bürkert
FLUID CONTROL SYSTEMS

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

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

Kolbengesteuerte Membranventile,
Antriebsgrößen 40–125 mm, Nennweiten DN8–DN65

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

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

MAN 1000010235 ML Version: UStatus: RL (released | freigegeben) printed: 22.09.2017

Operating Instructions 1706/19_EU-EN_00893028 / Original DE

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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.

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, 2031 K, 2032, 2033 and 2037.

1.2 Symbols

DANGER!

Warns of an immediate danger.

- Failure to observe the warning may 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 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 AUTHORIZED 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).
- In the potentially explosion-risk area the device 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.
- Devices without a separate Ex type label may not be used in a potentially explosive area.
- During use observe the authorized data, the operating conditions and conditions of use specified in the contract documents and operating instructions.
- 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 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.

Danger – high pressure.

- Before loosening the lines and valves, turn off the pressure and vent 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 electric 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!

Risk of burns and risk of fire if used continuously through hot device surface.

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

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 in the power supply or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- The device may be operated only when in perfect condition and in consideration of the operating instructions.
- The general rules of technology apply to application planning and operation of the device.

To prevent damage to property of the device, ensure:

- 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 www.burkert.com.
- Do not put any loads on the body (e.g. by placing objects on it or standing on it).
- Do not make any external modifications to the device bodies. Do not paint the body parts or screws.

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@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 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, 2031 K, 2032, 2033 and 2037 can be found on the Internet at: www.burkert.com

5 SYSTEM DESCRIPTION

5.1 General description

The Types 2030, 2031, 2031 K, 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, 2031 K, 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.

6 TECHNICAL DATA

6.1 Conformity

Type 2030, 2031, 2031 K, 2032, 2033 and 2037 conforms with the EU Directives according to the EU Declaration of Conformity.

6.2 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.

6.3 Type label

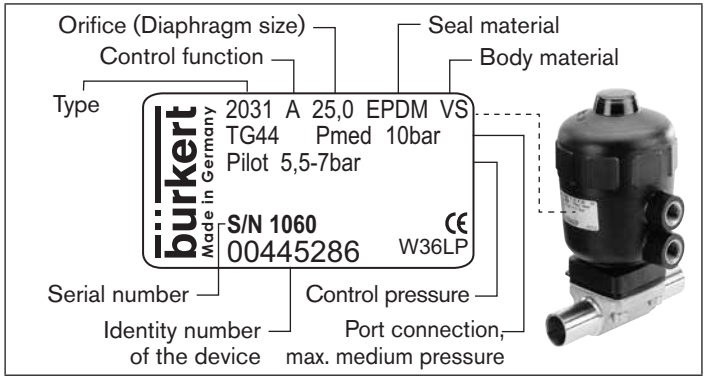


Fig. 1: Position and description of the type label (example)

6.4 Labeling of the forged bodies

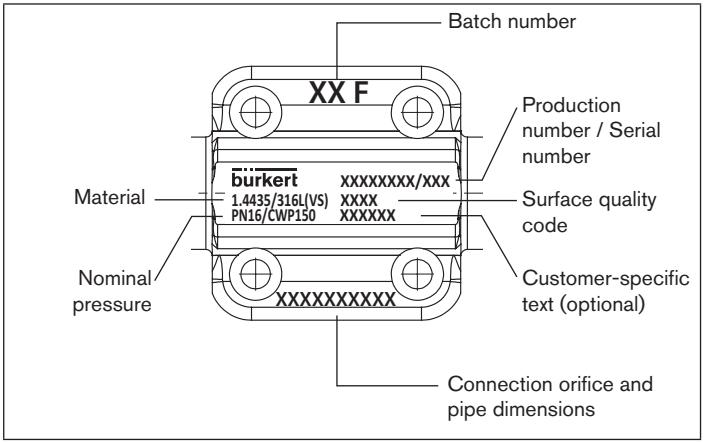


Fig. 2: Labeling of the forged bodies

6.5 Labeling of the tube valve body (VP)

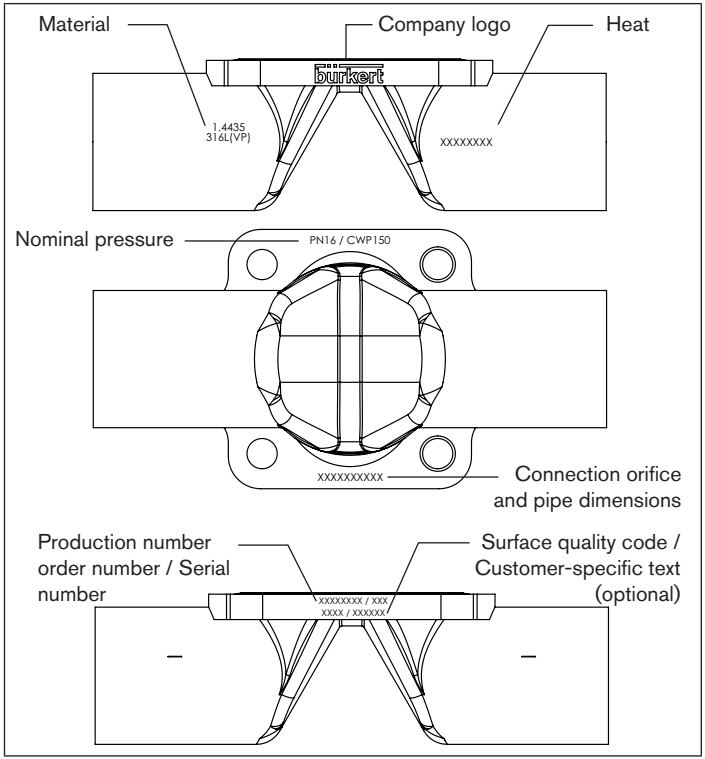


Fig. 3: Labeling of the tube valve body (VP)

6.6 Operating conditions

WARNING!

Risk of injury due to bursting in case of overpressure.

- Do not exceed the maximum pressure range or the permitted temperatures. Observe specifications on the type label.

6.6.1 Allowable temperatures

Ambient temperature for actuators:

Material	Size ø	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)

Tab. 1: Ambient temperature for actuators

A PPS actuator must be selected for applications with high temperatures (e.g. steam sterilization).

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

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)	-5...+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
Advanced PTFE (ET)	-10...+90 °C	-
Gylon (ER)	-5...+130 °C	Steam sterilisation up to +140 °C / 60 min

Tab. 3: Medium temperature for diaphragms

6.6.2 Permitted medium pressure

Permitted medium pressure depending on the medium temperature.
Plastic body:

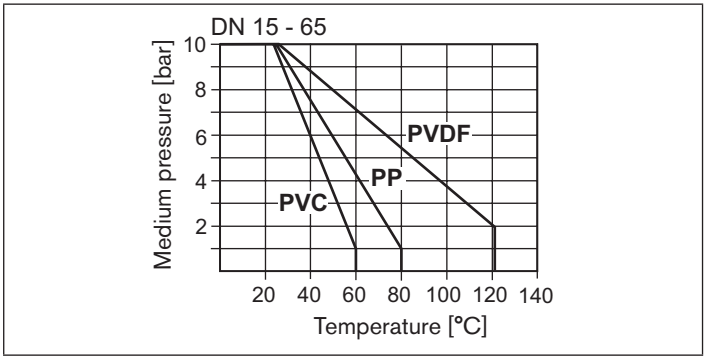


Fig. 4: Graph of medium pressure / Medium temperature

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.

Diaphragm size DN [mm]	Actuator size ø [mm]	Max. sealed medium pressure [bar] *)			
		Pressure on one side		Pressure on both sides	
		EPDM / FKM	PTFE	EPDM / FKM	PTFE
8	40	10	10	10	9
15	50	8.5	5	7	3.5
	63	10	10	10	9
20	63	10	5	8	5
	80	10	10	10	10
25	63	3	-	2	-
	80	10	7.5	8.5	5.5
32	100	10	8	9	6
40	100	6.5	6	5	5
	125	10	10	10	9
50	100	4.5	2.5	3.5	2
	125	8	7	7	6
65	125	7	4	4.5	2

Tab. 4: Maximum permitted medium pressure CFA

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

6.6.3 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

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

Tab. 5: Permitted control pressure

Control pressure for control function A

The values apply to body made of:

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

Diaphragm size DN [mm]	Actuator size [mm]	Control pressure [bar] for medium pressure *)	
		0 bar	maximum
8	40	5	4
15	50	5	3.5
	63	5	4
20	63	5.5	4
	80	5	4
25	63	5	4.5
	80	5.5	4.5
32	100	5.5	4
40	100	5.5	4
	125	5.5	4
50	100	5.5	3.5
	125	5.5	3
65	125	5.5	4.5

Tab. 6: Control pressure CFA

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

6.6.4 Minimum control pressure

Required minimum control pressure depending on medium pressure

The values apply to body made of

- Plastic,
- All models with cast body (VG), forged body (VS) und tube valve body (VP),
- Tube valve body (VA) with socket, DIN welding neck flange and weld-on ends in accordance with EN ISO 1127 (ISO 4200).

Control function B (CFB)

NOTE!

Important for the service life of the diaphragm!

- Do not select control pressure higher than required.

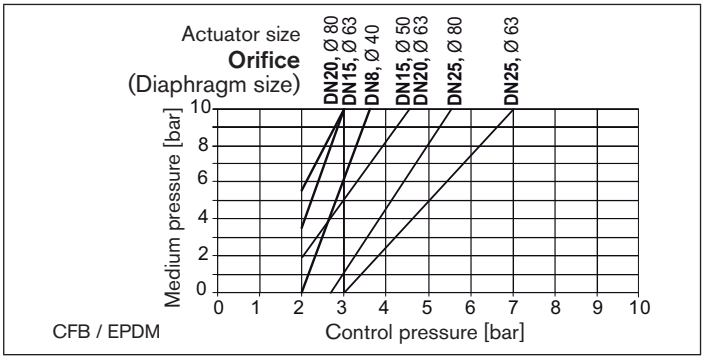


Fig. 5: Control function B, elastomer diaphragm, actuators ø 40 – 80 mm

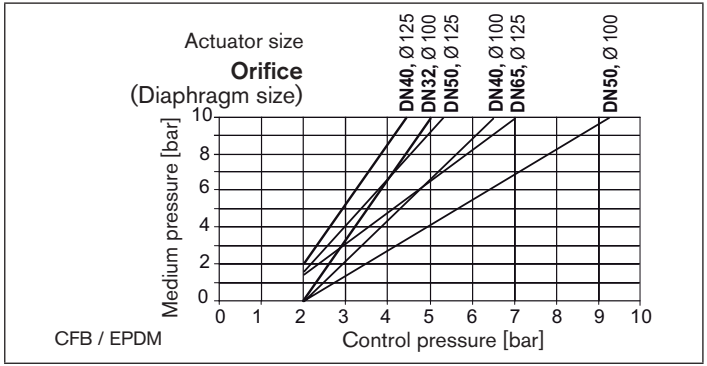


Fig. 6: Control function B, elastomer diaphragm, actuators ø 100 – 125 mm

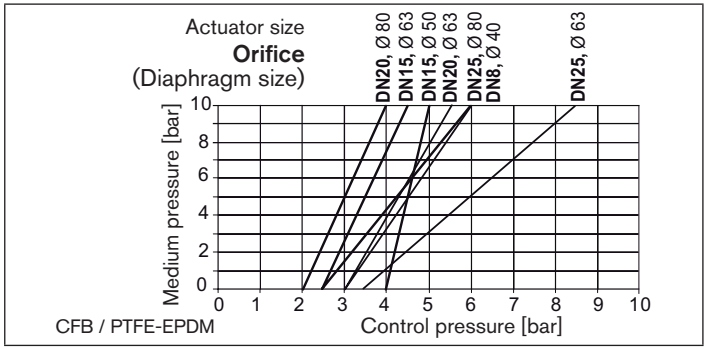


Fig. 7: Control function B, PTFE elastomer diaphragm, actuators ø 40 – 80 mm

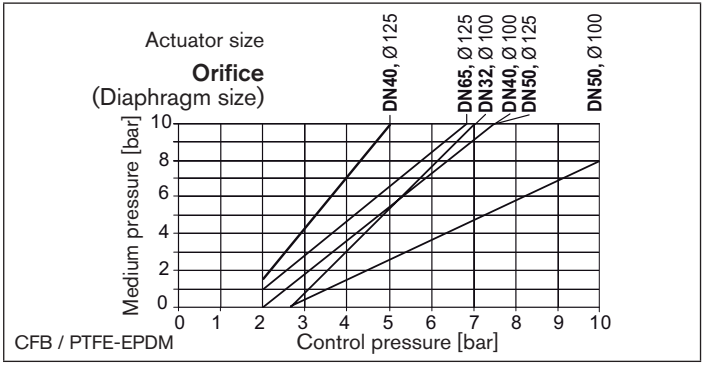


Fig. 8: Control function B, PTFE elastomer diaphragm, actuators ø 100 – 125 m

Control function I (CFI)

NOTE!

Important for the service life of the diaphragm.

- Do not select control pressure higher than required.

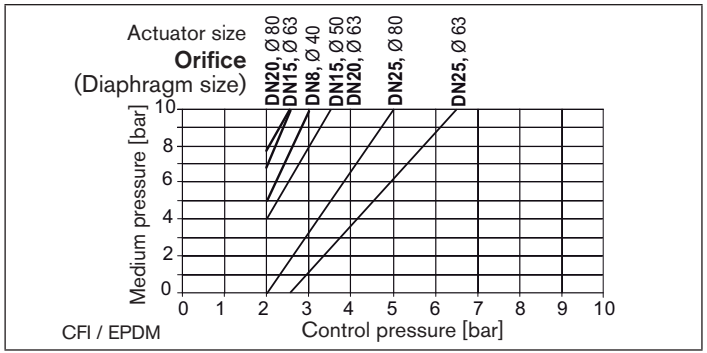


Fig. 9: Control function I, elastomer diaphragm, actuators ø 40 – 80 mm

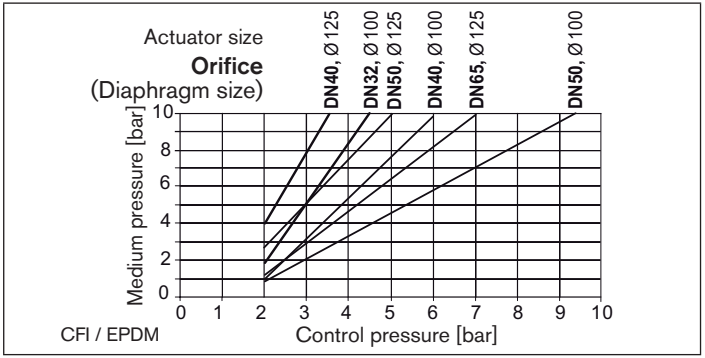


Fig. 10: Control function I, elastomer diaphragm, actuators ø 100 – 125 mm

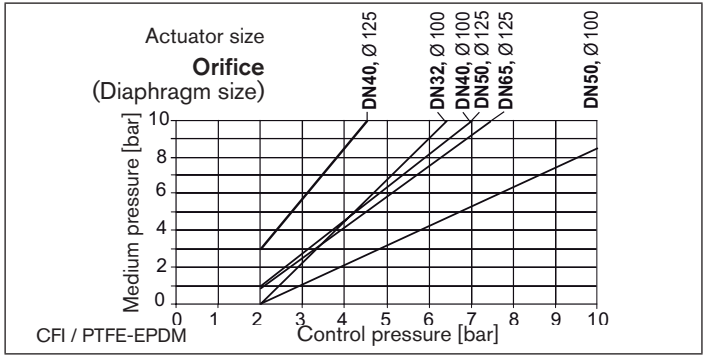


Fig. 12: Control function I, PTFE EPDM diaphragm, actuators ø 100 – 125 mm

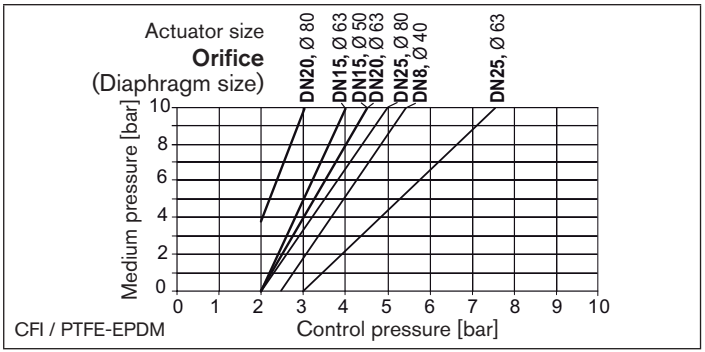


Fig. 11: Control function I, PTFE elastomer diaphragm, actuators ø 40 – 80 mm

Required minimum control pressure depending on medium pressure

The values are valid for

- tube valve body (VA) with weld-on ends in accordance with DIN 11850 series 2 as well as with OD weld-on ends, with ANSI and JIS welding neck flange

Control function B (CFB)

NOTE!

Important for the service life of the diaphragm.

- Do not select control pressure higher than required.

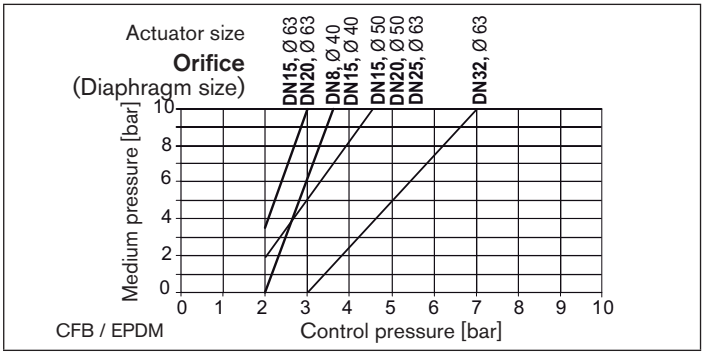


Fig. 13: Control function B, EPDM diaphragm, actuators ø 40 – 63 mm

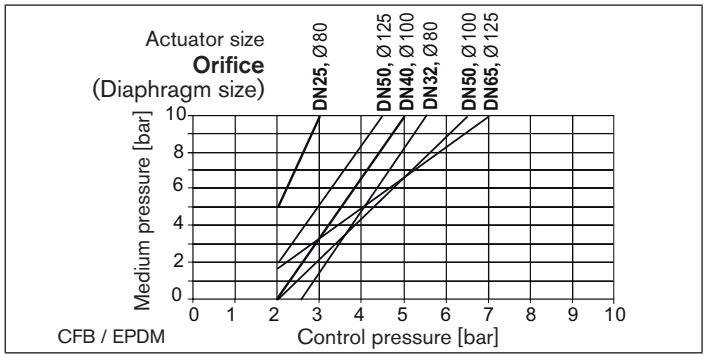


Fig. 14: Control function B, EPDM diaphragm, actuators ø 80 – 125 mm

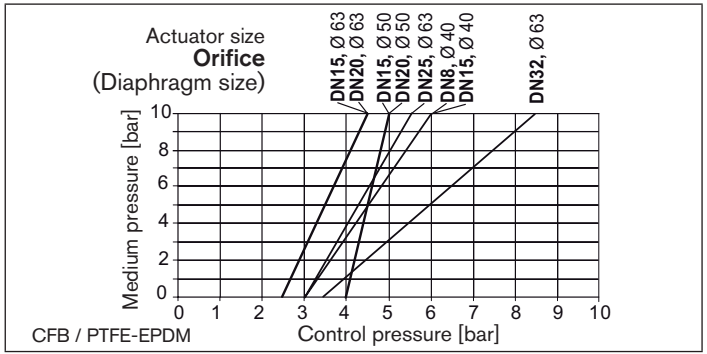


Fig. 15: Control function B, PTFE EPDM diaphragm, actuators ø 40 – 63 mm

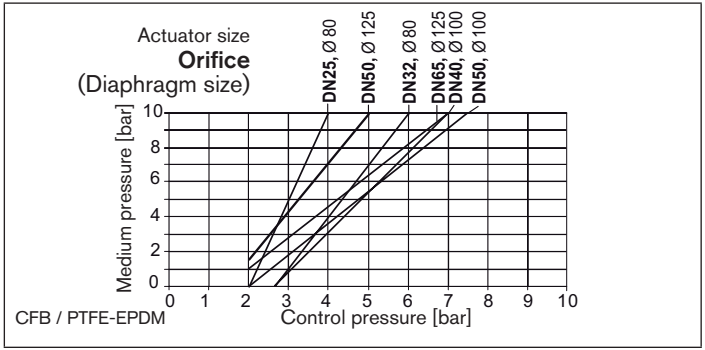


Fig. 16: Control function B, PTFE EPDM diaphragm, actuators ø 80 – 125 mm

Control function I (CFI)

NOTE!

Important for the service life of the diaphragm.

- Do not select control pressure higher than required.

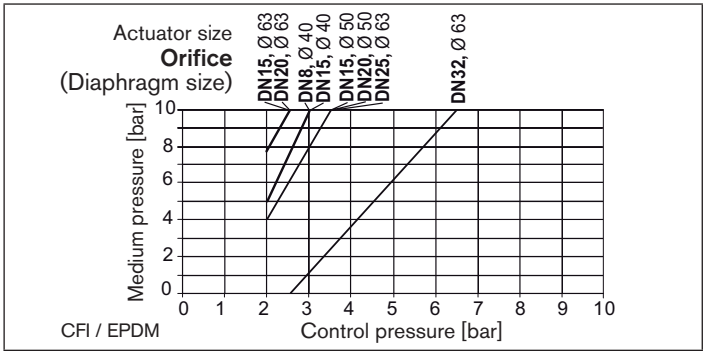


Fig. 17: Control function I, EPDM diaphragm, actuators ø 40 – 63 mm

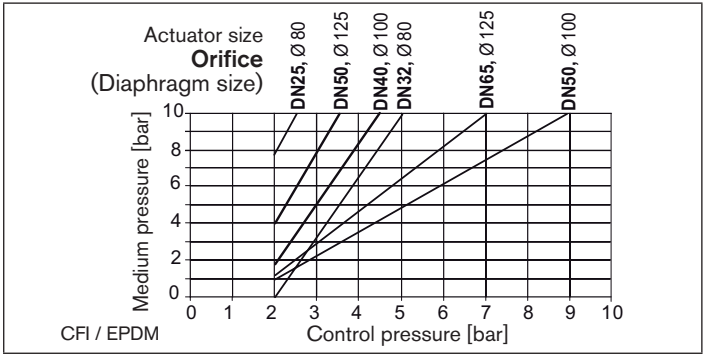


Fig. 18: Control function I, EPDM diaphragm, actuators ø 80 – 125 mm

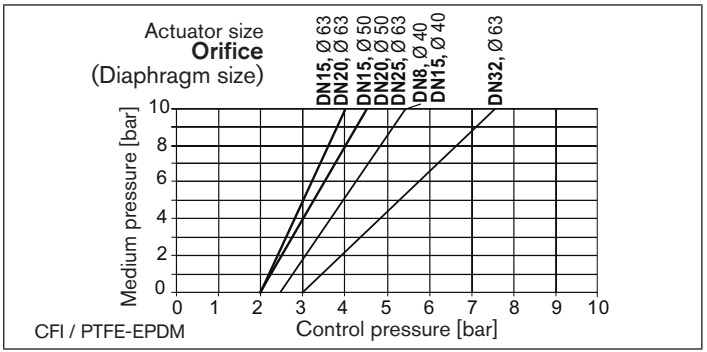


Fig. 19: Control function I, PTFE EPDM diaphragm, actuators ø 40 – 63 mm

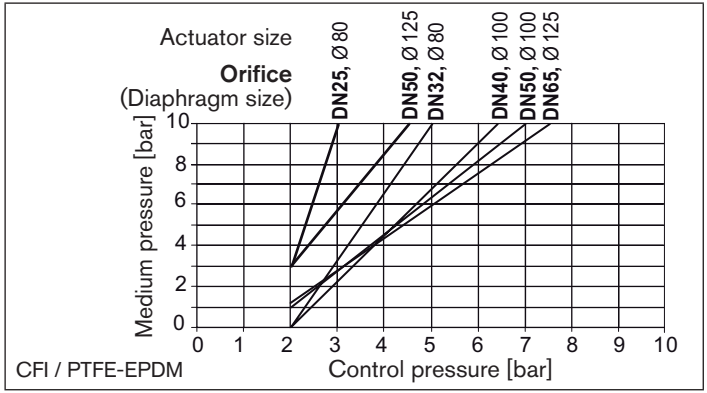


Fig. 20: Control function I, PTFE EPDM diaphragm, actuators ø 80 – 125 mm

6.7 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 (VA, VP)
Type 2032, 2033, 2037	Stainless steel - block material
Actuator	PA, PPS
Sealing elements actuators	FKM, NBR
Diaphragm	EPDM, PTFE, FKM

Connections

Control air connection	G1/8 for actuator sizes ø 40 and 50 G1/4 for actuator sizes ø 80, 100, 125
Medium connection	Welded connection: in accordance with DIN EN 1127 (ISO 4200), DIN 11850 R2, DIN 11866 (ASME-BPE 2055) other connections on request

Media

Control medium	neutral gases, air
Flow media	Type 2030; contaminated and aggressive media Types 2031, 2031 K, 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

6.8 Flow values

6.8.1 Flow values for forged bodies

Kvs values [m³/h] for forged bodies								
Diaph-ragm size	Orifice connec-tion (DN)	Actua-tor size	Seal mate-rial	DIN	ISO	ASME	BS	SMS
8	6	C/40	EPDM	1.1				
			PTFE	1.1				
	8 / 1/4"	C/40	EPDM	1.7	1.5	0.7	0.5	
			PTFE	1.9	2.0	0.7	0.5	
	10 / 3/8"	C/40	EPDM	1.5	1.5	1.6	1.4	
			PTFE	1.9	2.0	1.8	1.6	
	15 / 1/2"	C/40	EPDM			1.5		
			PTFE			1.9		
15	10 / 3/8"	E/63	EPDM	3.5	5.5			
			PTFE	3.4	5.2			
	15 / 1/2"	E/63	EPDM	6.5	6.5	3.1	3.7	
			PTFE	6.0	6.0	3.1	3.6	
	20 / 3/4"	E/63	EPDM			6.5		
			PTFE			6.0		
20	20 / 3/4"	F/80	EPDM	12.4	12.5	8.4	8.9	
			PTFE	12.0	12.0	8.5	8.8	

25	25 / 1"	F/80	EPDM	20.0	18.0	15.5		16.0
			PTFE	17.0	16.0	14.5		14.8
40	32	H/125	EPDM	34.0				
			PTFE	34.0				
	40 / 1 1/2"	H/125	EPDM	40.0	41.0	37.0		38.0
			PTFE	40.0	40.0	37.5		38.0
50	50 / 2"	H/125	EPDM	66.0	66.0	66.0		66.0
			PTFE	66.0	67.0	66.0		66.0
	2 1/2"	H/125	EPDM			66.0		
			PTFE			66.0		

Tab. 7: Kvs values for forged bodies

6.8.2 Flow values for cast bodies and plastic bodies

Kvs value [m^3/h] for cast bodies VG and plastic bodies PD. PP. PV				
Diaphragm size	**Orifice connection (DN)**	**Seal material**	**Cast body VG (all standards)**	**Plastic body (all materials)***
8	8	EPDM	0.95	-
		PTFE	1.5	-
15	15	EPDM	5.6	3
		PTFE	5.3	3
20	20	EPDM	10.7	7
		PTFE	10.5	6.7
25	25	EPDM	14.6	11.4
		PTFE	13.6	10
32	32	EPDM	-	17.5
		PTFE	-	17.1
40	40	EPDM	35.0	24.5
		PTFE	35.0	24.0
50	50	EPDM	47.0	41.5
		PTFE	48.0	41.5

Tab. 8: Kvs values for cast bodies and plastic bodies

** Plastic bodies: measured with bodies ASV*

6.8.3 Flow values for tube valve body

Kvs values [m³/h] for tube valve body VP (IHU2) TVB3G						
Diaphragm size	Orifice connection (DN)	Actuator size	Seal material	DIN	ISO	ASME
8	8 / 1/4"	C/40	EPDM		1.9	
			PTFE		2.4	
	10 / 3/8"	C/40	EPDM	1.9		
			PTFE	2.4		
	15 / 1/2"	C/40	EPDM			
			PTFE			2.2
15	15 / 1/2"	E/63	EPDM	7.2	7	
			PTFE	6.7	6.6	
	20 / 3/4"	E/63	EPDM	6.9		
			PTFE	5.5		6.5
20	20 / 3/4"	F/80	EPDM		13.5	
			PTFE		12.1	
	25 / 1"	F/80	EPDM	14.9		
			PTFE	13.7		12.7
25	25 / 1"	E/63	EPDM		17.3	
			PTFE		14.1	
	32	E/63	EPDM	18.6		
			PTFE	14.2		
	25 / 1"	F/80	EPDM		19.1	
			PTFE		15.6	
	32	F/80	EPDM	20.0		
			PTFE	15.8		
32	32	G/100	EPDM		36.0	
			PTFE		36.0	
	40 / 1 1/2"	G/100	EPDM	35.0		
			PTFE	34.5		32.0
40	40 / 1 1/2"	H/125	EPDM		48.0	
			PTFE		47.0	
	50 / 2"	H/125	EPDM	46.0		
			PTFE	43.5		45.0
50	50 / 2"	H/125	EPDM		70.0	
			PTFE		70.0	

Tab. 9: Kvs values for tube valve body VP

7 STRUCTURE AND FUNCTION

7.1 Structure

7.1.1 2/2-way valve type 2030, 2031 and 2031 K

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

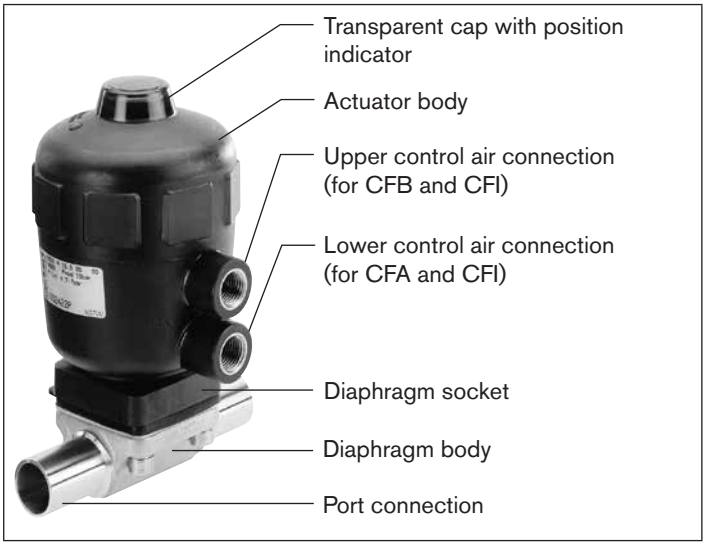


Fig. 21: Structure and description Type 2030, 2031 and 2031 K

7.1.2 T-valve Type 2032

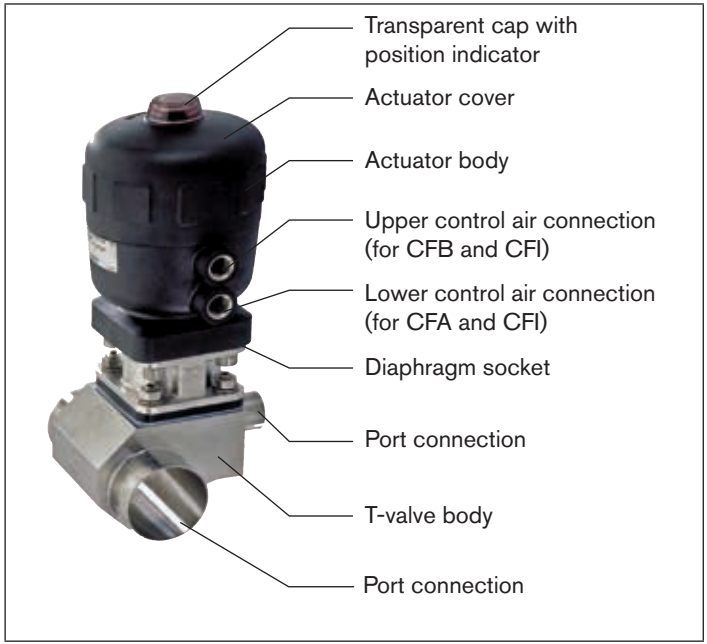


Fig. 22: Structure and description Type 2032

7.1.3 Tank bottom valve Type 2033

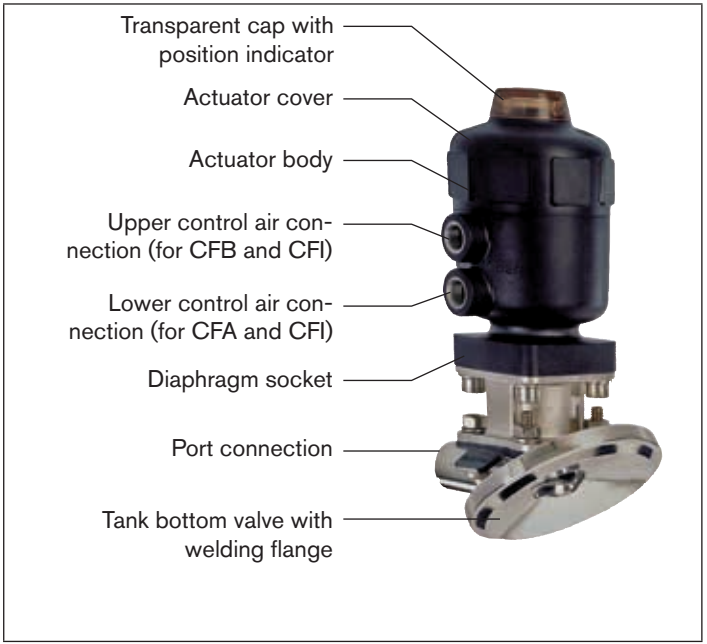


Fig. 23: Structure and description Type 2033

7.1.4 Y-valve Type 2037

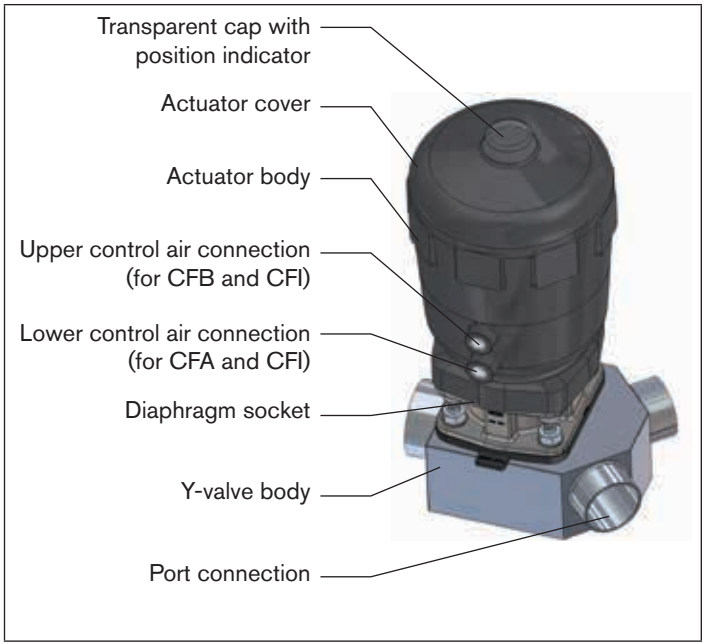


Fig. 24: Structure and description Type 2037

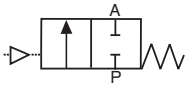
7.2 Function

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

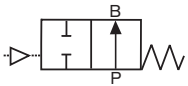
Control function A (CFA)

Closed by spring force in rest position



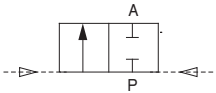
Control function B (CFB)

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.

8.1 Before installation

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

8.1.1 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 the diaphragm socket, for monitoring leakage must be at the lowest point.

8.1.2 Installation position 2/2-way valve

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

To ensure self-drainage:

→ Install body inclined by angle α = 10° to 40° to the horizontal (see "Fig. 25: Installation position for self-drainage of the body").

→ Observe an inclination angle of 1° – 5°. Forged and cast bodies feature a mark which must face upwards (12 o'clock position, see "Fig. 26: Mark for the correct installation position").

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

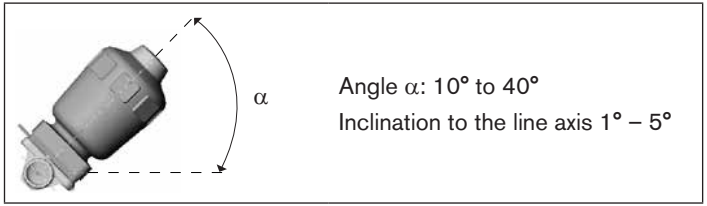


Fig. 25: Installation position for self-drainage of the body

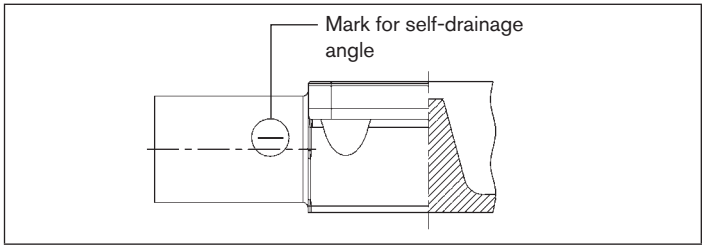


Fig. 26: Mark for the correct installation position

8.1.3 Installation position T-valve Type 2032

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

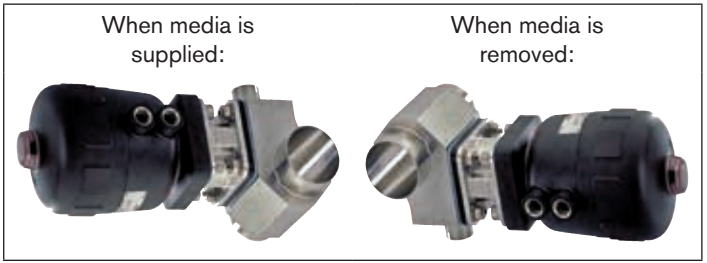


Fig. 27: Installation position type 2032

8.1.4 Installation position Y-valve Type 2037

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

Fig. 28: Installation position type 2037

8.1.5 Installation of the tank bottom valve Type 2033

For further information on containers and welding instructions, please refer to the standard ASME VIII Division I.

It is recommended to weld the valve prior to the container installation. However, it is possible to weld the valves to ready-assembled containers.

Prior to welding, please check to ensure that:

- The tank bottom valve does not collide with other equipment components and assembly/disassembly of the actuator is always possible.
- A minimal distance between two welding joints three times the thickness of the container wall is adhered to.

It is recommended to weld the valve in the center of the drain to ensure optimum draining of the container.

The diameter of the hole in the container and the flange must be equal. The valve has two welding edges to make welding and positioning of the valve easier. The length of the welding edges is approximately 3 mm. In case the thickness of the container wall exceeds 3 mm, the valve must be positioned as shown in "Fig. 29: Grinding point on tank".

→ Prior to welding the valve, grind the outlet wall.

Fig. 29: Grinding point on tank

Prior to commencing the welding process, check the charge number indicated on the supplied manufacturer's certificate 3.1.

Procedure:

→ Position the flange into the hole so that the flange surface is tangent to the drain surface.

→ Tack 4 welding points and check the position of the valve.

→ Weld the valve evenly to the inside and outside of the container, with gas being supplied and using welding material compatible with the valve's stainless steel 316L (DIN 1.4435).

→ Allow the welds to cool down before burnishing and cleaning them according to the applicable specifications.

These instructions assist in the installation of the tank bottom valves and allow the prevention of deformation and softening within the containers.

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

8.1.6 Preparatory work

→ Clean pipelines (sealing material, swarf, etc.).

→ Support and align pipelines.

Devices with welded or glued body:

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

8.2 Installation

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

WARNING!

Risk of injury from improper installation.

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

▸ Observe tightening torque during installation (see "Tab. 10: Tightening torques in Nm for diaphragms").

8.2.1 Devices with welded or glued body

NOTE!

To prevent damage.

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

Remove actuator and diaphragm from the body:

Procedure for control function A

→ Pressurize lower control air connection with compressed air (value as indicated on the type label) (see "Fig. 30").
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.

→ Weld or glue body into the pipeline.

Procedure for control functions B and I

→ Loosen fastening screws crosswise 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 gluing in the body, smooth the body surface by grinding if required.

→ Carefully clean the body.

Procedure for control function A

→ Pressurize lower control air connection with compressed air (value as indicated on the type label) (see "Fig. 30").

→ Place actuator on the body.

→ Lightly cross-tighten the body screws until the diaphragm is between the body and actuator.
Do not tighten the screws yet.

→ Actuate the diaphragm valve twice to position the diaphragm correctly.

→ Without applying pressure, tighten the body screws to the permitted tightening torque (see "Tab. 10").

→ Pressurize lower control air connection with compressed air (value as indicated on the type label).

→ Check the tightening torque of the screws again.

Procedure for actuator with control functions B and I:

→ Place actuator on the body.

→ Lightly cross-tighten the body screws without pressurization until the diaphragm is between the body and actuator.
Do not tighten the screws yet.

→ Pressurize upper control air connection with compressed air (value as indicated on the type label) (see below "Fig. 30").

→ Actuate the diaphragm valve twice.

→ Tighten the body screws to the permitted tightening torque (see "Tab. 10").

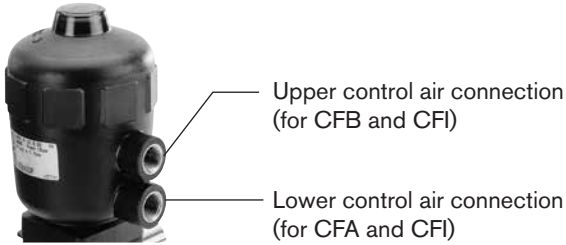


Fig. 30: Control air connection

Orifice (Diaph-ragm size) [mm]	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. 10: Tightening torques in Nm for diaphragms

8.2.2 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. 31: Pneumatic Connection”).

→ Pressure on the upper connection closes the valve.

→ Pressure on the lower connection opens the valve.

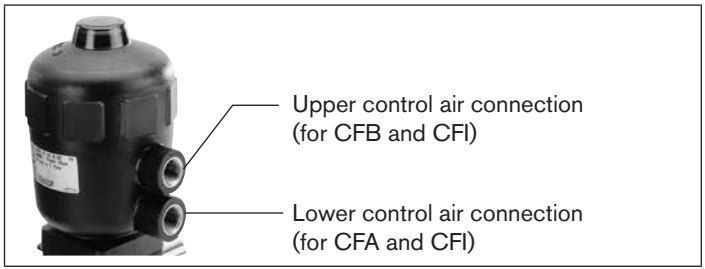


Fig. 31: Pneumatic Connection

8.3 Disassembly

DANGER!

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

It is dangerous to remove the device while under medium and control 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”.

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 ±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.

- Maintenance 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 chapter "12 Spare parts").

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,
- Medium pressure,
- Medium temperature,
- Actuator size,
- 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 slackened 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.

Fastening types

Orifice (Diaphragm size) [mm]	Fastening types for diaphragms	
	PTFE	EPDM / FKM / laminated PTFE
8	Diaphragm buttoned	Diaphragm buttoned
15	Diaphragm with bayonet catch	Diaphragm with bayonet catch
20		
25	Diaphragm with bayonet catch	Diaphragm screwed in
32		
40		
50		
65		

Tab. 11: Fastening types for diaphragms

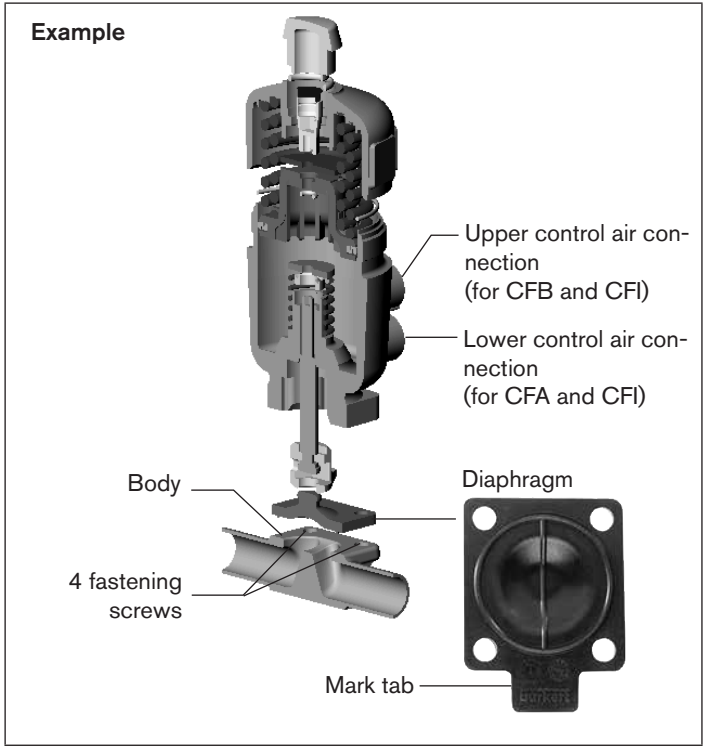


Fig. 32: Replacement of diaphragm

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 control air connection 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.

→ Unbutton or unscrew the old diaphragm. If attachment is with a bayonet catch, remove the diaphragm by rotating it through 90° (see "Tab. 11"). For orifice DN25-DN50 observe chapter "10.2.2".

→ Install new diaphragm in actuator (see "Tab. 11").

→ Align diaphragm.
Mark tab vertical to the flow direction.

→ Place actuator back on the body.

→ Lightly cross-tighten the body screws until the diaphragm is between the body and actuator.
Do not tighten the screws yet.

→ Actuate the diaphragm valve twice to position the diaphragm correctly.

→ Without applying pressure, tighten the body screws to the permitted tightening torque (see "Tab. 12").

→ Pressurize lower control air connection with compressed air (value as indicated on the type label).

→ Check the tightening torque of the screws again.

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.

→ Unbutton or unscrew old diaphragm. If attachment is with a bayonet catch, remove the diaphragm by rotating it through 90° (see "Tab. 11"). For orifice DN25-DN50 observe chapter "10.2.2".

→ Install new diaphragm in actuator (see "Tab. 11").

→ Align diaphragm.
Mark tab vertical to the flow direction.

→ Place actuator back on the body.

→ Lightly cross-tighten the body screws without pressurization until the diaphragm is between the body and actuator.
Do not tighten the screws yet.

→ Pressurize upper control air connection with compressed air (value as indicated on the type label) .

→ Actuate the diaphragm valve twice.

→ Tighten the body screws to the permitted tightening torque (see "Tab. 12").

Orifice (Diaphragm size) [mm]	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. 12: Tightening torques in Nm for diaphragms

10.2.2 Switch between PTFE and EPDM diaphragms

Orifice DN8:

→ Detach PTFE diaphragm and attach new EPDM diaphragm.

Orifice DN15 and DN20:

→ Loosen PTFE diaphragm bayonet and attach new EPDM diaphragm.

Orifice DN25 up to DN50:

→ Loosen PTFE diaphragm bayonet.

→ Place the insert in the pressure piece.

→ Insert and screw in EPDM diaphragm.

11 MALFUNCTIONS

Malfunction	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. 30: Control air connection”
	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, 2031 K, 2032 and 2033 are available as spare parts for the piston-controlled diaphragm valves.

- Seal set,
- Diaphragm.

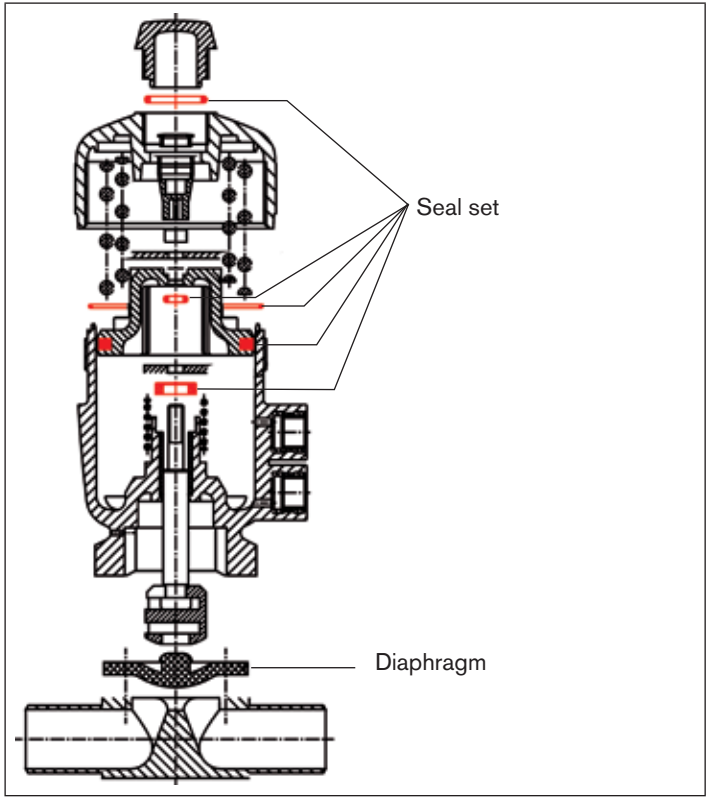


Fig. 33: Spare parts

12.1 Order table for seal sets

Actuator	Orifice (Diaphragm size)	Order numbers for seal sets	
		PPS actuator	PA actuator
C	8	011 465	-
D	15	011 477	011 426
E	15, 20	011 488	011 440
F	20, 25	011 492	011 448
G	32, 40	012 127	012 125
H	40, 50, 65	011 494	011 464

Tab. 13: Order numbers for seal sets

12.2 Order table for diaphragm

Orifice (Diaphragm size) [mm]	Order numbers for diaphragms					
	EPDM (AB*)		EPDM (AD*)		FKM (FF*)	
8	677 663	E02**	688 421	E03**	677 684	F01**
15	677 664	E02**	688 422	E03**	677 685	F01**
15 BC**	693 162	E02**	693 163	E03**	693 164	F01**
20	677 665	E02**	688 423	E03**	677 686	F01**
20 BC**	693 165	E02**	693 166	E03**	693 167	F01**
25	677 667	E01**	688 424	E03**	677 687	F01**
32	677 668	E01**	688 425	E03**	677 688	F01**
40	677 669	E01**	688 426	E03**	677 689	F01**
50	677 670	E01**	688 427	E03**	677 690	F01**
65	677 671	E01**	688 428	E03**	677 691	F01**
	PTFE (EA*)		Advanced PTFE (EU*)		Laminated Gylon (ER*)	
8	677 674	L04**	679 540	L05**	693 175	L06**
15	677 675	E02-PTFE**	679 541	E02-PTFE+Hole**	693 176	L06**
20	677 676	E02-PTFE**	679 542	E02-PTFE+Hole**	693 177	L06**

25	677 677	E02-PTFE**	679 543	E02-PTFE+Hole**	693 178	L06**
32	677 678	E02-PTFE**	679 544	E02-PTFE+Hole**	693 179	L06**
40	677 679	E02-PTFE**	679 545	E02-PTFE+Hole**	693 180	L06**
50	677 680	E02-PTFE**	679 546	E02-PTFE+Hole**	693 181	L06**
65	677 681	E02-PTFE**	679 743	E02-PTFE+Hole**	–	–

Tab. 14: 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: www.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.

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

- Observe applicable regulations on disposal and the environment.
- Observe the national waste disposal regulations.
- Dispose of the device and packaging in an environmentally friendly manner.

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