

User level: installer

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Factory setting: Timeout for pilot valve 1: 60 s

Menu or function	Values or description
Device	
> Control head	
> Parameter	
> Diagnostic functions	Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> SWITCH.CHECK Switching monitoring	This diagnostic function monitors whether the actuator is in a different end position within an adjustable time after starting the switching process. A movement without switching is also monitored
> Timeout for pilot valve 1	Time which the actuator has to move to another end position when the switching process starts. If the device takes longer, a message is displayed

Tab. 42: Menutree diagnostic function

10.6.5 SWITCH.TIME: monitor switching time

After activating the function in the menu Activation of add. diagnostic functions, the times required by the actuator for the distance between the 2 end positions after switching the pilot valve on or off are determined. The switching time limits can be set individually and recorded (counted) when exceeded.

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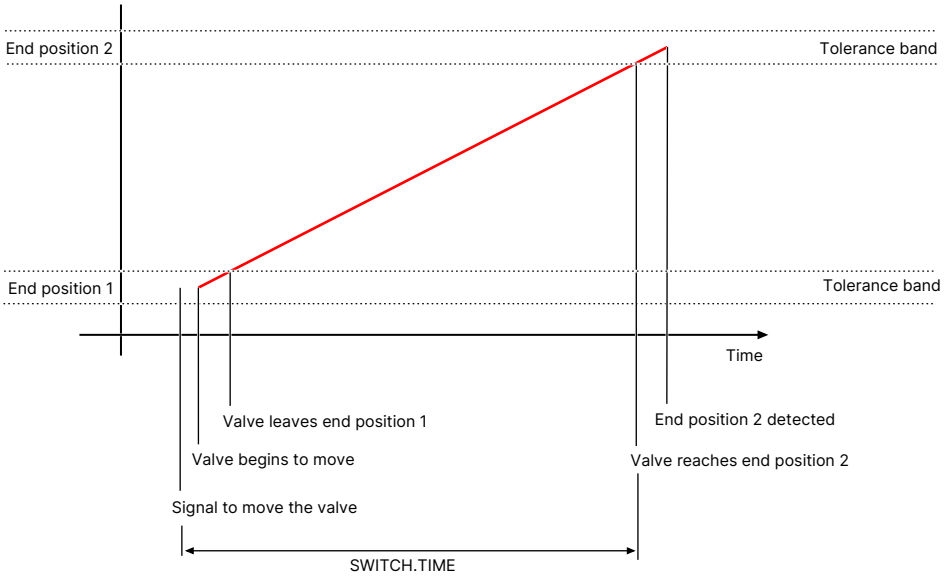

Fig. 45: SWITCH.TIME activation zones

User level: installer

Factory setting:
Limit for pilot valve 1 (from off to on): 0 ms
Limit for pilot valve 1 (from on to off): 0 ms

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Menu or function	Values or description
Device	
> Control head	
> Parameter	
> Diagnostic functions	Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> SWITCH.TIME Switching time monitoring	This diagnostics function is used for switching time monitoring. A switching operation starts with the change of the setpoint and ends with the entry into the end position tolerance range
> Limit for pilot valve 1 (from off to on)	Limit value for the switching time. If the actuator takes longer, a message is displayed
> Last time pilot valve 1 (from off to on)	Last measured switching time
> Events pilot valve 1 (from off to on)	Number of times the limit value for the switching time is exceeded
> Limit for pilot valve 1 (from on to off)	Limit value for the switching time. If the actuator takes longer, a message is displayed
> Last time pilot valve 1 (from on to off)	Last measured switching time
> Events pilot valve 1 (from on to off)	Number of times the limit value for the switching time is exceeded

Tab. 43: Menutree diagnostic function

10.6.6 SEAL.MONITOR: monitor sealed position

After enabling the function in the menu Activation of add. diagnostic functions for end position S1 and/or end position S2, the locations in the respective end positions are determined after a variable waiting time and checked to see whether they are within the variable limit value for the end position tolerance range. If the limit value is exceeded, a message is displayed.

Note on waiting time: if the waiting time set is too short, the end position may not have been reached yet. If the waiting time set is too long, no measurement can be taken because the end position will have already been left.

User level: installer

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Factory setting:
Waiting time: 5 s
Limit value end position S1: 75%
Limit value end position S2: 75%

Menu or function	Values or description	
Device		
> Control head		
> Parameter		
> Diagnostic functions		Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> SEAL.MONITOR Monitoring sealing position		This diagnostic function monitors the sealing position. If the sealing position changes, the valve may no longer close tightly
> Monitoring is used for	End position S1 (main stroke) End position S2 (main stroke)	The monitoring of a sealing position can only be used for taught-in end positions with the "Internal" feedback signal (see X.CONTROL) Selected when enabling the function.
> Waiting time		The waiting time of the end position starts after entering the end position tolerance range. After the waiting time has elapsed, the position is measured once (see last measured value of an end position)
> Limit value end position S1		Limit value as a percentage of the corresponding end position tolerances. A message is displayed if the limit value is exceeded
> End position S1 positive tolerance	3 mm	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached

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Menu or function	Values or description	
> End position S1 negative tolerance	3 mm	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> Last measured value end position S1		Displays the last measured position of the end position
> Limit value end position S2		Limit value as a percentage of the corresponding end position tolerances. A message is displayed if the limit value is exceeded
> End position S2 positive tolerance	3 mm	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> End position S2 negative tolerance	3 mm	A taught-in end position has an adjustable tolerance range. If the actuator is within this range, the end position is reached
> Last measured value end position S2		Displays the last measured position of the end position

Tab. 44: Menutree diagnostic function

10.6.7 RAPID.MOVE: monitoring sudden movements

After enabling the function in the menu **Activation of add. diagnostic functions**, sudden, rapid, unwanted valve movements can be detected and reported: after a variable minimum stroke has been exceeded, the time until the minimum stroke is undershot is measured and compared with the variable maximum duration. If the time exceeds the maximum duration, a message is displayed.

The value of the last reported stroke and the last reported duration, as well as the number of reports, are displayed.

In the menu **Reset**, the number of messages, the last reported stroke and the last reported duration can be reset.

User level: installer

Factory setting:
Minimum stroke: 0 mm
Maximum duration: 1 s

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Menu or function	Values or description	
Device		
> Control head		
> Parameter		
> Diagnostic functions		Overview of all diagnostic functions. Diagnostic functions are functions that are only used for diagnosis
> RAPID.MOVE Monitoring rapid movements		This diagnostic function monitors sudden, rapid, unintended valve movements that could cause the valve to flow
> Minimum stroke		Min. stroke of the valve movement, outside the end pos. tol. After exceeding the min. stroke the time meas. starts. The time meas. stops after falling below the min. stroke. If the duration is not longer than the max. duration, a message is displayed
> Maximum duration		Maximum duration of the valve movement. After exceeding the minimum stroke, the time measurement starts. The time measurement stops after falling below the minimum stroke. If the duration is not longer than the maximum duration, a message is displayed
> Last stroke		Indicates the measured stroke of the last message. The stroke begins outside the end position tolerance
> Last duration		Indicates the measured duration of the last message
> Number of events		Number of detected sudden movements
> Reset	A wizard starts up.	Resetting the message, number of events, last measured stroke and last measured duration

Tab. 45: Menutree diagnostic function

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10.6.8 Observe values relevant to diagnosis

This function can be used to display values relevant to diagnosis.

User level: installer

Menu or function	Values or description	
Device		
> Control head		
> Diagnostics		
> Monitor diagnostic values		This menu contains all diagnostic relevant values
> Total operating time		
> Operating period since last boot		
> Operation duration of pilot valve 1		Time during which the pilot valve was switched on
> Total covered distance		
> Total valve cycles of pilot valve 1		
> Device temperature		
> Max. measured temperature		
> Min. measured temperature		
> Device supply voltage		
> Actuator supply voltage		
> Max. device supply voltage		
> Min. device supply voltage		
> Voltage drops		
> Last time pilot valve 1 (from off to on)		
> Events pilot valve 1 (from off to on)		
> Last time pilot valve 1 (from on to off)		
> Events pilot valve 1 (from on to off)		
> Last stroke		
> Last duration		
> Number of events		

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Menu or function	Values or description	
> Device boot counter		

Tab. 46: Menutree diagnostic function

10.6.9 Reset diagnostic values

This function can be used to reset all display values for the diagnostic functions.

User level: installer

Menu or function	Values or description	
Device		
> Control head		
> Diagnostics		
> Resetting diagnostic values	A wizard starts up.	Resetting display values of all diagnostic functions, e.g. last measured values or number of events (no parameters)

Tab. 47: Menutree diagnostic function

10.7 Maintenance functions

Maintenance functions are functions that relate to device maintenance.

The following maintenance functions can be set using the Bürkert Communicator:

Additional maintenance functions that can be enabled:

Function name and description	Information
SERVICE.TIME Totalizer for operating duration	See SERVICE.TIME: set totaliser for operating duration [▶ 95]
The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	
TRAVEL.ACCU Totalizer for covered distance	See TRAVEL.ACCU: recording the distance travelled by the actuator movement [▶ 96]
The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	
CYCLE.COUNTER Totalizer for valve cycles	See CYCLE.COUNTER: setting totaliser for pilot valve cycles [▶ 97]
The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	

Tab. 48: Maintenance functions

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10.7.1 Enable or disable additional maintenance functions and configure settings

This function enables maintenance functions, which then appear in the menu Maintenance functions and can be set.

Factory setting: No

Menu or function	Values or description	
Device		
> Control head		
> Parameter		
> Maintenance functions		Overview of all maintenance functions. Maintenance functions are functions that are only used for maintenance
> Activation of add. maintenance functions		Additional functions can be activated within this menu. Activated functions are displayed below this menu and can be parameterized there
> SERVICE.TIME Totalizer for operating duration	Yes/no	The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts
> CYCLE.COUNTER Totalizer for valve cycles	Pilot valve 1	The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts
> TRAVEL.ACCU Totalizer for covered distance	Yes/no	The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts

Tab. 49: Menutree maintenance function

10.7.2 SERVICE.TIME: set totaliser for operating duration

After enabling the function in the menu Activation of add. maintenance functions, the totalizer starts recording the operating hours and displays this progress. When the set interval has been reached, a maintenance message appears.

Note: In the menu
Maintenance > Wear part replacement activities > Optimize maintenance functions
The maintenance functions SERVICE.TIME, TRAVEL.ACCU and CYCLE.COUNTER can be clearly monitored and optimised.

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Factory setting Set interval: 0 s

Menu or function	Values or description
Device	
> Control head	
> Parameter	
> Maintenance functions	Overview of all maintenance functions. Maintenance functions are functions that are only used for maintenance
> SERVICE.TIME Totalizer for operating duration	The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts
> Reset totalizer	
> Set interval	When the interval is reached, a corresponding maintenance message is displayed. Note: The counter is automatically reset when the interval is changed from 0 to another value
> Progress	Display in %
> Progress	Display in hh:mm:ss

Tab. 50: Menutree maintenance function

10.7.3 TRAVEL.ACCU: recording the distance travelled by the actuator movement

After enabling the function in the menu Activation of add. maintenance functions, the totalizer starts to record the distance travelled and displays this progress. When the set interval has been reached, a maintenance message appears.

Note: In the menu
Maintenance > Wear part replacement activities > Optimize maintenance functions
The maintenance functions SERVICE.TIME, TRAVEL.ACCU and CYCLE.COUNTER can be clearly monitored and optimised.

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Factory setting: Set interval: 0 s or 0 °

Menu or function	Values or description
Device	
> Control head	
> Parameter	
> Maintenance functions	Overview of all maintenance functions. Maintenance functions are functions that are only used for maintenance
> TRAVEL.ACCU Totalizer for covered distance	The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts
> Reset totalizer	
> Set interval	When the interval is reached, a corresponding maintenance message is displayed. Note: The counter is automatically reset when the interval is changed from 0 to another value
> Progress	Display in %
> Progress	Display in cm or °

Tab. 51: Menutree maintenance function

10.7.4 CYCLE.COUNTER: setting totaliser for pilot valve cycles

After enabling the function in the menu Activation of add. maintenance functions, the function appears in the menu Maintenance functions, the totalizer starts for recording the valve cycles and displays this progress. When the set interval has been reached, a maintenance message appears.

Note: In the menu
Maintenance > Wear part replacement activities > Optimize maintenance functions
The maintenance functions SERVICE.TIME, TRAVEL.ACCU and CYCLE.COUNTER can be clearly monitored and optimised.

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Factory setting: Set interval of pilot valve 1: 0

Menu or function	Values or description	
Device		
> Control head		
> Parameter		
> Maintenance functions		Overview of all maintenance functions. Maintenance functions are functions that are only used for maintenance
> CYCLE.COUNTER Totalizer for valve cycles		The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts
> Reset totalizer of pilot valve 1		
> Set interval of pilot valve 1	Setting range: (1...255) x 1000	When the interval is reached, a corresponding maintenance message is displayed. Note: The counter is automatically reset when the interval is changed from 0 to another value
> Progress of pilot valve 1		Display in %
> Progress of pilot valve 1		Display of cycles

Tab. 52: Menutree maintenance function

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10.7.5 Monitor values related to maintenance

When maintenance functions are enabled, the values in this menu can be displayed together.

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Monitor maintenance values		This menu contains all maintenance relevant values
> Progress of SERVICE.TIME	Value in %	SERVICE.TIME Totalizer for operating duration
> Progress of SERVICE.TIME	Value in units of time	SERVICE.TIME Totalizer for operating duration
> Progress of TRAVEL.ACCU	Value in %	TRAVEL.ACCU Totalizer for covered distance
> Progress of TRAVEL.ACCU	Value in units of length	TRAVEL.ACCU Totalizer for covered distance
> Progress of pilot valve 1 CYCLE.COUNTER	Value in %	CYCLE.COUNTER Totalizer for valve cycles
> Progress of pilot valve 1 CYCLE.COUNTER	Quantity	CYCLE.COUNTER Totalizer for valve cycles

Tab. 53: Menutree maintenance function

10.7.6 Reset maintenance values

This function can be used to reset all display values for the maintenance functions.

User level: installer

Menu or function	Values or description	
Device		
> Control head		
> Diagnostics		
> Resetting maintenance values	A wizard starts up.	Resetting display values of all maintenance functions, such as totalizer values (no parameters)

Tab. 54: Menutree maintenance function

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10.8 Device functions

10.8.1 Lock device for local operation (local control lock)

This function locks operation directly on the device.

User level: installer

Factory setting: No

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Local control lock	Yes/no	The device is locked for local control directly on the device

Tab. 55: Menutree function

10.8.2 Switch pilot valve manually

This function can be used to switch a pilot valve. To do this, enable the MANUAL operating state and switch the pilot valve by activating and deactivating the button.

User level: installer

Factory setting: No

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Activate MANUAL operating state	Yes/no	The actuator can only be moved manually
> Switching pilot valves manually	Pilot valve 1	MANUAL

Tab. 56: Menutree function

10.8.3 Display operating state

This function can be used to display the current operating state. An explanation is available in the menu Explanation of operating states.

User level: installer

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Menu or function	Values or description
Device	
> Device operation	
> Diagnostics	
> Current operating state	INIT AUTOMATIC TEACH SAFEPOS MANUAL PILOT.VALVE.OFF
	SPEED.CTRL tune
> Explanation of operating states	A wizard starts up.

Tab. 57: Menutree diagnostic function

Explanation of operating states:

Operating state	Explanation
INIT	The device is being initialized
AUTOMATIC	The device operates independently in normal control mode
TEACH	The device is taught in via TEACH.AUTO or TEACH.MANU
SAFEPOS	The actuator moves or is in the safety end position set in SAFEPOS due to a message
MANUAL	The actuator can only be moved manually
PILOT.VALVE.OFF	The actuator moves or is in the end position defined by a supply voltage-free device
SPEED.CTRL tune	When the SPEED.CTRL tune function is executed, the actuator performs movements to determine internal parameters for limiting the actuation speeds. The actuator's filling and exhaust times are also recalculated

10.8.4 Set status indicator

User level: installer

Factory setting: depends on the device (see description of display elements)

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Menu or function	Values or description	
Device		
> General settings		
> Parameter		
> Status LED		Colors and behavior of the device status LED
> Mode	NAMUR mode LED off 12)	
> Status LED brightness		

Tab. 58: Menutree set status indicator

10.8.5 FEEDBACK.LED: Set colours and backlight mode of the position indicator

The following parameters can be set with this function:

- Set the colour, backlight mode and brightness of the feedback LEDs for the position indicator

User level: installer

Factory setting:
End position S1 LED color: Green
End position S2 LED color: Yellow
End position S1 LED lighting mode: Permanent lighting
End position S2 LED lighting mode: Permanent lighting
Feedback LED brightness: 100%

Menu or function	Values or description	
Device		
> Device operation		
> Parameter		
> Control functions		Overview of all control functions. Control functions are functions that affect the approach of an end position of the actuator
> FEEDBACK.LED Parameters for the feedback LED		The feedback LED visually indicates the end positions

12) Depending on the device, further settings are possible (see description of display elements).

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Menu or function	Values or description	
> End position S1 LED color	Ignore White Green Blue Yellow Orange Red Pink Teal	Selection of the color for the feedback LED
> End position S2 LED color	Ignore White Green Blue Yellow Orange Red Pink Teal	Selection of the color for the feedback LED
> End position S1 LED lighting mode	Permanent lighting Slow blinking Fast blinking	Selection of the lighting mode for the feedback LED
> End position S2 LED lighting mode	Permanent lighting Slow blinking Fast blinking	Selection of the lighting mode for the feedback LED
> Feedback LED brightness	100%	

Tab. 59: Menutree

10.8.6 Display, delete or save logbook

This function allows all messages relating to the device to be displayed, deleted or saved.

User level: installer

Menu or function	Values or description
Device	
> Control head	
> Diagnostics	
> Logbook	

Tab. 60: Menu tree

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10.8.7 Display device information

This function allows all device information to be displayed.

User level: Advanced User

Menu or function	Values or description	
Device		
> Device operation		
> Diagnostics		
> Device information		
> Ident. number		Article number of the device
> Serial number		
> Firmware ident. number		Bürkert specific identification number of the device firmware
> Firmware version		Version of the device firmware
> Hardware version		
> Product type		
> Manufacture date		
> Device driver		Information about the used device driver

Tab. 61: Menutree

10.8.8 Restart device

This function can be used to restart the device.

The function **Automatically disable MANUAL after restarting** allows the active MANUAL operating state to be automatically disabled after a device restart. See Automatically disable the MANUAL operating state after device restart [▶ 106].

User level: installer

Menu or function	Values or description
Device	
> Control head	
> Diagnostics	
> Restart device	A wizard starts up.

Tab. 62: Menutree device function

10.8.9 Reset device to factory settings

This function allows the device to be reset to its factory setting.

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User level: installer

Factory setting: see chapter

Menu or function	Values or description
Device	
> Device operation	
> Diagnostics	
> Resetting the device to factory settings	A wizard starts up.

Tab. 63: Menutree

10.8.10 Enable the MANUAL operating state

This function enables the MANUAL operating state, which means that the actuator can only be moved manually using the pilot valves.

User level: installer

Factory setting: No

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Activate MANUAL operating state	Yes/no	The actuator can only be moved manually

Tab. 64: Menutree function

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10.8.11 Automatically disable the MANUAL operating state after device restart

This function allows the active MANUAL operating state to be automatically disabled after the device has been restarted.

User level: installer

Factory setting: No

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Automatically disable MANUAL after restarting	Yes/no	When the device is restarted, an active MANUAL operating state is automatically deactivated

Tab. 65: Menutree function

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11 Configuration with IO-Link communication

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

11.1 Connect IO-Link device

The IO-Link device with IO-Link interface is connected to an IO-Link master for the exchange of process data, parameters, diagnostic information and status messages.

Required components:

- Device Description File of the device (IODD, device description file)
- IO-Link master
- IO-Link standard cable: M12, 4- or 5-pin unshielded, A-coded (no büS cable)

The necessary start-up files and the description of the device parameters, such as output and input data, data format, data volume and supported transmission speed, are available on the Internet.

Download at:
/ Type xxxx / Software / Device Description Files

- Download IODD and unzip the ZIP file if necessary.
- Start IO-Link master.
- Refresh device catalogue (import IODD).
- Create a new project.
- Establish a connection.
- Configure, extract, monitor, etc. the device.

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12 Configuration with AS-Interface

12.1 Certification

The device is certified according to AS-Interface specification version 3.0 rev. 8.

Certificate no.: on request

12.2 Programming data

	S-7.A.E	S-7.A.7
I/O configuration	0x7 (3 inputs, 4 outputs)	0x7 (4 inputs, 4 outputs)
ID-Code	0xO	0xO
Extended ID code 1	0x7	0x7
Extended ID code 2	0xI	0x7

Tab. 66: Programming data

Bit assignment

Data bit	D3	D2	D1	D0
Input	Not used	Not used	Position S2: 0 End position not reached 1 End position reached	Position S1: 0 End position not reached 1 End position reached
Output	LED localisation[13]: 0 not active 1 active	Not used	Not used	Pilot valve V1 main stroke: 0 OFF 1 ON

Parameter bit	P3	P2	P1	P0
Input	Not used	Not used	Not used	Not used
Output	Not used	Not used	Not used	Not used

13) Only for profile S-7.A.7; for profile S-7.A.E, output bit D3 is not assigned.

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13 Factory settings

The device is supplied with the following firmware factory settings.

Changes to the factory settings can be made using the Bürkert Communicator.

With the IO-Link variant, changes to the factory settings can also be made via the communication interface IO-Link.

Status indicator

NAMUR operation mode

The status indicator shows the status of the device and its peripherals, based on NAMUR recommendation 107 (NE 107).

If various alerts are present, the status indicator always shines in the colour of the highest prioritised alert (red = outage = highest priority).

Colour	Colour code	Status signal	Description
Red	5	Failure	Output signals are invalid due to a malfunction in the device or its peripherals.
Orange	4	Check function	Work is being carried out on the device, which means that normal operation is temporarily not possible.
Yellow	3	Out of specification	The environmental or process conditions for the device are outside the specified range. Internal device diagnosis indicate problems in the device or process characteristics.
blue	2	Maintenance required	The device is in normal operation, although a function is briefly restricted. ▸ Service device
Green	1	Diagnosis active	Device is running faultlessly, diagnosis are active.

Tab. 67: Status indicator according to NE 107

Position indicator for valve positions

Valve position	Colour	Backlight mode
S1	Green	continuous illumination
S2	Yellow	continuous illumination

Tab. 68: Factory setting position indicator

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Feedback ranges for the linear position sensor

A feedback range is the range within which a valve position/position (e.g. S1) is reported back.

Valve position	Factory setting		Setting range [mm]
	Feedback range upper limit [mm]	Feedback range lower limit [mm]	
S1	+ 3	−3	±0.5...±20
S2	+ 3	−3	±0.5...±20

Tab. 69: Factory setting for the feedback ranges

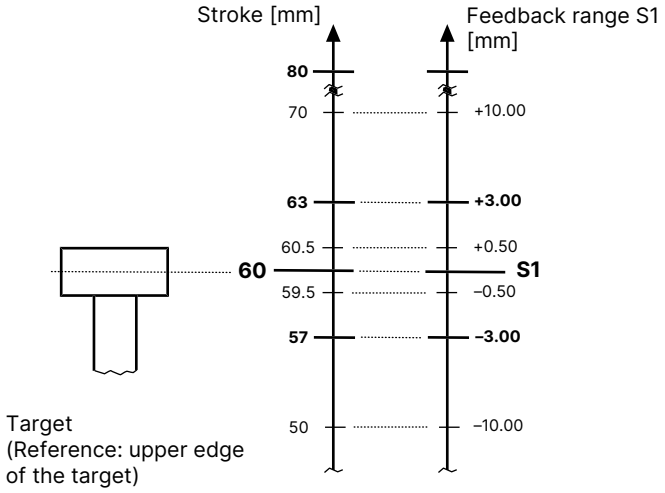

Fig. 46: Schematic diagram of the feedback ranges using the example of valve position S1

Feedback ranges for the rotary position sensor

Valve position	Factory setting		Setting range [°]
	Feedback range upper limit [°]	Feedback range lower limit [°]	
S1	+10	−10	±2...±45
S2	+10	−10	±2...±45

Tab. 70: Factory setting for the feedback ranges

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14 Maintenance

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

14.1 Cleaning

NOTICE!

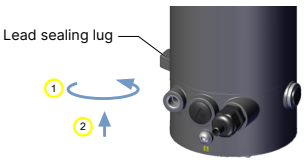
Avoid causing damage with cleaning agents.

- Before cleaning, check that the cleaning agents are compatible with device materials and seals.
- Observe the manufacturer's instructions and recommendations for use for the cleaning agent.
- To prevent electrostatic charging, only wipe the device with a damp or antistatic cloth.
- To prevent cleaning agent residues from remaining on the surface and in recesses, rinse the device thoroughly with clean water.

14.2 Change pilot valve

The valve module can only be replaced as a complete unit. It is not possible to replace individual pilot valves.

Open device:



- Remove lead seal when body is locked.

WARNING! Impairment of IP protection in the event of improper handling

- Do not use excessive force to open or close (e.g. by hitting).
- Turn the housing hood approx. 1.5 cm anticlockwise when viewed from above and pull it upwards.
- Do not contaminate seals when removing.

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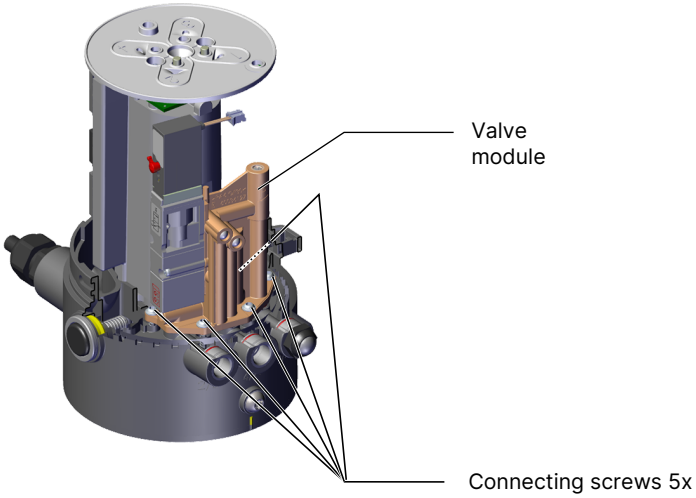
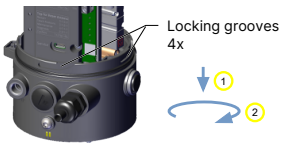


Fig. 47: Changing the pilot valve

- **WARNING! Switch off the supply voltage and supply pressure.**
- **NOTICE! Only dismantle and install the pilot valves (valve module) in an upright position, as there is a risk of the check valve falling out.**
- If necessary, mark the electrical ports on the PCB so that they can be correctly assigned during installation.
- Loosen the electrical connections.
- Loosen the connecting screws (T10) on the valve module.
- Remove the valve module and replace it with the spare part set.
- When inserting the valve module, make sure that the form seal fits correctly and fully on the lower side of the respective valve flange.
- To fix the valve module: insert the screws (T10) into the existing threading by turning them backwards and tighten them to a tightening torque of 1 Nm.
- Reattach the electrical ports. Note the labelling on the PCBA.

Close device:



- Clean the sealing surface and seal if necessary, and lightly lubricate with silicone grease.
- Place the housing hood onto the lower part so that the internal tabs are positioned over the fastening grooves and the sealing tabs are almost aligned. Press the housing hood fully over the seal of the lower part.
- Turn the housing hood by approx. 1.5 cm clockwise (or until the lead sealing lugs are positioned over each other).
- If applicable: Fit lead seal to prevent tool-free opening.

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14.3 Maintenance activities

The following settings and functions assist with maintenance:

- Set maintenance functions [▶ 113]
- Monitor values related to maintenance [▶ 114]
- Set maintenance-related values and functions that assist in the replacement of wear parts [▶ 114]
- Lock device for local operation (local control lock) [▶ 100]
- Switch pilot valve manually [▶ 100]
- Operating state MANUAL [▶ 105]
- MANUAL after restart [▶ 106]

14.3.1 Set maintenance functions in the Bürkert Communicator

The following maintenance functions can be enabled and set using the Bürkert Communicator:

Additional maintenance functions that can be enabled:

Function name and description	Information
SERVICE.TIME Totalizer for operating duration The operation duration is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See SERVICE.TIME: set totaliser for operating duration [▶ 95]
TRAVEL.ACCU Totalizer for covered distance The covered distance is an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See TRAVEL.ACCU: recording the distance travelled by the actuator movement [▶ 96]
CYCLE.COUNTER Totalizer for valve cycles The number of valve cycles are an indicator of wear. This totalizer can be used to set a maintenance interval for wear parts	See CYCLE.COUNTER: setting totaliser for pilot valve cycles [▶ 97]

Tab. 71: Maintenance functions

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14.3.2 Monitor values related to maintenance

When maintenance functions are enabled, the values in this menu can be displayed together.

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Monitor maintenance values		This menu contains all maintenance relevant values
> Progress of SERVICE.TIME	Value in %	SERVICE.TIME Totalizer for operating duration
> Progress of SERVICE.TIME	Value in units of time	SERVICE.TIME Totalizer for operating duration
> Progress of TRAVEL.ACCU	Value in %	TRAVEL.ACCU Totalizer for covered distance
> Progress of TRAVEL.ACCU	Value in units of length	TRAVEL.ACCU Totalizer for covered distance
> Progress of pilot valve 1 CYCLE.COUNTER	Value in %	CYCLE.COUNTER Totalizer for valve cycles
> Progress of pilot valve 1 CYCLE.COUNTER	Quantity	CYCLE.COUNTER Totalizer for valve cycles

Tab. 72: Menutree maintenance function

14.3.3 Set maintenance-related values and functions that assist in the replacement of wear parts

When a wear part is replaced, the menus **Optimize maintenance functions** and **Optimize maintenance functions** must be executed for the functions SERVICE.TIME, TRAVEL.ACCU and CYCLE.COUNTER.

The supporting functions are described in this chapter.

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Menu or function	Values or description
Device	
> Control head	
> Maintenance	
> Wear part replacement activities	This menu contains all the necessary activities for replacing wear parts
> Execute maintenance	
> Optimize maintenance functions	Evaluate the wear part: If the replacement was carried out at the right time from the point of view of the system, you do not need to do anything. If the time was too early or too late, increase or decrease the intervals of the totalizers for maintenance
> Resetting maintenance values	If you have replaced a wear part, it usually makes sense to reset the following maintenance values
> Optimize diagnostic functions	When replacing wear parts, it may be useful to adjust diagnostic values that are dependent on wear parts
> Resetting diagnostic values	If you have replaced a wear part, it usually makes sense to reset the following diagnostic values
> Teach in the device again	If you have replaced a wear part, it is necessary to teach in the end positions again. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP
> Last maintenance date	
> Last maintenance by	

Tab. 73: Menutree maintenance function

Optimise maintenance functions

Menu or function	Values or description
Device	
> Control head	

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Menu or function	Values or description	
> Maintenance		
> Wear part replacement activities		This menu contains all the necessary activities for replacing wear parts
> Optimize maintenance functions		Evaluate the wear part: If the replacement was carried out at the right time from the point of view of the system, you do not need to do anything. If the time was too early or too late, increase or decrease the intervals of the totalizers for maintenance
> Progress of SERVICE.TIME	Value in %	SERVICE.TIME Totalizer for operating duration
> Progress of SERVICE.TIME	Value in units of time	SERVICE.TIME Totalizer for operating duration
> Set interval of SERVICE.TIME	Value in units of time	SERVICE.TIME Totalizer for operating duration
> Progress of TRAVEL.ACCU	Value in %	TRAVEL.ACCU Totalizer for covered distance
> Progress of TRAVEL.ACCU	Value in units of length	TRAVEL.ACCU Totalizer for covered distance
> Set interval of TRAVEL.ACCU	Value in units of length	TRAVEL.ACCU Totalizer for covered distance
> Progress of pilot valve 1 CYCLE.COUNTER	Value in %	CYCLE.COUNTER Totalizer for valve cycles
> Progress of pilot valve 1 CYCLE.COUNTER	Quantity	CYCLE.COUNTER Totalizer for valve cycles
> Set interval of pilot valve 1 CYCLE.COUNTER	Quantity	CYCLE.COUNTER Totalizer for valve cycles

Tab. 74: Menutree optimise maintenance functions

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Reset maintenance values

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Wear part replacement activities		This menu contains all the necessary activities for replacing wear parts
> Resetting maintenance values		If you have replaced a wear part, it usually makes sense to reset the following maintenance values
> Resetting maintenance values	A wizard starts up.	Resetting display values of all maintenance functions, such as totalizer values (no parameters)
> Reset totalizer of SERVICE.TIME	A wizard starts up.	SERVICE.TIME Totalizer for operating duration
> Reset totalizer of TRAVEL.ACCU	A wizard starts up.	TRAVEL.ACCU Totalizer for covered distance
> Reset tot. of pilot valve 1 CYCLE.COUNTER	A wizard starts up.	CYCLE.COUNTER Totalizer for valve cycles

Tab. 75: Menutree reset maintenance values

Optimise diagnostic functions

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Wear part replacement activities		This menu contains all the necessary activities for replacing wear parts
> Optimize diagnostic functions		When replacing wear parts, it may be useful to adjust diagnostic values that are dependent on wear parts
> Last time pilot valve 1 (from off to on)		SWITCH.TIME Switching time monitoring
> Limit for pilot valve 1 (from off to on)		SWITCH.TIME Switching time monitoring
> Last time pilot valve 1 (from on to off)		SWITCH.TIME Switching time monitoring

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Menu or function	Values or description
> Limit for pilot valve 1 (from on to off)	SWITCH.TIME Switching time monitoring
> Waiting time	SEAL.MONITOR Monitoring sealing position
> Limit value end position S1	SEAL.MONITOR Monitoring sealing position
> End position S1 positive tolerance	SEAL.MONITOR Monitoring sealing position
> End position S1 negative tolerance	SEAL.MONITOR Monitoring sealing position
> Last measured value end position S1	SEAL.MONITOR Monitoring sealing position
> Limit value end position S2	SEAL.MONITOR Monitoring sealing position
> End position S2 positive tolerance	SEAL.MONITOR Monitoring sealing position
> End position S2 negative tolerance	SEAL.MONITOR Monitoring sealing position
> Last measured value end position S2	SEAL.MONITOR Monitoring sealing position

Tab. 76: Menutree optimise diagnostic functions

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Reset diagnostic values

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Wear part replacement activities		This menu contains all the necessary activities for replacing wear parts
> Resetting diagnostic values		If you have replaced a wear part, it usually makes sense to reset the following diagnostic values
> Resetting diagnostic values	A wizard starts up.	Resetting display values of all diagnostic functions, e.g. last measured values or number of events (no parameters)
> Reset	A wizard starts up.	RAPID.MOVE Monitoring rapid movements

Tab. 77: Menutree reset diagnostic values

Re-teach device

Menu or function	Values or description	
Device		
> Control head		
> Maintenance		
> Wear part replacement activities		This menu contains all the necessary activities for replacing wear parts
> Teach in the device again		If you have replaced a wear part, it is necessary to teach in the end positions again. This can be done with TEACH.AUTO, TEACH.MANU or TEACH.IN.OP
> Start automatic teach function 1	A wizard starts up.	Automatic teach-in of the main stroke (end position S1, end position S2)
> Start automatic teach function 2	A wizard starts up.	Automatic teach-in of the inverse main stroke (end position S2, end position S1)

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Menu or function		Values or description	
	> Start manual teach function 1	A wizard starts up.	Manual teach-in of end position S1 (main stroke)
	> Start manual teach function 2	A wizard starts up.	Manual teach-in of end position S2 (main stroke)
	> Enable autostart of Teach-In-Operation		Teach-in end position in parallel during normal operation
	> State	General error Distance between end positions too small End position not stable TEACH.IN.OP aborted Abort due to device error Error due to pilot valve Error end position S2 Error end position S1 Timeout end position S2 Timeout end position S1 Abort by user Successful Ready Initialisation End position S1 is taught End position S2 is taught TEACH.IN.OP is executed	
	> Explanation of states	A wizard starts up.	
	> End position S1 is taught in (main stroke)	No Yes	
	> End position S2 is taught in (main stroke)	No Yes	

Tab. 78: Menutree re-teach device

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14.4 Activities for diagnostics

The following settings and functions assist with diagnostics:

Function name and description	Information
Device information This function displays all device information.	See Display device information [▶ 104]
Current operating state This function displays the current operating state. An explanation is available in the menu Explanation of operating states.	See Display operating state [▶ 100]
Logbook This function displays, deletes or saves all messages relating to the device.	See Display, delete or save logbook [▶ 103]
Monitor diagnostic values This menu contains all diagnostic relevant values	See Observe values relevant to diagnosis [▶ 93]
Resetting diagnostic values Resetting display values of all diagnostic functions, e.g. last measured values or number of events (no parameters)	See Reset diagnostic values [▶ 94]
Monitor maintenance values This menu contains all maintenance relevant values	See Display, delete or save logbook [▶ 114]
Resetting maintenance values Resetting display values of all maintenance functions, such as totalizer values (no parameters)	See Reset maintenance values [▶ 99]
Resetting teach function values Resetting the values determined in the TEACH.AUTO, TEACH.MANU and TEACH.IN.OP teach functions	See Reset values of the teach function [▶ 81]
Restart device This function restarts the device.	See Restart device [▶ 104]
Resetting the device to factory settings This function resets the device to its factory setting.	See Reset device to factory settings [▶ 104]

Tab. 79: Maintenance functions

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15 Troubleshooting

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

15.1 Troubleshooting activities

This function allows troubleshooting activities to be performed for individual functions.

User level: installer

Menu or function	Values or description
Device	
> Control head	
> Diagnostics	
> Troubleshooting activities	This menu contains activities for troubleshooting error messages
> Messages from TEACH	TEACH.AUTO Automatic teach function; TEACH.MANU Manual teach function; TEACH.IN.OP Automatic teach-in during operation
> Messages from TEMP.MONITOR	TEMP.MONITOR Temperature monitoring
> Messages from VOLT.MONITOR	VOLT.MONITOR Supply voltage monitoring
> Messages from SWITCH.CHECK	SWITCH.CHECK Switching monitoring
> Messages from SWITCH.TIME	SWITCH.TIME Switching time monitoring
> Messages from SEAL.MONITOR	SEAL.MONITOR Monitoring sealing position
> Messages from RAPID.MOVE	RAPID.MOVE Monitoring rapid movements
> Messages from SERVICE.TIME	SERVICE.TIME Totalizer for operating duration
> Messages from TRAVEL.ACCU	TRAVEL.ACCU Totalizer for covered distance

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Menu or function		Values or description
	> Messages from CYCLE.COUNTER	CYCLE.COUNTER Totalizer for valve cycles
	> Other messages	

Tab. 80: Menu tree

15.2 No feedback signal

Cause	Solution
Setting of the position sensor (teach function) not matching the spindle position	▸ Perform or repeat the teach function, see section Teach function: determine and save end positions [▸ 48]
No or faulty connected feedback signals or external proximity switch	▸ Establish ports in accordance with these operating instructions for the respective voltage or communication variant (pin assignment).
The target is not fitted to the valve spindle extension of the process valve, or the target is faulty	▸ Check the target for correct installation or condition. ▸ Check whether the correct target for linear or rotary actuators has been installed.

15.3 Feedback signal is “lost” in system operation

Cause	Solution
Position at the limit of the feedback range, see Factory settings [▸ 109]	▸ Perform or repeat the teach function, see section Teach function: determine and save end positions [▸ 48]
	▸ Check pressure supply.
The process valve end positions during operation differ from the end positions when the system is in sleep mode.	▸ Increase the tolerance band of the respective end positions accordingly (see X.CONTROL: set parameter for positioning [▸ 79])

15.4 Valve outlets cannot be switched by the controller

Cause	Solution
MANUAL operating state is still active (electric manual override)	▸ MANUAL operating state: switch to AUTOMATIC operating state
Mechanical manual override at the solenoid valve is still active	▸ Deactivate the mechanical manual override on the solenoid valve, see Switch pilot valve manually [▸ 61]

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15.5 Error message signalled on the status indicator

Cause	Solution
Various causes possible	▸ Read out error message via service interface on the Bürkert Communicator (see chapter 13.6)

15.6 No or faulty function of the process valves

Cause	Solution
No supply voltage or communication from the device	▸ Check the supply voltage and communication settings.
No or insufficient pneumatic supply of the device	▸ Check the pressure supply and ensure that there is a sufficient supply.

15.7 Incorrect function of the process valves

Cause	Solution
Swapped pneumatic connection lines	▸ Check that the device has a correct pneumatic connection to the process valve (see Connect the device pneumatically [▸ 39] for fluid diagrams)
Pilot valve not connected correctly	▸ Check that the pilot valves have a correct electrical connection.

15.8 Messages in the Bürkert Communicator

Messages are displayed in the Bürkert Communicator.

The function **Troubleshooting activities** can help to rectify an error: causes, measures and parameters are listed here. See Troubleshooting activities [▸ 122].

15.9 Read out errors with the Bürkert Communicator

15.9.1 Connect the device to the Bürkert Communicator

Options for connecting the device to the Bürkert Communicator:

- With a büS stick

Connecting with a büS stick:

Required components (see accessories):

- Communication software: Bürkert Communicator for PC
- USB-C to USB-A or USB-C cable

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To connect the device to the Bürkert Communicator:

- Install Bürkert Communicator on a PC.
  Note: do not connect the device to the PC during installation.
- **NOTICE! The USB-C port on the PC must be electrically isolated from the device's power supply unit (run the PC on battery power or use a USB isolator).**
  Use the USB cable to establish the connection between device and PC. For the USB-C service interface on the device, see the following chapter.
- Start Bürkert Communicator.

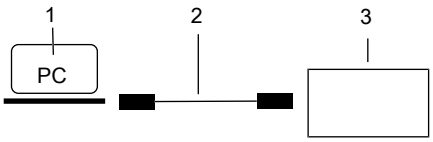

Fig. 48: Connection

1 PC	2 USB-A to USB-C or USB-C to USB-C cable
3 Device	

Adding the interface:

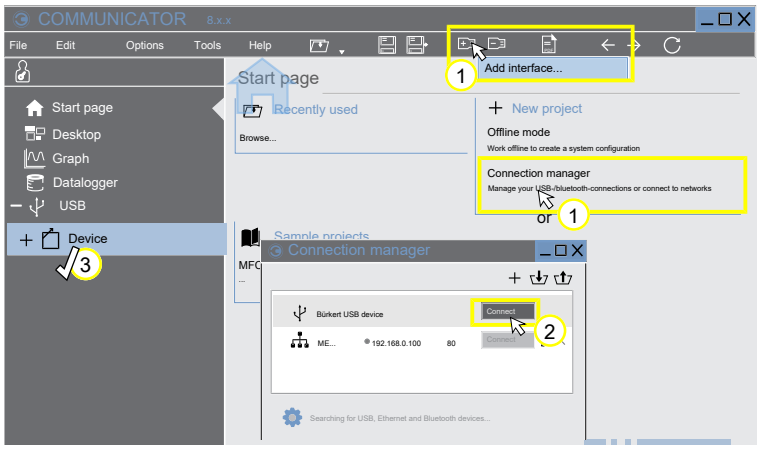

Fig. 49: Adding the interface

- 1. Add interface... or Connection manager
- 2. Connect

✓ 3. The device is now connected to Bürkert Communicator and appears in the navigation area.

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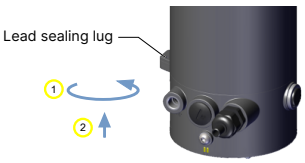
15.9.2 Connect USB-C service interface

Open device:



- Remove lead seal when body is locked.

WARNING! Impairment of IP protection in the event of improper handling

- Do not use excessive force to open or close (e.g. by hitting).
- Turn the housing hood approx. 1.5 cm anticlockwise when viewed from above and pull it upwards.
- Do not contaminate seals when removing.

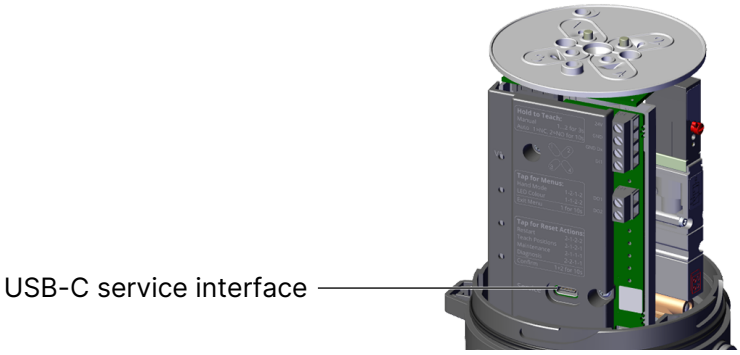


Fig. 50: USB-C service interface

- Plug the USB-C connector into the USB-C service interface.

15.9.3 Read errors in the Bürkert Communicator

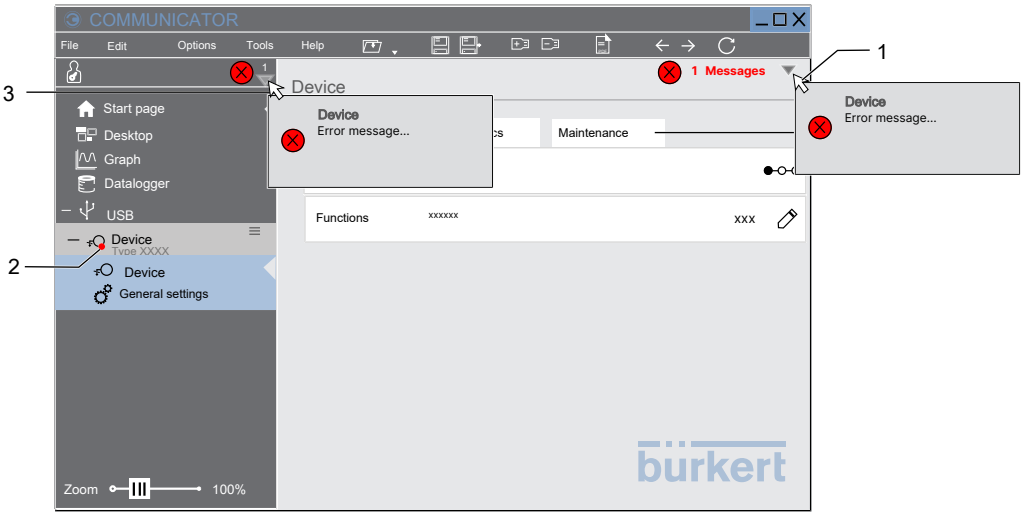


Fig. 51: Read errors

1	To display the error message: click on the icon with the left mouse button.	2	Error message on this device
3	To display the error message: click on the icon with the left mouse button.		

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16 Spare parts and accessories

Risk of injury and/or damage due to incorrect parts.

- Use only original accessories and original spare parts from the manufacturer.

Order the parts directly in our eShop.

Service and support

- For further information, technical advice and support, contact Bürkert service.

16.1 Spare parts

Article	Order number
Set 3/2-way solenoid valves 6524 for type 8682	20131328
Set valve module 3/2-way solenoid valve 6524 WWC+adapter+seal for type 8682	20131330
Set 5/2-way solenoid valve 6525 for type 8682	20131332
Set valve module 5/2-way solenoid valve 6525 WWH+adapter+seal for type 8682	20131333
Target for linear position sensor	60038268
Target for rotary position sensor	60038269
Set housing cover, plastic for type 8682	20131541
Set small parts (fastening screws + seals) for type 8682	20131540
Set housing base (base parts+seal+screws) for type 8682	20117203
Set housing base, internal air duct (base parts+air duct+seal+screws) for type 8682	20117205
Cable gland M16x1.5 SW19 black (clamping range 2...6 mm)	918563
Cable gland M16x1.5 SW22 black (clamping range 5...10 mm)	918343
Cable gland M16x1.5 SW19 Ex black (clamping range 2...6 mm)	920302
Cable gland M16x1.5 SW22 Ex black (clamping range 5...10 mm)	920228
Cable gland M16x1.5 SW22 Ex blue (clamping range 5...10 mm)	919495
Silencer G1/8	775755
Cable, M12 straight connector, 4-pin, A-coded, 1 m	217572
Cable, M12 straight connector, 5-pin, A-coded, 1 m	60007945
Cable, M12 straight connector, 5-pin, A-coded, 0.3 m	759136

Tab. 81: Spare parts

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16.2 Accessories

Article	Article number
Set steel seals (protection against opening without tools), 20 pieces	257100
Swivel angled push-in fitting G1/8, hose diameter 6 mm, nickel-plated brass	780082

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17 Uninstallation

Risk of injury or material damage when working on the device or system.

- Read and observe the chapter Safety [▶ 9] before working on the device or system.

Service and support

- For further information, technical advice and support, contact Bürkert service.

17.1 Disassemble the device

Pneumatically dismantling the device

- Switch off the compressed air supply and vent the lines.
- Release the pilot air port.
- If the exhaust air port is connected, disconnect it.
- Loosen the pneumatic connection to the actuator.

Uninstall the device electrically

- Disconnect the power supply to the device.

Devices with circular plug-in connector

- Loosen the circular plug.

Devices with cable gland:

- Open the housing.
- Uninstall the electrical connections at the terminal strip.
- Close the housing.

Uninstall the device mechanically

- Loosen the safety screws.
- Pull the device upwards.

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18 Logistics

18.1 Transport and storage

- Protect the device against moisture and dirt in the original packaging during transportation and storage.
- Avoid UV radiation and direct sunlight.
- Protect connections, if present, from damage with protective caps.
- Observe the permitted storage temperature.

18.2 Return

No work or tests will be carried out on the device until a valid Contamination Declaration has been received.

- Before returning a used device, log in to a Bürkert account and create a return request via My Services.
  Register an account before creating the request, if necessary. A return number is required for all used devices.
- Complete the Contamination Declaration and include it with the return shipment.
- Reinstall all original protective caps and plugs before shipping. This helps protect the device against contamination and transport damage.
- Pack the device securely and clearly indicate the return number on the shipment.

18.3 Disposal

Environmentally friendly disposal

- Follow national regulations regarding disposal and the environment.
- Collect electrical and electronic devices separately and dispose of them as special waste.

Further information can be found at country.burkert.com

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