bürkert
FLUID CONTROL SYSTEMS

Type 2063, 2064, 2065

Piston-controlled diaphragm valve
Kolbengesteuertes Membranventil
Vanne à membrane commandée par piston

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

1 OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. Keep these instructions in an easily accessible location for every user. The instructions must be available to each new owner of the device.

Important safety information.

Failure to observe these instructions and notes may result in hazardous situations.

- The operating instructions must be read and understood.

1.1 Definition of terms

Term	in these instructions, refers to
Device	Types 2063, 2064 and 2065
Ex area	Potentially explosive atmosphere
Explosion protection approval	Approval for use in potentially explosive areas

1.2 Means of representation

DANGER!

Warns of an immediate danger.

- Failure to observe these instructions will result in death or serious injuries.

WARNING!

Warns of a potentially hazardous situation.

- Failure to observe these instructions may result in serious injuries or death.

CAUTION!

Warns of a potential danger.

- Failure to observe these instructions may result in moderate or minor injuries.

NOTE!

Warns of damage.

Important tips and recommendations.

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

- Designates instructions to avoid a danger.

→ Designates a procedure that you must carry out.

2 INTENDED USE

Only use diaphragm valves type 2063, 2064 and 2065 as intended. Improper use of the device may be dangerous to people, nearby equipment and the environment.

Diaphragm valves type 2063, 2064 and 2065 are designed for the control of contaminated, high-purity or sterile media as well as for abrasive or aggressive media (also with higher viscosity).

The device is designed to control the flow of liquid and gaseous media.

- Only use the devices for media that do not attack the body and sealing materials (see type label). Information on the resistance of the materials to the media is available from your Bürkert sales office or on the Internet at: country.burkert.com → resistApp
- Only use equipment that is approved for this type of potentially explosive area. These devices are identified by a separate Ex type label. Before use, observe the information on the separate Ex type label and the Ex additional instructions or the separate Ex operating instructions.
- To use the device, observe the permitted data, operating conditions and application conditions. These specifications can be found in the contract documents, the operating instructions and on the type label.
- Protect device from harmful environmental influences (e.g. radiation, air humidity, steam). For any matters requiring clarification, contact the relevant sales office .
- Use the device only in conjunction with third-party devices and components recommended or approved by Bürkert.
- Correct transportation, correct storage and installation and careful use and maintenance are essential
- 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 of the devices.
- local safety regulations that are within the operator's scope of responsibility, including those relating 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 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 Secure it against reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment!

Risk of injury when opening the actuator.

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

- Do not open the actuator.

Risk of injury due to moving parts in and on 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.

Risk of burns or 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.

Medium may leak out if 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 injuries, ensure:

- Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- 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.
- 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.
- Use the device only when it is in perfect condition and in accordance with the operating instructions.
- For deployment planning and device operation, observe the plant-specific safety regulations.
- The plant owner is responsible for the safe operation and handling of the plant.
- Observe the general rules of technical equipment.
- The exhaust air of the device may be contaminated with lubricants.

Please observe the following in order to protect against damage to the device:

- Feed only those media listed in chapter “6 Technical data” into the medium ports.
- Do not make any changes to the device and do not subject it to mechanical stress.

4 GENERAL INFORMATION

4.1 Contact addresses

Germany

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

International

The contact addresses can be found on the back pages of the printed Quickstart.

They are also available online at: country.burkert.com

4.2 Warranty

A precondition for the warranty is that the device is used as intended in consideration of the specified operating conditions.

4.3 Information on the Internet

Operating instructions and data sheets for types 2063, 2064 and 2065 can be found online at: country.burkert.com

5 PRODUCT DESCRIPTION

5.1 General description

The diaphragm valve consists of a pneumatically actuated piston actuator and a 2-way body. It uses neutral gases or air to control the flow of contaminated, aggressive, abrasive, high-purity or sterile media; media with high viscosity can also be used.

5.1.1 2/2-way valve type 2063

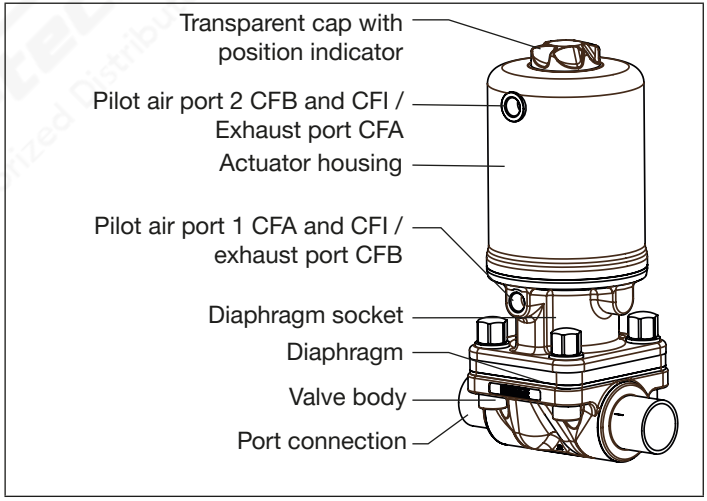


Fig. 1: 2/2-way valve type 2063, design and description

5.1.2 T-valve type 2064

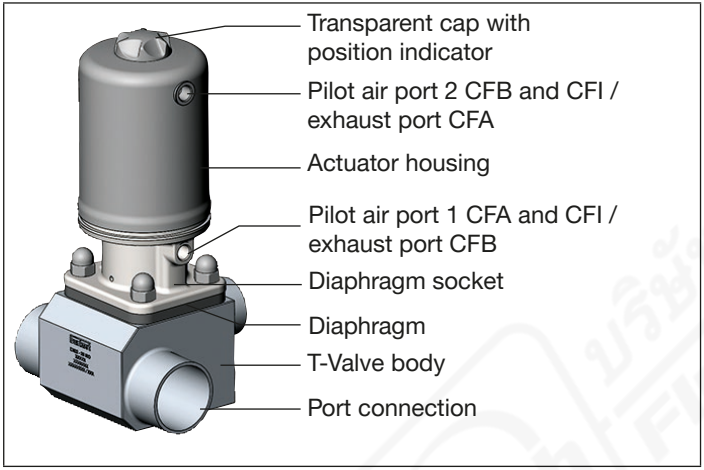


Fig. 2: T-valve type 2064, design and description

5.1.3 Tank bottom valve type 2065

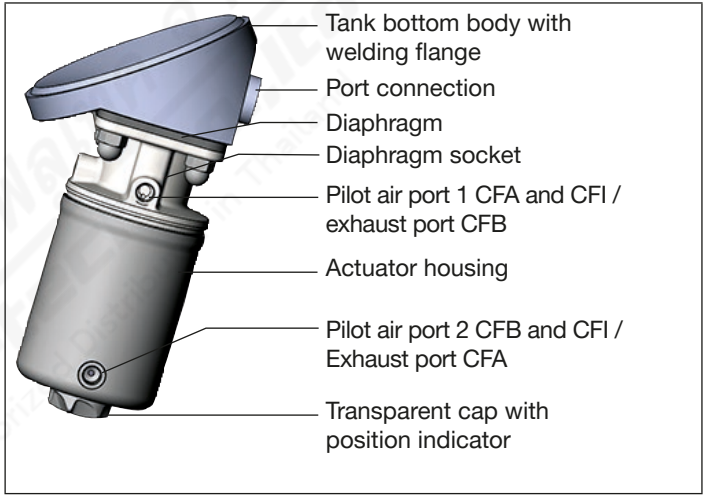


Fig. 3: Tank bottom valve type 2065, design and description

5.2 Application range

Observe the maximum pressure range on the type label!

- Contaminated, aggressive, abrasive, high-purity or sterile media.
- Higher viscosity media.

5.3 Properties

- Any flow direction.
- Self-draining with appropriate installation. The ends of the connections used must be cylindrical.
- Optimised deadleg.
- Low turbulence flow.
- High flow values due to streamlined valve body.
- Maintenance-free under normal conditions.
- Simple exchange of the diaphragm material.

5.3.1 Options

- Stroke limitation (as max. or min./max. variant)
  Limitation of the maximum and/or minimum open position / flow rate by means of adjusting screw.
- Position feedback sensor
  Feedback sensor for the valve position using inductive proximity switch or Type 8697 feedback sensor.

5.3.2 Device variants

The diaphragm valve is available for the following actuator sizes: ø 32 mm, ø 50 mm, ø 70 mm, ø 90 mm, ø 130 mm.

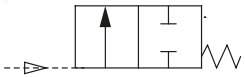
5.4 Function

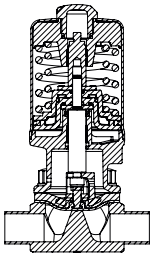
Spring force (SFA) or pneumatic pilot pressure (CFB and CFI) generate the closing force of the diaphragm pressure piece. Force is transmitted through a spindle connected to the actuator piston.

5.4.1 Control functions (CF)

Control function A (CFA)

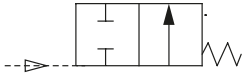
Closed by spring force in rest position

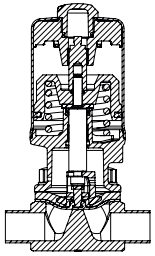




Control function B (CFB)

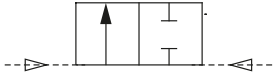
Opened by spring force in rest position





Control function I (CFI)

Actuating function via reciprocal pressurization



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 Labelling of forged steel valve body

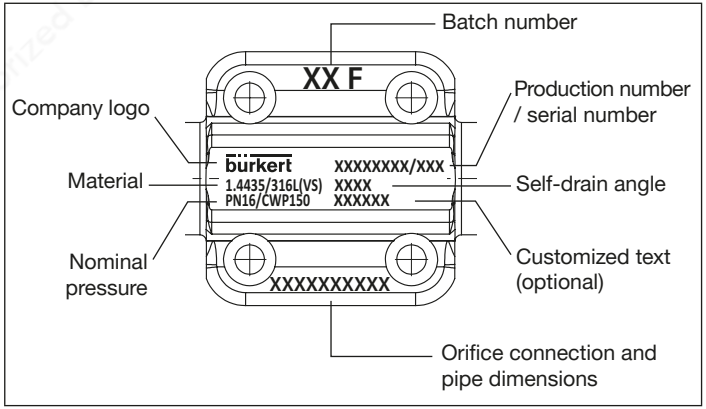


Fig. 4: Labelling of forged steel valve body

6.3 Labelling of tube valve body (VP)

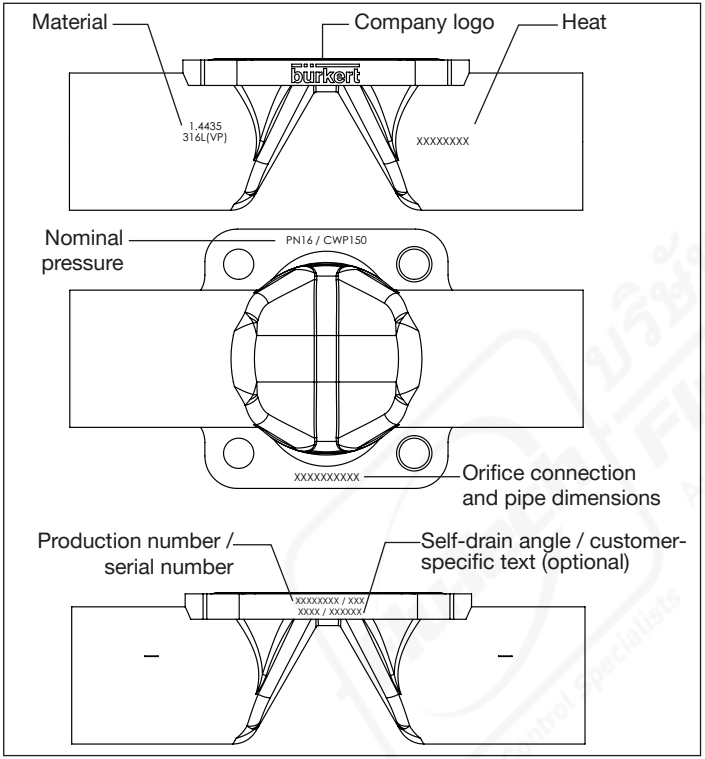


Fig. 5: Labelling of tube valve body (VP)

6.4 Type label

WARNING!

Risk of injury from high pressure.

Excessive pressure can damage the device.

- Comply with pressure range values on the type label.

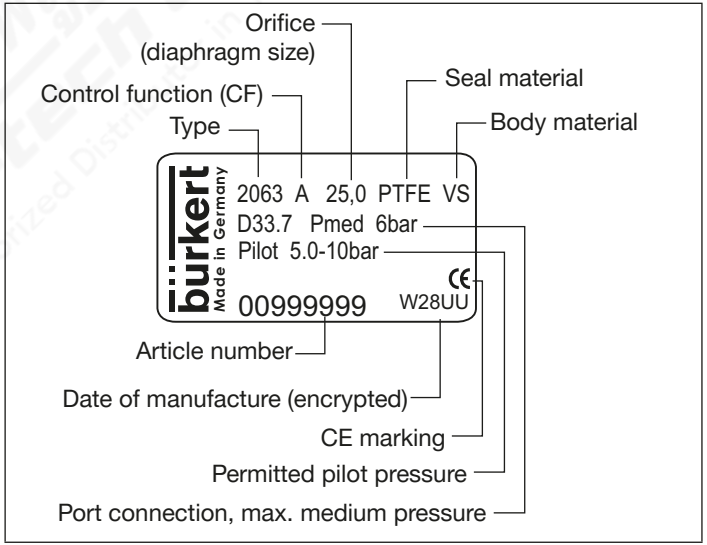


Fig. 6: Description of the type label (example)

6.5 Operating conditions

6.5.1 Temperature ranges

Permissible ambient temperature for actuators

Actuator size [mm]	Actuator material	Temperature
ø 32	Stainless steel	–10...+130 °C
ø 50		
ø 70		
ø 90		
ø 130		

Tab. 1: Permissible ambient temperature for actuators

Permitted medium temperature for valve body

Body material		Temperature
Cast valve body (VG)	1.4435 (AISI 316L)	-10...+150 °C
Forged steel valve body (VS)	1.4435 BN2 (AISI 316L) according to ASME BPE	
Tube valve body (VP)	1.4435 BN2 (AISI 316L)	

Tab. 2: Permitted medium temperature for valve body

Permissible medium temperature for diaphragms

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

The behaviour 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	Comments
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: Permissible medium temperature for diaphragms

6.5.2 Pressure ranges

Maximum permitted pilot pressure

Actuator size [mm]	Actuator material	Max. permitted pilot pressure
ø 32	Stainless steel	10.5 bar
ø 50		
ø 70		
ø 90		
ø 130		7.5 bar

Tab. 4: Maximum permitted pilot pressure

Pilot pressure for control function A

Actuator size [mm]	DN (diaphragm size)	Pilot pressure [bar] with medium pressure	
		0 bar	maximum
ø 32	8	5.5	4.5
ø 50	15	5.4	5.0
ø 70		4.8	4.5
ø 70	20	4.8	4.5
ø 70	25	5.5	4.3
ø 90		5.0	4.0
ø 90	32	5.0	4.5
ø 90	40	5.5	4.5
ø 130		5.0	4.6
ø 130	50	5.0	4.8

Tab. 5: Pilot pressure for control function A

Medium pressure for control function A

The values are valid for stainless steel valve bodies.

Actuator size [mm]	DN (diaphragm size)	Max. sealed medium pressure [bar]			
		Pressure on one side		Pressure on both sides	
		EPDM/FKM	PTFE	EPDM/FKM	PTFE
ø 32	8	10	6	10	4
ø 50	15	8.5	5	5	3.5
ø 70		10	10	10	10
ø 70	20	10	10	10	7.5
ø 70	25	6.5	4.5	5.5	3.5
ø 90		10	8	10	7
ø 90	32	8	6	6	4
ø 90	40	5.5	5	4	3
ø 130		10	10	10	9
ø 130	50	8	7	7	5

Tab. 6: Medium pressure for control function A

Required minimum pilot pressure depending on the medium pressure

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

The values are valid for stainless steel valve bodies.

Control function B / elastomer diaphragm

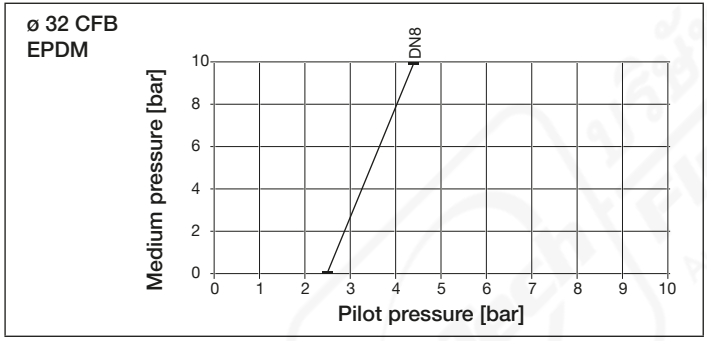


Fig. 7: Pressure diagram, actuator ø 32 mm, control function B, elastomer diaphragm

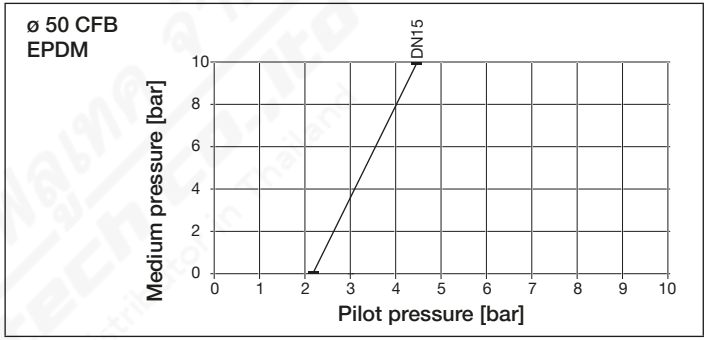


Fig. 8: Pressure diagram, actuator ø 50 mm, control function B, elastomer diaphragm

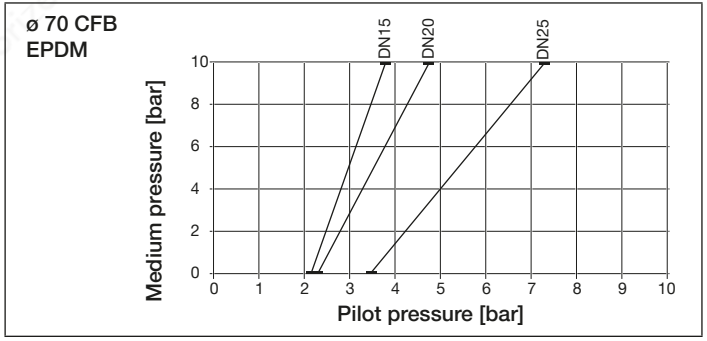


Fig. 9: Pressure diagram, actuator ø 70 mm, control function B, elastomer diaphragm

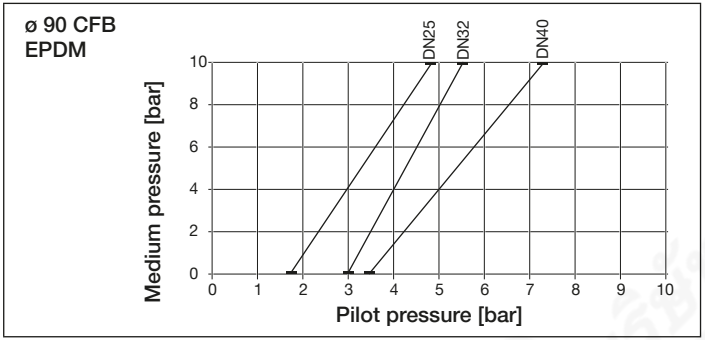


Fig. 10: Pressure diagram, actuator ø 90 mm, control function B, elastomer diaphragm

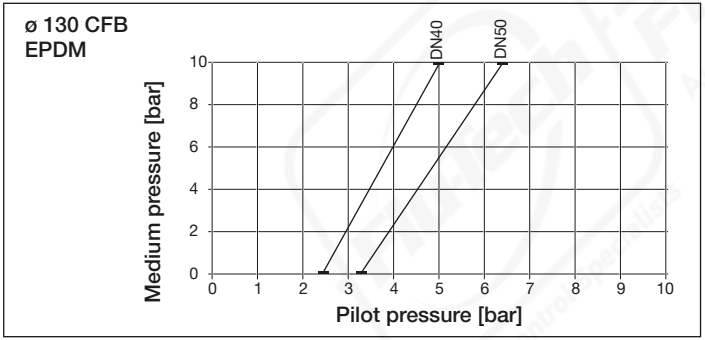


Fig. 11: Pressure diagram, actuator ø 130 mm, control function B, elastomer diaphragm

Control function B / PTFE elastomer diaphragm

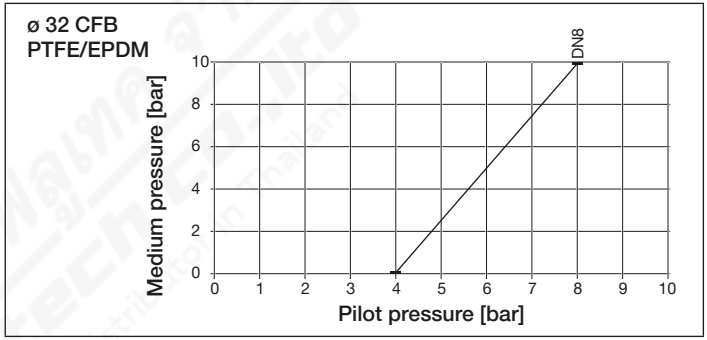


Fig. 12: Pressure diagram, actuator ø 32 mm, control function B, PTFE elastomer diaphragm

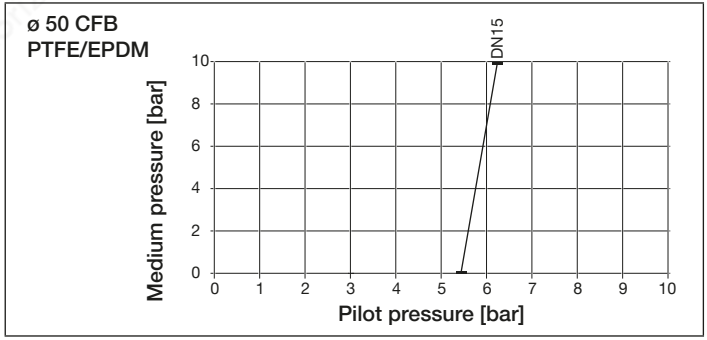


Fig. 13: Pressure diagram, actuator ø 50 mm, control function B, PTFE elastomer diaphragm

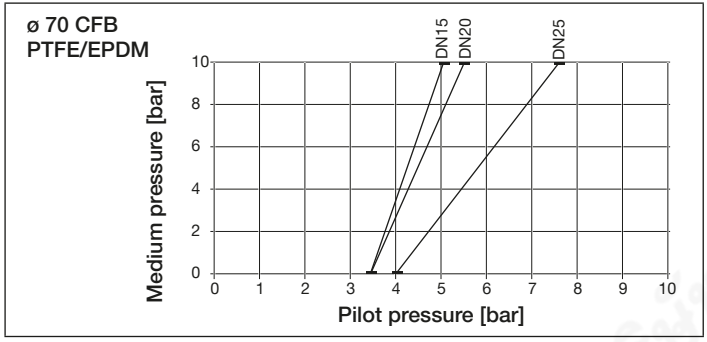


Fig. 14: Pressure diagram, actuator ø 70 mm, control function B, PTFE elastomer diaphragm

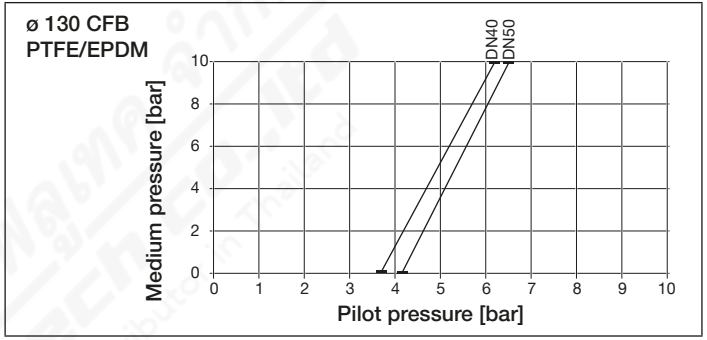


Fig. 16: Pressure diagram, actuator ø 130 mm, control function B, PTFE elastomer diaphragm

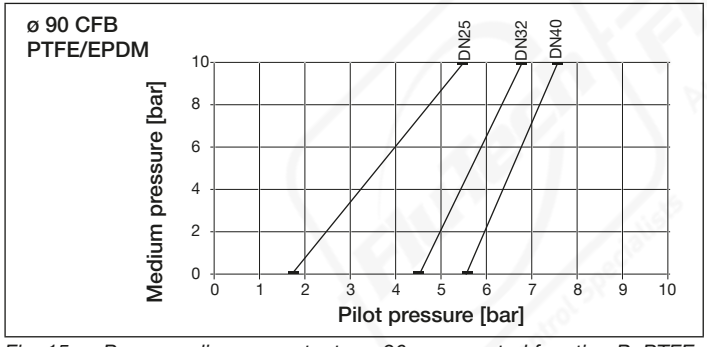


Fig. 15: Pressure diagram, actuator ø 90 mm, control function B, PTFE elastomer diaphragm

Control function I / elastomer diaphragm

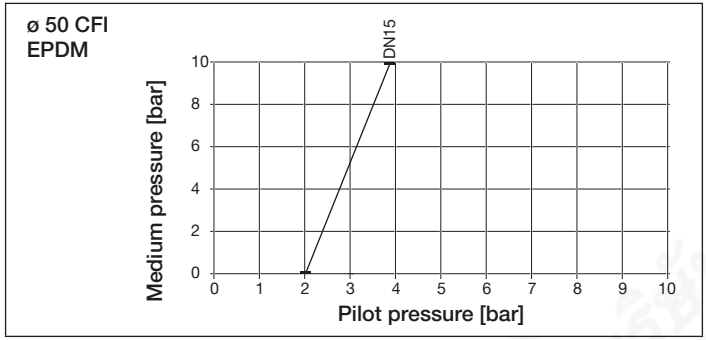


Fig. 17: Pressure diagram, actuator ø 50 mm, control function I, elastomer diaphragm

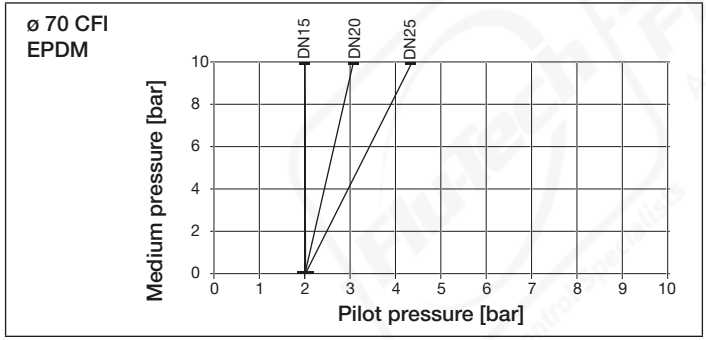


Fig. 18: Pressure diagram, actuator ø 70 mm, control function I, elastomer diaphragm

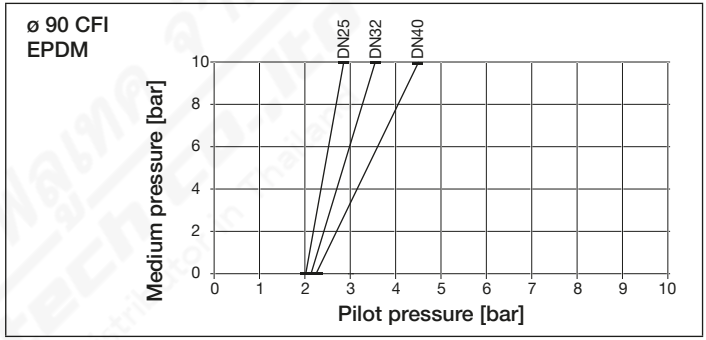


Fig. 19: Pressure diagram, actuator ø 90 mm, control function I, elastomer diaphragm

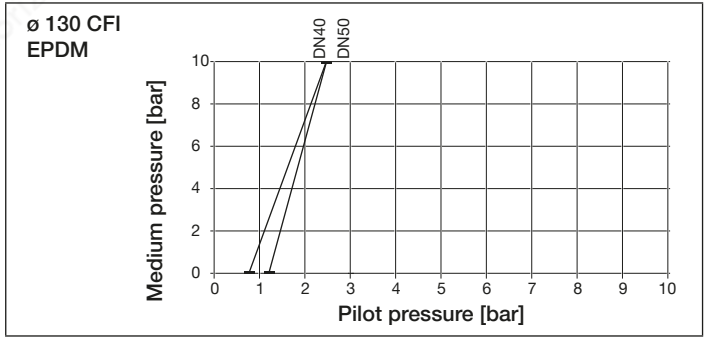


Fig. 20: Pressure diagram, actuator ø 130 mm, control function I, elastomer diaphragm

Control function I / PTFE elastomer diaphragm

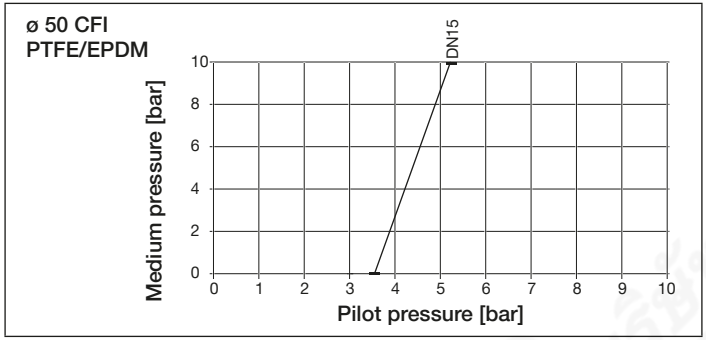


Fig. 21: Pressure diagram, actuator ø 50 mm, control function I, PTFE elastomer diaphragm

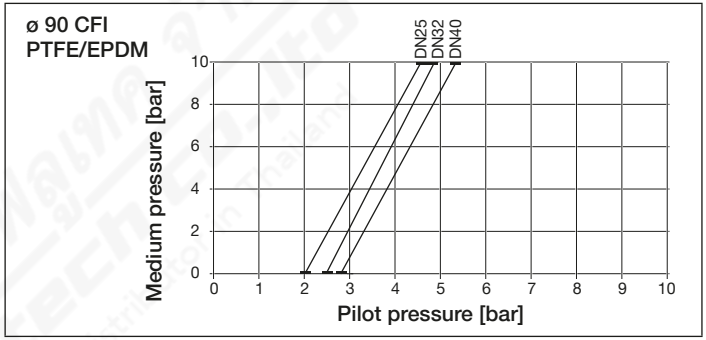


Fig. 23: Pressure diagram, actuator ø 90 mm, control function I, PTFE elastomer diaphragm

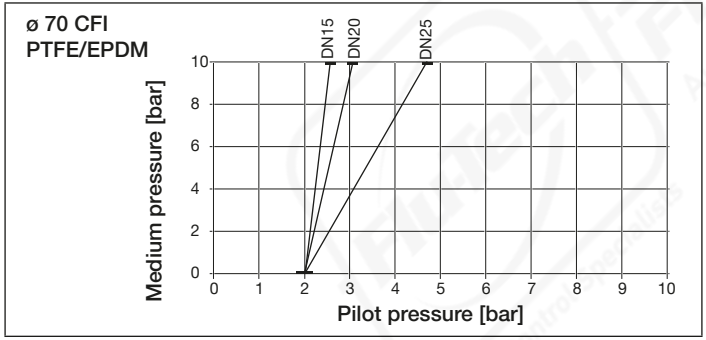


Fig. 22: Pressure diagram, actuator ø 70 mm, control function I, PTFE elastomer diaphragm

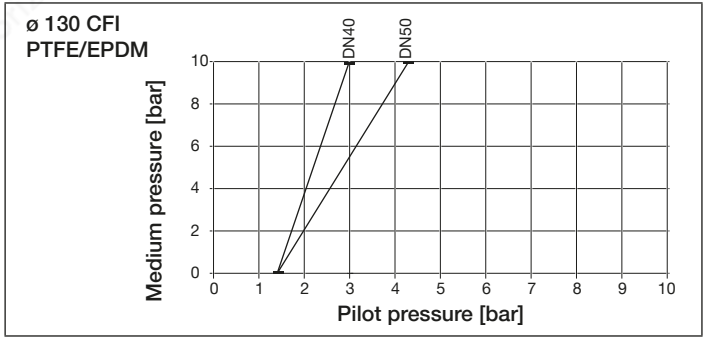


Fig. 24: Pressure diagram, actuator ø 130 mm, control function I, PTFE elastomer diaphragm

6.6 Flow rate values

6.6.1 Flow rate values for forged steel valve bodies

Diaphragm size	Orifice connection	Seal material	Kv values [m³/h] as per standard				
			DIN	ISO	ASME	BS	SMS
8	8 / ¼"	EPDM	1.1				
		PTFE	1.1				
15	10 / ⅜"	EPDM	3.5	5.5			
		PTFE	3.4	5.2			
	15 / ½"	EPDM	6.5	6.5	3.1	3.7	
		PTFE	6.0	6.0	3.1	3.6	
20	20 / ¾"	EPDM	12.4	12.5	8.4	8.9	
		PTFE	12.0	12.0	8.5	8.8	
25	25 / 1"	EPDM	20.0	18.0	15.5		16.0
		PTFE	17.0	16.0	14.5		14.8
40	32	EPDM	34.0				
		PTFE	34.0				
	40 / 1½"	EPDM	40.0	41.0	37.0		38.0
		PTFE	40.0	40.0	37.5		38.0
50	50 / 2"	EPDM	66.0	66.0	66.0		66.0
		PTFE	66.0	67.0	66.0		66.0
	2½"	EPDM			66.0		
		PTFE			66.0		

Tab. 7: Kv values for forged steel valve bodies

6.6.2 Flow values for cast valve bodies

Diaphragm size	Orifice connection	Seal material	Kv values [m³/h] Cast iron valve body VG (all standards)
8	8	EPDM	0.95
		PTFE	1.5
15	15	EPDM	5.6
		PTFE	5.3
20	20	EPDM	10.7
		PTFE	10.5
25	25	EPDM	14.6
		PTFE	13.6
40	40	EPDM	35.0
		PTFE	35.0
50	50	EPDM	47.0
		PTFE	48.0

Tab. 8: Kv values for cast valve bodies

6.6.3 Flow values for tube valve bodies

Diaphragm size	DN connection	Sealing material	Kv values [m³/h] as per standard		
			DIN	ISO	ASME
8	8 / ¼"	EPDM		1.9	
		PTFE		2.4	
15	15 / ½"	EPDM	7.2	7.0	
		PTFE	6.7	6.6	
	20 / ¾"	EPDM	7.4		
		PTFE	5.1		6.5
20	20 / ¾"	EPDM		13.5	
		PTFE		12.1	
	25 / 1"	EPDM	14.9		
		PTFE	13.7		12.7
25	25 / 1"	EPDM		21.0	
		PTFE		18.4	
	32	EPDM	22.5		
		PTFE	18.8		
32	32	EPDM		36.0	
		PTFE		36.0	
	40 / 1½"	EPDM	35.0		
		PTFE	34.5		32.0
40	40 / 1½"	EPDM		48.0	
		PTFE		47.0	
	50 / 2"	EPDM	46.0		
		PTFE	44.5		46.0
50	50 / 2"	EPDM		70.0	
		PTFE		70.0	

Tab. 9: Kv values for tube valve bodies

6.7 General technical data

Actuator size	ø 50 mm, ø 70 mm, ø 90 mm, ø 130 mm.
Control function	For a description of the control functions, see chapter "5.4.1"
Installation position	
Type 2063, 2064	Any, preferably actuator face up
Type 2065	Preferably with the actuator to the bottom (tank bottom valve)
Media	
Control media	Neutral gases, air
Flow media	Liquids and gases; contaminated, high-purity, sterile, abrasive or aggressive media (also with higher viscosity)
Materials	
Valve body	
Type 2063	Precision casting (VG), forged steel (VS), tube valve body (VP)
Type 2064, 2065	Stainless steel block material
Actuator	Stainless steel
Sealing elements	FKM and EPDM
Diaphragm	EPDM, PTFE, FKM

Ports

Pilot air port	Stainless steel threaded bushing G1/8 M5 (for actuator size ø 32 mm)
Port connection	Welded connection: according to EN ISO 1127 (ISO 4200), DIN 11850 R2, DIN 11866 (ASME-BPE) other connections on request

7 INSTALLATION

DANGER!

Risk of injury from high pressure in the system.

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

WARNING!

Risk of injury due to improper installation.

- Installation may only be performed by qualified and trained personnel.
- Ensure a controlled restart after installation.

For control function I: Risk of pilot pressure failure.

The valve stays in an undefined position in the event of a pilot pressure failure.

- To ensure a controlled restart, first pressurize the device with pilot pressure, then switch on the medium.

Risk of injury due to unintentional activation of the system and uncontrolled restart.

- Secure the system against unintentional activation.
- Ensure a controlled restart after installation.

CAUTION!

Risk of injury due to heavy device.

During transportation or installation work, a heavy device may fall down and cause injuries.

- Transport, install and remove heavy device with the aid of a second person only.
- Use suitable tools.

7.1 Installation position 2/2-way valves

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

Installation for leakage detection

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

Ensuring self-draining

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

The following points must be observed during installation regarding self-draining:

- Inclination angle of the pipeline:
  The inclination angle of the diaphragm valves 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 angles according to the valid ASME BPE.

- Self-drainage angle for valve body:

  The self-drainage-angle (α) depends on the valve body size (diaphragm size) and the inner diameter of the port connection (DN).

  The self-draining angle is indicated as a value on forged steel valve bodies (VS) and tube valve bodies (VP) (see “Fig. 4” and “Fig. 5”).

  The marking on the port connection of valve bodies serves as an orientation aid (see “Fig. 25”). The marking must point upwards.

  The actual self-drainage angle must be set with a suitable measuring tool.

  For valve bodies without angle specification, you will find information on the self-drainage angle on the Internet at country.burkert.com → Type → Manuals → Additional manual “Angles for self-draining of diaphragm valves”.

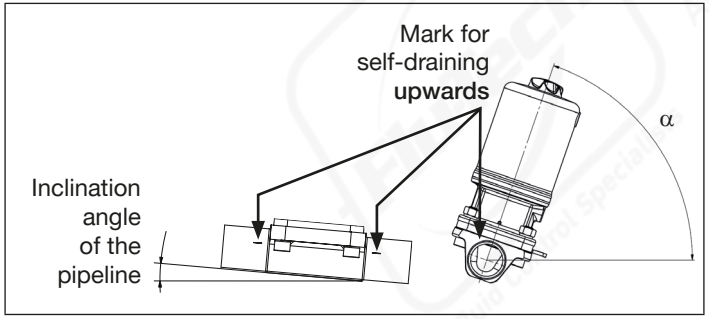


Fig. 25: Installation position for self-drainage of the valve body

7.1.1 Installation position T-valve type 2064

Installation for leakage detection

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

The following installation positions are recommended for the installation of a T-valve in circular pipelines:

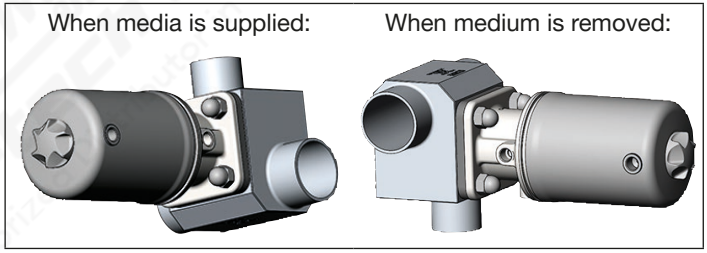


Fig. 26: Installation position of the type 2064

7.1.2 Installation position for tank bottom body, type 2065

Preferably with the actuator to the bottom.

7.2 Installation into the pipeline

7.2.1 Preparatory work

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

→ Support and align pipelines.

7.2.2 Installation requirements

Pipelines: Ensure that pipelines are in alignment.

The flow direction is optional.

NOTE!

Damage to the diaphragm or the actuator.

- Remove the actuator and diaphragm before welding in the valve body.

7.3 Removing actuator from the valve body

NOTE!

Damage to the diaphragm or the seat contour.

- When removing the actuator, ensure that the valve is in open position.

→ For control function A pressurize the pilot air port 1 with compressed air: Valve opens.

→ Loosen the body screws cross-wise and remove the actuator with diaphragm from the body.

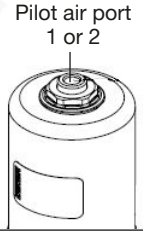
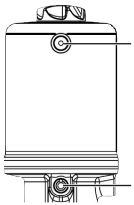
Actuator size ø 32 mm	Actuator size ø 50...130 mm
	

Fig. 27: Pneumatic connection

7.4 Installing valve body

WARNING!

Risk of injury due to improper installation.

- Installation may only be performed by qualified and trained personnel.
- Observe tightening torques.

7.4.1 Installation of 2-way valve body and T-valve body

Installation conditions:

Pipelines: Ensure that pipelines are in alignment.

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

Valve body with welded connection

→ Weld valve body into pipeline system.

Other valve bodies

→ Connect valve body to pipeline.

7.4.2 Welding tank bottom body type 2065

Recommendations

Observe sequence!

1. Welding 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 the tank bottom body into the pipeline.

Installation conditions:

Pipelines: Ensure that pipelines are in alignment.

Preparation: Support and align pipelines. To ensure that the pipeline is self-draining, we recommend the inclination angles 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 empty the 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

- Only use welding materials which are 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 the tank bottom body into the pipeline.
   ⚠Ensure installation is de-energized and low-vibration.

After welding in the valve body:

→ Mount the actuator with diaphragm on the valve body.

7.5 Mount the actuator with diaphragm on the valve body

NOTE!

Damage to the diaphragm or the seat contour!

- When installing the actuator, ensure that the valve is in open position.

Installation for actuator with control function A:

→ Pressurise pilot air port 1 with compressed air: Valve opens.

→ Place actuator together with diaphragm on the valve body.

→ Lightly tighten the body screws **cross-wise** until the diaphragm lies between the valve body and the actuator. **Do not tighten the screws yet.**

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

→ Without applying pressure, tighten the body screws in three stages (approx. 1/3, approx. 2/3, 3/3 of the full tightening torque, according to “Tab. 10”), in each case tightening them **cross-wise**. The diaphragm should be positioned and pressed evenly all around the actuator and body.

Installing actuators with control function B and I:

→ Place actuator together with diaphragm on the valve body.

→ Lightly tighten the body screws **cross-wise** without applying pressure until the diaphragm is between the valve body and the actuator. **Do not tighten the screws yet.**

→ Pressurise pilot air port 2 with compressed air (value as indicated on the type label).

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

→ With applying pressure, tighten the body screws in three stages (approx. 1/3, approx. 2/3, 3/3 of the full tightening torque, according to "Tab. 10"), in each case tightening them **cross-wise**. The diaphragm should be positioned and pressed evenly all around the actuator and body.

DN (diaphragm size)	Tightening torques for diaphragms [Nm]	
	EPDM/FKM	PTFE/ advanced PTFE/ laminated PTFE
8	2.5	2.5
15	3.5	4
20	4	4.5
25	5	6
32	8	10
40	8	10
50	12	15

Tab. 10: Diaphragm tightening torques for mounting the drive

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

7.6 Pneumatic connection

WARNING!

Risk of injury from unsuitable connection hoses.

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

For control function I: Risk of pilot pressure failure.

The valve stays in an undefined position in the event of a pilot pressure failure.

- To ensure a controlled restart, first pressurize the device with pilot pressure, then switch on the medium.

7.6.1 Connecting the control medium

Control function A and B

→ Connect the control medium to pilot air port **1**.

Control function I

→ Connect control medium to pilot air port **1** and **2**.
Pressure on pilot air port 1 opens the valve.
Pressure on pilot air port 2 closes the valve.

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

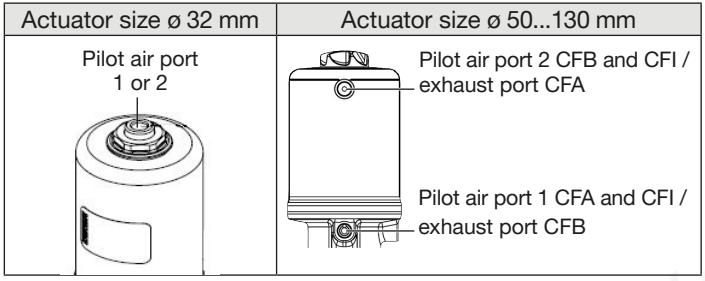


Fig. 28: Pneumatic connection

8 DISASSEMBLY

DANGER!

Risk of injury from discharge of medium and pressure.

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

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

→ Loosen pneumatic connection.

→ Disassemble the device.

Replacement of the diaphragm is described in the chapter “9.2 Repair”.

9 MAINTENANCE

DANGER!

Risk of injury from high pressure in the system.

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

Risk of injury from electric 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 due to improper maintenance.

- Only trained technicians may perform maintenance work. Perform maintenance work using suitable tools only.
- Ensure a controlled restart after maintenance.

9.1 Maintenance

9.1.1 Actuator

When used in accordance with these operating instructions, the actuator of the diaphragm valve is maintenance-free.

9.1.2 Wearing parts of the diaphragm valve

Parts which are subject to natural wear are:
Seals and membrane

→ If leaks occur, replace the wearing part in question with a corresponding spare part (see chapter “11 Spare parts”).

→ Periodic control of the relief bore (see “Fig. 29”).

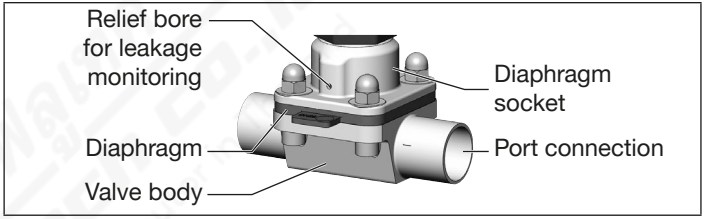


Fig. 29: Relief bore

A bulging PTFE diaphragm may reduce the flow rate.

Replacement of the diaphragm is described in chapter “9.2 Repair”.

9.1.3 Inspection intervals

The following maintenance must be performed on the diaphragm valve

→ After the first steam sterilization or when required retighten body screws crosswise.

→ Check the diaphragm for wear after a maximum of 10^5 switching cycles.

Muddy and abrasive media require correspondingly shorter inspection intervals.

9.1.4 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
- Pilot 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.

9.1.5 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 body materials and seals.

9.2 Repair

9.2.1 Replacing the diaphragm

DANGER!

Risk of injury from discharge of medium and pressure.

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

- Before removing a device, switch off the pressure and vent the lines.
- Empty the pipelines completely.
- When reassembling, check the tightening torque of the body screws.

Fastening types

DN (diaphragm size)	Fixture 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	Devices with threaded connection
32		
40		
50		

Tab. 11: Fixture types for diaphragms

Replacement for control function A

→ Clamp valve body in a collet
(only for valves which have not yet been installed).

NOTE!

Damage to the diaphragm or the seat contour!
When removing the actuator, ensure that the valve is open.

→ Pressurise pilot air port **1** with compressed air (value as indicated on the type label). This is necessary so that the diaphragm detaches from the body and is not damaged.

→ Loosen the body screws cross-wise and remove the actuator with diaphragm from the body.

→ Unscrew the old diaphragm. When fastening with a bayonet catch, loosen the diaphragm by turning it 90° (see "Tab. 11"). For DN25-DN50, see chapter "9.2.2".

NOTE!

For diaphragm with threaded connection:
If the pin is strained, the diaphragm may be damaged.
▸ First screw in the diaphragm hand-tight. Then, turn it back counterclockwise by half a turn.

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

→ Align diaphragm.
The mark tab of the diaphragm must be perpendicular to the flow direction (see "Fig. 30").

→ Pressurise pilot air port 1 with compressed air:

→ Place the actuator together with diaphragm back on the valve body.

→ Insert the body screws and lightly tighten them **cross-wise** until the diaphragm lies between the valve body and the actuator. **Do not tighten the screws yet.**

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

→ Without applying pressure, tighten the body screws in three stages (approx. 1/3, approx. 2/3, 3/3 of the full tightening torque, according to "Tab. 12"), in each case tightening them **cross-wise**. The diaphragm should be positioned and pressed evenly all around the actuator and body.

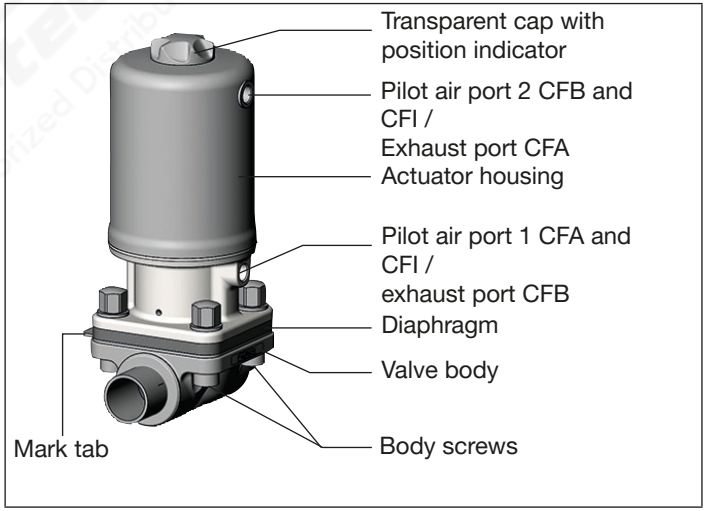


Fig. 30: Maintenance

Replacement for control function B and I

→ Clamp valve body in a collet
(only for valves which have not yet been installed).

NOTE!

Damage to the diaphragm or the seat contour!
When removing the actuator, ensure that the valve is open.

→ Loosen the body screws cross-wise and remove the actuator with diaphragm from the body.

→ Unscrew the old diaphragm. When fastening with a bayonet catch, loosen the diaphragm by turning it 90° (see "Tab. 11"). For DN25-DN50, see chapter "9.2.2".

NOTE!

For diaphragm with threaded connection:
If the pin is strained, the diaphragm may be damaged.
▸ First screw in the diaphragm hand-tight. Then, turn it back counterclockwise by half a turn.

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

→ Align diaphragm.
The mark tab of the diaphragm must be perpendicular to the flow direction (see "Fig. 30").

→ Place the actuator together with diaphragm back on the valve body.

→ Insert the body screws and lightly tighten them **cross-wise** without pressurisation until the diaphragm lies between the valve body and actuator. **Do not tighten the screws yet.**

→ Pressurise pilot air port **2** with compressed air (value as indicated on the type label).

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

→ With applying pressure, tighten the body screws in three stages (approx. 1/3, approx. 2/3, 3/3 of the full tightening torque, according to "Tab. 12"), in each case tightening them cross-wise. The diaphragm should be positioned and pressed evenly all around the actuator and body.

DN (diaphragm size)	Tightening torques for diaphragms[Nm]	
	EPDM/FKM	PTFE/ advanced PTFE/ laminated PTFE
8	2.5	2.5
15	3.5	4
20	4	4.5
25	5	6
32	8	10
40	8	10
50	12	15

Tab. 12: Tightening torques for diaphragms

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

9.2.2 Switching between PTFE and EPDM diaphragm

Orifice DN8:

→ Detach PTFE diaphragm and attach new EPDM diaphragm.

Orifice DN15 and DN20:

→ Loosen PTFE diaphragm bayonet and insert new EPDM diaphragm.

Orifice DN25 up to DN50:

→ Loosen PTFE diaphragm bayonet.

→ Place insert into the pressure piece

NOTE!

For diaphragm with threaded connection:

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

- First screw in the diaphragm hand-tight. Then, turn it back counterclockwise by half a turn.

Change of diaphragm material

- When changing to a different diaphragm material, observe the permissible medium pressure.

→ Insert and screw in EPDM diaphragm.

10 MALFUNCTIONS

Malfunction	Cause / elimination
Actuator does not switch	Pilot air port interchanged CFA: Connect pilot air port 1 CFB: Connect pilot air port 2 CFI: Pilot air port 1: Open Pilot air port 2: Close
	Pilot pressure too low – see pressure information on the type label.
	Medium pressure too high – see pressure information on the type label.
Valve is not tight	Medium pressure too high – see pressure information on the type label.
	Pilot pressure too low – see pressure information on the type label.
Flow rate reduced	PTFE diaphragm bulged → Replace diaphragm

Tab. 13: Malfunctions

11 SPARE PARTS

CAUTION!

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

Incorrect accessories and unsuitable spare parts may cause injuries and damages to both the device and the area around it.

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

The diaphragm is available as a spare part for the piston-controlled diaphragm valve types 2063, 2064 and 2065.

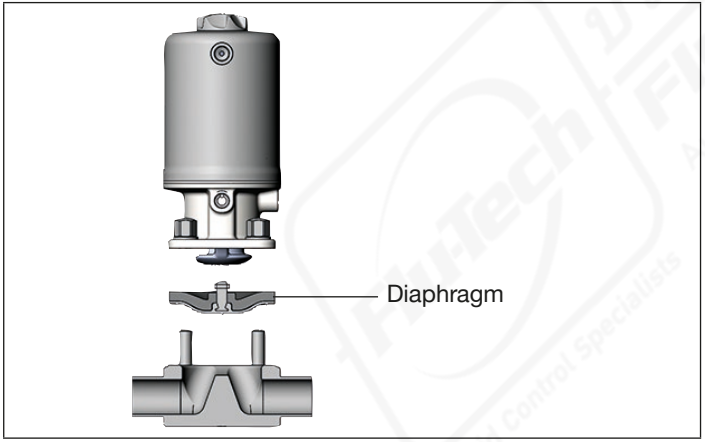


Fig. 31: Spare part diaphragm

11.1 Ordering tables for diaphragms

DN (diaphragm size)	Order numbers for diaphragms			
	EPDM (AD*)		FKM (FF*)	
8	688 421	E03/E04**	677 684	F01**
15 BC**	693 163	E03/E04**	693 164	F01**
20 BC**	693 166	E03/E04**	693 167	F01**
25	688 424	E03/E04**	677 687	F01**
32	688 425	E03/E04**	677 688	F01**
40	688 426	E03/E04**	677 689	F01**
50	688 427	E03/E04**	677 690	F01**

Tab. 14: Oder numbers for EPDM and FKM diaphragms

DN (diaphragm size)	Order numbers for diaphragms					
	PTFE (EA*)		Advanced PTFE (EU*)		Gylon laminated (ER*)	
8	677 674	L04/L10**	679 540	L05/L09**	693 175	L06/L08**
15	677 675	E02/E04-PTFE**	679 541	E02/E04-PTFE+ Hole**	693 176	L06/L08**
20	677 676	E02/E04-PTFE**	679 542	E02/E04-PTFE+ Hole**	693 177	L06/L08**
25	677 677	E02/E04-PTFE**	679 543	E02/E04-PTFE+ Hole**	693 178	L06/L08**

DN (diaphragm size)	Order numbers for diaphragms					
	PTFE (EA*)		Advanced PTFE (EU*)		Gylon laminated (ER*)	
32	677 678	E02/E04-PTFE**	679 544	E02/E04-PTFE+Hole**	693 179	L06/L08**
40	584 378	E02/E04 PTFE**	584 379	E02/E04-PTFE+Hole**	693 180	L06/L08**
50	584 386	E02/E04-PTFE**	584 387	E02/E04-PTFE+Hole**	693 181	L06/L08**

Tab. 15: Oder numbers for PTFE and Gylon diaphragms

** SAP code*

*** Marking on the diaphragm*

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

12 TRANSPORTATION, STORAGE, DISPOSAL

NOTE!

Transport damages.

Inadequately protected devices may be damaged during transport.

- Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- Avoid exceeding or dropping below the permitted storage temperature.

Incorrect storage may damage the device.

- For longer storage, loosen the body screws to avoid deformation of the diaphragm.
- Mark loosened screws for safety reasons.
- Store the device in a dry and dust-free location.

Storage temperature –20 – +65 °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.

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