LEADING IN PRODUCTION EFFICIENCY

Pressure Relief Valve

Operation manual

MRV00001EN, V02

N32170009
N32170010
N32170011

www.durr.com

Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

Validity range of the document

This document describes the following products:

N32170011 Pressure relief valve 21bar	
N32170009 Pressure relief valve 21bar with pressure switch ignition protection category Ex db	
N32170010 Pressure relief valve 21bar with pressure switch ignition protection category Ex ia	

Applicable documents

In addition to this document, also follow the manufacturer's operating instructions of the pressure switch.

E22030059 - Operating instructions Pressure switch Ex db

E22030046 - Operating instructions Pressure switch Ex ia

Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

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1 Product overview

1.1 Overview

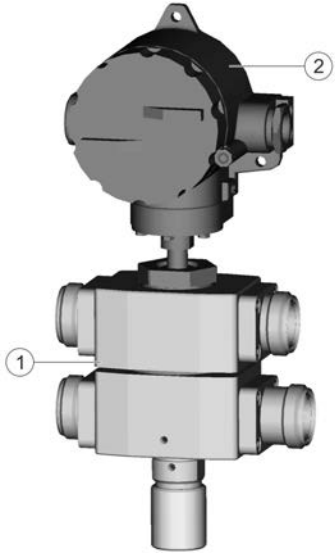

Fig. 1: Overview

1 Pressure Relief Valve
2 Pressure switch (only in the case of N32170009 and N32170010)

1.2 Short description

The Pressure relief valve is a directly controlled pressure relief valve, for which the triggering pressure is specified through a compression spring. The denomination Valve is used in the following for all variants of the pressure relief valves described in the document.

2 Safety

2.1 Presentation of Notes

The following notes can appear in this instruction:

DANGER!

High risk situation that can lead to serious injuries or death.

WARNING!

Medium risk situation that can lead to serious injuries or death.

CAUTION!

Low risk situations that can lead to minor injuries.

NOTICE!

Situations that can lead to material damage.

ENVIRONMENT!

Situations that can lead to environmental damage.

Additional information and recommendations.

2.2 Intended Use

Use

The pressure relief valve (hereafter called “Valve”) is intended for protection of supply lines and application components of an industrial painting system, in which fluid coating materials are processed. An electrically driven pump can cause too high a material pressure.

For feed rates of electrical pumps greater than 32L/min, a valve with pressure switch N32170009 or N32170010 must be used.

The valve is intended exclusively for use under the following conditions:

- With flammable and non-flammable fluid coating materials of the explosion group IIA and their approved detergents and cleaning agents
- In explosive areas of Ex zones 1 and 2
- In low pressure painting stations using electrically driven pumps
- In the ring line of a paint supply
- Only for N32170009 and N32170010: With integration in the system control
  - The system control must switch off the drive of the pump on exceeding the maximum allowable material pressure.
- The valve may only be operated within the approved technical data. Respect logic symbol on the valve casing 11 “Technical data”.
  Respect pressure switch manufacturer’s operating instructions “Applicable documents”.

The valve N32170011 is intended for feed rates of electrical pumps less than or equal to 32L/min.

Misuse

Not using as intended entails danger to life.

Examples of wrong use are:

- Diverting permanently present material flow in the suction line (return line)
- Use of unapproved materials
- Use of PVC material, adhesives, gases, acids and lyes
- Use of component and parts that are not approved by Dürr Systems.
- Change triggering pressure of the valve.
- Making conversions or changes on your own
- Use in Ex zone 0
- Use of the N32170009 and N32170010 valves without isolating switch amplifier

Ex labeling

Ex II 2G Ex h IIA T6 Gb X

II	-	Device group II: all areas except mining
2G	-	Device category: 2 (for gaseous atmosphere)
Ex h	-	Ignition protection category for non-electrical devices
IIA	-	Explosion group
T6	-	Temperature class
Gb	-	Device protection level: Zone 1
X	-	Restriction: The device is configured for operation with an ambient temperature of 15°C to 40°C.

2.3 Safety signs

Only for N32170009, N32170010

Fig. 2: Warning notice on the Pressure Switch

The warning notice is on the type plate of the pressure switch and its content is as follows:

Do not open pressure switch, if an explosive atmosphere is present.

2.4 Residual risks

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. If the material under pressure escapes, it can cause serious injuries.

The feed rate of the electrical pump decides which valve must be used:

- N32170011: Feed rate up to the pump up to 32L/min: Use valve without pressure switch.
- N32170009, N32170010: Feed rate of the pump is greater than 32L/min: Use valve with pressure switch.
  Integrate pressure switch in the system control, so that the drive of the pump is switched off on exceeding the maximum material pressure.

Before working on the valve:

- Switch off system in which the valve is installed.
- Relieve the lines.
- Secure the system against switching on again.
- Wear specified protective equipment.

2.5 Staff qualification

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

This document is intended for qualified personnel in industry and craftmanship.

Cleaning staff
The cleaning staff receives regular instructions from the operator about the following contents:

- Using the product
- Handling cleaning tools
- Handling cleaning agents
- Technical Measures for occupational safety and health

Electrician
Electricians assemble, install, service and repair electrical systems in a professional manner.

Furthermore, electrical engineers have the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Electrical Systems and Their Loading Limits
- Technical Measures for occupational safety and health

Mechanic
The mechanic is trained specifically for the field of work in which he works.

Furthermore, he has the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Technical Measures for occupational safety and health

The mechanic is responsible for the following activities on equipment and components:

- Assembly
- Waiting
- Maintenance
- Disassembly

System operator
The system operator is trained specifically for the field of work in which he works.

The system operator has knowledge in the following specialized areas:

- System-specific process engineering
- Knowledge of the application processes regarding the application medium used
- Local technical measures for occupational safety and health

The system operator is responsible for the following tasks on equipment and components:

- Operate and monitor the system.
- Introduce measures in the event of faults.
- Clean the system.

+ additional qualification explosion protection
In addition to the knowledge of the various specialist fields, the mechanic has knowledge of regulations and safety measures when working in potentially explosive areas.

Dürr Systems offers special product training for ↳ “Hotline and Contact”.

2.6 Personal protective equipment

When working in explosive areas, the protective clothing, including gloves, must meet the requirements of DIN EN 1149-5. Footwear must meet the requirements of EN ISO 20344 and EN IEC 61340-4-3. The volume resistivity must not exceed 100MΩ.

Wear the specified personal protective equipment when working. Provide the following personal protective equipment:

3 Design and Function

3.1 Design

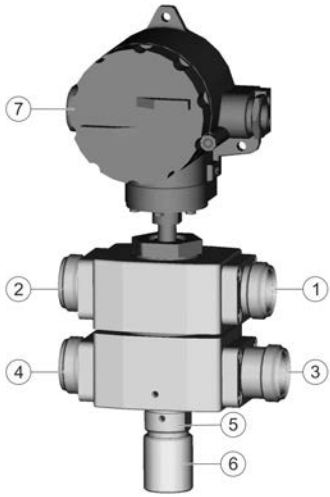

Fig. 3: Design

1 Pressure pipe inlet
2 Pressure pipe outlet
3 Suction pipe outlet
4 Suction pipe inlet
5 Valve core
6 Valve cap
7 Pressure switch Ex db or Ex ia (only in the case of N32170009 and N32170010)

The numbering 1 to 4 shows the digits of the logic symbol lasered on the valve casing.

The valve consists of two mutually screwed housing halves.

3.2 Operation

The valve protects supply lines from too high a pressure, which can occur due to an electrically driven pump.

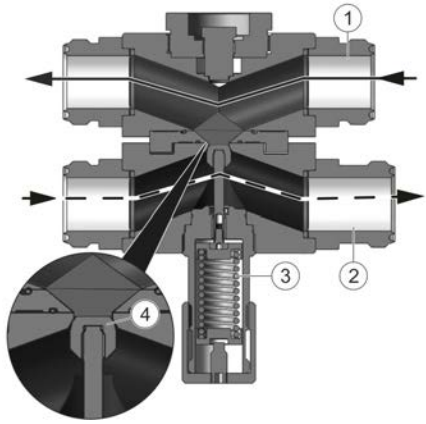

Fig. 4: Valve deactivated, position closed

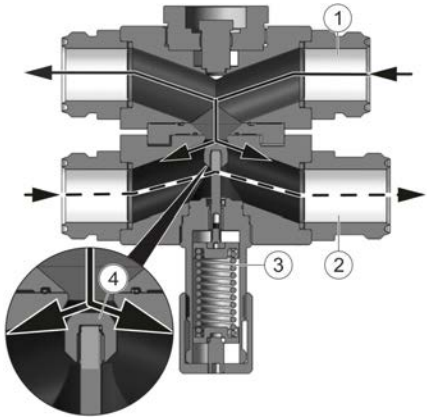

Fig. 5: Valve activated, position opened

1 Pressure line
2 Suction line
3 Compression spring
4 Needle tip
— Pressure pipe (material pressurized)
– – Suction line (material depressurized)
► Flow direction

The valve is closed in the normal mode. The needle tip (4) mutually seals pressure line and suction line (2) by means of the spring force. If the material pressure in the pressure line (1) exceeds the triggering pressure of the valve, a gap develops between the needle tip (4) and the housing. Material flows into the suction line (2) of the valve without leakage, through the gap.

If the material pressure in the pressure line (1) again drops below the triggering pressure of the valve, the spring pressure again becomes greater than the material pressure. The valve closes automatically.

The valve has no intermediate settings.

Variants with pressure switch

Only N32170009, N32170010

The function as pressure relief valve is the same for all variants.

The signals of the pressure switch are integrated into the system control through a signal line. The pressure switch reacts to the maximum allowable pressure in the system (paint supply).

If the switching point is reached, the drive of the pump must be switched off.

4 Transport, scope of supply and storage

4.1 Scope of delivery

The scope of supply includes the following components:

- Valve
- Pressure switch (only N32170009 and N32170010)

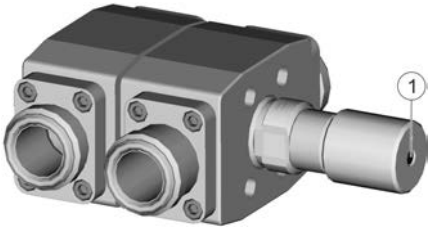

Fig. 6: Status at the time of dispatch

1 Seal

The valve is deactivated in the state at delivery.

» The valve cap is unscrewed up to the thread-free point and is easily movable.
» The compression spring in the valve core is stress-relieved.

1. Inspect delivery on receipt for completeness and integrity.
2. Ensure that the seal (1) on the valve cap is not damaged.

   The threaded pin is firmly glued to the valve cap and given a seal (1). The spring force of the valve core is thus firmly set ↳ 11.4 “Operating values”.

3. Report defects immediately ↳ “Hotline and Contact”.

4.2 Handling of packaging material

ENVIRONMENT!

Incorrect disposal

Incorrectly disposed packaging material can damage environment.

– Dispose of material no longer required in an environment-friendly manner.
– Observe local disposal specifications.

4.3 Storage

Requirements for the warehouse:

» Do not store outdoors.
» Store in a dry and dust-free place.
» Do not expose to aggressive media.
» Protect from solar radiation.
» Avoid mechanical vibrations.
» Temperature: 10°C to 40°C
» Relative humidity: 35% to 90%

5 Assembly

5.1 Safety recommendations

WARNING!

Sparks due to electrostatic discharge

If the Valve is not grounded, there can be an electrostatic charge on the the Valve. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

– Ground Valve as specified.
– Before carrying out any work, make sure that there is no explosive atmosphere.

5.2 Requirements for the Installation point.

The valve is installed in the ring line of a paint supply. Adhere to the following conditions:

» The type plate on the product is readable.

5.3 Assembly

Personnel:
- Mechanic
- + additional qualification explosion protection

Protective equipment:
- Protective gloves
- Anti-Static Safety Boots
- Eye protection

Requirements:
- Power supply of the system is switched off and secured against reconnection.
- Material supply of the system is switched off and secured against reconnection.
- Material-carrying lines are depressurized.
- New seals are used for assembly on the pipelines.
- All installation openings of the valve are clean.
- Threads on the suction line and the pressure line of the valve are greased
- Suitable shut off valves are installed in front and behind the valve in the pipelines.

Installing Valve

WARNING!

Material leakage due to improper assembly

If the suction line and pressure line are interchanged, the valve cannot function. The pump continues to deliver the material under excessively high pressure, which can damage supply lines and application devices. Escaping compressed material can cause serious injury.

Install valve correctly.
- Respect direction of flow.
- Note the suction and pressure line of the valve.

The threaded flanges have different lengths to avoid mixing up pressure side and suction side. The suction side has a longer threaded flange (3). Respect the logic symbol ↳ 11.2 “Connections”.

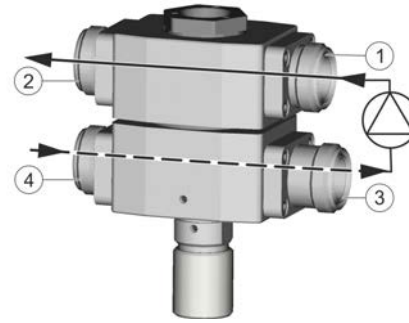

Fig. 7: Assembly example with pump

1 Pressure pipe inlet
2 Pressure pipe outlet
3 Suction pipe outlet
4 Suction pipe inlet
—— Material pressurized
– – Material depressurized
➔ Flow direction

1. Assemble longer threaded flange (3) on the suction line (pump side).
2. Assemble threaded flange (1) on the pressure line (pump side).
3. Assemble threaded flange (4) on the suction line (pipeline side).
4. Assemble threaded flange (2) on the pressure line (pipeline side).
5. Tighten screw connections on the pipelines with open-end wrench (SW 46) with 110Nm.
   ⇨ The valve is grounded through conductive pipelines. Pipeline and pump are grounded.

Installation position on electrical horizontal piston pump

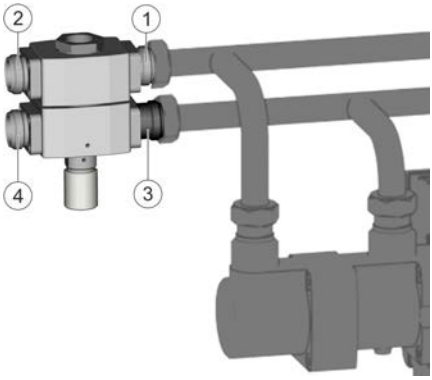

Fig. 8: Installed position

1 Pressure pipe inlet
2 Pressure pipe outlet
3 Suction pipe outlet
4 Suction pipe inlet

The numbering 1 to 4 shows the digits of the logic symbol lasered on the valve casing.

5.4 Connecting

5.4.1 Ground the pressure switch

Only for N32170009, N32170010
The ground conductor is not included in the scope of supply.

WARNING!

Sparks due to electrostatic discharge

If the Valve is not grounded, there can be an electrostatic charge on the the Valve. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

– Ground Valve as specified.
– Before carrying out any work, make sure that there is no explosive atmosphere.

Personnel:

» Electrician
» + additional qualification explosion protection

Protective equipment:

» Anti-Static Safety Boots

Requirements:

» Power supply of the system is switched off and secured against reconnection.
» Material supply of the system is switched off and secured against reconnection.
» Material-carrying lines are depressurized.
» The valve is grounded through conductive pipelines. Pipeline and pump are grounded.
» No explosive atmosphere

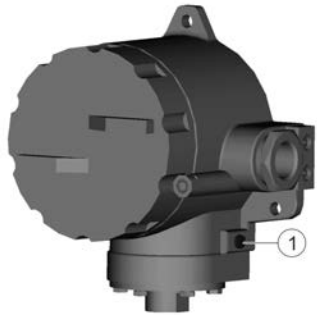

Fig. 9: Ground the pressure switch

1. Connect the ground conductor hose to the grounding bolt (1).
2. Clamp free end of the ground conductor to a secure power collector.
3. Measure grounding resistance.

5.4.2 Connecting Signal Line to Pressure Switch

Only N32170009, N32170010
Signal line is not included in the scope of supply.

WARNING!

Danger of explosion due to opened pressure switch

Electrical voltage can cause sparking inside the pressure switch. In an explosive atmosphere, these sparks can prove to be the cause for an explosion. Serious injuries and death can be the consequence.

– Before opening the pressure switch, ensure that there is no explosive atmosphere present.

Personnel:

» Electrician
» + additional qualification explosion protection

Protective equipment:

» Anti-Static Safety Boots
» Protective gloves

Requirements:

» Power supply of the system is switched off and secured against reconnection.
» Material supply of the system is switched off and secured against reconnection.
» Material-carrying lines are depressurized.
» Atmosphere is not explosive.
» The pressure switch is grounded according to manufacturer's instructions for the pressure switch ↳ "Applicable documents".

Connecting signal line

Connect signal line in the pressure switch conforming to ATEX according to detailed manufacturer's specifications.

Follow the following standards, among others:

» EN 60079-0
» EN 60079-1
» EN 60079-11
» EN 60079-14
» EN 60079-17

Integrating pressure switch in the system control

Integrate signals of the pressure switch into the system control with locking for safety.

Follow the following standards, among others:

» EN 12621
» EN ISO 13849-1
» EN ISO 13849-2

Adhere to the following conditions:

- The electrical pump must be securely switched off on reaching the maximum allowable material pressure in the system 11.4 “Operating values”.
- The required Performance Level (PL) must be defined in a risk assessment. (PL_r = c or better)

Selecting cable gland for signal line

Adhere to the following conditions:

- Select suitable cable gland for thread of the pressure switch. Respect the ignition protection categories of the pressure switch Ex ia and Ex db.
- Fix cable gland conforming to ATEX.

The cable gland is installed into the pressure switch. The cable gland must not dispense with the special features of the ignition protection category of the pressure switch.

Fixing signal line

Adhere to the following conditions:

- Screw-in signal line according to manufacturer’s specifications of the line guide with the specified tightening torque into the thread adapter of the pressure switch.
- Connect individual cores of the signal line in the pressure switch according to the pressure switch manufacturer’s operating instructions by the “Overpressure” variant. Use NC (normally closed) contact.

6 Commissioning

6.1 Safety Instructions

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

- Ensure that the flashpoint of the fluid is at least 15 K above the ambient temperature.
- Note explosion group of the fluid.
- Follow safety data sheets.
- Ensure that forced ventilation and fire protection equipment are in operation.
- Do not use sources of ignition and open light.
- Do not smoke.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

- Ensure that the forced ventilation is operational.
- Follow safety data sheets.
- Wear specified protective clothing.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping compressed material can cause serious injury.

- Select a suitable valve. Pay attention to the feed rate of the pump.
- Integrate valve in the system control, so that the drive of the pump is switched off.

6.2 Activating valve

Personnel:
- System operator
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Eye protection

Check the following conditions and functions:
- All lines are correctly connected and sealed.

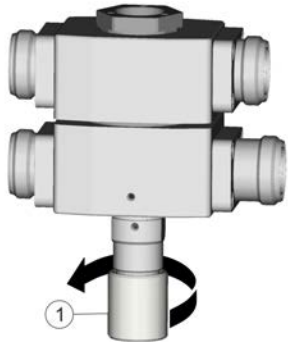

Fig. 10: Activating valve

1. Screw-in valve cap (1) on the mechanical stop.

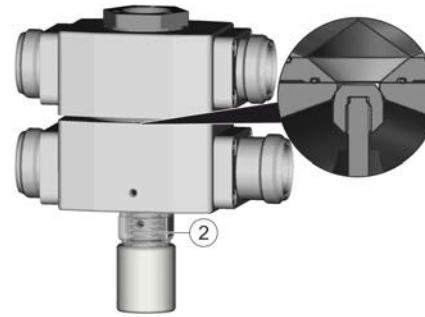

Fig. 11: Valve deactivated

⇨ Valve is activated. Compression spring (2) in the valve core is pre-stressed. Valve is ready for use.

6.3 Check operation

Personnel:
- Electrician
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Eye protection

Requirements:
- The valve is installed and activated ↳ 6.2 “Activating valve”.
- Material supply system and power supply are switched on.

1. Switch on pump.
   ⇨ Material flows in normal mode.

2. Close pressure line (2) of the pump (3) on ball valve (1) of the shut-off valve.

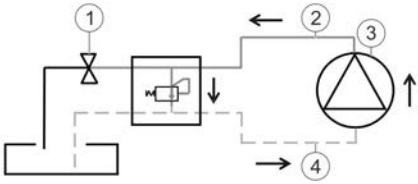

Fig. 12: Installation drawing, function check

⇨ **Valve without pressure switch**

The diagram does not map the full installation.

Material pressure rises, because the pump is pumping against the closed shut-off valve. If the material pressure exceeds the triggering pressure of the valve, the valve opens.

Material flows into the suction line (4).

Material pressure does not again fall below the triggering pressure, because the pump pumps a constant material volume. Valve remains in undefined opened position.

3. Open pressure line (2) of the pump (3) on ball valve (1).
   ⇨ Material pressure falls below the triggering pressure. Valve closes automatically.
4. Open shut-off valve again.
   ⇨ Material flows again in normal mode.

   Function test performed successfully.

6.4 Changing switch point of the pressure switch

Only for N32170009 and N32170010

WARNING!

Danger of explosion due to opened pressure switch

Electrical voltage can cause sparking inside the pressure switch. In an explosive atmosphere, these sparks can prove to be the cause for an explosion. Serious injuries and death can be the consequence.

– Before opening the pressure switch, ensure that there is no explosive atmosphere present.

Detailed description and instructions are given in the manufacturer's operating instructions of the pressure switch ↳ "Applicable documents".

7 Operation

7.1 Safety recommendations

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

– Ensure that the flashpoint of the fluid is at least 15 K above the ambient temperature.
– Note explosion group of the fluid.
– Follow safety data sheets.
– Ensure that forced ventilation and fire protection equipment are in operation.
– Do not use sources of ignition and open light.
– Do not smoke.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

– Ensure that the forced ventilation is operational.
– Follow safety data sheets.
– Wear specified protective clothing.

WARNING!

Danger due to damaged components

Operating the product with damaged components can result in serious injury or death.

– Check components at specified intervals for damage.
– If you detect unusual operating sounds or any other noticeable aspects, put the product out of service.
– Contact the manufacturer “Hotline and Contact”.
– Replace damaged components promptly.

7.2 General notes

Personnel:

» System operator
» + additional qualification explosion protection

Protective equipment:

» Anti-Static Safety Boots
» Eye protection

Perform the following visual inspections:

1. Check attachment points (1) for material leakage.

If necessary, tighten or replace cap nut on the screw connections. Respect tightening torque 11.7 “Tightening torques”.

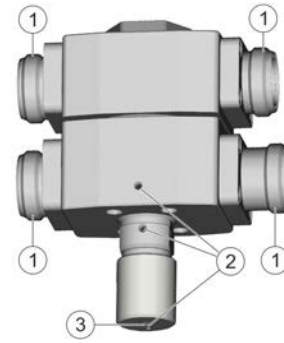

Fig. 13: Inspection points

2. Check leakage bores (2) for material leakage.

If a leakage occurs, replace the valve core 8.4.2 “Replacing Valve Core”.

3. Ensure that the seal (3) on the valve cap is not damaged.

The threaded pin is firmly glued to the valve cap and given a seal (3). The spring force of the valve core is defined and must not be changed.

4. Check cleanliness.

If necessary, remove contamination 8.3 “Cleaning”.

7.3 Normal operation

In normal mode, coating material or detergent flows through pipelines and the valve.

If the material pressure exceeds the triggering pressure, the valve opens and reduces the overpressure.

If the material pressure again drops below the triggering pressure of the valve, the valve shuts off automatically.

Rinsing

Purge

Use fluid to remove inner soiling from components. The product is purged in the assembled state, together with the total system.

NOTICE!

Material damage due to unsuitable rinsing agent

If the rinsing agent reacts chemically with the components or the material, components get damaged.

– Use only the rinsing agents that are compatible with the components and the material.
– Refer to safety data sheet of material manufacturer.

Purge the valve in the following cases:

- Before color change
- Prior to disassembly
- Before and after a long time of non-use
- Before and after a longer idle time of the pump

Personnel:

- System operator
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots
- Eye protection

Requirements:

- The valve is installed in the ring line of a paint supply.

1. Purge system.
   ⇨ The valve is purged together with the total system.

Purge sealing surfaces

In the valve there are no dead spaces, no back tapers and no inside pockets. The sealing surfaces in the valve can be optionally purged.

1. Deactivate valve ↳ 10.2 “Deactivating valve”.

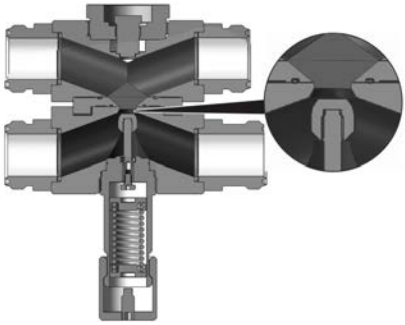

Fig. 14: Purge sealing surfaces

2. Switch on material supply and power supply of the system.
   ⇨ The detergent flows past the sealing faces of the needle tip and of the housing into the suction line of the valve.
3. Finally, activate valve ↳ 6.2 “Activating valve”.

8 Cleaning and maintenance

8.1 Safety recommendations

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

– Ensure that the flashpoint of the fluid is at least 15 K above the ambient temperature.
– Only electrically conductive containers may be used for the cleaning fluid. Containers must be grounded.
– Note explosion group of the fluid.
– Follow safety data sheets.
– Ensure that forced ventilation and fire protection equipment are in operation.
– Do not use sources of ignition and open light.
– Do not smoke.

WARNING!

Danger of fire and explosion

Sources of ignition in explosive atmosphere can cause a fire or an explosion. Serious injuries and death can be the consequence.

– Before carrying out any cleaning and maintenance work, ensure there is no explosive atmosphere.

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

– Ensure that the forced ventilation is operational.
– Follow safety data sheets.
– Wear specified protective clothing.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping material under pressure can cause serious injuries.

Before working on the product:

– Switch off system, in which the Valve is installed.
– Secure the system against switching on again.
– Depressurize the lines.
– Wear specified protective equipment.

8.2 General notes

NOTICE!

Unsuitable cleaning agents

Unsuitable detergents can cause material damage.

– Only use cleaning agents approved by the material manufacturer.
– Follow safety data sheets.

NOTICE!

Unsuitable Cleaning Tools

Unsuitable cleaning tools can cause damage.

– Only use cloths, soft brushes and paintbrushes.
– Do not use abrasive cleaning tools.
– Do not use compressed air for cleaning.
– Do not use any thinner spray guns.
– Do not use high pressure for cleaning agents.

8.3 Cleaning

Cleaning

Free components and parts from external contamination.

8.4 Maintenance

8.4.1 Maintenance schedule

If a maintenance assistant is used in the system visualizer, the maintenance intervals of the maintenance assistant are valid.

Interval	Maintenance work
Weekly	Check attachment points and leakage bores on material leakage or detergent leakage 8.2 “General notes”.
	Check tubes and connections for contamination. Clean if necessary.
After 2 years	Replace valve core 8.4.2 “Replacing Valve Core”.

Personnel:

» Cleaning staff

Protective equipment:

» Anti-Static Safety Boots
» Protective gloves
» Protective workwear
» Eye protection
» Respirator mask

Requirements:

» No explosive atmosphere
» Cleaning agent is approved by the paint manufacturer.

1. Free valve casing of dried coating material using an approved cleaning agent. Use a piece of cloth wetted with cleaning agent.

8.4.2 Replacing Valve Core

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots
- Protective gloves
- Eye protection

Requirements:

- Valve is purged ↳ “Rinsing”.
- Power supply of the system is switched off and secured against reconnection.
- Material supply of the system is switched off and secured against reconnection.
- Material-carrying lines are depressurized.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping material under pressure can cause serious injuries.

Before working on the product:

– Switch off system, in which the Valve is installed.
– Secure the system against switching on again.
– Depressurize the lines.
– Wear specified protective equipment.

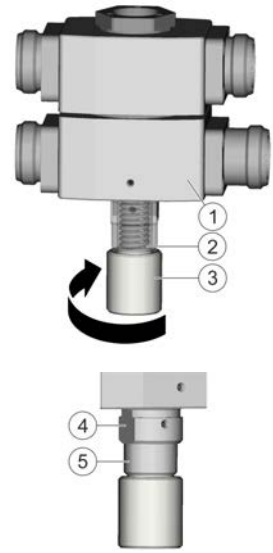

Fig. 15: Removing the valve core

Removing the valve core

1. Rotate the valve cap (3) in the direction of the arrow until the thread socket (5) is free.

⇨ The compression spring (2) inside the valve core is relieved. The valve is deactivated.

2. Place open-end wrench (SW 30) on free wrench surface (4). Unscrew valve core from the valve casing (1).

Install valve core

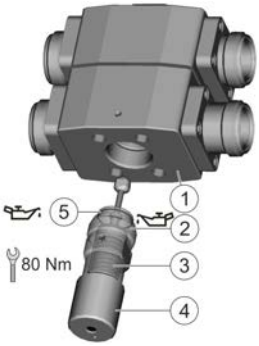

Fig. 16: Install valve core

1. Clean valve casing (1) thoroughly.
2. Lightly grease thread (2) and sealing ring (5) on valve core.
3. Screw-in valve core into the valve casing (1).
4. Tighten valve core with open-end wrench (SW 30) with 80Nm.

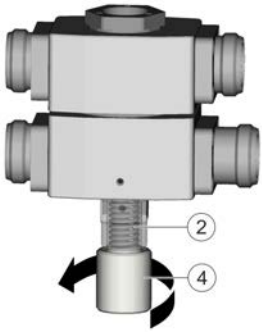

Fig. 17: Turn valve cap tight.

5. Rotate valve cap (4) in the direction of the arrow up to the mechanical stop.
   ⇨ The compression spring (3) inside the valve core is pre-stressed. The valve is activated.
6. Perform specified visual inspections during operation ↳ 8.2 “General notes”.

9 Faults

9.1 Safety recommendations

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.

– Ensure that the forced ventilation is operational.
– Follow safety data sheets.
– Wear specified protective clothing.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping material under pressure can cause serious injuries.

Before working on the product:

– Switch off system, in which the Valve is installed.
– Secure the system against switching on again.
– Depressurize the lines.
– Wear specified protective equipment.

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

9.2 General notes

NOTICE!

Faulty functioning due to leaking valve

If you use used seals or assemble them badly, the valve will not be tight.

If the seal is greased too much, the grease can block the bores.

– Use only new seals.
– Only grease the seals lightly.
  The grease should be hardly visible.
– Do not twist O-rings when inserting them.

9.3 Behavior during faults

1. Switch off the power supply of the system. Secure against reconnection.
2. Switch off material supply of the system. Secure against reconnection.
3. Depressurize material-bearing lines.
4. Follow the defects table to correct the fault ↳ 9.4 “Defects table”.

9.4 Defects table

Fault description	Cause	Remedy
Material or detergent leaks out from the leakage bores in the valve casing.	O-ring in the valve core is defective.	Replace the valve core or send it for repairs ↳ 8.4.2 “Replacing Valve Core”.
Material or detergent leaks out at the connections of the pipelines.	Screw connection on connection thread is loose.	Tighten screw connection. Note tightening torque ↳ 11.7 “Tightening torques”
	Sealing ring between threaded flange and housing is worn out.	Replace sealing ring ↳ 9.5.3 “Replacing sealing ring”.
Material or detergent leaks out from the leakage bores on the lid or laterally on the valve core.	Needle seal in the valve core is defective.	Replace valve core ↳ 8.4.2 “Replacing Valve Core”.
Only for N32170009, N32170010: Material or detergent leaks out from the interspaces of the mount.	Sealing ring on the pressure switch is defective.	Replace sealing ring ↳ 9.5.1 “Replace pressure switch.”.
Only for N32170009, N32170010: Material or detergent is not pumped.	Maximum permissible material pressure has been exceeded. The pump is switched off.	Localize and eliminate the cause for the increase in pressure in the system.
	Switch point of the pressure switch is incorrectly set.	Change switch point ↳ 6.4 “Changing switch point of the pressure switch”.
	Pressure switch does not switch correctly. Pressure switch is defective.	Replace pressure switch ↳ 9.5.1 “Replace pressure switch.”. Acknowledge error message.
Only for N32170009, N32170010: Pressure switch switches too early or too late.	Switch point has been displaced. Pressure switch is defective.	Replace pressure switch. ↳ 9.5.1 “Replace pressure switch.”
Material leaks out between the housing halves.	O-rings on the centering ring between the valve casings are defective.	Replace O-rings ↳ 9.5.2 “Replacing O-rings Between Housing Halves”.

9.5 Troubleshooting

9.5.1 Replace pressure switch.

Only for N32170009, N32170010

Remove pressure switch

Personnel:
- Mechanic
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Protective gloves
- Eye protection

Requirements:
- Valve is purged ↳ “Rinsing”.
- Power supply of the system is switched off and secured against reconnection.
- Material supply of the system is switched off and secured against reconnection.
- Material-carrying lines are depressurized.
- Valve is deactivated ↳ 10.2 “Deactivating valve”.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping material under pressure can cause serious injuries.

Before working on the product:
- Switch off system, in which the Valve is installed.
- Secure the system against switching on again.
- Depressurize the lines.
- Wear specified protective equipment.

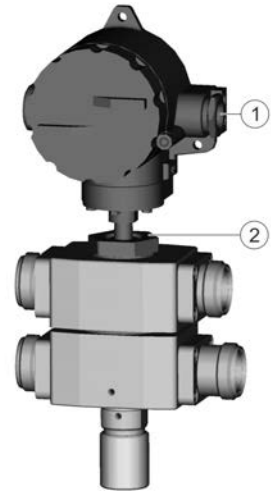

Fig. 18: Unscrew mount.

1. Unscrew signal line (1).
2. Unscrew mount (2) from the valve casing using an open-end wrench.
3. Pull off pressure switch with the mount (2) from the valve casing.

Fig. 19: Remove pressure switch

4. Pull and remove sealing ring (3) on the pressure switch.

5. Unscrew and remove sleeve (4) on the pressure switch.
   ⇨ Removal of pressure switch is complete.
6. Remove (2) mount.

Install pressure switch

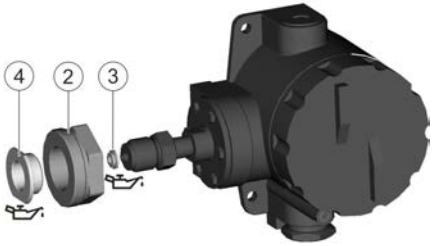

Fig. 20: Assemble pressure switch

1. Lightly grease sleeve (4) on the threads.
2. Set the mount (2) on the pressure switch.
3. Fit sleeve (4) on the pressure switch and tighten.
4. Fit sealing ring (3) on the pressure switch.
5. Lightly grease sealing ring (3).

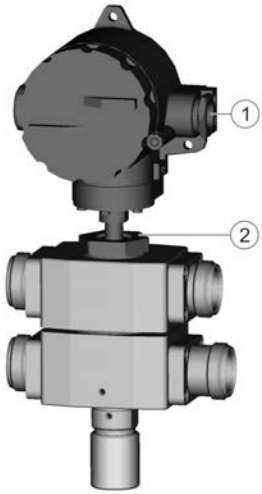

Fig. 21: Install pressure switch

6. Insert pressure switch in the valve casing.
7. Screw-in pressure switch.
8. Align pressure switch.
9. Tighten pressure switch. At the same time, secure the mount (2) with an open-end wrench.
10. Insert signal line on connection (1).
11. Ground the pressure switch ↳ 5.4.1 “Ground the pressure switch”.
12. If necessary, change the switching point of the pressure switch ↳ 6.4 “Changing switch point of the pressure switch”.

9.5.2 Replacing O-rings Between Housing Halves

Personnel:
- Mechanic

Protective equipment:
- Anti-Static Safety Boots
- Protective gloves
- Eye protection

Requirements:
- Valve is purged ↳ “Rinsing”.
- Valve is deactivated ↳ 10.2 “Deactivating valve”.
- Valve is removed ↳ 10.3 “Disassembly”.

Remove O-rings

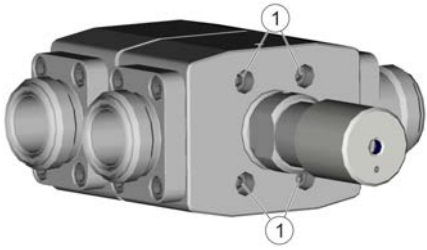

Fig. 22: Place valve

1. Place the valve on a firm resting pad.
2. Thread off four screws (1).

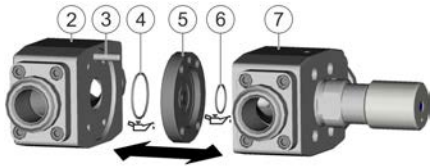

Fig. 23: Pull valve asunder

3. Pull off housing halves (2) and (7) from each other.
4. Remove centering ring (5), pin (3) and O-rings (4) and (6).

Install O-rings

5. Lightly grease new O-rings (4) and (6).
6. Insert small O-ring (6) into the centering ring (5).
7. Insert pin (3) into the housing half (suction side) (2).
8. Fit centering ring (5) with the small O-ring (6) on the pin (3).
9. Insert big O-ring (4) into the centering ring (5).
10. Plug together housing halves (2) and (7).
11. Lightly grease screws (1).

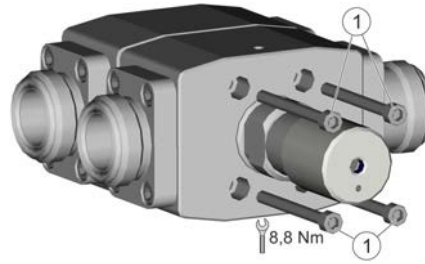

Fig. 24: Thread in the screws

12. Screw in four screws (1).
13. Tighten screws (1) with 8.8Nm.
14. Perform specified visual inspections during operation ↳ 9.2 “General notes”.

9.5.3 Replacing sealing ring

Personnel:
- Mechanic

Protective equipment:
- Anti-Static Safety Boots
- Protective gloves
- Eye protection

Requirements:
- Valve is purged ↳ “Rinsing”.
- Valve is deactivated ↳ 10.2 “Deactivating valve”.
- Valve is removed ↳ 10.3 “Disassembly”.

Remove sealing ring

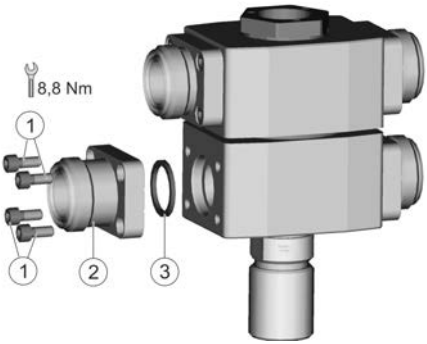

Fig. 25: Replace sealing ring

1. Thread off four screws (1).
2. Remove threaded flange (2).
3. Remove sealing rings (3).

Install sealing ring

4. Insert new sealing ring (3) into the housing.
5. Firmly attach threaded flange (2) to the housing with four screws (1).
6. Tighten screws (1) with 8.8Nm.

10 Disassembly and Disposal

10.1 Safety recommendations

WARNING!

Danger to health from harmful or irritant substances

Contact with hazardous liquids or vapors, can result in serious injury or death.
- Ensure that the forced ventilation is operational.
- Follow safety data sheets.
- Wear specified protective clothing.

WARNING!

Danger due to escaping material

If the pump continues to deliver material even at too high a material pressure, the supply lines can be damaged. Escaping material under pressure can cause serious injuries.

Before working on the product:
- Switch off system, in which the Valve is installed.
- Secure the system against switching on again.
- Depressurize the lines.
- Wear specified protective equipment.

10.2 Deactivating valve

Personnel:
- System operator
- + additional qualification explosion protection

Protective equipment:
- Anti-Static Safety Boots
- Eye protection

Requirements:
- Power supply of the system is switched off and secured against reconnection.
- Material supply of the system is switched off and secured against reconnection.
- Material-carrying lines are depressurized.

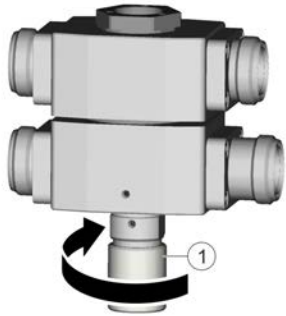

Fig. 26: Deactivate valve

1. Unscrew lid (1) to the left on the valve core up to the thread-free place.

> If you turn out the valve cap too far, the valve cap can fall down. Due to this, the valve cap and inner lying components can get lost.

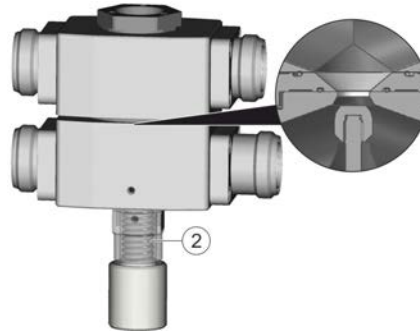

Fig. 27: Valve deactivated

⇨ Compression spring (2) in the valve core is defective. The valve is relieved and deactivated.

10.3 Disassembly

Personnel:
- Mechanic
- Electrician
- + additional qualification explosion protection

Protective equipment:
- Protective workwear
- Anti-Static Safety Boots
- Protective gloves
- Eye protection

Requirements:
- Valve is purged ↳ “Rinsing”.
- Material supply system and power supply are switched off and secured against being switched on again.
- Material-carrying lines are depressurized.
- All lines are dry.

Even if the valve is flushed, material can still come out on loosening the connections to pipelines.

1. Deactivate valve ↳ 10.2 “Deactivating valve”.

Only for N32170009 and N32170010:

2. Open lid of the pressure switch.
3. Loosen individual cables of the signal line on the contacts in the pressure switch.
4. Loosen screw connection of the signal line on the connection (1).
5. Pull out signal line.
6. Disassemble ground conductor on the grounding bolt (2).

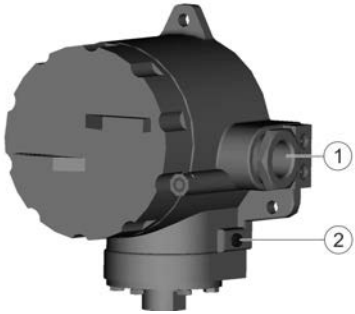

Fig. 28: Disassemble lines

7. Support the valve during disassembly.

Loosen screw connections (1), (2), (3) and (4) on pipelines with an open-end wrench (SW 46).

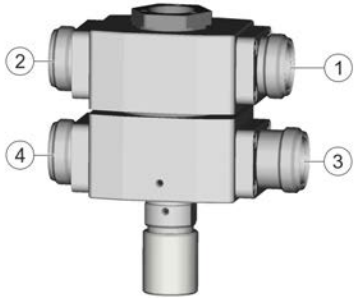

Fig. 29: Disassembly

10.4 Disposal

ENVIRONMENT!

Incorrect disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

– Always dispose of components in accordance with their characteristic. ↳ 11.6 “Materials used”
– Collect leaked out operating and auxiliary materials completely.
– Dispose of operating and auxiliary materials according to the disposal provisions in force.
– In case of doubt, refer to the local disposal authorities.

11 Technical data

11.1 Dimensions and weight

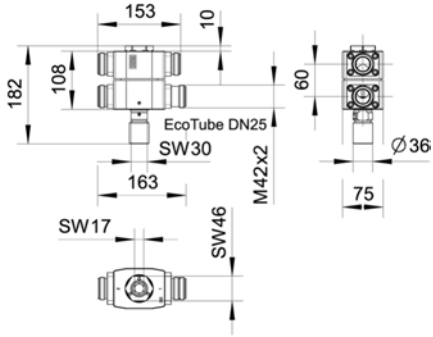

Fig. 30: Dimensions N32170011

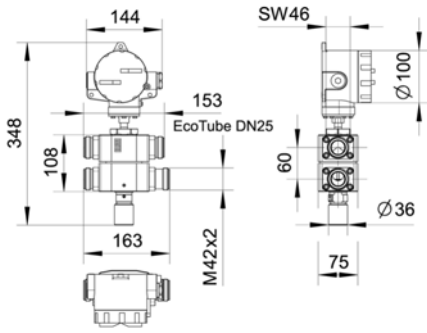

Fig. 31: Dimensions N32170009, N32170010

Valve N32170011	Value
Height	163 mm
Width	182 mm
Depth	75 mm
Weight	approx. 7.2 kg

Valve N32170009, N32170010	Value
Height	163 mm
Width	348 mm
Depth	75 mm
Weight	approx. 8.8 kg

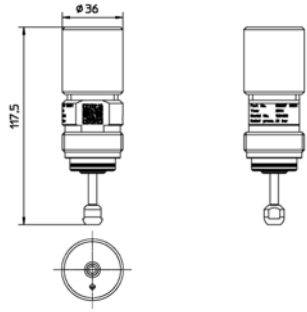

Fig. 32: Valve core

Valve core	Value
Height	117.5 mm
Diameter	36 mm

11.2 Connections

Connection	Value
Connection of pressure line and suction line	**Eco**Tube DN25 (M42 x 2)
Electrical connection of the pressure switch, inner	3/4 NPT x M20

The security marking is on the rear side of the valve casing.

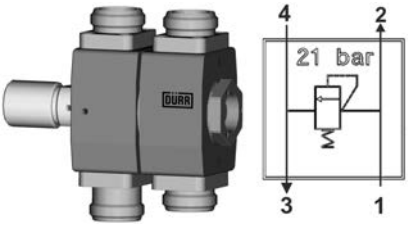

Fig. 33: Logic symbol N32170011

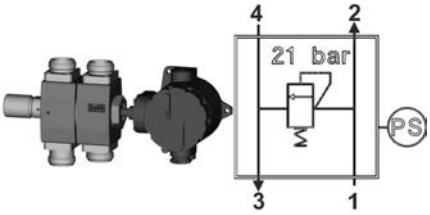

Fig. 34: Logic symbol N32170009, N32170010

1 Pressure pipe inlet
2 Pressure pipe outlet
3 Suction pipe outlet
4 Suction pipe inlet
PS Pressure switch

The numbering 1 to 4 shows the digits of the logic symbol lasered on the valve casing.

11.3 Operating conditions

Detail	Value
Only for N32170009, N32170010 Pressure switch protection type	IP66
Ambient temperature, min.	10 °C
Max. ambient temperature	40 °C
Ambient temperature during transportation, min.	For a few hours -30 °C
Max. ambient temperature during transportation, max.	For a few hours 60 °C
Min. material temperature	10 °C
Max. material temperature	40 °C
Only for N32170011 Flow rate of electrical pump, max.	32 l/min

11.4 Operating values

Valve

Detail	Value
Triggering pressure of the valve	21 bar
Material pressure range, recommended	12 to 18 bar
Material pressure of the system, max.	25 bar

Pressure switch

Detail	Value
Switch point, preset	25.2 bar

11.5 Type plate

Valve

The type plate with the following details on the rear side of the valve:

- Product denomination: Pressure Relief Valve
- Material number
- Year of manufacture
- Serial number
- EX labeling
- Maximum material pressure of the system
- Triggering pressure of the valve
- Recommended material pressure range
- Nominal width
- Valid standard
- Narrowest flow cross section
- CE labeling
- Manufacturer
- QR Code

Pressure switch

The type plate with the following details on the front side of the pressure switch.

- Category number
- Serial number
- Maximum measuring range
- EX labeling
- CE labeling
- Electrical power
- Material
- Test pressure
- Dead zone
- Manufacturer

11.6 Materials used

Materials in contact with material

Denomination	Material number	Value
Sealing ring (N32170009, N32170010)	M08010532	PE-UHMW
Special screw (N32170011)	M41060152	POM
Housing	M16020531 M16020532	Stainless steel 1.4301
Needle seal	M08130006	PE-UHMW
Valve core sleeve	M20010304	Stainless steel 1.4301
O-ring	M08030696	FFKM
Needle		Stainless steel 1.4301
Needle tip		POM

11.7 Tightening torques

Indication	Value
Screw connection **Eco**Tube DN25	110 Nm
Valve core	80 Nm
Screws (housing, threaded flange)	8.8 Nm
Only for N32170011: Special screw	2.5 Nm

11.8 Operating and auxiliary materials

Material	Material number
Seal lubricant Klüber Syntheso GLEP 1	W32020010

11.9 Material specification

Detail	Value
Viscosity min.	40 mPas
Viscosity, max.	250 mPas

12 Replacement parts and accessories

12.1 Replacement parts

N32170011

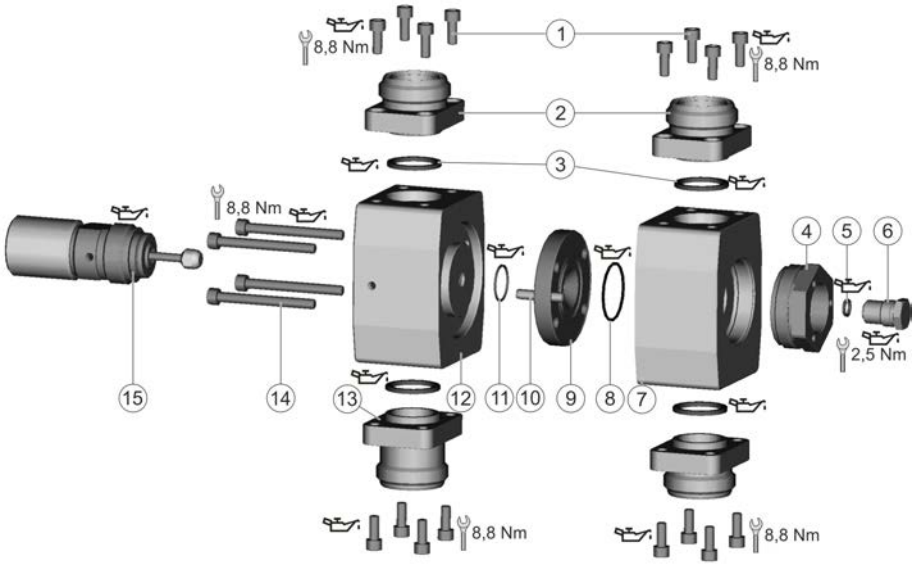

Fig. 35: Exploded view

Item	Denomination	Quan-tity	Material number
1	Screw M6 x 14	16	D09120293
2	Threaded flange	3	M11170013
3	Sealing ring Ø 32	4	M08010239
4	Inlet	1	M03010371
5	Sealing ring Ø 9.9	1	M08010332
6	Special screw	1	M41060152
7	Valve casing pressure side	1	M16020531
8	O-Ring 33.05 x 1.78	1	M08030326
9	Centering ring	1	M35110041

Item	Denomination	Quan-tity	Material number
10	Pin	1	D63250021
11	O-Ring 19 x 1.5	1	M08030336
12	Valve casing suction side	1	M16020532
13	Threaded flange long	1	M11170014
14	Screw M6 x 60	4	D09120309
15	Valve core 21 bar	1	N32970001

N32170009, N32170010

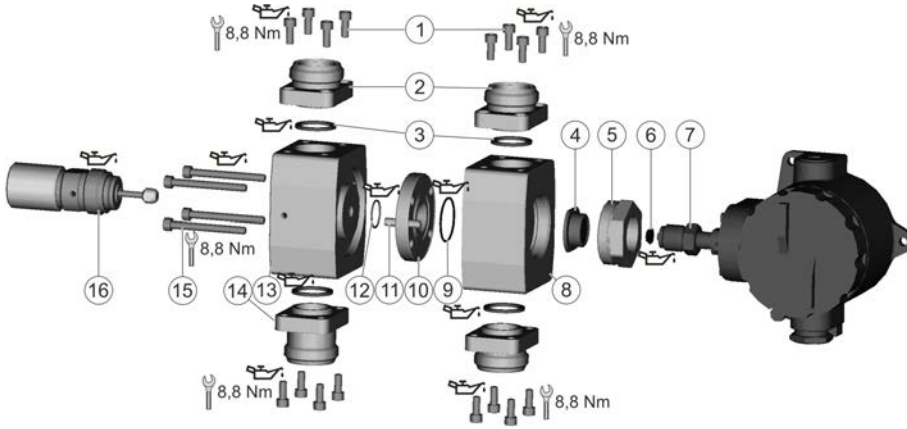

Fig. 36: Exploded view

Item	Denomination	Quan-tity	Material number
1	Screw M6 x 14	16	D09120293
2	Threaded flange	3	M11170013
3	Sealing ring	4	M08010239
4	Tube	1	M20010310
5	Inlet	1	M03010372
6	Sealing ring Ø 13	1	M08010532

Item	Denomination	Quantity	Material number
7	Pressure switch Ex ia (only in the case of N32170010)	1	E22030046
7	Pressure switch Ex db (only for N32170009)	1	E22030059
8	Valve casing pressure side	1	M16020531
9	O-Ring 33.05 x 1.78	1	M08030326
10	Centering ring	1	M35110041
11	Pin	1	D63250021
12	O-Ring 19 x 1.5	1	M08030336
13	Valve casing suction side	1	M16020532
14	Threaded flange long	1	M11170014
15	Screw M6 x 60	4	D09120309
16	Valve core 21 bar	1	N32970001

12.2 Accessories

There are no accessories available for this product.

12.3 Order

WARNING!

Risk of injury from unsuitable replacement parts in explosive areas.

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injuries and death can be the consequence.

– Use exclusively original replacement parts.

WARNING!

Risk of injury from unsuitable replacement parts

Parts of third party suppliers may not bear the loads. Serious injuries and death can result.

– Only use original replacement parts.

Ordering replacement parts, tools and accessories as well as information on products that are listed without order number
↳ “Hotline and Contact”.

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Translation of the original operation manual