

Type 2030, 2031, 2031 K, 2032, 2033, 2037

Piston-operated diaphragm valves,
Actuator sizes 40 - 125, Diameter DN8 - DN65

Kolbengesteuerte Membranventile,
Antriebsgröße 40 - 125 mm, Nennweiten DN8 - DN65

Vannes à membrane, commandé par piston, Tailles de
mécanisme 40 - 125 mm, Piston section nominale DN8 - DN65



Quickstart

English Deutsch Français

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

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Operating Instructions 1812/06_EU-ML_00810102 / Original DE

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1 QUICKSTART

The quickstart guide comprises important information.

- ▶ Carefully read the quickstart guide and observe any safety information.
- ▶ The quickstart guide must be available to every user.
- ▶ The liability and warranty for types 2030, 2031, 2031 K, 2032, 2033 and 2037 do not apply if the quickstart instructions are not observed.

The quickstart guide illustrates the installation and commissioning of the equipment with examples. A detailed description of the device can be found in the operating instructions for types 2030, 2031, 2031 K, 2032, 2033 and 2037 in the internet at:

www.burkert.com



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

2 SYMBOLS

Warning to prevent death or serious injuries:



DANGER!

Warns of an immediate danger!



WARNING!

Warns of a potentially dangerous situation!

Warning to prevent moderate or minor injuries:



CAUTION!

Warns of a possible danger!

NOTE!

Warns of material damage!



Important 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.

3 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, 2031 K, 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.
- ▶ In the potentially explosion-risk area the diaphragm valves of Types 2030, 2031, 2031 K, 2032, 2033 and 2037 may be used only according to the specification on the separate Ex type label. For use observe the additional information enclosed with the device together with safety instructions for the explosion-risk area.
- ▶ During use observe the authorized data, the operating conditions and conditions of use specified in the contract documents and operating instructions.
- ▶ 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.
- ▶ The exhaust air may be contaminated with lubricants in the actuator.
- ▶ Use the device only as intended.

4 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 with reference to the installation personnel.



Risk of injury from high pressure and discharge of medium.

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

Risk of burns and risk of fire due to hot device surface if duty cycle is long or medium temperature is high

- ▶ Keep the device away from highly flammable substances and media and do not touch with bare hands.

Leaking medium when the diaphragm is worn.

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

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.



General hazardous situations.

To prevent injury, 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.
- ▶ After an interruption, ensure that the process is restarted in a controlled manner. Observe sequence.
 1. Apply supply voltage.
 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.
- ▶ The general rules of technology apply to application planning and operation of the device.

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 put any loads on the valve (e.g. by placing objects on it or standing on it).
- ▶ Do not make any external modifications to the valves. Do not paint the body parts or screws.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.

5 CONTACT ADDRESSES

Germany

Bürkert Fluid Control Systems
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International

Contact addresses can be found in the internet at: www.burkert.com

6 TECHNICAL DATA

6.1 Conformity

The types 2030, 2031, 2031 K, 2032, 2033 and 2037 are compliant with the EU Directives according to the EU Declaration of Conformity.

6.2 Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU type test certificate and/or the EU Declaration of Conformity.

6.3 General technical data

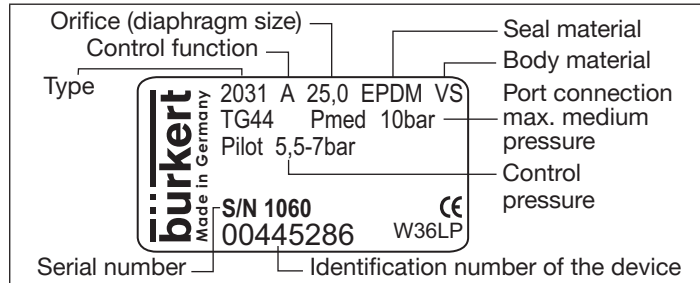
Control medium: neutral gases, air
Flow media: Type 2030 contaminated, corrosive media
Types 2031, 2031 K, 2032, 2033 and 2037 contaminated, ultrapure, sterile media and media with higher viscosity
Installation position: any, preferably with actuator facing up; tank bottom valve Type 2033: Actuator facing downwards

Materials and connections see data sheet.

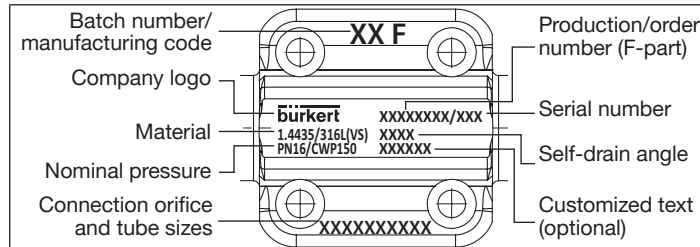
6.4 Control functions

A		Closed by spring force in rest position
B		Opened by spring force in rest position
I		Actuating function via reciprocal pressurization

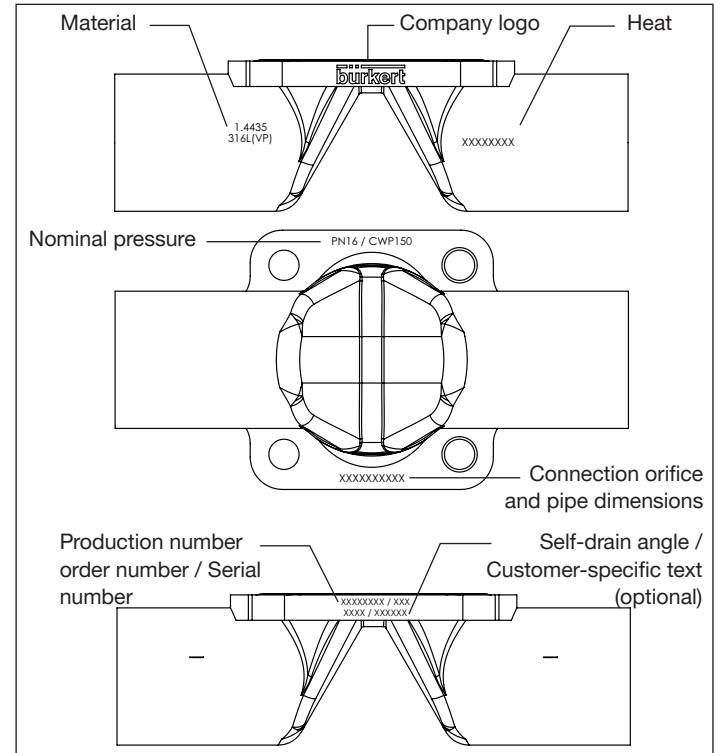
6.5 Type label



6.6 Labeling of forged body



6.7 Labeling of tube valve body (VP)



6.8 Application conditions



WARNING!

Danger of bursting from overpressure.

If the device explodes, there is a risk of serious injuries, chemical burns, scalding.

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

Ambient temperature for actuators:

Material	Actuator size \varnothing	Temperature
PA	40 - 125 mm	-10...+60 °C
PPS	40 - 80 mm	+5...+140 °C
	100 mm, 125 mm	+5...+90 °C (briefly up to +140 °C)

Medium temperature for body:

Body material	Temperature
Stainless steel	-10 ... +150 °C
PVC (see PT graph)	-10 ... +60 °C
PVDF (see PT graph)	-10 ... +120 °C
PP (see PT graph)	-10 ... +80 °C

Medium temperature for diaphragms:

Material	Temperature [°C] ¹⁾	Remarks
EPDM (AB)	-10...+130	Steam sterilization up to +140 °C / 60 min
EPDM (AD)	-10...+143	Steam sterilization up to +150 °C / 60 min
FKM (FF)	0...+130	No steam / dry heat up to +150 °C / 60 min
PTFE (EA)	-10...+130	Steam sterilization up to +140 °C / 60 min
Advanced PTFE (EU)	-5...+143	Steam sterilization up to +150 °C / 60 min
Gylon (ER)	-5...+130	Steam sterilization up to +140 °C / 60 min

1) 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.

Maximum permitted medium pressure:

Permitted medium pressure depending on the medium temperature for plastic bodies:

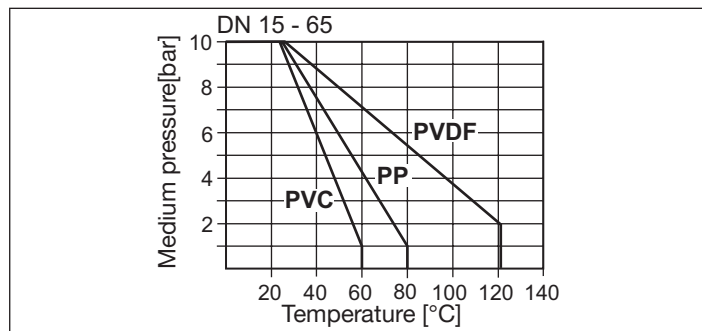


Fig. 1: Graph of medium pressure / medium temperature

Permitted control pressure:

Actuator size ø [mm]	Actuator material	Min. control pressure [bar]	Max. control pressure [bar]
40 - 100	PA	2	10
125	PA	2	7
40 - 125	PPS	2	7


Control 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 ø [mm]	Control pressure [bar] at medium pressure ²⁾	
		0 bar	maximum
8	40	5	4
	50	5	3.5
15	63	5	4
	80	5.5	4
20	63	5	4.5
	80	5.5	4.5
25	100	5.5	4
	125	5.5	4
32	100	5.5	3.5
	125	5.5	3
40	100	5.5	4.5
	125	5.5	4.5
50	100	5.5	4
	125	5.5	4
65	100	5.5	3.5
	125	5.5	3

Tab. 1: Control pressure CFA

 ²⁾ Approximate data, exact values can be found on the type label.

The required minimum control pressure P_{\min} with control function B and I is dependent on the medium pressure.

 The pressure diagrams can be found in the operating instructions on the internet at: www.burkert.com.

7 INSTALLATION



DANGER!

Danger – high pressure.

- ▶ Turn off the pressure and vent the lines before loosening lines or valves.

Risk of electric shock.

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



WARNING!

Risk of injury from incorrect installation.

- ▶ Installation may only be performed by authorized technicians with the appropriate tools.

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

- ▶ Secure system against unintentional activation.
- ▶ Following installation, ensure a controlled restart.



CAUTION!

Risk of injury due 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.

7.1 Before installation

- Before connecting the valve, ensure that the pipelines are aligned.
- The flow direction is optional.

7.1.1 Installation position general

Installation for self-drainage of the body



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

Installation for leakage detection



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

7.1.2 Installation position 2/2-way valve

Installation position: any position, preferably with the actuator face up.

To ensure self-drainage:

- Install body at an angle $\alpha = 10^\circ$ to 55° to the horizontal (see “Fig. 2”).
- Observe an inclination angle of $1^\circ - 5^\circ$.
- Forged bodies, tube valve bodies and cast bodies feature a mark which must face upwards (12 o'clock position, see “Fig. 2”).
- One of the bores in the diaphragm socket for monitoring leakage, must be at the lowest point.

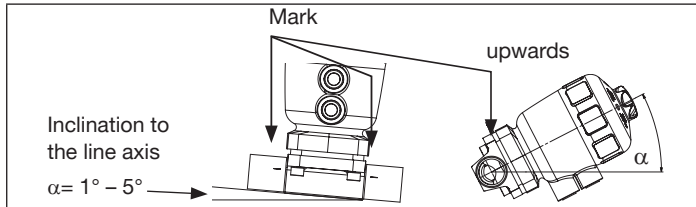


Fig. 2: Installation position for self-drainage of the body

7.1.3 Installation position of T-valve Type 2032

The following positions are recommended for installation in the ring circuits:

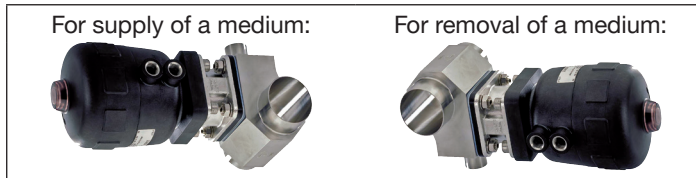


Fig. 3: Installation position of Type 2032

7.1.4 Installation position of Y-valve Type 2037

The following positions are recommended for installation in the systems:

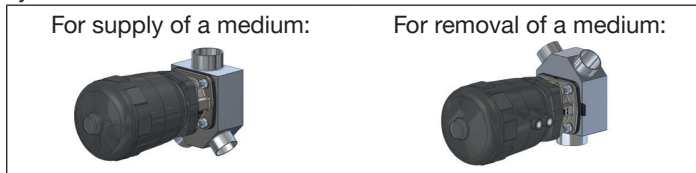


Fig. 4: Installation position of Type 2037

7.1.5 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, observe an inclination angle of $1^\circ \dots 5^\circ$.



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.

7.1.6 Preparatory work

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

Devices with welded or bonded body:



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

7.2 Installation



If used in a corrosive environment, we recommend running a pneumatic hose from all free pneumatic connections to a neutral atmosphere.



WARNING!

Risk of injury from incorrect installation.

Non-observance of the specified tightening torque is hazardous as the device may be damaged.

- ▶ Observe tightening torque during installation (see [“Tab. 2: Tightening torques in Nm for diaphragms”](#)).

7.2.1 Devices with welded or bonded body

NOTE!



To avoid damage!

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

Remove actuator and diaphragm from the body:

Procedure for control function A

- Pressurize the lower control air connection with compressed air (value on type label) (see [“Fig. 5: Control air connection”](#)). This is required so that the diaphragm detaches from the body and is not damaged.
- Loosen fastening screws in diagonal pairs and remove actuator together with diaphragm from the body.
- Weld or glue body into the pipeline.

Procedure for control functions B and I

- Loosen fastening screws in diagonal pairs and remove actuator together with diaphragm from the body.
- Weld or glue body into the pipeline.

Mount actuator and diaphragm on the body:

- After welding or bonding the body, smooth the body surface by grinding if required.
- Carefully clean the body.

Procedure for control function A

- Pressurize the lower control air connection with compressed air (value on type label) (see “[Fig. 5: Control air connection](#)”).
- Place actuator on the body.
- Lightly cross-tighten the body screws in diagonal pairs until the diaphragm lies between the body and actuator.
Do not fully tighten 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 (“[Tab. 2: Tightening torques in Nm for diaphragms](#)”). The diaphragm should be positioned and pressed evenly all around the actuator and body.

Procedure for actuator with control functions B and I:

- Place actuator on the body.
- Lightly cross-tighten the body screws in diagonal pairs without pressurization until the diaphragm is between the body and actuator. **Do not fully tighten screws yet.**
- Pressurize the upper control air connection with compressed air (value on type label) (see following “[Fig. 5: Control air connection](#)”).
- Actuate the diaphragm valve twice.
- 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 (“[Tab. 2: Tightening torques in Nm for diaphragms](#)”). The diaphragm should be positioned and pressed evenly all around the actuator and body.

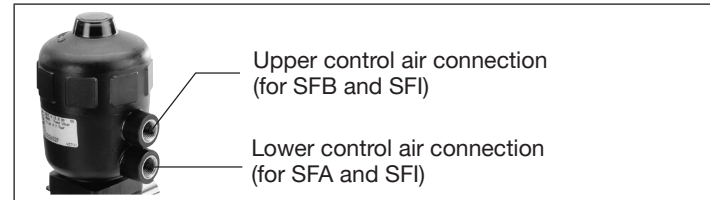


Fig. 5: Control air connection

Orifice DN (Diaphragm size)	VS, PP, PVC, PVDF, VG		VA and VP	
	EPDM/FKM	PTFE/advanced PTFE/laminated PTFE	EPDM/FKM	PTFE/advanced PTFE/laminated PTFE
8	2	2.5	2.5	2.5
15	3.5	4	3.5	4
20	4	4.5	4	4.5
25	5	6	7	8
32	6	8	8	10
40	8	10	12	15
50	12	15	15	20
65	20	30	-	-

Tab. 2: Tightening torques in Nm for diaphragms

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

7.2.2 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
(see “[Fig. 5: Control air connection](#)”).

→ Pressure on the upper connection closes the valve.

→ Pressure on the lower connection opens the valve.

7.3 Maintenance work

7.3.1 Actuator

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

7.3.2 Wearing parts of the diaphragm valve

Parts which are subject to natural wear:

- Seals
 - Diaphragm
- If leaks occur, replace the particular wearing part with an appropriate spare part.
- Periodic control of the leakage detection bore (see “[Fig. 6](#)”).

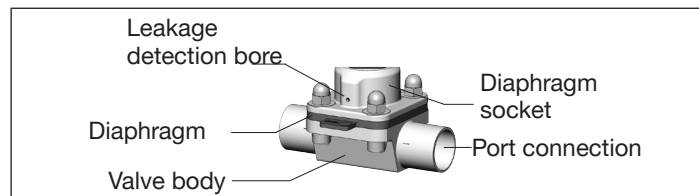


Fig. 6: Leakage detection bore



The maintenance and repair instructions can be found in the internet at: www.burkert.com.



A distended PTFE diaphragm may reduce the flow-rate.

7.3.3 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!

8 TRANSPORTATION, STORAGE, DISPOSAL

NOTE!

Transport and storage damage.

- Protect the device against moisture and dirt in shock-resistant packaging during transportation and storage.
- Permitted storage temperature: -40...+55 °C.

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

- Dispose of the device and packaging in an environmentally friendly manner!

www.burkert.com