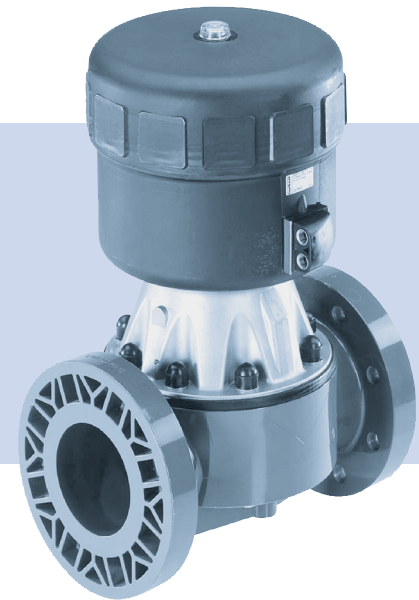


## Type 2030, 2031, 2032, 2033, 2037

Piston operated diaphragm valve,  
Actuator sizes 175 and 225 mm, Diameter DN65 - DN100

Kolbengesteuerte Membranventile,  
Antriebsgrößen 175 und 225 mm, Nennweiten DN65 - DN100

Vannes à membrane commandée par piston,  
Tailles d'actionneur 175 et 225 mm, Diamètre nominal DN65 - DN100



## Operating Instructions

Bedienungsanleitung  
Manuel d'utilisation

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

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Operating Instructions 2310/14\_EU-ML\_00803968 / Original DE

## Piston operated diaphragm valves type 2030, 2031, 2032, 2033, 2037

<b>1</b>	<b>OPERATING INSTRUCTIONS</b> .....	<b>4</b>	<b>8</b>	<b>INSTALLATION</b> .....	<b>17</b>
1.1	Definition of the Term “Device” .....	4	8.1	Installation position 2/2-way valve .....	17
1.2	Symbols.....	4	8.2	Installation position of T-valve type 2032 .....	18
<b>2</b>	<b>INTENDED USE</b> .....	<b>5</b>	8.3	Installation position of Y-valve type 2037.....	18
<b>3</b>	<b>BASIC SAFETY INSTRUCTIONS</b> .....	<b>5</b>	8.4	Installation into the pipeline.....	19
<b>4</b>	<b>GENERAL INFORMATION</b> .....	<b>7</b>	8.5	Removing the actuator and diaphragm from the valve body .....	20
4.1	Contact addresses .....	7	8.6	Mounting the actuator and diaphragm on the valve body .....	20
4.2	Warranty .....	7	8.7	VA insert .....	21
4.3	Information on the internet .....	7	8.8	Connection of the control medium.....	22
<b>5</b>	<b>SYSTEM DESCRIPTION</b> .....	<b>7</b>	8.9	Disassembly .....	22
5.1	General description.....	7	<b>9</b>	<b>ELECTRICAL CONNECTION</b> .....	<b>23</b>
5.2	Intended application area .....	7	<b>10</b>	<b>MAINTENANCE</b> .....	<b>23</b>
<b>6</b>	<b>TECHNICAL DATA</b> .....	<b>7</b>	10.1	Maintenance .....	23
6.1	Standards and directives.....	7	10.2	Repairs .....	25
6.2	Type label .....	8	<b>11</b>	<b>MALFUNCTIONS</b> .....	<b>27</b>
6.3	Labeling of the forged steel valve body .....	8	<b>12</b>	<b>SPARE PARTS</b> .....	<b>28</b>
6.4	Labeling of the tube valve body (VP).....	9	12.1	Order table .....	29
6.5	Operating conditions.....	9	<b>13</b>	<b>TRANSPORT, STORAGE, DISPOSAL</b> .....	<b>30</b>
6.6	General technical data.....	13			
<b>7</b>	<b>STRUCTURE AND FUNCTION</b> .....	<b>14</b>			
7.1	Structure.....	14			
7.2	Function.....	16			

# 1 OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. 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.

## WARNING!

The operating instructions contain important safety information!

Failure to observe these instructions may result in hazardous situations.

- ▶ The operating instructions must be read and understood.

## 1.1 Definition of the Term “Device”

In these instructions, the term “device” always refers to the diaphragm valves of Types 2030, 2031, 2032, 2033, 2037.

## 1.2 Symbols

### DANGER!

Warns of an immediate danger.

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

### WARNING!

Warns of a potentially dangerous situation.

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


### CAUTION!


Warns of a possible danger.

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

### NOTE!

Warns of damage to property.

 Important additional information, tips and recommendations.

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

- ▶ Designates instructions for risk prevention.  
→ Designates a procedure which you must carry out.

## 2 INTENDED USE

**Non-authorized use of the devices may be dangerous to people, nearby equipment and the environment.**

The diaphragm valves of Types 2030, 2031, 2032, 2033 and 2037 are designed for the control of contaminated, ultra-pure or sterile media, as well as for abrasive or aggressive media (also with higher viscosity).

- ▶ The device is designed for the controlled flow of liquid and gaseous media.
- ▶ The devices may be used only for media which do not attack the body and seal materials (see type label). Information on the resistance of materials to the media is available from your Bürkert sales office or on the Internet at: [country.burkert.com](http://country.burkert.com) → resistApp
- ▶ In potentially explosive atmospheres, only use devices that are approved for this purpose. These devices are identified by a separate Ex type label. Before use, note the information on the separate Ex type label and the Ex additional instructions or the separate Ex operating instructions.
- ▶ During use observe the authorized data, the operating conditions and conditions of use specified in the contract documents, operating instructions and on the type label.
- ▶ Protect device from damaging environmental influences (e.g. radiation, humidity, steam, etc.). If anything is unclear, consult the relevant sales office.
- ▶ The device may be used only in conjunction with third-party devices and components recommended and authorized by Bürkert.

- ▶ Correct transportation, correct storage and installation and 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 consider any contingencies or incidents which occur during installation, operation and maintenance. The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.



### **DANGER!**

**Risk of injury from high pressure and discharge of medium.**

- ▶ Before working on the device or system, switch off the pressure. Vent or empty the lines.

**Danger of bursting from overpressure.**

- ▶ Observe the specifications on the type label for maximal control and medium pressure.
- ▶ Observe permitted medium temperature.

**Risk of injury from electric shock (when electrical component installed).**

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

**Risk of injury from moving parts in the device!**

- ▶ Do not reach into openings.

**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.

**Danger of burns and risk of fire.**

Quickly switching actuators or hot medium may cause the surface of the device to become hot.

- ▶ Only touch the device while wearing protective gloves.
- ▶ Keep the device away from highly flammable substances and media.

**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.



**General hazardous situations.**

**To prevent injury, ensure:**

- ▶ That the system cannot be activated unintentionally.
- ▶ Only trained technicians may perform installation and maintenance work.
- ▶ Perform installation work and maintenance work using suitable tools only.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- ▶ After an interruption, ensure that the process is restarted in a controlled manner. Observe sequence!
  1. Apply supply voltage or pneumatic supply.
  2. Charge the device with medium.
- ▶ The device may be operated only when in 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.
- ▶ Observe the general rules of technology.
- ▶ The exhaust air may be contaminated with lubricants in the actuator.

**To prevent damage to property of the device, ensure:**

- ▶ Supply the media connections only with those media which are specified as flow media in the chapter entitled "6 Technical data".
- ▶ Do not make any changes on the device and do not subject it to mechanical stress.

## 4 GENERAL INFORMATION

### 4.1 Contact addresses

#### Germany

Bürkert Fluid Control Systems  
Sales Center  
Chr.-Bürkert-Str. 13-17  
D-74653 Ingelfingen  
Tel. + 49 (0) 7940 - 10 91 111  
Fax + 49 (0) 7940 - 10 91 448  
E-mail: [info@de.buerkert.com](mailto:info@de.buerkert.com)

#### International

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

Also on the Internet at [country.burkert.com](http://country.burkert.com)

### 4.2 Warranty

The warranty is only valid if the device 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 2030, 2031, 2032, 2033 and 2037 can be found on the Internet at: [country.burkert.com](http://country.burkert.com)

## 5 SYSTEM DESCRIPTION

### 5.1 General description

The Types 2030, 2031, 2032, 2033 and 2037 are an externally controlled diaphragm valve with piston drive and diaphragm seal. The valve is self-draining in the appropriate installation position.

### 5.2 Intended application area

The diaphragm valve of Type 2030 is designed for the control of contaminated and aggressive media. The valves of Type 2031, 2032, 2033 and 2037 can be used even for ultra-pure or sterile media with a higher viscosity. The valves may only control media which do not attack the body and seal materials (see type label). Information on the resistance of materials to the media is available from your Bürkert sales office or on the Internet at: [country.burkert.com](http://country.burkert.com) → resistApp.

## 6 TECHNICAL DATA

### 6.1 Standards and directives

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

## 6.2 Type label



### WARNING!

**Risk of injury from high pressure!**

Important device-specific technical specifications are indicated on the type label.

- ▶ Observe permitted pressure range on the type label of the device.

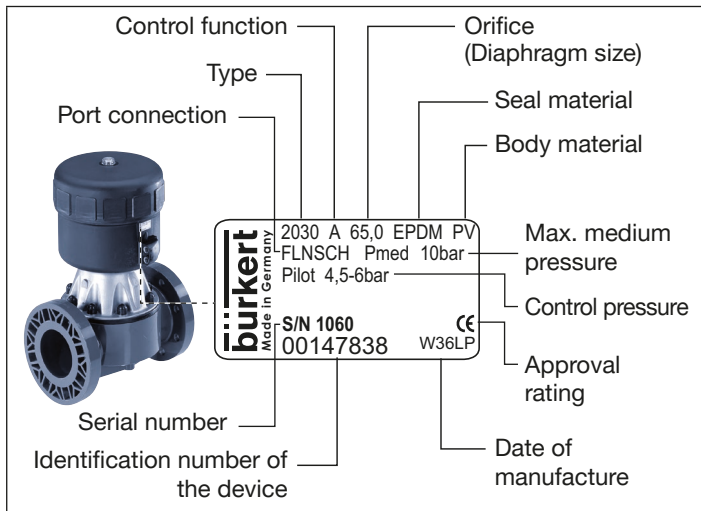


Fig. 1: Inscription on the type label (Example)

## 6.3 Labeling of the forged steel valve body

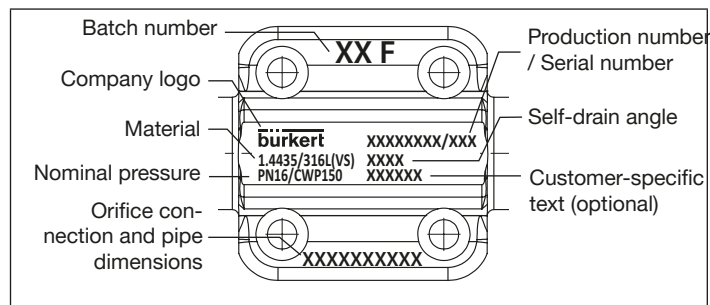


Fig. 2: Labeling of the forged steel valve body



## 6.4 Labeling of the tube valve body (VP)

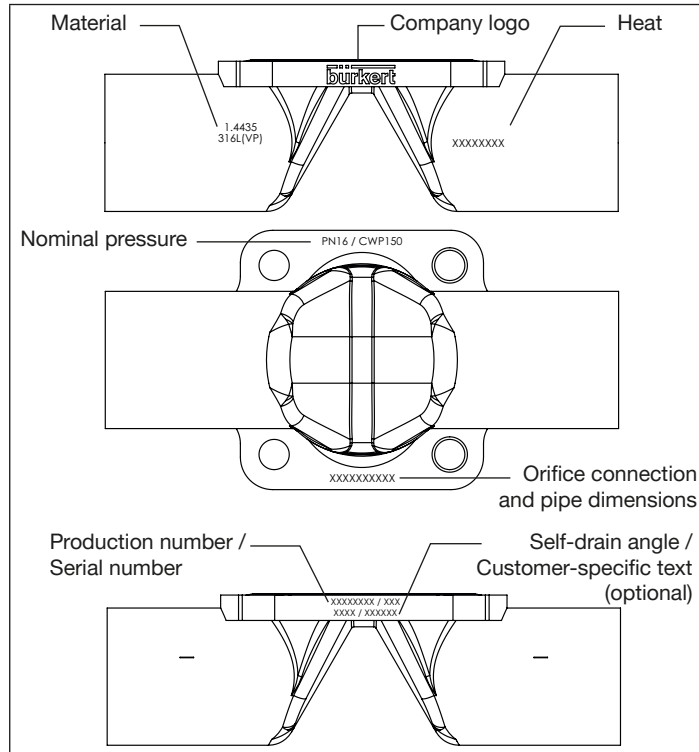


Fig. 3: Labeling of the tube valve body (VP)

## 6.5 Operating conditions



### WARNING!

**Danger of bursting from overpressure!**

If the device ruptures, the medium may cause injuries, chemical burns or scalds!

- ▶ Do not exceed the maximum control and medium pressure. Observe specifications on the type label!
- ▶ Observe permitted ambient and media temperature.

### 6.5.1 Allowable temperatures

Ambient temperature for actuators:

Material	Actuator size $\varnothing$	Temperature
PA	175 mm / 225 mm	-10 ... +50 °C

Tab. 1: Ambient temperature for actuators

Medium temperature for body:

Body material	Temperature
Stainless steel	-10 ... +150 °C
PVC (see PT-graph)	10 ... +60 °C
PVDF (see PT-graph)	-20 ... +120 °C
PP (see PT-graph)	10 ... +90 °C

Tab. 2: Medium temperature for body

### Medium temperature for diaphragms:



The indicated medium temperatures apply only to media which do not corrode or swell the diaphragm materials.

The behavior of the medium with respect to the diaphragm may be changed by the medium temperature.

The function properties, in particular the service life of the diaphragm, may deteriorate if the medium temperature increases.

Do not use the diaphragms as steam shut-off element.

Material	Temperature	Remarks
EPDM (AB)	-10...+130 °C	Steam sterilisation up to +140 °C / 60 min
EPDM (AD)	-10...+143 °C	Steam sterilisation up to +150 °C / 60 min
FKM (FF)	0...+130 °C	No steam / dry heat up to +150 °C / 60 min
PTFE (EA)	-10...+130 °C	Steam sterilisation up to +140 °C / 60 min
Advanced PTFE (EU)	-5...+143 °C	Steam sterilisation up to +150 °C / 60 min
Gylon (ER)	-5...+130 °C	Steam sterilisation up to +140 °C / 60 min

Tab. 3: Medium temperature for diaphragms

### 6.5.2 Maximum permitted medium pressure

Permitted medium pressure depending on the medium temperature with plastic valve body:

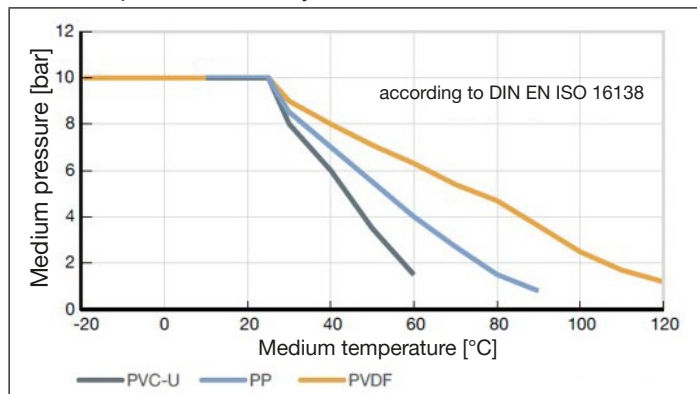


Fig. 4: Graph of medium pressure / Medium temperature with plastic valve body

### Maximum permitted medium pressure for control function A

The values apply to body made of:

- plastic,
- stainless steel: block material, forged, casted and tube valve body

Orifice DN (Diaphragm size)	Actuator size $\varnothing$ [mm]	Max. sealed medium pressure [bar]			
		Pressure on one side		Pressure on both sides	
		EPDM/ FKM	PTFE	EPDM/ FKM	PTFE
65	175	8.0	5.0	5.0	4.5
80	175	5.0	3.0 <sup>1)</sup>	2.5	2.0 <sup>1)</sup>
	225	10.0	7.0 <sup>2)</sup>	6.0	4.5 <sup>3)</sup>
100	225	8.0	4.0	3.5	1.5

Tab. 4: Maximum permitted medium pressure CFA

- 1) Tightness value only applies to GYLON/EPDM laminated (ER diaphragm), otherwise 0 bar for PTFE/EPDM and advanced PTFE/EPDM (EA and EU diaphragms).
- 2) Max. operating pressure for GYLON/EPDM laminated is 8.5 bar.
- 3) Max. operating pressure for GYLON/EPDM laminated is 8.0 bar.

### 6.5.3 Control pressure



#### WARNING!

#### Danger of bursting from overpressure!

If the device explodes, there is a risk of serious injury, chemical burns, scalding!

- ▶ Do not exceed the maximum control and medium pressure. Observe specifications on the type label!

#### NOTE!

Malfunction due to incorrect control pressure!

The specifications on the type label apply to valves with reduced spring force (i.e. with lower control pressure). If you are unsure, please contact your Bürkert sales office.

#### Permitted control pressure\*

Orifice DN (Diaphragm size)	Actuator size $\varnothing$ [mm]	Min. control pressure [bar]	Max. control pressure [bar]
65	175	2	6
80	175	2	6
80	225	2	6
100	225	2	6

Tab. 5: Permitted control pressure



\* Observe the permitted pressure range according to the type label!

Control pressure for control function A

Orifice DN (Diaphragm size)	Actuator size ø [mm]	Control pressure [bar] for medium pressure	
		0 bar	maximum
65	175	6	4.5
80	175	6	5.0
80	225	6	5.0
100	225	6	5.0

Tab. 6: Control pressure CFA

6.5.4 Minimum control pressure

Required minimum control pressure depending on medium pressure

The values apply to body made of:

- plastic
- stainless steel: block material, forged, casted and tube valve body

Control function B (CFB)

**NOTE!**

Important for the service life of the diaphragm!

- Do not select control pressure higher than required.

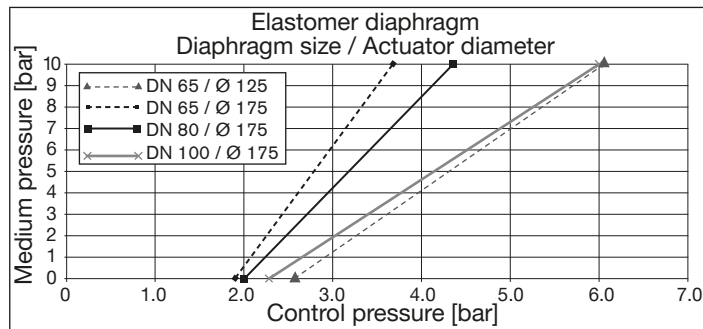


Fig. 5: Control function B - Elastomer diaphragm

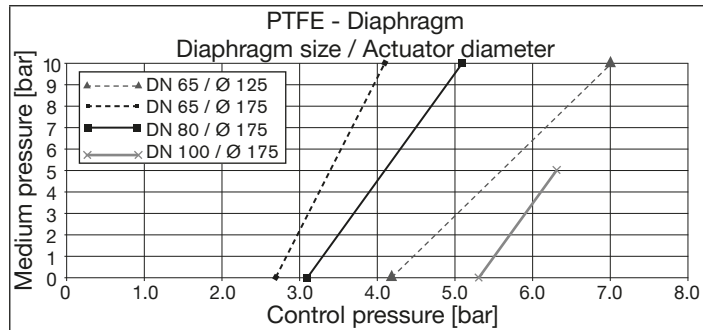


Fig. 6: Control function B - PTFE diaphragm

### Control function I (CFI)

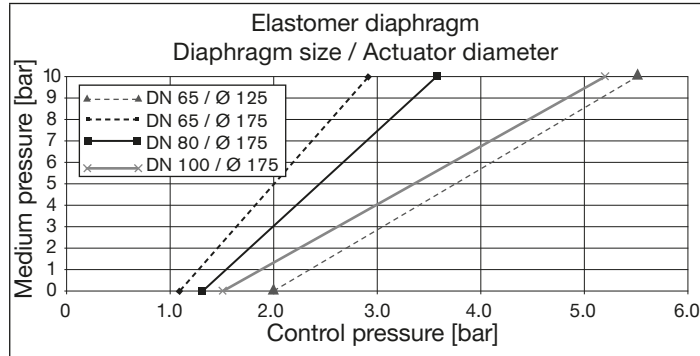


Fig. 7: Control function I - Elastomer diaphragm

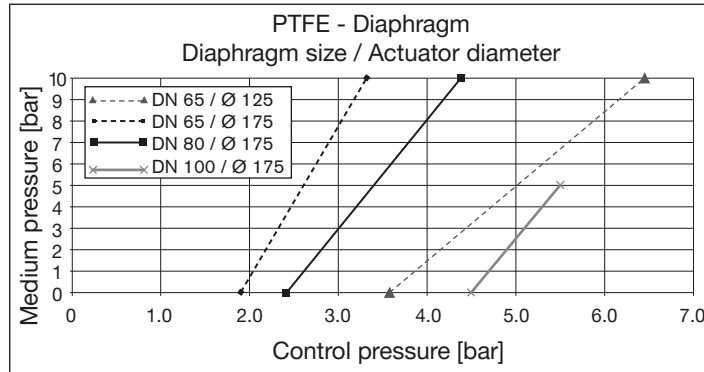


Fig. 8: Control function I - PTFE Diaphragm

## 6.6 General technical data

### Materials

#### Body

Type 2030

PP, PVC, PVDF

Type 2031

Stainless steel precision casting (VG),

Forged steel (VS)

Stainless steel tube valve body (VP)

Type 2032, 2033, 2037

Stainless steel - block material

#### Actuator

PA

#### Sealing elements actuator

NBR

#### Diaphragm

EPDM, PTFE, FKM

### Connections

#### Control air connection

G1/4

#### Medium connection

Weld end: in accordance with  
DIN EN 1127 (ISO 4200), DIN 11850 R2,  
DIN 11866 (ASME-BPE)  
other connections on request

## Media

Control medium neutral gases, air

## Flow media

Type 2030: contaminated and aggressive media

Type 2031, 2032,  
2033 and 2037: contaminated, aggressive, ultra-pure, sterile media and media with higher viscosity

## Installation position

any position, preferably with the actuator face up,  
Tank bottom valve Type 2033: Actuator to the bottom

## 7 STRUCTURE AND FUNCTION

### 7.1 Structure

#### 7.1.1 2/2-way valve type 2030 and 2031

The piston-controlled diaphragm valve consists of a pneumatically actuated piston actuator and a 2/2-way valve body.

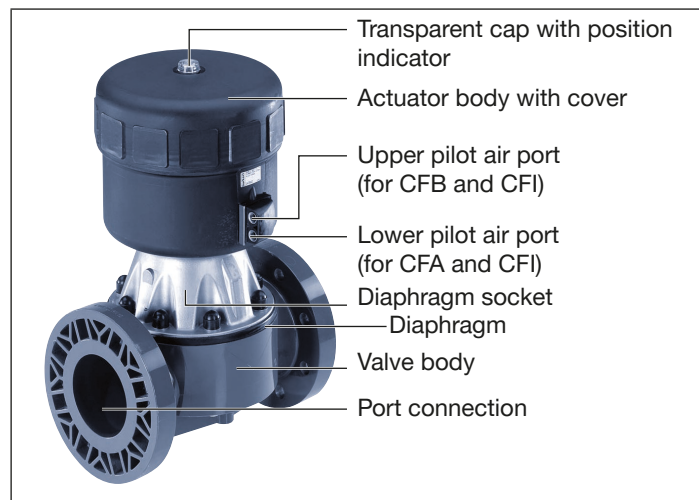


Fig. 9: Structure and description type 2030 and 2031

### 7.1.2 T-valve type 2032

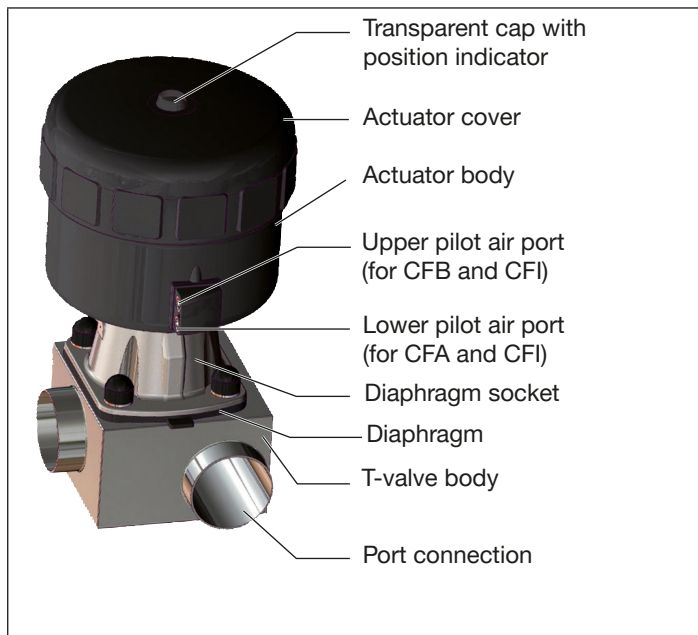


Fig. 10: Structure and descriptions type 2032

### 7.1.3 Tank bottom valve type 2033

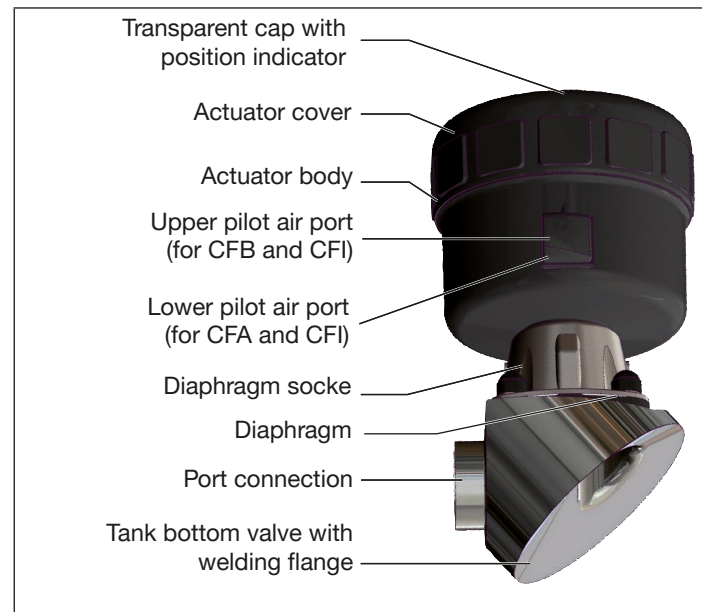


Fig. 11: Structure and description type 2033

### 7.1.4 Y-valve type 2037

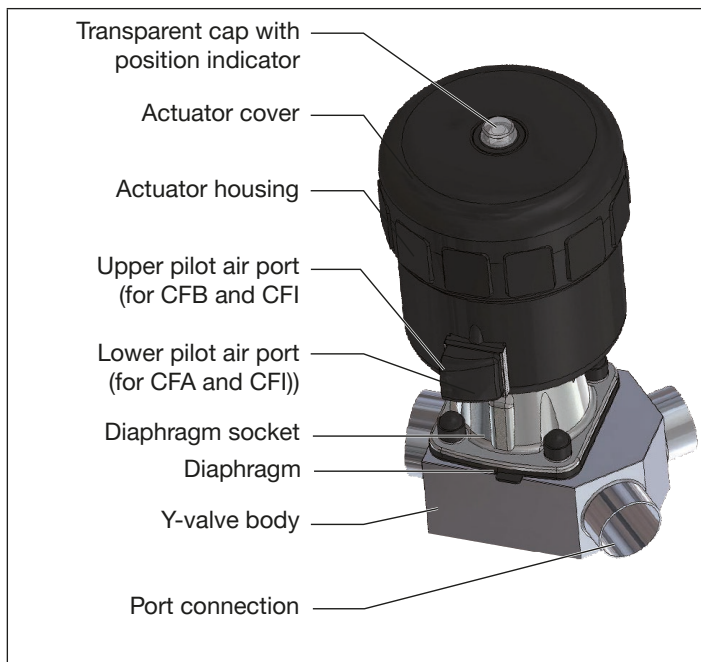


Fig. 12: Structure and description type 2037

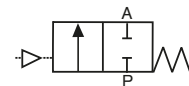
## 7.2 Function

Spring force (CFA) or pneumatic control pressure (CFB and CFI) generates the closing force on the diaphragm pressure piece. The force is transferred via a spindle which is connected to the actuator piston and the valve is opened and closed.

### 7.2.1 Control functions

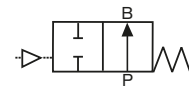
#### Control function A (CFA)

Closed by spring force in rest position



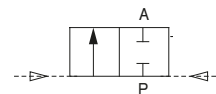
#### Control function B (CFB)

Opened by spring force in rest position



#### Control function I (CFI)

Double-acting actuator without spring





## 8 INSTALLATION



### DANGER!

**Risk of injury from high pressure in the equipment.**

- ▶ Before loosening the lines and valves, turn off the pressure and vent the lines.

**Risk of injury due to electrical shock.**

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



### WARNING!

**Risk of injury from improper installation.**

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

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

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



### CAUTION!

**Risk of injury due to heavy devices!**

- ▶ During transport or during assembly, a heavy device may fall and cause injury.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- ▶ Use appropriate tools.

## 8.1 Installation position 2/2-way valve

The piston-controlled diaphragm valve can be installed in any installation position, preferably with the actuator face up.

### Installation for leakage detection



One of the bores in the diaphragm socket, for monitoring leakage must be at the lowest point.

### To ensure self-draining



It is the responsibility of the installer and operator to ensure self-draining.

Self-draining must be considered during the installation:

- Inclination angle of the pipeline:  
The inclination angle is the responsibility of the installer and operator and should correspond to the inclination angle of the pipeline.  
For the pipeline, we recommend the inclination angle according to the valid ASME BPE.
- Self-drainage-angle for valve body:  
The self-drainage-angle ( $\alpha$ ) depends on the valve body size (diaphragm size) and the inner diameter of the port connection (DN). The self-drainage angle is specified as a value on forged steel valve bodies (VS) and tube valve bodies (VP) (see “Fig. 2” and “Fig. 3”).  
The marking on the port connection of valve bodies serves as an orientation aid (see “Fig. 13”). The marking must point upwards.  
The actual self-drainage-angle must be set with a suitable measuring tool.

For valve bodies without angle information, you can find the self-drainage-angle on the Internet.

[www.buerkert.com](http://www.buerkert.com). Type / User Manuals / Additional manual „Angles for self-draining of diaphragm valves“.

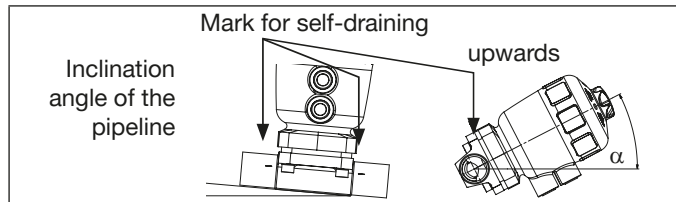


Fig. 13: Installation position for self-draining of the body

If you require clarification, contact your Bürkert sales department.

## 8.2 Installation position of T-valve type 2032

Installation for leakage detection



One of the bores in the diaphragm socket, for monitoring leakage must be at the lowest point.

For the installation of the T-valves into circular pipelines, we recommend the following installation positions:

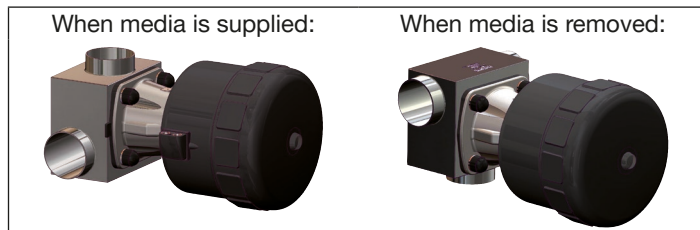


Fig. 14: Installation position of type 2032

## 8.3 Installation position of Y-valve type 2037

Installation for leakage detection



One of the bores in the diaphragm socket, for monitoring leakage must be at the lowest point.

For the installation of the Y-valves into systems, we recommend the following installation positions:

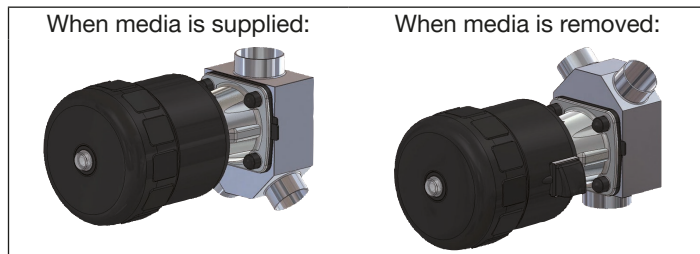


Fig. 15: Installation position of type 2037

## 8.4 Installation into the pipeline

### 8.4.1 Preparatory work

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

### 8.4.2 Installation requirements

- Ensure that pipelines are in alignment.
- Flow direction as required.



If used in an aggressive environment, we recommend conveying all free pneumatic connections into a neutral atmosphere with the aid of a pneumatic hose.

### 8.4.3 Weld or glue the valve body into the pipeline



Before welding or gluing the body, the actuator and the diaphragm must be removed.

The installation is divided into the following steps:

1. Disassemble actuator and diaphragm, see chapter [“8.5”](#)
2. → Weld or glue the valve body into the pipeline.
  - After welding or gluing in the body, smooth the valve body surface by grinding if required.
  - Carefully clean the body.
3. Mount the actuator and diaphragm, see chapter [“8.6”](#).

### 8.4.4 Welding tank bottom body Type 2033



Recommendation

Observe sequence:

1. Weld the tank bottom body onto the base of the tank before installing the tank. Welding onto a tank which has already been installed is possible but more difficult. Weld the tank bottom body in the middle of the tank base so that the tank can be optimally drained.
2. Weld tank bottom body into the pipeline.

**Installation requirements:**

Pipelines: Ensure that the pipelines are aligned.

Preparation: Support and align pipelines. To ensure that the pipeline is self-draining, we recommend the inclination angle according to the valid ASME BPE.



**DANGER**

**Risk of injury from high pressure.**

- ▶ Before working on the system, switch off the pressure and vent or drain lines.



For information on tanks and instructions on welding observe the standard ASME VIII Division I.

Before you start welding, check the batch number indicated on the supplied manufacturer's certificate 3.1.



Observe the applicable laws and regulations of the respective country with regard to the qualification of welders and the execution of welding work.

1. Welding tank bottom body onto the tank.

#### NOTE

##### Before welding, note the following:

- ▶ Use only welding material which is suitable for the tank bottom body.
- ▶ The tank bottom valve must not collide with any other installation part; the actuator must be easy to install and remove.

2. Welding tank bottom body into the pipeline.

→ Weld in tank bottom body.

 Ensure installation is de-energized and low-vibration.

#### After welding in the valve body:

Install the diaphragm and the actuator, see chapter [“8.6”](#).

## 8.5 Removing the actuator and diaphragm from the valve body

### 8.5.1 Procedure for control function A

→ Pressurize lower pilot air port with compressed air (value as indicated on the type label) (see [“Fig. 17”](#)).

This is required to detach the diaphragm without damage from the body.

→ Loosen fastening screws crosswise and remove actuator together with diaphragm from the valve body.

### 8.5.2 Procedure for control functions B and I

→ Loosen fastening screws crosswise and remove actuator together with diaphragm from the valve body.

## 8.6 Mounting the actuator and diaphragm on the valve body



#### WARNING!

**Risk of injury due to damaged device or malfunction.**

The failure to observe the tightening torque can damage the device or lead to malfunctions.

- ▶ Observe the tightening torque (see [“Tab. 7: Tightening torques for diaphragms”](#)).

### 8.6.1 Procedure for control function A

- Pressurize lower pilot air port with compressed air (value as indicated on the type label) (see “Fig. 17”).
- Place actuator together with diaphragm on the body.
- Lightly cross-tighten the body screws until the diaphragm lies between the body and actuator.  
**Do not tighten the screws yet.**
- Actuate the diaphragm valve twice to position the diaphragm correctly.
- Tighten body screws without pressurization in diagonal pairs in three stages (approx. 1/3, approx. 2/3, 3/3 of the tightening torque), according to table (see “Tab. 7”). The diaphragm should be positioned and pressed evenly all around the actuator and body.

### 8.6.2 Procedure for control functions B and I

- Place actuator together with diaphragm on the body.
- Lightly cross-tighten the body screws without pressurization until the diaphragm lies between the body and actuator.  
**Do not tighten the screws yet.**
- Pressurize upper pilot air port with compressed air (value as indicated on the type label) (see “Fig. 17”).
- Actuate the diaphragm valve twice to position the diaphragm correctly.
- Tighten body screws with pressurization in diagonal pairs in three stages (approx. 1/3, approx. 2/3, 3/3 of the tightening torque), according to Table (see “Tab. 7”). The diaphragm should be positioned and pressed evenly all around the actuator and body.

Orifice DN (Diaphragm size)	Tightening torque [Nm]	
	EPDM/FKM	PTFE / advanced PTFE / laminated PTFE
65	20	30
80	30	40
100	40	50

Tab. 7: Tightening torques for diaphragms

- A tolerance of +10% of the respective tightening torque applies to all values.

## 8.7 VA insert

Devices delivered without a diaphragm and a valve body have a VA insert (order no. 648 864) enclosed.

- The VA insert is required for devices with a diaphragm featuring a threaded connection.

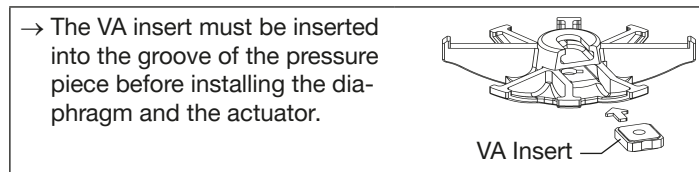


Fig. 16: VA insert

- The VA insert is not required for devices with a diaphragm featuring a bayonet catch.

## 8.8 Connection of the control medium

### Control function A:

→ Connect control medium to lower connection.

### Control function B:

→ Connect control medium to upper connection.

### Control function I:

→ Connect control medium to upper and lower connections.

→ Pressure on the upper connection closes the valve.

→ Pressure on the lower connection opens the valve.

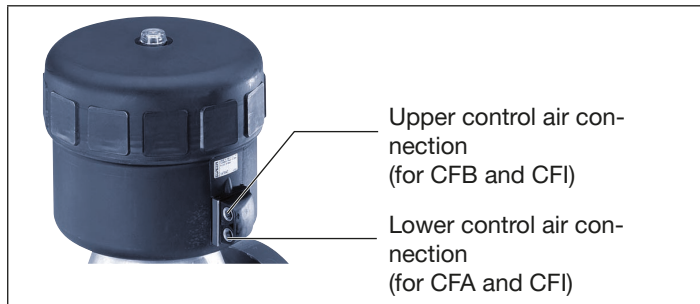


Fig. 17: Pneumatic connection

## 8.9 Disassembly



### DANGER!

Risk of injury from discharge of medium (acid, alkali, hot media)!

It is dangerous to remove the device 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.
- ▶ Completely drain the lines.



Replacement of the diaphragm is described in the chapter entitled [“10.2 Repairs”](#), page 25.

## 9 ELECTRICAL CONNECTION



The electrical connection is described in the respective operating instructions for the pilot valve.



Note the voltage and current type as specified on the type label (Voltage tolerance  $\pm 10\%$ )!

## 10 MAINTENANCE



### DANGER!

**Risk of injury from high pressure in the equipment!**

- ▶ Before loosening the lines and valves, turn off the pressure and vent the lines.

**Risk of injury due to electrical shock!**

- ▶ Before reaching into the system, switch off the power supply and secure to prevent reactivation!
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment!



### WARNING!

**Risk of injury from improper maintenance!**

- ▶ Installation may be carried out by authorized technicians only and with the appropriate tools!

**Risk of injury from unintentional activation of the system and an uncontrolled restart!**

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

## 10.1 Maintenance

### 10.1.1 Actuator

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

### 10.1.2 Wearing parts of the diaphragm valve

Parts which are subject to natural wear:

- Seals
- Diaphragm

→ If leaks occur, replace the particular wearing parts with an appropriate spare part. (see “12 Spare parts”).

→ Periodic control of the relief bore (“Fig. 18”)

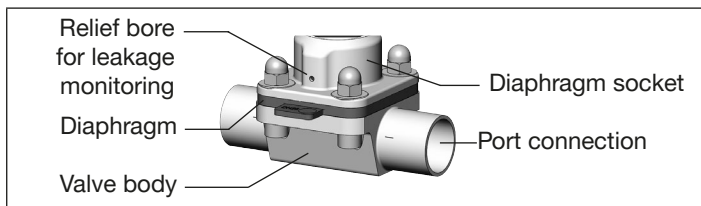


Fig. 18: Relief bore

**!** A bulging PTFE diaphragm may reduce the flow-rate.

### 10.1.3 Inspection intervals

The following maintenance work is required for the diaphragm valve:

- After the first steam sterilization or when required retighten body screws crosswise.
- After maximum  $10^5$  switching cycles check the diaphragm for wear.

**!** Muddy and abrasive media require correspondingly shorter inspection intervals!

### 10.1.4 Service life of the diaphragm

The service life of the diaphragm depends on the following factors:

- Diaphragm material
- Medium temperature
- Medium
- Actuator size
- Medium pressure
- Control pressure for CFB and CFI

### Protecting the diaphragm

- For CFA match the actuator size (actuator force) to the medium pressure to be actuated. If required, select the actuator with reduced spring force EC04.
- For CFB and CFI try and select the control pressure not higher than is required to actuate the medium pressure.

### 10.1.5 Cleaning

Commercially available cleaning agents can be used to clean the outside.

#### NOTE!

**Avoid causing damage with cleaning agents.**

- ▶ Before cleaning, check that the cleaning agents are compatible with the body materials and seals.



## 10.2 Repairs

### 10.2.1 Replacing the diaphragm



#### DANGER!

Risk of injury due to discharge of medium.

It is dangerous to remove the device under pressure due to the sudden release of pressure or discharge of medium. During reinstallation slackeden body screws may cause medium to be discharged.

- ▶ Before removing a device, switch off the pressure and vent the lines.
- ▶ Completely drain the lines.
- ▶ During reinstallation check tightening torque of the body screws.

#### Required spare part

- Diaphragm

#### Fastening types

Orifice DN (Diaphragm size)	Fastening types for diaphragms	
	PTFE	EPDM / FKM / laminated PTFE
65	Diaphragm with bayonet catch	Diaphragm with threaded connection
80		
100		

Tab. 8: Fastening types for diaphragms

Example:

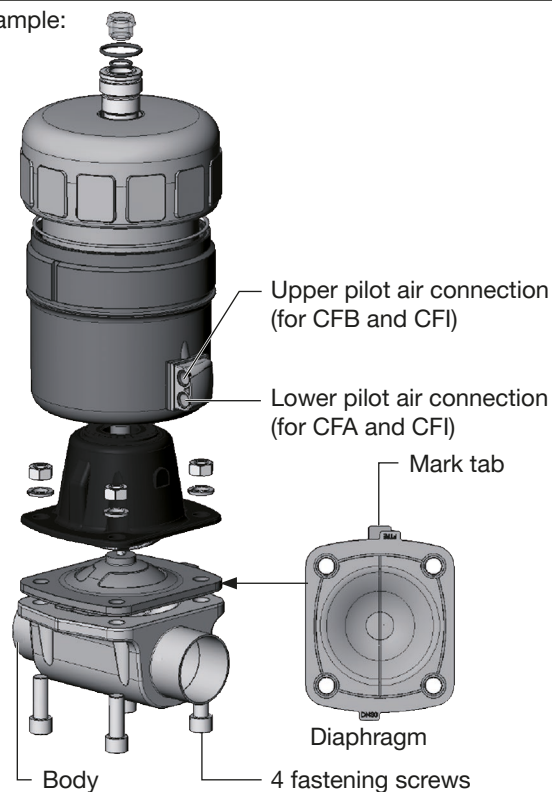


Fig. 19: Replacement of diaphragm

### Replacement of the diaphragm for control function A

- Clamp the valve body in a holding device (applies only to valves not yet installed).
- Pressurize lower pilot air port with compressed air (value as indicated on the type label). This is required to detach the diaphragm without damage from the body.
- Loosen fastening screws crosswise and remove actuator together with diaphragm from the body.
- Unscrew the old diaphragm. If attachment is with a bayonet catch, remove the diaphragm by rotating it through 90° (“[Tab. 8](#)”).
- Install new diaphragm in actuator (“[Tab. 8](#)”).

#### NOTE!

##### For diaphragms with threaded connection:

If the pin is live, the diaphragm may be damaged.

- ▶ First screw on the diaphragm hand-tight, then loosen it by one-half turn counterclockwise.
- Align diaphragm. Mark tab vertical to the flow direction.
- Place actuator together with diaphragm back on the body.
- Lightly cross-tighten the body screws until the diaphragm lies between the body and actuator.  
**Do not tighten the screws yet.**
- Actuate the diaphragm valve twice to position the diaphragm correctly.

- Tighten body screws without pressurization in diagonal pairs in three stages (approx. 1/3, approx. 2/3, 3/3 of the tightening torque), according to “[Tab. 7](#)”. The diaphragm should be positioned and pressed evenly all around the actuator and body.

### Replacement of the diaphragm for control functions B and I

- Clamp the valve body in a holding device (applies only to valves not yet installed).
- Loosen the fastening screws crosswise and remove actuator together with diaphragm from the body.
- Unscrew old diaphragm. If attachment is with a bayonet catch, remove the diaphragm by rotating it through 90° (“[Tab. 8](#)”).
- Install new diaphragm in actuator (“[Tab. 8](#)”).

#### NOTE!

##### For diaphragms with threaded connection:

If the pin is live, the diaphragm may be damaged.

- ▶ First screw on the diaphragm hand-tight, then loosen it by one-half turn counterclockwise.
- Align diaphragm. Mark tab vertical to the flow direction.
- Place actuator together with diaphragm back on the body.
- Lightly cross-tighten the body screws without pressurization until the diaphragm lies between the body and actuator.  
**Do not tighten the screws yet.**
- Pressurize upper pilot air port with compressed air (value as indicated on the type label) .

- Actuate the diaphragm valve twice to position the diaphragm correctly.
- Tighten body screws with pressurization in diagonal pairs in three stages (approx. 1/3, approx. 2/3, 3/3 of the tightening torque), according to Table (see “Tab. 7”). The diaphragm should be positioned and pressed evenly all around the actuator and body.

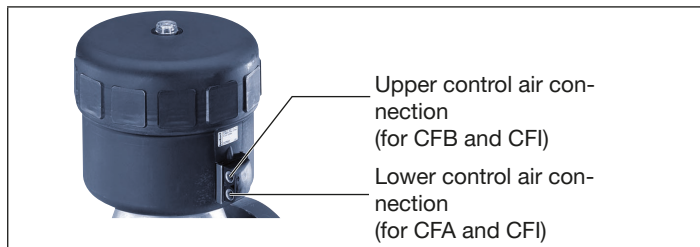


Fig. 20: Control air connection

## 11 MALFUNCTIONS

Malfunctions	Cause / Remedial action
Actuator does not switch	Control connection interchanged* CFA: → Connect lower control connection CFB: → Connect upper control connection CFI → Upper control connection: Close Lower control connection: Open * see “Fig. 20”
	Control 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.
	Control pressure too low See pressure specifications on the type label.
Flow rate reduced	PTFE diaphragm bulging Replace diaphragm.

## 12 SPARE PARTS

### WARNING!

#### Risk of injury when opening the actuator body!

The actuator contains a tensioned spring. If the body is opened, there is a risk of injury from the spring jumping out!

- ▶ Carefully open the actuator body and hold it in such a way that any parts which jump out cannot injure anyone or damage anything.

### 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 only original accessories and original spare parts from Bürkert.

Types 2030, 2031, 2032, 2033 and 2037 are available as spare parts for the piston-controlled diaphragm valves.

- Seal set for actuator
- Diaphragm

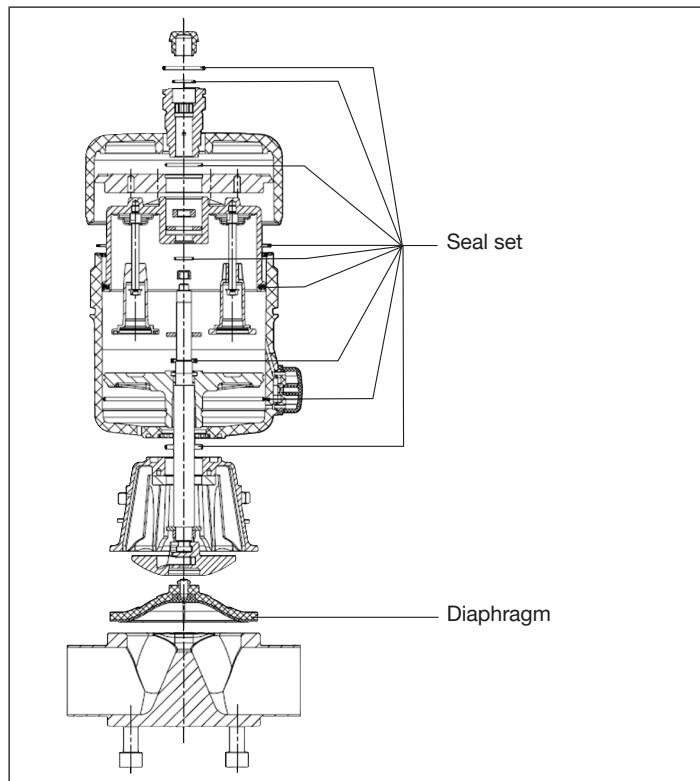


Fig. 21: Spare parts

## 12.1 Order table

Actuator size $\varnothing$ [mm]	Orifice DN (Diaphragm size)	Order numbers for seal sets
175	65, 80, 100	181 802
225	80, 100	186 775

Tab. 9: Order numbers for seal sets

Orifice DN (Diaphragm size)	Order numbers for diaphragms			
	EPDM (AD*)		FKM (FF*)	
65	688 428	E03/ E04**	677 691	F01**
80	688 429	E03/ E04**	677 692	F01**
100	688 430	E03/ E04**	677 693	F01**

Orifice DN (Dia- phragm size)	Order numbers for diaphragms					
	PTFE (EA*)		Advanced PTFE (EU*)		Laminated Gylon (ER*)	
65	677 681	E02/E04- PTFE**	679 743	E02/E04- PTFE+ Hole**	586 616	L08**
80	677 682	E02/E04- PTFE**	679 744	E02/E04- PTFE+ Hole**	586 617	L08**
100	677 683	E02/E04- PTFE**	679 745	E02/E04- PTFE+ Hole**	-	-

Tab. 10: Order numbers for diaphragms

\* SAP-Code

\*\* Identification on the diaphragm



The data sheet and further information for the type can be found on the Internet at: [country.burkert.com](http://country.burkert.com)

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

## 13 TRANSPORT, STORAGE, DISPOSAL

### NOTE!

#### Transport damages.

Inadequately protected equipment may be damaged during transport.

- During transportation protect the device against wet and dirt in shock-resistant packaging.
- Observe permitted storage temperature.
- Protect pneumatic connections from damage with protective caps.

#### Incorrect storage may damage the device.

- For prolonged storage, slacken the body screws to prevent the diaphragm from becoming distorted.
- Identify slackened screws for reasons of safety.
- Store the device in a dry and dust-free location.
- Storage temperature. -40...+55 °C.

### 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 [country.burkert.com](https://country.burkert.com).



### DANGER!

Risk of injury during re-installation. Risk of injury from discharge of medium through slackened body screws (acid, alkali, hot media)!

Before re-installing the valves, ensure that the body screws have been tightened correctly.

- ▶ Before re-installation, check the tightening torque of the body screws.



[country.burkert.com](https://country.burkert.com)