

Type 2036

Robolux multiple-way diaphragm valve
Robolux Mehrwege-Membranventil
Vanne à membrane multivoies Robolux



Quickstart

English Deutsch Français

We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

© 2013 - 2017 Bürkert Werke GmbH & Co. KG

Operating Instructions 1711/01_EU-ML_00810360 / Original DE

1	QUICKSTART	3
2	AUTHORIZED USE	4
3	BASIC SAFETY INSTRUCTIONS.....	5
4	GENERAL INFORMATION	8
5	TECHNICAL DATA.....	8
6	ASSEMBLY.....	12
7	ELECTRICAL CONTROL UNIT	16
8	DISASSEMBLY	16
9	MAINTENANCE, CLEANING	16
10	SPARE PARTS.....	17
11	MALFUNCTIONS	17
12	TRANSPORT, STORAGE, PACKAGING	18

1 QUICKSTART

The Quickstart describe in a short form the importantly information and instructions for use of the device. A detailed description of the device can be found in the operating instructions for Type 2036.

Keep these instructions in a location which is easily accessible to every user, and make these instructions available to every new owner of the device.

Important Safety Information.

Read Quickstart carefully and thoroughly. Study in particular the chapters entitled “Basic safety instructions” and “Intended use”.

- ▶ Quickstart must be read and understood.



The operating instructions can be found on the Internet at: www.burkert.com

1.1 Definition of term / abbreviation

In these instructions, the term 'device' always refers to the Robolux Multiway Diaphragm Valve Type 2036.

In these instructions, the term 'Diaphragm Valve' always refers to the Robolux Multiway Diaphragm Valve Type 2036.



In these instructions, the abbreviation “Ex” always refers to “potentially explosive”.

1.2 Symbols



DANGER!

Warns of an immediate danger.

- ▶ Failure to observe the warning will result in a fatal or serious injury.



WARNING!

Warns of a potentially dangerous situation.

- ▶ Failure to observe the warning may result in serious injuries or death.



CAUTION!

Warns of a possible danger.

- ▶ Failure to observe this warning may result in a moderate or minor injury.

NOTE!

Warns of damage to property.



Indicates important tips and recommendations.



Refers to information in these operating instructions or in other documentation.

- ▶ Indicates an instruction to prevent risks.

→ Designates a procedure which you must carry out.

2 AUTHORIZED USE

Improper use of the Robolux multiway diaphragm valve Type 2036 may represent a hazard to persons, neighboring equipment and the environment.

The device is designed for controlling the flow-rate of liquid media.

- ▶ The approved data, the operating conditions and conditions of use specified in the contract documents, operating instructions and on the type label are to be observed during use.
- ▶ Protect device from damaging environmental influences (e.g. radiation, humidity, steam, etc.). If anything is unclear, consult the relevant sales office.
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Correct transportation, storage, and installation, as well as careful use and maintenance are essential for reliable and faultless operation.
- ▶ Use the device only as intended.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- Contingencies and events which may arise during the installation, operation, and maintenance of the devices.
- Local safety regulations – the operator is responsible for observing these regulations, also in relation to the installation personnel.



DANGER!

Risk of injury from high pressure in the equipment/device.

- ▶ Before working on equipment or device, switch off the pressure and deaerate/ drain lines.

Risk of electric shock (when electrical component installed).

- ▶ Before working on equipment or device, switch off the power supply and secure to prevent reactivation.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment.



WARNING!

Risk of injury caused by the spring jumping out when the actuator is opened.

- ▶ The actuator must not be opened.



WARNING!

Risk of burns.

The surface of the device may become hot during long-term operation.

- ▶ Do not touch the device with bare hands.

Risk of being crushed by moving spindle ends.

- ▶ Install transparent cap.

Danger due to loud noises.

Depending on the operating conditions, the device may generate loud noises. More detailed information on the likelihood of loud noises is available from the relevant sales office.

- ▶ Wear hearing protection when in the vicinity of the device.
- ▶ Observe the noise pressure level in the technical data.



CAUTION!

Leaking medium when the diaphragm is worn.

- ▶ Regularly check relief bore for leaking medium.
- ▶ If medium is leaking out of the relief bore, change the diaphragm.
- ▶ If the media is hazardous, protect the area surrounding the discharge point against dangers.

Generally hazardous situations.

To prevent injuries:

- ▶ Ensure that the system cannot be activated unintentionally.
- ▶ Installation and repair work may be carried out by authorized technicians only and with the appropriate tools.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- ▶ After an interruption in the electrical or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ The device must only be operated when in a perfect condition and in consideration of the operating instructions.
- ▶ Observe the safety regulations specific to the plant for application planning and operation of the device.
- ▶ The plant operator is responsible for the safe operation and handling of the plant.

To prevent material damage:

- ▶ Supply only media to the media connections that are specified in chapter "5 Technical Data" as flow media.
- ▶ Do not place the valve under mechanical stress (e.g. by placing objects on it or standing on it).
- ▶ Do not make any external alterations to the valves. Do not apply paint to body parts or screws.

3.1 Use in Ex area

Abbreviation "Ex": see chapter "[1.1 Definition of term / abbreviation](#)"

3.1.1 Safety instructions

For operation in Ex area Zone (gas) 1 and 2, Zone (dust) 21 and 22, the following applies:

The valve actuator is suitable for use as a Category 2 device for Zone 1 and 21, non-electrical production equipment.



DANGER!

Danger of explosion caused by electrostatic charge.

Depending on the conductivity of the medium, electrostatic charges may occur on the valve membrane if plastic bodies are used.

To prevent electrostatic charges in the fluid, the following instructions must be observed (as per IEC 60079-32-1):

- ▶ (1) Media with a conductivity ≤ 100 pS/m may only be used if no flow speeds > 1 m/s occur or if the possibility of the pipe system running dry is excluded by suitable monitoring.
- ▶ (2) Media with a conductivity > 100 pS/m and ≤ 1000 pS/m may only be used if they are liquids without any particles, steam or pure gases/steam, or if the instructions in (1) are observed.
- ▶ (3) Media with a conductivity > 1000 pS/m are not subject to any restrictions.

Further instructions:

- ▶ The user must ensure that the appliance is used in Zone 1/21 or 2/22 only.
- ▶ The control unit may restrict use in an explosive atmosphere. Follow operating instructions for control unit.
- ▶ Check that any cleaning agents are approved for use in explosive atmospheres.

3.1.2 Media temperature**DANGER!**

- ▶ If explosive media are used this can cause additional explosion risks.
- ▶ If media temperatures are used between 130 °C and 150 °C, the temperature class T3 / 200 °C applies (dust).

Media temperature max. 130 °C

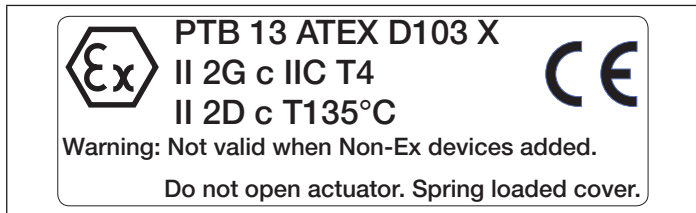
3.1.3 Ex marking

Fig. 1: Ex marking



The Ex marking is not valid if Non-Ex devices are added.

3.2 Special conditions

→ To ensure potential equalization, ground the valve body to the pipe system using an electrically conductive connection.

**DANGER!****Danger of explosion caused by electrostatic charge.**

In the event of a sudden discharge from electrostatically charged devices or individuals there is a risk of an explosion in the Ex area.

- ▶ Implement suitable measures to ensure that there are no electrostatically charges in the Ex area (see also "[3.1 Use in Ex area](#)").
- ▶ Clean the device surface by gently wiping it with a damp or anti-static cloth only.
- ▶ Earth the actuator and valve body.
- ▶ If a plastic body is used, earth the actuator separately.

Ambient temperature range: $0\text{ °C} \leq T_{amb} \leq 60\text{ °C}$

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. + 49 (0) 7940 - 10 91 111
Fax + 49 (0) 7940 - 10 91 448
Email: info@burkert.com

International

Contact addresses can be found on the final pages of the printed operating instructions.

And also on the Internet at: www.burkert.com

4.2 Warranty

The warranty is only valid if the diaphragm valve is used as intended in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Types 2036 can be found on the Internet at: www.burkert.com

5 TECHNICAL DATA

5.1 Conformity

The diaphragm valve of Type 2036 conforms with the EU Directives according to the EU Declaration of Conformity.

5.2 Standards

The applied standards, which verify conformity with the EU Directives, can be found on the EU-Type Examination Certificate and / or the EU Declaration of Conformity.

5.3 Approvals

The product is approved for use in zone 1 and 21 in accordance with ATEX directive 2014/34/EU category 2 GD.



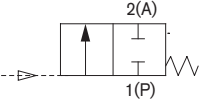
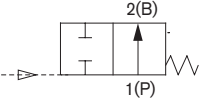
Observe chapter "[3.1 Use in Ex area](#)".

5.4 Operating conditions

Ambient temperature 0 – +60 °C¹⁾
higher temperatures on request

¹⁾ If a control unit or a pilot valve is used, the max. ambient temperature is +55 °C.

5.5 Control functions (CF)

<p>Control function A, NC (CFA) Closed by spring force in rest position.</p>	
<p>Control function B, NO (CFB) Opened by spring force in rest position</p>	

5.6 Mechanical data

Dimensions	see data sheet
Materials and connections	see data sheet or operating instructions
Noise pressure level	< 70 dB (A)

5.7 Fluidic data

Media	ultra-pure, sterile, aggressive,
flow media	
Media pressure	see chapter " 5.7.1 Pressure ranges "
Media temperature	
stainless steel/EPDM	+5 to +130 °C (max. +140 °C for 60 min.)
stainless steel/ Advanced PTFE	+5 to +90 °C (no steam)
stainless steel/FKM	+5 to +130 °C (no steam)
stainless steel/silicone	+5 to +130 °C (no steam)



Observe chapter "[3.1 Use in Ex area](#)".

Pilot medium	Neutral gases, dry air (min. 10 K below min. operating temperature), preferably unoled
Pilot pressure ²⁾	6 – 10 bar (RV50, RV70) 6 – 7 bar (RV110) from 4.2 bar (with reduced medium pressure) on request

²⁾ Pressure values [bar]: Overpressure with respect to atmospheric pressure

5.7.1 Pressure ranges

Pilot pressure and operation pressure for CFA, NC

Values for stainless steel body

Size	Actuator version ³⁾	Pilot pressure [bar] ⁴⁾	Test criterion	Max. operation pressure [bar] ⁴⁾	
				EPDM, FKM, Silicone	Advanced PTFE/EPDM
RV50	D11 D1x; Dx1	6 – 10	Static	7.5	7.5
			Dynamic	6.5	5.5
	D55	4.2 – 10	Static	5.0	3.5
			Dynamic	4.0	2.5
RV70	D11 D1x; Dx1	6 – 10	Static	8.0	8.0
			Dynamic	6.0	6.0
	D55	4.2 – 10	Static	5.5	6.0
			Dynamic	3.5	4.0
RV110	D11 D1x; Dx1	6 – 7	Static	7.0	7.5
			Dynamic	5.0	5.5
	D55	4.2 – 7	Static	5.0	5.0
			Dynamic	3.0	3.0

Tab. 1: Pilot pressure and operation pressure

³⁾ See type label.

⁴⁾ Pressure values [bar]: Overpressure with respect to atmospheric pressure

Remarks

Static leak-tightness:

Valve is closed (diaphragm is in contact with the body seat). One side of the body seat is under pressure. At the given pressure no leakage takes place via the body seat.

Dynamic leak-tightness:

Valve is open and the medium is flowing through it. The downstream flow is only slightly throttled by components placed downstream. Both sides of the body seat are under pressure. The valve is closed (CFA, NC via spring force; CFB, NO via pilot pressure). At the given pressure the valve closes onto the body seat and the seal is complete.

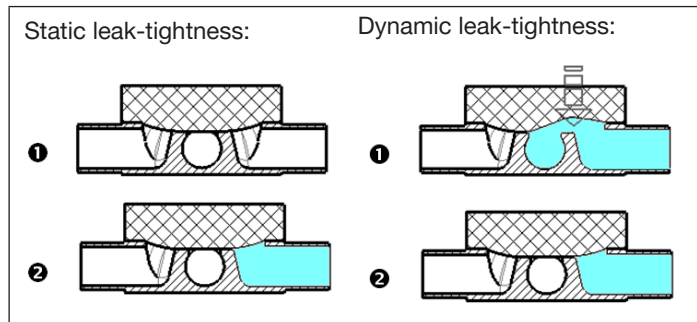


Fig. 2: Static and dynamic leak-tightness

Pilot pressure and operation pressure for CFB, NO

The following graphs illustrate the required minimum pilot pressure depending on the medium pressure for control function B.

Permitted pilot pressure range: 2 – 7 bar.



The pilot pressure should be selected to be as low as possible to reduce wear on the diaphragm.

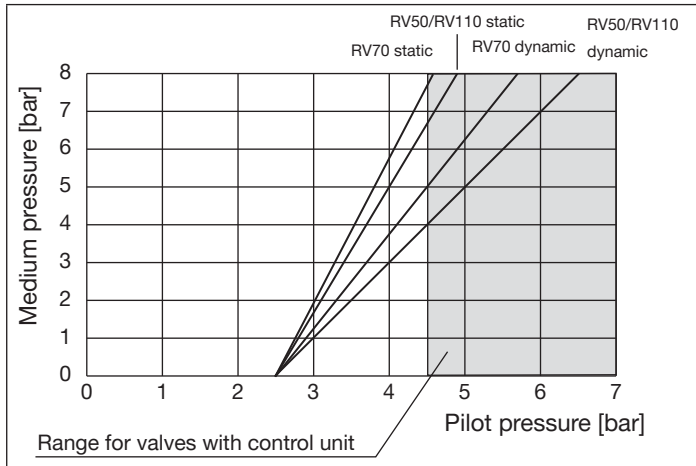


Fig. 3: Pilot pressure depending on the medium pressure

5.8 Valve marking

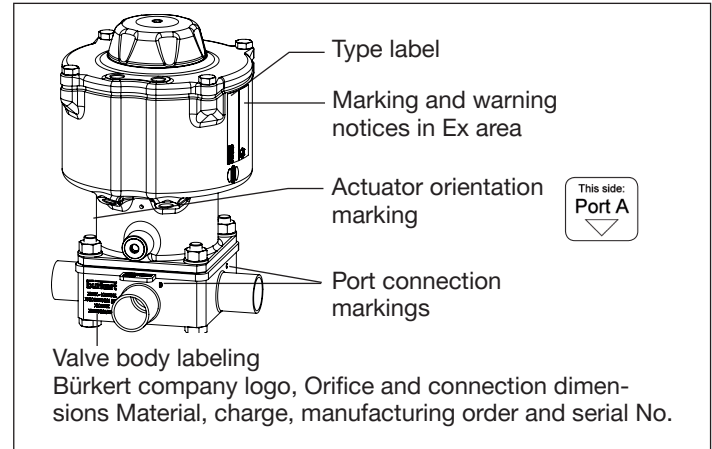


Fig. 4: Valve marking

5.8.1 Type label

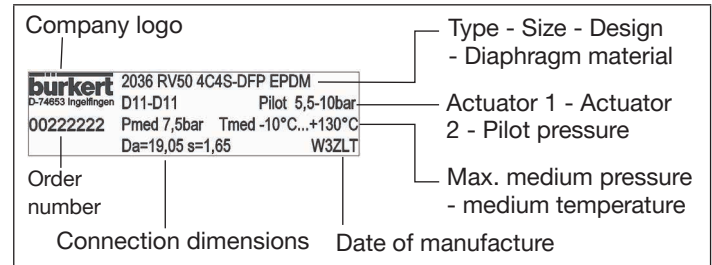


Fig. 5: Type label

6 ASSEMBLY

6.1 Safety instructions



DANGER!

Risk of injury from high pressure in the equipment/device.

- ▶ Before working on equipment or device, switch off the pressure and deaerate/drain lines.



WARNING!

Risk of injury from improper assembly.

- ▶ Installation must only be carried out by authorized technicians and with the appropriate tools.

Risk of injury from unintentional activation of the system and uncontrolled restart.

- ▶ Secure system from unintentional activation.
- ▶ Following assembly, ensure a controlled restart.



CAUTION!

Risk of injury due to a heavy device.

A heavy device can fall down during transport or during installation and cause injuries.

- ▶ Transport, install and dismantle a heavy device with the help of another person.
- ▶ Use appropriate tools.

6.2 Before installation

- Before connecting the valve, ensure the pipelines are flush.
- Pay attention to the flow direction.

6.2.1 Installation position

- The piston-controlled diaphragm valve can be installed in any position, preferably with connection B downwards.
- Installation for self-drainage of the body:
see chapter "[Valve self-draining](#)" in operating instruction.

6.2.2 Preparatory work

- Clean pipelines (sealing material, swarf, etc.).
- Support and align pipelines.

Devices with welded body

NOTE!

Damage to diaphragm or actuator.

- ▶ Before welding in the body disassemble the actuator and diaphragm.

Remove the actuator from the valve body:

- Move the actuator to the upper actuator position (CFA, NC: by applying pilot pressure; CFB, NO: by removing the pilot pressure).
- Mark the position of the actuator in relation to the valve body.
- Unscrew the four body screws that connect the valve body with the actuator. Remove the actuator and the diaphragm.

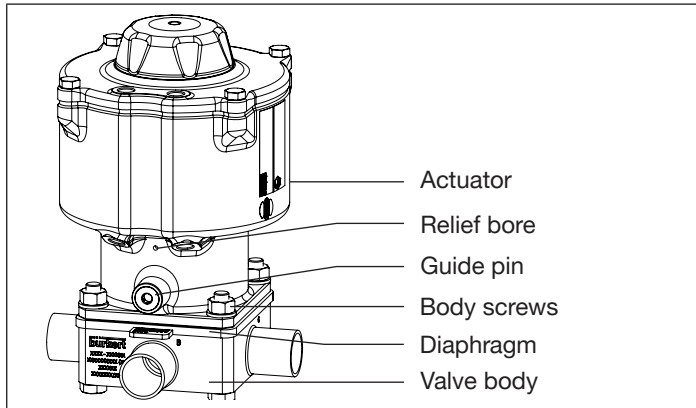


Fig. 6: Assembly

6.3 Installation



WARNING!

Risk of injury from improper assembly.

Non-compliance with the tightening torques is dangerous due to possible discharge of medium and possible release of pressure.

- ▶ Observe the tightening torque (see "Tab. 2").

NOTE!

When installing the device in the system, note:
The device and the relief bore must be accessible.

6.3.1 Installing the body

Welded body

→ Weld valve body in pipeline system.

Other body designs

→ Connect body to pipeline.

6.3.2 Installing the actuator (welded body)

→ Move the actuator to the upper actuator position (CFA, NC: by applying pilot pressure; CFB, NC: by removing the pilot pressure).

→ Put the actuator / diaphragm on the body with correct alignment (so that the markings made previously align). In the case of RV110 the four spacer sleeves must be inserted in the designated body holes (see "Fig. 7: Spacer sleeve").

→ Tighten the diagonally opposed body screws / nuts until there is visible, uniform mechanical contact between the valve body, diaphragm and actuator.

→ Switch the diaphragm valve twice.

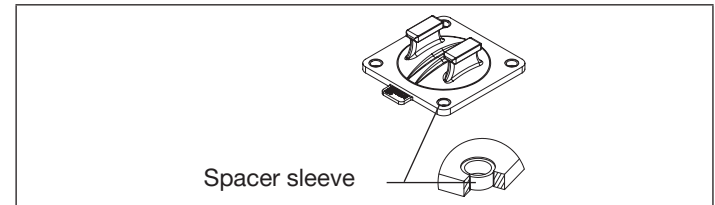


Fig. 7: Spacer sleeve



WARNING!

Risk of injury from discharge of medium and release of pressure.

▶ Tighten the body screws sufficiently (see "Tab. 2").

→ Move the actuator to the lower actuator position (CFA, NC: by removing pilot pressure; CFB, NO: by applying the pilot pressure).

→ Tighten body screws in diagonal pairs in three stages (approx. 1/3, approx. 2/3, 3/3 of the tightening torque), according to "Tab. 2".

The diaphragm should be positioned and pressed evenly all around the actuator and body.

Size	Tightening torque [Nm]
RV50	6
RV70	17
RV110	30

Tab. 2: Tightening torque

6.4 Pneumatic connection



WARNING!

Risk of injury from unsuitable connection hoses.

Hoses which cannot withstand the pressure and temperature range may result in hazardous situations.

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

6.4.1 Connection of the pilot medium



To comply with the degree of protection IP65 / IP67 on the pilot air port which is not required (for CFA, NC and CFB, NO), install an exhaust air line in the dry area.

For the assignment of pilot air ports refer to the installation and dimensional drawing included with delivery of the valve.

The use of pneumatic hose with a minimum size of 6/4 is recommended. For longer hose lengths the hose cross-sections should be adapted accordingly.



In aggressive surroundings and in situations where moisture could enter the actuator via the exhaust air port or muffler the exhaust air should be collected and ducted to a non-critical location.

Type 2036 Assembly

Control function A:

→ Connect the control medium to the pilot air port 1 and/or 3 (see "Fig. 8").

Control function B:

→ Connect the control medium to the pilot air port 2 and/or 4 (see "Fig. 8").

Silencer

→ Connect the silencer into the free air discharge connection (see "Fig. 8").

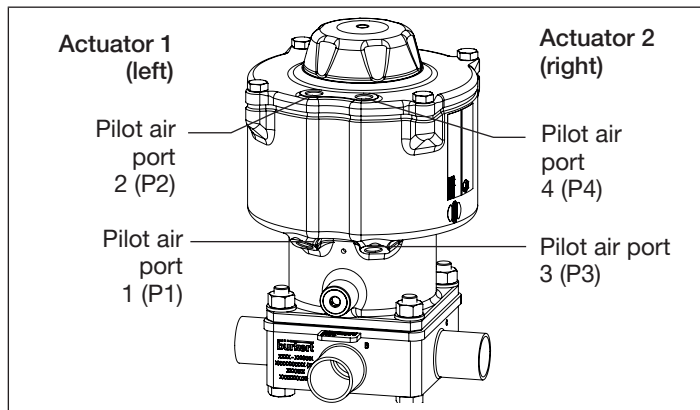


Fig. 8: Pneumatic connection

Actuator version	Actuator 1		Actuator 2	
	CF	Connection	CF	Connection
D11, D55 CFA/CFA (NC/NC)	CFA, NC	Pilot air → P1 P2: air discharge	CFA, NC	Pilot air → P3 P4: air discharge
D12 CFA/CFB (NC/NO)	CFA, NC	Pilot air → P1 P2: air discharge	CFB, NO	Pilot air → P4 P3: air discharge
D21 CFB/CFA (NO/NC)	CFB, NO	Pilot air → P2 P1: air discharge	CFA, NC	Pilot air → P3 P4: air discharge
D22 CFB/CFB (NO/NO)	CFB, NO	Pilot air → P2 P1: air discharge	CFB, NO	Pilot air → P4 P3: air discharge

Tab. 3: Pneumatic connection for actuator versions

CFA, NC : Valve normally closed by spring action

CFB, NO : Valve normally open by spring action

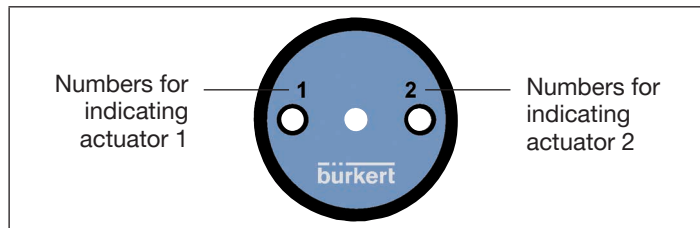


Fig. 9: Cover film

7 ELECTRICAL CONTROL UNIT



The electrical connection of the pilot valve / control unit is described in the operating instructions for the pilot valve / control unit.



Observe chapter "[3.1 Use in Ex area](#)".

8 DISASSEMBLY



DANGER!

Risk of injury from discharge of medium and release of pressure.

It is dangerous to remove a device which is under pressure due to the sudden release of pressure or discharge of medium.

- ▶ Before removing a device, switch off the pressure and vent the lines.



If the valve is to be reused after removal, the actuator must be removed before disassembly where welded bodies are involved. For this, refer to the assembly instructions.

→ Loosen pneumatic connection.

→ Remove device.

9 MAINTENANCE, CLEANING

9.1 Servicing intervals

Check the diaphragm valves regularly for proper operation in terms of assembly, installation and operation.

9.2 Servicing work



Do not repair the device yourself, but replace it with an equivalent device. Repairs may be performed by the manufacturer only.

9.2.1 Actuator

The actuator of the diaphragm valve is maintenance-free provided it is used according to these operating instructions.

9.2.2 Wearing parts of the diaphragm valve

The diaphragm is subject to wear.

→ If leakage occurs replace the diaphragm.



A bulging diaphragm may reduce the flow rate.



The replacement of the wearing parts is described in the operating instruction in chapter "[Repairs](#)".

9.3 Cleaning

NOTE!

Avoid causing damage with cleaning agents.

- ▶ Before cleaning, check that the cleaning agents are compatible with the device materials.



Observe instructions in chapter "[3.1 Use in Ex area](#)".

10 SPARE PARTS



CAUTION!

Risk of injury and/or damage by the use of incorrect parts.

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and the surrounding area.

- ▶ Use original accessories and original spare parts from Bürkert only.

The diaphragm is available as a spare part for the diaphragm valve Type 2036.



If you have any queries, please contact your Bürkert sales office.

11 MALFUNCTIONS

Malfunction	Cause / remedial action
Actuator does not switch	Pilot air port interchanged ⁵⁾ CFA: Connect the pilot air port 1 and/or 3 CFB: Connect the pilot air port 2 and/or 4
	Pilot pressure too low See pressure specifications on the type label.
	Medium pressure too high See pressure specifications on the type label.
Valve is not sealed	Medium pressure too high See pressure specifications on the type label.
	Pilot pressure too low See pressure specifications on the type label.
	Actuator is rotated by 90° and installed opposite the valve body. → Guide pin, identification plate and body seats must be aligned in parallel.
Flow rate reduced	Diaphragm bulging → Replace diaphragm.

Tab. 4: Malfunctions

⁵⁾ see "[Fig. 8: Pneumatic connection](#)".

12 TRANSPORT, STORAGE, PACKAGING

NOTE!

Transport damage.

Inadequately protected devices may be damaged during transportation.

- ▶ Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- ▶ Prevent the temperature from exceeding or dropping below the permitted storage temperature.
- ▶ Protect the pneumatic connections from damage by placing protective caps on them.

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature 0 – +60 °C.

If the device is stored with tightened body screws, the diaphragm may be permanently deformed.

- ▶ If the device is stored for a prolonged period, slacken the body screws.

Damage to the environment caused by device components contaminated with media.

- ▶ Ensure that the device and packaging are disposed of in an environmentally sound manner.
- ▶ Observe applicable disposal and environmental regulations.

www.burkert.com