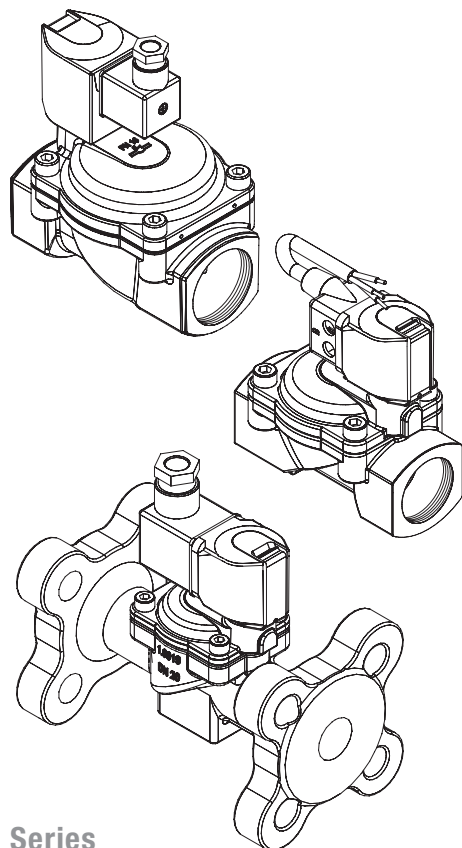


## Operation manual – pre-controlled diaphragm valves

Document No. 1377005.0000.10011 Revision 8

*Keep documentation for future use!*



### Series

**82400<sup>G</sup>** **82410<sup>N</sup>**

**82730<sup>G</sup>** **82740<sup>N</sup>**

**83030<sup>F</sup>**

<sup>G</sup> G-Thread  
<sup>N</sup> NPT-Thread  
<sup>F</sup> Flange

## Contents

1 About this documentation	1
1.1 Documentation validity	1
1.2 Structure of safety instructions	1
1.3 Hazard classes (ANSI Z535.6)	1
1.4 Styles and symbols	2
1.5 Intended use	2
1.6 Improper use	2
1.7 Obligations of operator	2
1.8 Personnel qualification	2
1.9 Personal protection equipment	2
2 General safety instructions	2
3 Avoid damage to property	3
4 Identifying the valve	3
5 Transport and storage	3
6 Function	4
6.1 NC-valve (normally closed)	4
6.2 NO-valve (normally open)	4
6.3 Solenoid types AC/DC	4
7 Mounting	4
7.1 Dimensions	5
7.2 Mounting accessories	5
7.3 Conditions of installation	5
7.4 Preparation	5
7.5 Mounting valve to pipeline	5
8 Connect solenoid electrically	6
9 Operating conditions	7
10 Commissioning	7
10.1 Checking the switching function	7
10.2 Flooding the valve	7
11 Operation	8
12 Maintenance	8
12.1 Cleaning and visual inspection	8
12.2 Checking for tightness and strength	8
12.3 Preparing maintenance of internal parts	8
12.4 Component overview	8
12.5 Unmounting solenoid	9
12.6 Disassemble the valve parts	9
12.7 Checking valve parts	9
12.8 Cleaning valve parts and valve	9
12.9 Replacing spare parts	10
12.10 Tightening torque screws	10
12.11 Mounting valve parts	10
12.12 Mounting solenoid	10
13 Re-commissioning	10
14 Decommissioning	10
15 Replace complete valve	10
16 Trouble shooting	11
17 Return	11
18 Disposal	11
19 Directives and certificates	11

Translation of the original operating manual  
Status as of November 2018

## 1 About this documentation

These mounting instructions guides you to mount, operate and maintain pre-controlled diaphragm valves safely.



This operation manual is intended for:  
plant operators, installers, maintenance and service technicians.

### 1.1 Documentation validity

This operation manual applies to pre-controlled diaphragm valves of the following series

- 82400, 82730 (G-Thread)
- 82410, 82740 (NPT-Thread)
- 83030 (Flange)
- for special products that are based on the series mentioned above

in combination with these **Click-on®**-solenoids:

Series	9101	9151	9136 	6106 
82400 <sup>G</sup>	•	•	•	•
82410 <sup>N</sup>	•	•	•	•
82730 <sup>G</sup>	•	•	•	•
82740 <sup>N</sup>	•	•	•	•
83030 <sup>F</sup>	•	•	•	•

Order No.	Connection	Connection	Nominal size
xxxx0xx	G 1/4	1/4 NPT	-
xxxx1xx	G 3/8	3/8 NPT	-
xxxx2xx	G 1/2	1/2 NPT	DN 15
xxxx3xx	G 3/4	3/4 NPT	DN 20
xxxx4xx	G 1	1 NPT	DN 25
xxxx5xx	G 1 1/4	1 1/4 NPT	DN 32
xxxx6xx	G 1 1/2	1 1/2 NPT	DN 40
xxxx7xx	G 2	2 NPT	DN 50
Series	82400 82730	82410 82740	83030

### 1.2 Structure of safety instructions

Safety instructions warns against dangerous situations and must be observed in particular. Safety instructions are structured as follows:

#### SIGNAL WORD

##### Type of hazard

Consequences of non-observance

→ Precautions necessary to avoid the hazard

### 1.3 Hazard classes (ANSI Z535.6)

#### DANGER

Safety information indicates a hazardous situation with high risk which, if not avoided, will certainly result in death or (serious) injury.

#### WARNING

Safety information indicates a hazardous situation with moderate risk which, if not avoided, can cause death or severe injury.

#### CAUTION

Safety information indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

#### NOTICE

Information indicates a hazardous situation which, if not avoided, could result damage to property.

#### 1.4 Styles and symbols

This documentation uses the following styles and symbols:

•	list
→	instruction
1. 2.	preset order of instructions
<b>701</b>	part number (according to part list)
<b>1</b>	flexible part number (section)
<b>X</b>	replace spare part

**⚠ + DANGER / WARNING / CAUTION;**  
**NOTICE:** embedded safety message

given limits or fixed value

#### 1.5 Intended use

The valve is solely intended to control or stop a fluid flow within approved operating limits. The fluid must only flow through the valve in the determined flow direction.

You may only operate the valve with fluids that will not cause any chemical reaction with the valve's materials or lead to abrasive effects.

Under the following conditions, a valve with nominal diameter > DN 25 is not approved as the only shut-off valve at the end of a pressure line:

- The contents of the pressure system must not be released into the atmosphere.
- The contents of the pressure system must not be transferred to a downstream system with lower nominal pressure rating (PN).

#### 1.6 Improper use

In the following cases it is prohibited to operate the valve:

- The valve is not used for the designated purpose.
- The permitted temperature and pressure ranges are exceeded.
- Damages to the valve – e.g. cracks,

deformation – were detected but the valve remains in operation.

- Malfunctions were detected but the valve remains in operation.
- The valve has been modified without authorization of the manufacturer.
- The safety instructions of this documentation are not observed.

For damages caused by improper use, the liability of the manufacturer is excluded.

Our guarantee expires in the following cases:

- Undue intervention and altering are done to the valve.
- This documentation or the operating limits as shown in the particular data sheet are not observed.

#### 1.7 Obligations of operator

##### Product

- Over the entire life cycle of the valve all applicable regulations must be observed. The instructions of this operation manual must be observed and followed.
- Initiate a risk assessment of the overall installation, to detect potential dangers that may occur in combination of the valve with other components.

##### Persons

- Initiate the instruction of each person who is working with the valve.  
Applicable regulations about occupational safety and safety engineering must be known and applied.

##### Documentation

- This documentation must be fully read and understood.
- The instructions given in this operation manual must be put into practice.
- This documentation must be available at any time.

#### Markings at the operating site

- Ensure adequate warning of the risks linked to the valve. Use in the area of the installed valve the following warning and prohibition signs in compliance with EN ISO 7010 and and BGV A8 (VBG125):

	Warning sign to indicate risk of burns at the solenoid
	Warning sign to indicate electrical hazards at the solenoid
	Prohibition sign to prevent people from entering hazardous areas

#### 1.8 Personnel qualification

- Ensure as operator that persons who work on or with the valve are sufficiently qualified for this job.
- Comprehensively train the operating personnel in terms of safety.
- Only allow trained specialists to perform electric connections, commissioning, maintenance and trouble shooting.

##### Demands

**Operating personnel** must be instructed on operational sequences and procedures.

**Operating personnel** must know its responsibilities regarding the work to be performed.




**Trained specialists** must possess profound knowledge in mechanical engineering, electrical engineering, hydraulic and pneumatic.

**Trained specialists** must be authorized to commission, ground and designate devices, systems and power circuits according to the standards of safety technology.

**Trained specialists** must possess profound knowledge about design and principle of operation of the valves and the plant.

#### 1.9 Personal protection equipment

- Wear appropriate protection equipment. Observe the personal protection equipment as requested in “residual risks” (see chapter 2).

	<b>Protective eye glasses</b> to protect from escaping fluids or exhausting compressed air
	<b>Protective gloves</b> Resistance to cutting to protect from sharp edges or ridges; <b>Resistance to acids</b> to protect from hazardous fluids
	<b>Protective footwear</b> to protect from parts or tools falling down

## 2 General safety instructions

These safety instructions are only related to the single valve. In combination with other plant components there may be other potential dangers, which must be taken into account by carrying out a risk analysis for the system.

- Compare the details on rating plate and datasheet to the operating data. The limits for the particular application (e.g. pressure, temperature) must not be exceeded.
- Only perform assembly and maintenance works when the pipe system is in depressurized state.
- Flood the valve slowly during commissioning. Fast pressurizing will cause the valve to open briefly.
- Strength tests with the valve seat open are permitted maximum up to 1.5 times of the nominal pressure rating (PN) at room temperature. The valve must not be operated during these tests.

## ⚠ DANGER



### Hazardous electrical voltage (>25V AC; >60V DC)

There are risks from electrical voltage during assembly and maintenance.

- The electrical connection of the solenoid must be carried out only by a qualified electrician.
- You may only plug or remove the device socket in de-energized state.
- Disconnect the power supply off the solenoid prior to assembly or disassembly.

## ⚠ WARNING



### Danger from pressurized pipelines

Pressurized pipelines may burst resulting in injuries.

- Depressurize pipe system and block the fluid flow prior to opening or unmounting the valve.

## ⚠ CAUTION



### Risk of burns at the solenoid

Solenoid is heating up during operation. Touching the solenoid leads to risk of burns.




- Leave the solenoid to cool down before working at the valve.

## Residual risks



### Weight of the valve

Phases: transport, storage, assembly, maintenance, disposal  
Risk: falling off, tipping over  
**Personal protection equipment (PPE):** Protective footwear

	<b>Hazardous fluids</b> Phases: assembly, operation, maintenance, disposal Risk: skin contact, eye contact, breathing vapors PPE: protective gloves, protective eye glasses, breathing protection
	<b>Potentially explosive atmosphere</b> Risk: danger of explosion ⚠ <b>WARNING:</b> Use solenoid an device socket with Ex-protection.
	<b>Sharp-edges and threads</b> Phases: transport, assembly, maintenance, disposal Risk: risk of cuts PPE: protective gloves

## 3 Avoid damage to property

### NOTICE

#### Deposits and dirt lead to malfunctions

If the control bores are clogged or the core is blocked by soil the valve no longer closes or opens.



- Install a strainer (mesh size ≤ 0.25 mm) in front of the valve inlet **P** if necessary.

#### Damages through accumulation of heat

The solenoid will overheat during continuous duty if the heat can not be radiated. This shortens the service life of the solenoid.

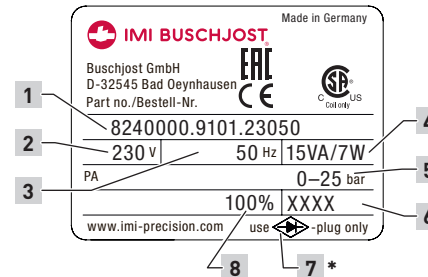
- You must not cover the solenoid with paint.
- You must not encase the solenoid in a tight housing or in a thermal insulation.

## Residual risks

	<b>Pressure against valve outlet</b> The valve only firmly closes in flow direction.
	<b>Fluid freezing</b> The valve is not designed to withstand the fluid freezing.

## 4 Identifying the valve

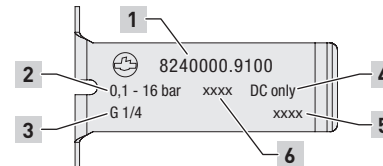
The rating plate is situated on the solenoid body.



Rating plate (example)

- Order number
- Operating voltage
- Frequency of voltage
- Power consumption inrush/holding
- Operating pressure range
- Date of manufacture (week/year)
- \* if this marking is shown on the rating plate: use device socket with rectifier
- Duty cycle

An additional marking is applied to the spring clip of the **Click-on**®-solenoid.



Marking of the spring clip (example)

- Order number (without voltage/frequency)
- Operating pressure range
- Size of connection
- DC only (only with DC coils)
- Date of manufacture (week/year)
- Serial number

## 5 Transport and storage

### NOTICE

#### Damage of the valve

Valve may be damaged if foreign particles get into the valve.

- Transport and store the valve dry and only in the delivery packaging.
- Take valve out of the packaging immediately prior to assembly.
- Leave the blanking plugs or protective collars into valve connections.

Prolonged storage at -10 °C to +20 °C

#### Avoid during transport:

**mechanical loads:** falling off, tipping over  
Damages to the electrical terminal elements

#### Avoid during storage:

**thermal stress:** permanently increased storage temperatures; distance to heat sources < 1m  
**chemical load:** through solvents, chemicals, acids, fuels and similar at the storing site  
**weather conditions:** at construction sites strong, watertight containers are necessary

Unfavourable storing conditions may reduce the service life of the sealing materials.

## 6 Function

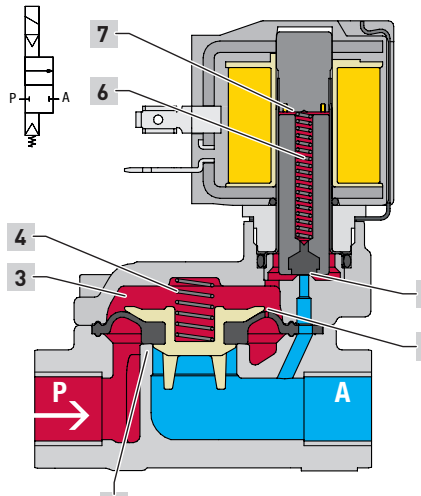
### Design

2/2-Way seat valve with diaphragm as sealing device.

### Operation

The valve is electromagnetic indirectly-controlled. The switching function needs a pressure difference between valve inlet **P** and valve outlet **A**.

#### 6.1 NC-valve (normally closed)



Sectional view (NC-valve; closed)

- 1 Main valve seat
- 2 Control bore in the diaphragm (pressure build-up)
- 3 Chamber
- 4 Compression spring above the diaphragm
- 5 Pilot seat
- 6 Compression spring inside the core
- 7 Magnet face of the core tube

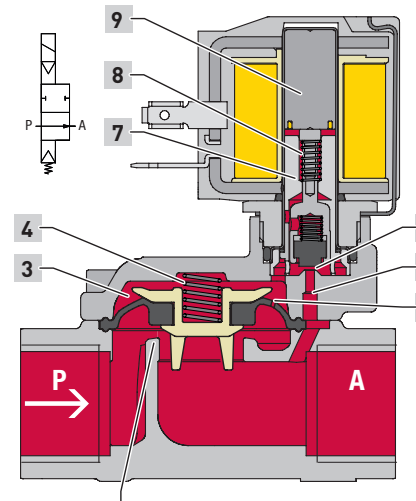
### Normal position: closed

Due to the effect of the compression spring **6** inside the core the pilot seat **5** is closed. Compression spring **4** presses the diaphragm sealingly to the main valve seat **1**. The operating fluid flows through the control bore **2** in the diaphragm to the chamber **3** above the diaphragm and increases the closing force.

### Switching position: open

The magnetic force lifts the core towards the magnet face of core tube **7** when the solenoid is energized. Since the pilot seat **5** is open the fluid pressure is reducing from chamber **3** towards valve outlet. More fluid is flowing off via the pilot seat **5** to the chamber **3** than the amount flowing in via the control bore **2** in the diaphragm. The differential pressure lifts up the diaphragm and opens the main valve seat **1**.

#### 6.2 NO-valve (normally open)



Sectional view (NO-valve; open)

- 1 Main valve seat
- 2 Control bore in the diaphragm (pressure build-up)
- 3 Chamber
- 4 Compression spring above the diaphragm
- 5 Control bore in the valve (pressure reduction)
- 6 Pilot seat
- 7 Pole piece
- 8 Compression spring inside pole piece
- 9 Core

### Normal position: open

When the solenoid is de-energized, the pilot seat **6** is opened by the effect of the compression spring **8** and the control bore **5** inside the valve is opened. The pressure difference inside chamber **3** keeps the diaphragm open against the power of the compression spring **4**. The main valve seat **1** is open.

### Switching position: closed

When the magnet is energized, the core **9** is pulled against the pole piece **7**. The core **9** presses the seal plug sealingly against the force of compression spring **8** on the pilot seat **6**. The outflow of the fluid flow from the chamber **3** is interrupted. Compression spring **4** presses the diaphragm sealingly to the main valve seat **1**. The operating fluid flows through the control bore **2** in the diaphragm to the chamber **3** above the diaphragm and increases the closing force.

#### 6.3 Solenoid types AC/DC

The valve may be equipped without changing of the mechanical part with an DC voltage solenoid or AC voltage solenoid. In both cases the permissible voltage tolerance amounts to  $\pm 10\%$ . Special versions may cause deviations.

## 7 Mounting

### NOTICE

#### Damage of the valve

The valve may be damaged through inappropriate installation.

- Only trained and authorized specialists may install the valve.
- Only use appropriate tools and suitable sealing materials.
- Make sure that the valve is mounted in flow direction.
- Make sure not to distort the valve body, particularly in case of a misaligned pipe-work.

There must be no mechanical loads applied to the solenoid.

- Do not use solenoid as a lever during mounting.

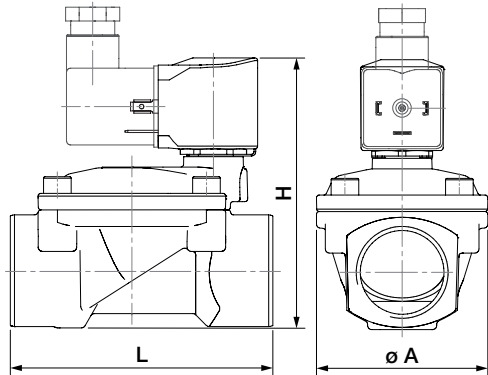
Valve only firmly closes in flow direction. Inflow against the valve's flow direction may lead to the destruction of components.

- Implement adequate measures if back flow is to expect; for example by adding check valves to the pipe system.

The valve may get damaged by external loads at the operating site.

- Protect valve from objects falling down.
- Secure the valve against direct weather influences and the possible effects.

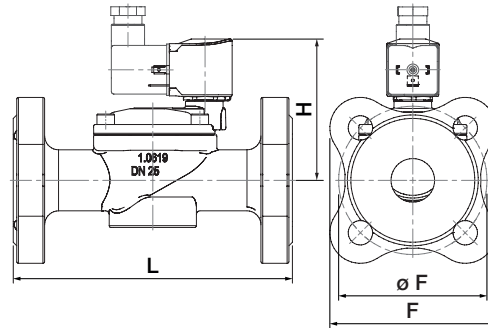
## 7.1 Dimensions



Series 82400, 82410, 82730, 82740

Port size		L	H <sup>[1]</sup>	Ø A
G 1/4	1/4 NPT	60	79	44
G 3/8	3/8 NPT	60	79	44
G 1/2	1/2 NPT	67	81	44
G 3/4	3/4 NPT	80	88	50
G 1	1 NPT	95	98	62
G 1 1/4	1 1/4 NPT	132	125	92
G 1 1/2	1 1/2 NPT	132	125	92
G 2	2 NPT	160	143	109

<sup>[1]</sup> measured with solenoid 9100



Series 83030

flange – sealing ring according to DIN EN 1092-1B

Nominal size	L	H <sup>[1]</sup>	F	Ø F	Ø B
DN 15	130	69	77	65	14
DN 20	150	77	86.6	75	14
DN 25	160	81	95.1	85	14
DN 32	180	97	110.7	100	18
DN 40	200	102	117.8	110	18
DN 50	230	113	128.4	125	18

<sup>[1]</sup> measured with solenoid 9100

with bores according to ASME B16.5 Class 150, RF

Nominal size	L	H <sup>[1]</sup>	F	Ø F	Ø B
DN 15	130	67	77	60.3	15.9
DN 20	150	77	86.6	69.9	15.9
DN 25	160	81	95.1	79.4	15.9
DN 32	180	95	110.7	88.9	15.9
DN 40	200	100	117.8	98.4	15.9
DN 50	230	111	128.4	120.7	19

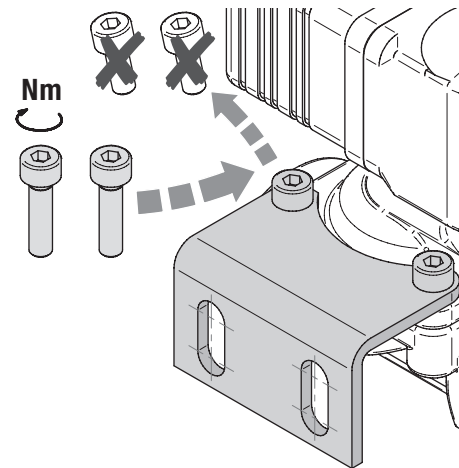
<sup>[1]</sup> measured with solenoid 9100

## 7.2 Mounting accessories

### Mounting bracket

With an optional mounting bracket, you can connect the valve to an load-bearing structure at the installation site, thus protecting against vibration, for example.

→ Attach the mounting bracket to a long site of valve cover before to assembly. Use the fixing screws delivered with the mounting bracket to achieve the necessary screw-in depth.



Mounting bracket (example)

### Available mounting brackets

Order No.	Port size		
1258986	G 1/4	1/4 NPT	
	G 3/8	3/8 NPT	
	G 1/2	1/2 NPT	DN 15
1258991	G 3/4	3/4 NPT	DN 20
1258996	G 1	1 NPT	DN 25
1259005	G 1 1/4	1 1/4 NPT	DN 32
	G 1 1/2	1 1/2 NPT	DN 40

## 7.3 Conditions of installation

### Compliance with operating limits

Ensure to comply with the operating limits prior to mounting the valve. Observe the valve's data sheet.

### Planning of the pipe system

The manufacturer recommends to include manual stop valves and drain valves in the plant so that the pipe system may be depressurized and drained prior to working on the valve.

### Valve's mounting position

Valve's mounting position may be any, preferably: Solenoid vertical on top



## 7.4 Preparation

- Check the valve for externally visible damages.
- Leave the valve in its protective package prior to mounting.
- Make sure that there is enough free space for disassembly the valve in case of maintenance.
- **⚠ WARNING** Depressurize the pipe system.
- **NOTICE** Clean the pipe system prior to mounting the valve.

## 7.5 Mounting valve to pipeline

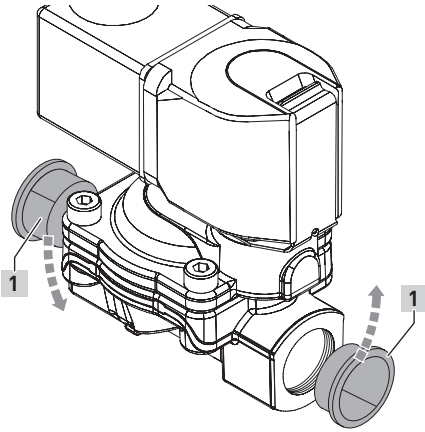
- Mount the valve to the designated pipeline. Comply with existing connections.
- Arrange the valve according to the pipeline's flow direction. An arrow on the valve body marks the flow direction.





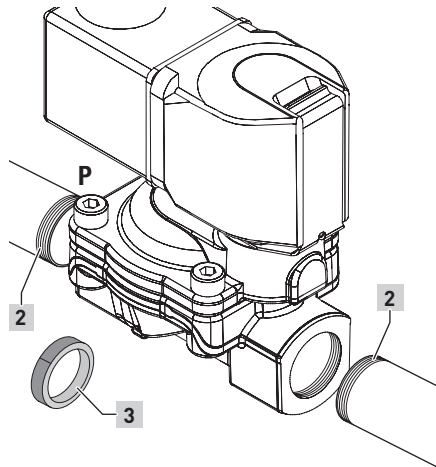
### Valve with thread connection

1. Take out the blanking plugs **1** from valve inlet and valve outlet.



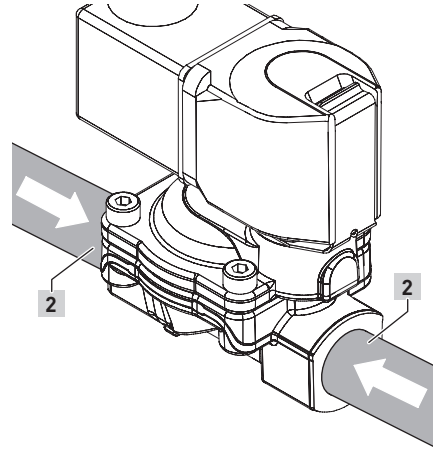
Take out blanking plugs

2. Install a strainer in front of the valve inlet **P** if necessary.
3. Firmly seal pipeline's thread **2** with an appropriate sealing material (e.g. PTFE sealing tape **3**).



Firmly seal pipeline's thread

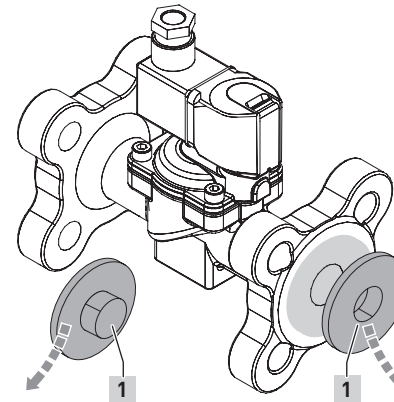
4. Attach the pipelines to the valve. **NOTICE** Make sure not to distort the valve body.
5. Attach pipelines threads **2** to the valve's connection threads



Attach pipelines to valve

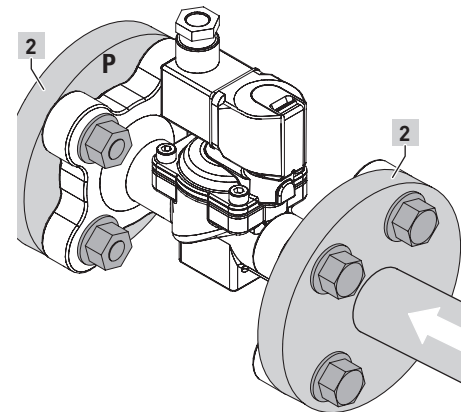
### Valve with flange connection

1. Take out the protective collars from valve inlet and valve outlet **1**.



Take out protective collars

2. Install a strainer in front of the valve inlet **P** if necessary.
3. Connect the flange connections of the valve body with flanges of the pipe line **2**. **NOTICE** Make sure that the flange seal is correctly positioned.



Connect pipe line flanges to flange connections

### 8 Connect solenoid electrically

→ Connect solenoid in accordance with the electrical regulations.


solenoid	9101	9151
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#### DANGER



**Hazardous electrical voltage (>25V AC; >60V DC)**

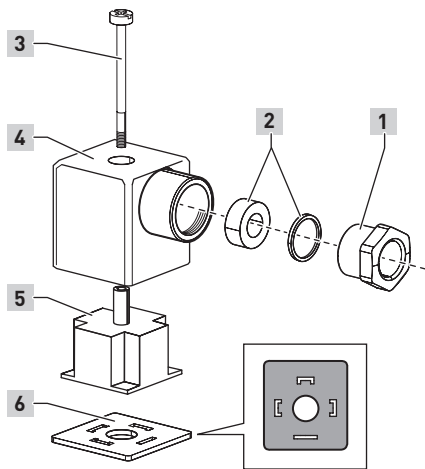
There are high risks from electrical voltage during assembly works.

- Work on electrical installations may only be carried out by a qualified and authorized electrician (refer to section 1.8).
- You must connect the earth wire to the terminal marked with the grounding symbol .
- You may only plug the device socket in de-energized state.
- Make sure that the insulation of the strands is not pinched.

#### Connection errors lead to dangers

- After connecting the solenoid carefully close the terminal compartment to restore protection.
- To secure IP 65 protection after connecting: Carefully close the device socket. Check whether the flat seal between solenoid and device socket is properly seated. Check whether cable gland is properly sealed.

- Use a **round** cable with diameters from 5 mm to 10 mm. The wire cross section must not exceed 1.5 mm<sup>2</sup>.

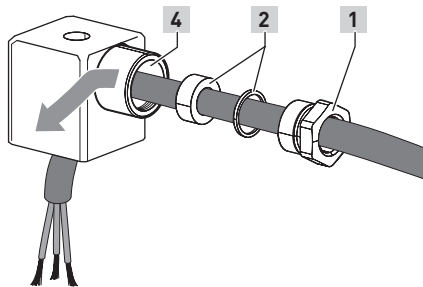


Overview: Device socket

- 1 Pressure screw
- 2 Washers
- 3 Middle screw
- 4 Device socket's housing
- 5 Socket insert
- 6 Flat gasket

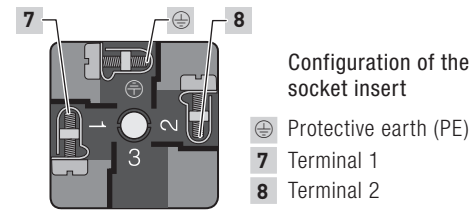
→ Make sure that the flat gasket **6** and socket insert **5** are mounted congruently with the connecting lugs of the solenoid.

1. Slide pressure screw **1**, washers **2** and device socket's housing **4** on the cable.



Feed cable through device socket

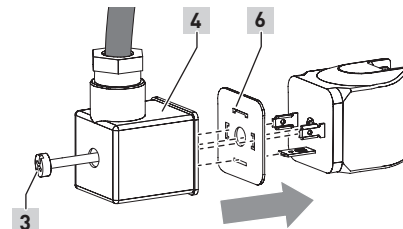
2. Attach the protective conductor at first (insulation: yellow/green) to the terminal marked with the grounding symbol  $\oplus$ .



Configuration of the socket insert

- $\oplus$  Protective earth (PE)
- 7 Terminal 1
- 8 Terminal 2

3. Attach the other wires to the terminals **7** and **8** of the socket insert **5**.  
**⚠ WARNING** Ensure the correct polarity of terminals marked „+“ and „-“.
4. Put the housing of the device socket **4** in the chosen position (9 o'clock, 12 o'clock, 3 o'clock, 6 o'clock) onto socket insert **5**.
5. Tighten pressure screw **1** to cable gland.  
**NOTICE** Cable gland must firmly seal.
6. Pull protective cap from the plug contacts of the solenoid.
7. Attach flat gasket **6** and housing **4** with socket insert to the connection lugs of the solenoid.  
**⚠ WARNING** Make sure that the seal is evenly positioned on the entire surface between solenoid and device socket.



Place mounted device socket (example)

8. Tighten middle screw **3** with 40 Ncm.  
**NOTICE** Avoid visible distortion of the device socket's housing.

Tightening torque 40 Ncm  $\pm$  10 Ncm

solenoid	9136
	6106

#### Solenoid 9136

→ Observe operation manual 1377056 supplied with the solenoid.

#### Solenoid 6106

→ Observe operation manual 1377068 supplied with the solenoid.

### 9 Operating conditions

→ Ensure that all operating limits of the valve are considered during the configuration of the overall system.

#### Operating limits with NBR diaphragm

Differential pressure	0.1 bar necessary
Operating pressure $\leq$ G 1	0.1 to 16 bar
Operating pressure $>$ G 1	0.1 to 10 bar
Fluid temperature	-10 °C to +90°C
Ambient temperature	-10°C to +50°C

#### Operating limits with FPM diaphragm

Differential pressure	0.1 bar necessary
Operating pressure $\leq$ G 1	0.1 to 16 bar
Operating pressure $>$ G 1	0.1 to 10 bar
Fluid temperature	-5°C to +110°C
Ambient temperature	-10°C to +50°C

#### Operating limits with EPDM diaphragm

Differential pressure	0.3 bar necessary
Operating pressure $\leq$ G 1	0.3 to 16 bar
Operating pressure $>$ G 1	0.3 to 10 bar
Fluid temperature	-10°C to +110°C
Ambient temperature	-10°C to +50°C

**info** For special products apply the operating limits specified on the article data sheet and the rating plate.

#### Permitted media

Baureihe 82400, 82410, 83030 for neutral, gases and liquid fluids
Baureihe 82730, 82740 for slightly aggressive, gases and liquid fluids

### 10 Commissioning

#### ⚠ CAUTION

**Danger through escaping fluid**  
 NO-type valves are open in de-energized state.

→ Apply protective measures to prevent any fluid escaping during commissioning.

→ Ensure compliance with the operating conditions specified in chapter **9**.

#### 10.1 Checking the switching function

→ Check valve's switching function without fluid prior to flooding the valve and exposing valve to the operating pressure. A metallic clicking sound must be heard during the electrical actuation of the valve. This sound is caused by the impact of the core.

#### 10.2 Flooding the valve

1. Check whether all connections to pipe lines are firmly sealed.
2. Slowly increase the pressure to flood the valve. Thus to prevent pressure hammers.  
**NOTICE** Fast pressurizing will cause the valve to open briefly.  
**⚠ WARNING** To fast flooding of the valve may lead fluid to escape. **NOTICE** Do not exceed the maximum operating pressure.

## 11 Operation

### NOTICE

#### Thermal destruction of AC solenoids

Operating AC solenoids in unmounted state will cause them to burn out.

- Do not operate AC voltage solenoids without being mounted above core tube with core.

#### Actuate valve periodically

- **NOTICE** Actuate the valve at least **once a month** to prevent functional parts getting blocked.

## 12 Maintenance

Maintenance work must only be carried out by qualified personnel (refer to section 1.8). Deposits of the medium, dirt particles, aged or worn out seals may lead to malfunctions.

- Individually determine as the operator application specific maintenance intervals.

### 12.1 Cleaning and visual inspection

- Periodically clean the valve and perform a visual inspection at the same time.

1. **⚠ DANGER** Disconnect the solenoid from power supply.
2. **⚠ CAUTION** Leave the solenoid to cool down prior to working on the valve.
3. Check whether cover screws are properly fixed. Refer to section 12.7.
4. Check whether the device socket is firmly sealed. (refer to chapter 8)
5. Check for damages and leakages.

### 12.2 Checking for tightness and strength

#### NOTICE

##### Risk of damaging the valve

Invalid test conditions may lead to damage of the valve.

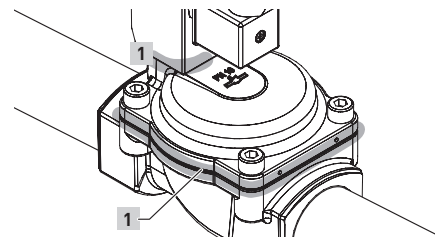
- Do not exceed the maximum operating pressure during the test for internal tightness (valve seat closed).
- The test for strength and external leakage (valve seat opened) according to EN12266 is permitted with maximum 1.5 times of the nominal pressure rating (PN) at room temperature.
- The valve must not be operated during these tests.
- Ensure to increase the pressure slowly.
- After each test, depressurize the valve outlet first.

#### Checking internal tightness

1. Close the valve (NC-valve: solenoid de-energized; NO-valve: solenoid energized).
2. Flood the valve.
3. Pressurize up to the maximum operating pressure. There must no fluid escape.

#### Checking strength and external tightness

1. Open the valve (NC valve: solenoid energized; NO valve: solenoid de-energized).
2. Flood the valve.
3. Pressurize maximum up to 1.5 times of the nominal pressure rating (PN) at room temperature. Apply soap sud to the outer sealing edges 1 and check for the formation of bubbles. There must no bubbles appear.



Check sealing edges

### 12.3 Preparing maintenance of internal parts

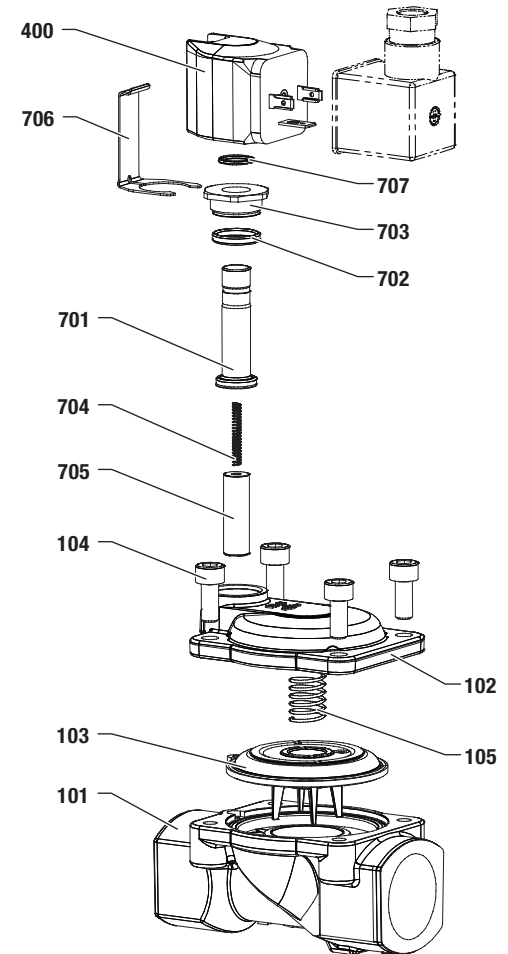
The valve body may remain in the pipework during maintenance.

1. **⚠ DANGER** Disconnect the solenoid from power supply.
2. **⚠ WARNING** Depressurize the pipe system.
3. **⚠ CAUTION** Risk of burns at the heated solenoid. Leave the solenoid to cool down before working at the valve.
4. **⚠ WARNING** Drain the pipeline completely in case of polluting and harmful fluids. Deal with water-endangering fluids according to legal regulations.

101	Valve body	
102	Valve cover	
103	Diaphragm	X
104	Fixing screws	4 x
105	Compression spring	X
400	Solenoid body	
701	Core tube	
702	O-ring	X
703	Screw piece	
704	Compression spring	X
705	Core	X
706	Spring clip	
707	O-ring	X

### 12.4 Component overview

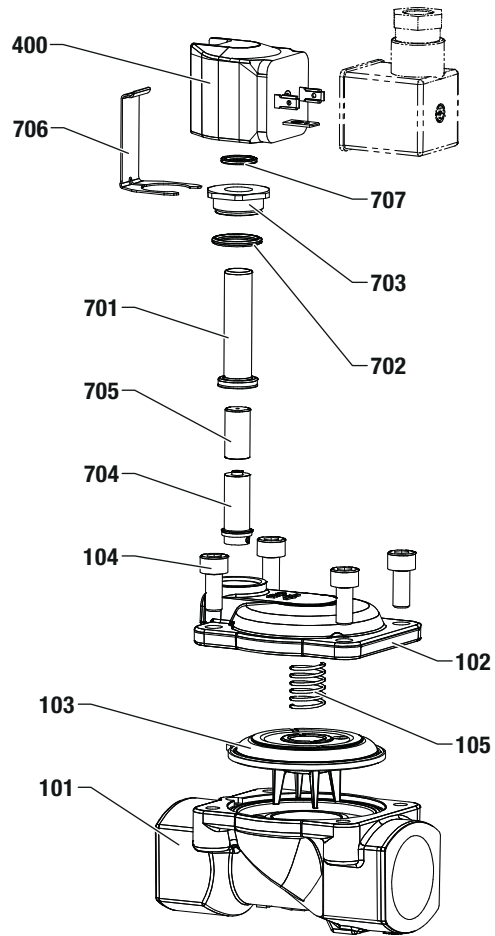
#### A NC-valve (normally closed)



NC valve (Series 82400)



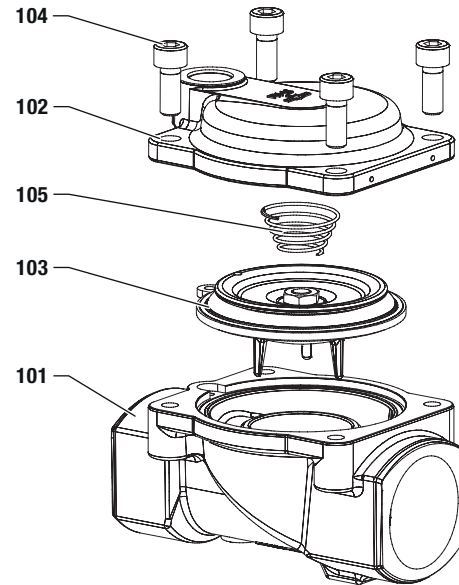
### B NO-valve (normally open)



NC valve (Series 82400)

101	Valve body	
102	Valve cover	
103	Diaphragm	X
104	Fixing screws	4 x
105	Compression spring	X
400	Solenoid body	
701	Core tube	X
702	O-ring	X
703	Screw piece	
704	Pole piece	X
705	Core	X
706	Spring clip	
707	O-ring	X

### C Design $\geq G 1 \frac{1}{4}$ or $1 \frac{1}{4}$ NPT or DN 32

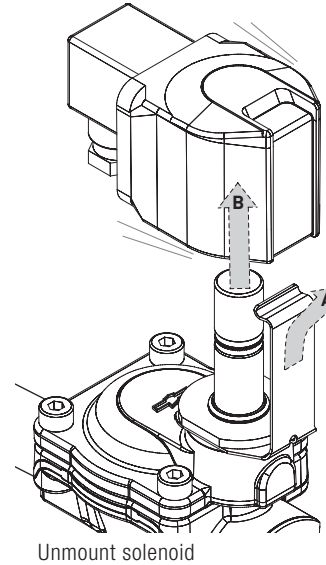


Main valve  $\geq DN 32$

101	Valve body	
102	Valve cover	
103	Diaphragm	X
104	Fixing screws	4 x
105	Compression spring	X

### 12.5 Unmounting solenoid

- **A** Slightly bend back fixing clamp **706**.  
**B** Pull solenoid with a twist upwards to take off solenoid from core tube **701**.  
**NOTICE** O-ring **707** may get stripped away. Do not lose! Without this O-Ring the IP protection can no longer be guaranteed.



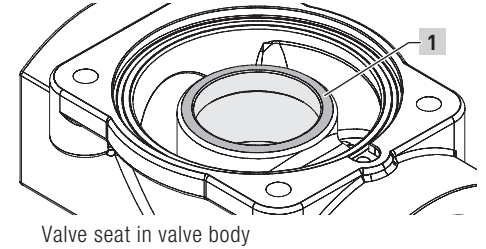
Unmount solenoid

### 12.6 Disassemble the valve parts

- Loosen screw piece **703** (wrench size 22).
- Take off the screw piece **703** with the core tube **701** together with spring clip **706**.
- Core tube assembly NC-valve:** Pay attention to loose components: core **705** and compression spring **704**.  
**Core tube assembly NO-valve:** Pay attention to loose components: core **705** and pole piece **704**.
- Loosen four fixing screws from the valve cover **104** and take off the valve cover **102**.
- Take off the compression spring **105** and diaphragm **103** from the valve seat.

### 12.7 Checking valve parts

- Check disassembled valve parts for damages and wear.
- Check whether valve seat **1** is intact. The valve seat must not have any damages.
- If the valve seat is damaged you must replace the valve body **101**.



Valve seat in valve body

### 12.8 Cleaning valve parts and valve

- Clean diaphragm **103**. **NOTICE** Use only neutral, non-aggressive cleaners.
- Clean all contact surfaces between o-rings and diaphragm.
- Remove dirt in control bores, chambers and threads.
- NC valve:** Clean core **705**.  
**NO valve:** Clean core **705** and pole piece **704**.

## 12.9 Replacing spare parts

### ⚠ CAUTION

#### Risk of injury caused through the installation of wrong parts

The installation of wrong components may lead to early wear and early failure of the component. This increases the risk of injury.

- Ensure that only original spare parts are installed.
- Specify the valve number when ordering a spare part kit.

- The manufacturer recommends to replace all spare parts at the same time.
- ⚠ CAUTION Ensure that only original spare parts are installed.
- NOTICE Protect all components from dirt.
- The spare parts are marked with **X** in section 12.4 in the respective component overview for **A** to **C**.
- NOTICE Observe that pole piece **704** in the NO-valve consists of several individual parts. The external o-ring needs to be mounted.

## 12.10 Tightening torque screws

Following tightening torque of the fixing screws **104** must be observed during reassembly:

Port size / Nominal size			Thread	Torque
G 1/4	1/4 NPT		M4	2 Nm <sup>[1]</sup>
G 3/8	3/8 NPT		M4	2 Nm <sup>[1]</sup>
G 1/2	1/2 NPT	DN 15	M4	2 Nm <sup>[1]</sup>
G 3/4	3/4 NPT	DN 20	M5	3.6 Nm <sup>[1]</sup>
G 1	1 NPT	DN 25	M6	6 Nm <sup>[1]</sup>
G 1 1/4	1 1/4 NPT	DN 32	M8	16 Nm <sup>[1]</sup>
G 1 1/2	1 1/2 NPT	DN 40	M8	16 Nm <sup>[1]</sup>
G 2	2 NPT	DN 50	M8	16 Nm <sup>[1]</sup>

<sup>1</sup> Nm ±10%

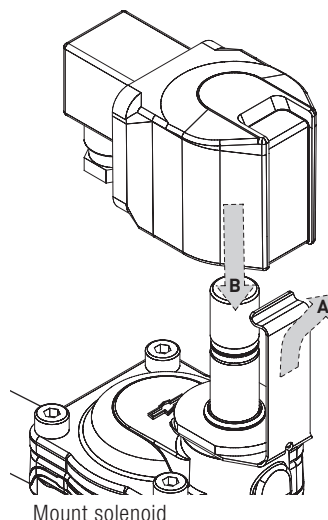
## 12.11 Mounting valve parts

- Place the diaphragm **103** correctly positioned on the valve body **101**. The tab must be above the bleed orifice in the recess.
- Put the compression spring **105** centered according to figure on the diaphragm **103**. Put valve cover **102** on.  
**NOTICE** Make sure that the diaphragm does not jammed.
- Insert the four fixing screws **104**. Tighten the fixing screws crosswise. Observe the necessary tightening torque. Refer to 12.10 Tightening torque screws.
- Core tube assembly NC-valve:** Insert the compression spring **704** into the core **705** and then into core tube **701**.  
**Core tube assembly NO-valve:** Insert the core **705** and the multi-piece pole piece **704** into core tube **701**.
- Insert the core tube **701** on the valve cover **102**.
- Pull the O-ring **702** over the core tube, until it is in the groove in the valve cover **102**.
- Push the screw piece **703** from above over the core tube **701**.
- Insert the spring clamp **706** between screw piece **703** and valve cover **102**.
- Screw the preassembled core tube **701** at its screw piece **703** (wrench size 22).

Tightening torque 20 Nm ±2

## 12.12 Mounting solenoid

- Push the O-ring **707** onto core tube **701** until is flush to the screw piece **703**.
- Arrange the solenoid parallel to the spring clip above core tube **701**.
- A** Slightly bend back spring clip **706**.  
**B** Place the solenoid on the core tube **701**. Let the solenoid snap to spring clip.
- NOTICE** Press the solenoid with a little twist towards the valve cover. Thus to ensures that the solenoid is **flush** to the screw piece **703**. Otherwise the O-ring **707** will not seal sufficiently. Penetrating humidity may cause corrosion of the solenoid cavity.



## 13 Re-commissioning

- Check valve's switching function without fluid (refer to 10.1).
- Flood the valve slowly (refer to 10.2).
- Perform a leak and strength tests (refer to 12.2).

## 14 Decommissioning

- ⚠ DANGER Disconnect the solenoid from power supply.
- ⚠ WARNING Depressurise the pipe system. Drain the pipework completely. Handle water polluting fluids in accordance with local regulations.
- ⚠ CAUTION Leave the solenoid to cool down.
- Loosen the middle screw of the device socket.
- Loosen the connected cables from the terminals of the device socket.
- ⚠ CAUTION Wear protective gloves. Loosen pipe connection or the screws from the flange connections.
- Disassemble the valve.
- Drain and dry the valve.

## 15 Replace complete valve

- Disassemble the valve as described in chapter 14 "Decommissioning".
- Assembly the new valve as described in chapter 7 "Assembly".
- Connect the solenoid as described in chapter 8 "Connect solenoid electrically".

## 16 Trouble shooting

→ Observe safety information and instructions in chapter 12 "Maintenance".

### Error table

not function
possible cause: the solenoid coil defective Remedy: Replace solenoid
possible cause: the control voltage must be >90% of its nominal value. Remedy: Measure the control voltage directly in front of the solenoid. If the operating voltage is lower or a long cable is used, a heavier conductor (crosssection up to 1.5 mm <sup>2</sup> ) must be chosen to keep the voltage drop small.
impaired function
possible cause: diaphragm soiled Remedy: Clean the control bore in the diaphragm
possible cause: core jammed Remedy: Clean core and core tube
possible cause: valve seat leaking Remedy: a) clean valve body b) clean or replace diaphragm
inadmissible operating conditions
possible cause: operating pressure too high or too low Remedy: Check maximum operating pressure and reduce pressure accordingly.

## 17 Return

1. Disassemble the valve as described in chapter 14 "Decommissioning".
2. Save the "goods return declaration" form – PDF file available online at:  
<http://www.buschjost.com/service/other-documents/goods-return-declaration/>
3. Fill in the return form and work through the requirements listed there.
4. ⚠ **CAUTION** Consider the weight of the valve in the choice of packaging.
5. Attach the printed, completed and signed goods return declaration to the package.

## 18 Disposal

1. Disassemble the valve as described in chapter 14 "Decommissioning".
2. Disassemble the valve parts to enable reusable materials to be recycled.
3. Dispose of the valve parts as appropriate for their materials:

Material	Way of disposal
Valve body, valve cover	Metal recycling
Diaphragm, o-rings	Industrial waste similar category to domestic refuse
Solenoid (copper wire)	Electrical waste recycling

## 19 Directives and certificates

### Note to Pressure Equipment Directive (PED)

The valves of this series, including the connection size DN 25 (G 1), are according to Art. 4 § 3 of the Pressure Equipment Directive (PED) 2014/68/EU.

This means interpretation and production are in accordance to engineers practice wellknown in the member countries.

The CE-sign at the valve refers not to the PED. Thus the declaration of conformity is not longer applicable for this directive.

For valves > DN 25 (G 1) Art. 3 § (1) No.1.4 of of the Pressure Equipment Directive (PED) 2014/68/EU applies. The basic requirements of the Enclosure I of the PED must be fulfilled. The CE-sign at the valve includes the PED. A certificate of conformity of this directive will be available on request.

### Notes on EEC Directive

The valves shall be provided with an electrical circuit which ensures the limits of the harmonised standards EN 61000-6-3 and EN 61000-6-1 are observed, and hence the requirements of the Electromagnetic Compatibility Guideline (2004/108/EG) satisfied. The CE-marking is related to this EU-requirements.



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