handtmann

Ideas for the future.

Translation **Safety relief valves**

Operating manual **33501, 33502, 33503, 33521, 33601, 33602, 33603, 33621**

BA(k)_033501.06_EN

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The Handtmann Armaturenfabrik can look back over a long and successful tradition. Today it is part of the globally operating Handtmann Group of Companies.

The Handtmann Armaturenfabrik is one of the leading suppliers of armatures, valves and processing plants for the beverage industry, and increasingly for biotechnology and the chemical-pharmaceutical industry.

The success of the Handtmann Armaturenfabrik is based on long-term experience and processing expertise, practice-oriented consultation, comprehensive engineering work and state-of-the-art production

The ambitious goals can only be realised with highly qualified and motivated employees. This is why our employees are at the heart of what Handtmann does.

The Handtmann Armaturenfabrik is not looking for short-term success but rather the establishment of a long-term partnership with customers.

Albert Handtmann Armaturenfabrik GmbH & Co. KG

Arthur-Handtmann-Straße 11

88400 Biberach an der Riss

Germany

Tel.: +49 7351 342-0

Fax: +49 7351 342-4480

service.af@handtmann.de

www.handtmann.de

0 Foreword

These instructions contain instructions, notes and advice worth knowing, which are necessary for the installation and/or operation.

Read the instructions to ensure trouble-free operation.

The technical data, descriptions and design specifications correspond to the state at the time of printing. Intermediate design changes are possible in the interest of continuous further development.

Pictures and drawings shown are only complete to the extent that they are required for understanding.

The instructions serve to inform the operating personnel, the operator and, if applicable, trained qualified personnel. The instructions are part of the system delivery. Removing chapters from these instructions is prohibited. Missing instructions or missing pages thereof must be replaced immediately.

Any person who is instructed to set up, commission, operate, maintain and repair the system is required to read these instructions, specifically the safety notes, and have an understanding of its content and language.

If necessary, internal instructions under consideration of the technical qualification of the respective personnel must be provided.

To prevent operating errors and ensure the correct performance of necessary testing measures, the instructions must be accessible to operating personnel at all times.

Handtmann Armaturenfabrik GmbH & Co. KG is not liable for damages and malfunctions resulting from non-compliance with these instructions.

1 General

1.1 Manufacturer

Albert Handtmann Armaturenfabrik GmbH & Co. KG
Arthur-Handtmann-Str. 11; D-88400 Biberach
Tel.: +49(0) 73 51/3 42-0; Fax: +49(0) 73 51/ 3 42-44 80
E-Mail: sales.fittings@handtmann.de

1.2 Proper application

- Safety relief valves protect a pressurized system (tanks, containers, pipelines) against impermissible pressure exceedance.
- Safety relief valves may be used for the intended purpose only. In this case, special attention must be paid to the permissible pressure and temperature ranges, the type of fluids to be discharged and the installation situation.
- Safety relief valves are intended for application in the beverage and food processing as well as in the chemical-pharmaceutical industries.
- Safety relief valves are subject to the Pressure Equipment Directive 2014/68/EC.
- Safety relief valves comply with the requirements of DIN EN ISO 4126-1.

1.3 Improper application

Improper use is considered if:

- there are different operating conditions or uses than those intended for the type,
- unauthorized changes or modifications are made to the component/assembly/plant,
- unqualified personnel carry out installation, operation and maintenance,
- shut-off devices are installed in front of the safety valves, which can then override them,
- instructions in the operating instructions are not observed.

Improper use will result in the loss of any warranty services as well as statutory liability claims.

1.4 Duties of operator

The operator must ensure in particular that

- the component/assembly/plant is operated in accordance with its intended purpose and in correct functional condition.
- the legal requirements for operation and maintenance are observed.
- only sufficiently qualified authorised personnel performs maintenance on the component/assembly/plant.
- the personnel responsible for operation and maintenance is familiar with and observes the operating and assembly instructions and particularly the safety instructions contained in them.
- the attached safety and warning signs are not removed and remain legible.

2 Safety Information

2.1 Symbols

DANGER

Danger - endangerment caused by product-specific and process-specific conditions!

This symbol identifies an extremely dangerous situation that may result in severe bodily injury or even death if the relevant safety instructions are disregarded.

WARNING

Warning – general dangers!

This symbol identifies dangerous situations that may result in light to severe bodily injury if the relevant safety instructions are disregarded.

CAUTION

Caution – damage to components!

This symbol points out that special care must be taken during installation, operation or maintenance.

NOTICE

Note

This symbol refers to issues requiring special attention.

NOTICE

Note

This symbol identifies an environmentally friendly procedure or disposal method.

2.2 Hazards and Safety Instructions

Endangerment to service personnel	
Explanations	**Measures**
Squeezing danger for fingers, hands and feet Unintentional opening and closing of the safety relief valve must be prevented during maintenance work.	• Disconnect the pneumatic connection with the safety valve. • Do not reach into the seat area of the valve disk with your hands.
The safety relief valve can weigh several kilograms.	• Secure the valve against slipping and falling during assembly, disassembly and in maintenance work.
Shock and impact danger	

Before taking out the upper valve part and loosening the screws, the safety valve must be lifted manually or pneumatically.	• Turn the counter nut on the valve rod by 2-3 rotations against the valve housing or apply compressed air to the valve actuator.
Danger of thermal burns, chemical burns and scalding If the safety relief valve in a system is operated with hot media, the surface temperature of the safety valve can also reach this value.	• Make sure that the piping system has cooled to a value below 50°C. • Attach warning signs (W026) for hot surfaces. • The piping area in question must be sealed off from the rest of the piping system.
When discharging fluid from the safety relief valve, there is a risk of burns, scalding or chemical burns for the operating and service personnel.	• Make sure that the fluids are discharged properly and safely (exhaust line). • Make sure that the valve is not opened in an uncontrolled manner during maintenance work.
Chemical burns If the safety valve in a system is operated with acidic or alkaline media, your hands and fingers may suffer chemical burns when disassembling the valve.	• Before removing the safety relief valve, check which fluid the piping was conducting. If necessary, rinse the piping again beforehand with water. • Check the system pressure before removing the safety relief valve.
Malfunction due to incorrect handling	
Explanations	**Measures**
The valve must be switched off in the case of noticeable malfunctions.	• Faults must be eliminated immediately.
The switching process of the valve is faulty or takes place jerkily.	• Remove residues or loose small parts from the valve seat area. • Ventilate the valve periodically to prevent jamming of the seat sealing (clean seat).
If the valve is not checked or maintained at regular intervals, this can lead to malfunction or major functional disruption.	• Check the valve during operational maintenance cycles. • Inspection and maintenance work should only be carried out by qualified staff.
Malfunction through improper use	
The range of application of the valve is intended for specific operating states (pressure, temperature, media).	• Ensure proper use.
Installation of faulty or non-specified parts or using the same as replacement parts may disable or disrupt functionality considerably.	• Only use parts approved by the manufacturer.

3 Notes

3.1 Notes on transport

DANGER

Danger - Danger of injury to persons!

There is a risk of accident during transport due to the high weight.

– Do not walk or stand under suspended loads.
– When unloading the assembly, always use inspected and approved lifting gear (e.g., forklift truck, pallet truck, crane) and suitable aids with a sufficient load carrying capacity.
– Shackles, e.g., in accordance with DIN 82101
– Lashing chains, e.g., in accordance with DIN 5687 quality class 8
– Transport must be performed only by instructed personnel.

CAUTION

Warning - General dangers

The danger areas must be cordoned off during transport and assembly (barrier tape).

ATTENTION

Note

Observe the information signs for transport.

Fig. 1: Transport signs

3.2 Instructions for Delivery and Performance

- Check the delivery note data for factual correctness.
- Check the delivery for completeness. Later complaints will not be accepted.
- Perform visual inspection of the packaging system for external transport damage. These must be reported to the forwarder immediately.
- Claims due to transport damage not visible right away must be made within a week.

3.3 Storage Instructions

- The goods should remain in the delivered packaging systems until assembly.
- The goods must be stored in dry, closed rooms. Exposure to UV radiation and direct sunlight must be avoided. The maximum moisture must not exceed 60 %; the maximum storage temperature must not exceed 40 °C.
- It is vital to read the manual after unpacking the goods and before assembly.

4 Technical Description

4.1 Technical Data

Valve data

Type	Safety relief valve
Type of functioning	Opens with pressure/closes with spring force
Order code	335xx/336xx

Product range

Materials	Stainless steel 1.4404
Seals	EPDM, optionally FKM/FPM (all FDA proof)
Surface	≤ 0.8 µm

Other parts

Materials	Stainless steel 1.4301, 1.4307
Seals	EPDM
Surface	Precision-turned, matte

Production / CIP

Applications	Free outflow
Fluids (nontoxic)	Fluids/gases/vapours (Group II, PED 2014/68/EU) Readily commercially-available CIP cleaning media with 2-4 % lye/acid
Performance data	Performance data within 10 % pressure increase
Operating pressure	PS min/max 0/10 bar-g
Temperature	TS min/max 0/140 °C
Control air pressure	5 – 7 bar, compressed air connection Ø 6/4 mm

4.2 Identification of components

All safety relief valves are marked with a nameplate and a marking on the housing.

Marking of the nameplate

(The values on the nameplate shown below are example values.)

Albert Handtmann Armaturenfabrik GmbH & Co. KG			
set pressure 1,0 bar		Serial no. 123456	
CE 0062 EAC	SV Type 33501	Size DN80	Date 04/19
	d_0 38,00 mm	aw	stroke
	Steam	0,18	2,4 mm
	Gas	0,18	
	Liquid	0,18	

Marking of the housing

AH / DNXX / PNXX / T 0°C - 140°C / 1.4404 / Heat no.

4.3 Valve types

Type	Lifting man	Lifting pneu	Fluids	Nominal size per type [DN]	Set pressure [bar-g]	Counterforce	Installation position	Weight [kg]
33501, 33521	X		F/D/G	15 - 80	0.5 - 10.0	Pressure spring	standing or horizontal	2.5 - 28.0
33601, 33621		x	F/D/G	15 - 80	0.5 - 10.0			2.5 - 28.0
33502	X		F/D/G	50	0.5 - 10.0	Pressure spring	standing or horizontal	13.0 - 21.0
33602		X		50	0.5 - 10.0			
33503	X		F/D/G	40 - 80	0.5 - 10.0	Pressure spring	standing or horizontal	9.0 - 28.0
33603		X	F/D/G	40 - 80	0.5 - 10.0			9.0 - 28.0

Notes

- Fluids (F), air/gases (G), steam (D)
- Lifting: Manual (man) or pneumatic (pneu)
- Type: 33502/33602 with proportional opening characteristic
- Type: 33503/33603 with hygienic connecting flange integrated in housing
- Type: 33521/33621 with adjustable pressure range and scaling
- Sealing material: EPDM / optionally FKM (FPM)

Optional equipment

- Scaling and restraint
- Heating cartridges, plugging, proximity switch

5 Perfomance Data

Fluid: Air						
33501/33521/33601/33621			33501/33503/33521/33601/33603/33621			
Pressure [bar-g]	Throughput [Nm³/h]					
	DN 15	DN 25	DN 40	DN 50	DN 65	DN 80
1	137	369	736	1.054	1.917	3.035
2	208	560	1.119	1.603	2.915	4.615
3	279	752	1.502	2.152	3.913	6.195
4	210	944	1.885	2.701	4.911	7.775
5	253	1.136	2.268	3.250	5.909	9.355
6	295	1.328	2.651	3.799	4.107	10.935
7	338	1.520	3.034	4.348	4.700	7.196
8	380	1.711	3.417	4.896	5.293	8.105
9	423	1.903	3.800	5.445	5.887	9.013
10	466	2.095	4.183	5.994	6.480	9.922

Fluid: Water						
33501/33521/33601/33621			33501/33503/33521/33601/33603/33621			
Pressure [bar-g]	Throughput [kg/h]					
	DN 15	DN 25	DN 40	DN 50	DN 65	DN 80
1	3.970	10.760	26.012	42.430	65.910	107.260
2	5.610	15.210	36.790	60.010	93.210	151.690
3	6.870	18.630	45.050	73.490	114.160	167.210
4	7.940	21.520	52.030	84.860	131.820	193.080
5	8.870	24.060	58.160	94.870	147.370	215.870
6	9.720	26.370	63.710	103.940	161.450	236.470
7	10.500	28.460	68.820	112.260	174.380	255.420
8	11.220	30.440	73.570	120.010	186.420	273.060
9	11.900	32.290	78.040	127.290	197.730	289.620
10	12.540	34.040	82.260	134.180	208.420	305.290

Fluid: Steam						
33501/33521/33601/33621			33501/33503/33521/33601/33603/33621			
Pressure [bar-g]	Throughput [kg/h]					
	DN 15	DN 25	DN 40	DN 50	DN 65	DN 80
1	56	255	518	709	1.294	2.297
2	85	387	788	1.078	1.967	3.143
3	117	520	1.058	1.447	2.640	4.219
4	147	653	1.327	1.816	3.314	5.295

Fluid: Water		Fluid: Air		Fluid: Steam	
33502/33602					
Pressure [bar-g]	Throughput [kg/h] DN 50	Pressure [bar-g]	Throughput [Nm³/h] DN 50	Pressure [bar-g]	Throughput [kg/h] DN 50
1	18.628	1	527	1	401
2	26.344	2	802	2	603
3	32.265	3	1.076	3	801
4	37.257	4	1.351	4	1.000
5	41.654	5	1.625	---	---
6	45.630	6	1.900	---	---
7	49.286	7	2.174	---	---
8	52.689	8	2.449	---	---
9	55.885	9	2.723	---	---
10	58.908	10	2.998	---	---

6 Operation

WARNING

Warning – General hazards!

If the pressure system is exposed to a higher fluid temperature, the surface temperature of the assembly can reach this value as well.

– Attach warning signs for hot surfaces.

CAUTION

Caution - **Damage to components**!

If the valve is not checked and serviced at certain intervals, the function may be overridden or significantly disturbed.

– It is recommended to carry out regular checks.

6.1 Valve actuator

- Safety relief valves protect a pressurised system against impermissible pressure exceedance.
- Fluids (F), gases (G) and vapours (D) can be discharged via the safety relief valves.
- During normal operation the safety relief valve should not be activated / opened. (Always ensure sufficient allowance between the operating pressure and the set pressure).
- Safety relief valves open within an opening pressure difference of 10 % of the response pressure. At a response pressure of < 1 bar, the opening pressure difference can be up to 0.1 bar. The specified exhaust performance is achieved here.
- The lifting itself can be performed according to the process requirements. The duration of lifting should be about 5-20 seconds and can take place during different cleaning steps. Lifting takes place during the startup phase of the pump with reduced power.

6.2 Valve Tightness / Leak

If the area of the valve seat is not sealed properly (seal defective, foreign object trapped, valve disk lifted manually, spring broken), the valve will exhaust in normal position (valve closed).

This also results in pressure not being built up or only with difficulty in a pressurized system.

Note

Heed the pressure difference between operating pressure and response pressure!

6.3 Operating Characteristics

- All the safety relief valves are checked ex works and set to the required pressure. The setting or the set value is documented in a setting test log.
- The pressure setting occurs at ambient pressure.
- A change of the set pressure is prevented through positive locking inside the upper valve part. An optional lead sealing provides an additional safety measure on the outside.

CAUTION

Caution – functional impairment or material damage!

Mechanical manipulations may cause malfunctions.

– Mechanical modifications to the safety relief valves that influence the set pressure or functionality are impermissible.

– Required modifications should only be carried out by the manufacturer.

Operating pressure:	Working pressure under normal operating conditions (lower than set pressure)
Set pressure:	Excess pressure at which the safety relief valve starts opening
Response pressure:	Excess pressure at the safety relief valve starts opening during operation (abnormal operating condition)
Closing pressure:	Pressure at which the safety relief valve is closed again

6.4 Valve cleaning / CIP

Safety relief valves should be cleaned within a defined time period.

- Manual safety relief valves must be disassembled.
  The seat area and the seal are cleaned manually.
- Safety relief valves with pneumatic actuator are lifted via compressed air.
  The seat area and the seal are cleaned within an automated CIP process.
  The safety relief valve should be alternately opened and closed.

CAUTION

Caution – functional impairment or material damage!

Jamming hazard for valve seat/valve disk!

– If the safety relief valve opens upon tank overfilling, especially with viscous, sugary media, the valve seat must always be cleaned.

Safety valves with pneumatic actuator can be opened for CIP cleaning. For this purpose, a control air pressure of 5-7 bar are required independent of the set pressure.

Pneumatic connection G 1/8“ with plug connection for compressed air hose Ø 6/4 mm

7 Disassembly

7.1 Assembly instructions

Before starting work:

- Read the operating instructions and, in particular, the safety information.
- Check the current system status, e.g., pressure, temperature, medium, operating status.
- Clean, empty and/or depressurise the piping system.
- Disconnect pneumatic and electric connections from the actuator.

CAUTION

Caution – damage to components!

Installation of faulty or non-specified parts or using the same as replacement parts may disable or disrupt functionality considerably.

– Only use parts and equipment approved by the manufacturer.
– After the work has been carried out, the function of the valve must be checked.

WARNING

Warning – Welding hazards!

When dismantling valves or setting up a system, pipes must be welded. This can lead to a fire. The fire can seriously injure people.

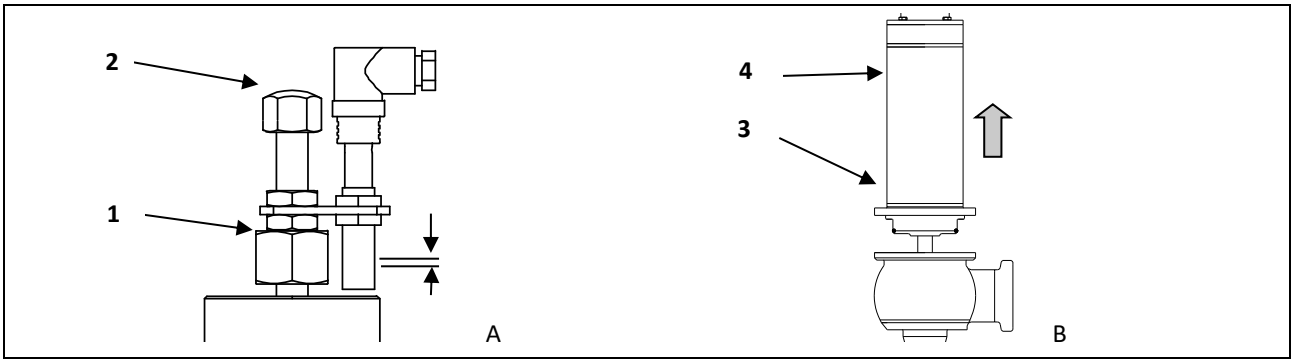
During disassembly/assembly, sharp-edged pipe ends may be present. The staff can cut themselves at the sharp edges.

Welding or cutting pipes creates hot surfaces. These can lead to burns.

Therefore, please note the following before welding:

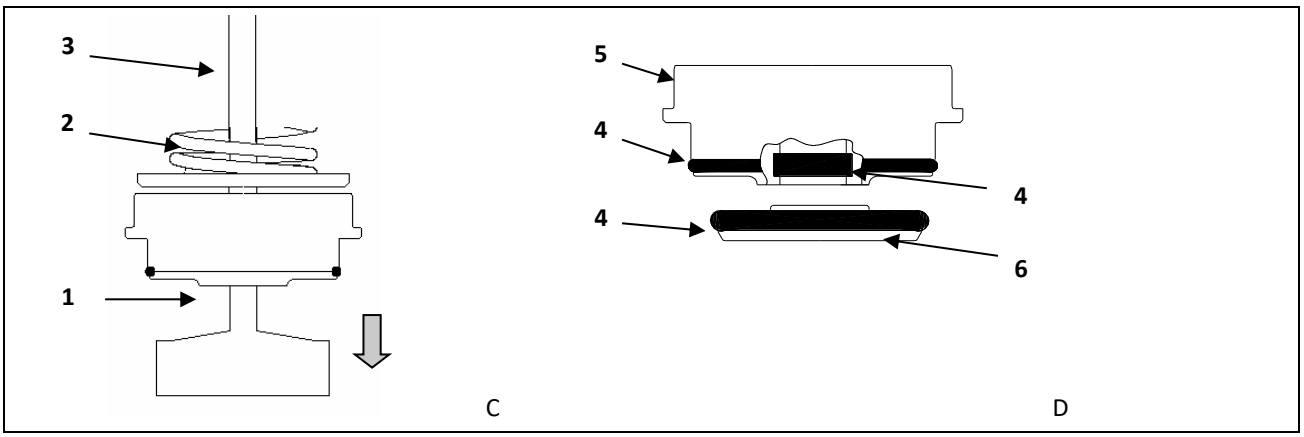
– Welding work may only be carried out by qualified personnel.
– Remove all flammable parts from the environment before welding.
– Cover combustible parts that cannot be removed.
– Prior to commencement of flame, welding, soldering and/or grinding operations, approval must be obtained from the plant manager for open fire/welding work.
– Work only with a release certificate.
– Have fire extinguishing agents, e.g. powder extinguishers ready.
– Organize fire stations.
– Check the workplace for fire nests several times up to 24 hours after completion of the work.
– Wear personal protective clothing during welding.
  - cut-resistant, heat-resistant hand protection
  - Foot protection
  - Head protection

7.2 Disassembling manual safety relief valves - Types 33501, 33502, 33503, 33521



A) Turn lifting nut (1) against the actuator, add two further turns.

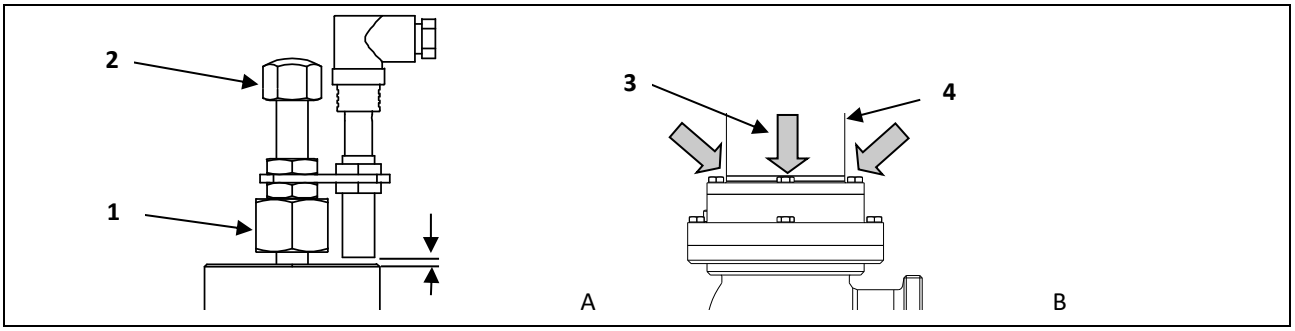
B) Remove the screws (3), extract the upper part of the valve (4).



C) Screw on valve disc (1).

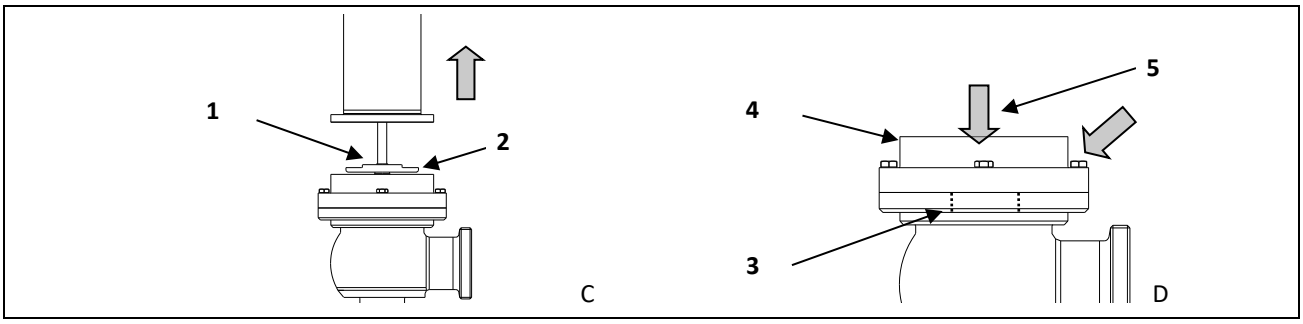
D) Replace the seals (4) of the housing inset (5) and the valve disk (6).

7.3 Disassembling pneumatic safety relief valves - Types 33601, 33602, 33603, 33621



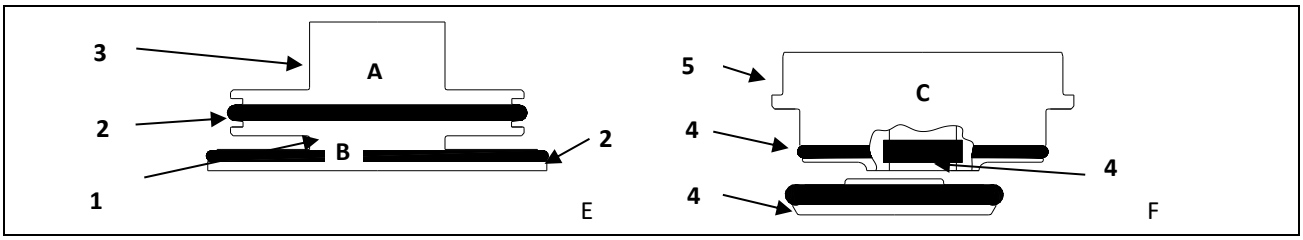
A) Remove the cap nut (2), turn lifting nut (1) against the actuator, add two further turns.

B) Remove the screws (3), remove the lifting nut, extract the upper part of the valve (4).



C) Remove the pressure spring and securing ring (1), remove spring pressure disc (2).

D) Remove screws (5), remove pneumatic drive (4), loosen inside screws (3) and remove flange (only with large nominal sizes DN 50, 65, 80), remove housing insert with valve rod.



E) Pull lifting piston (3) from piston guide (1), replace seals (2).

F) Screw on valve disk, replace seals (4) for housing insert (5) and valve disk.

8 Installation and Commissioning

Before you start with the installation and commissioning:

- Check the current system status (pressure, temperature, medium) against the technical data.
- Check the valve for external and internal damage.
- Check the valve body in the area of the valve disc for dirt.

ATTENTION

Note

To avoid risks to life and health, be sure to read the general safety instructions.

The function of the valve must always be checked

- after the work has been carried out,
- before the system is put into operation for the first time, and
- after each disassembly and assembly of the valve.

8.1 Installation Instructions

- Safety relief valves are installed in a vertical or horizontal position.
  For pressures of < 1 bar, the factory pressure setting also occurs in this installation position.
- Safety relief valves with a detachable connection are installed in the piping system free of tension.
- Safety relief valves for welding in must be disassembled first. For this purpose, the upper part of the valve is removed from the housing. The housing is then welded into the piping system free of tension.
- The welding work (TIG, forming gas) should only be carried out by qualified welders (EN 287-1).
- There must be sufficient free space around the installed valve for assembly and maintenance tasks later on.
- Shut-off devices that impair the function must not be installed on the upstream and downstream sides of the safety relief valve.
- The pipe cross-section of the supply and outflow pipes must at least correspond to that of the valve inlet and outlet.
- When the safety relief valves are installed horizontally, the exhaust manifold must face downward (draining).
- Exhausting must be performed without pressure. An exhaust line should empty into corresponding draining or collecting facilities without constituting a hazard.
- Exhaust lines for fluids must be routed downward and must empty into a receptacle without constituting a hazard (provide for complete draining).
- Exhaust lines for vapours and gases must be routed upward and must empty into a receptacle without constituting a hazard (provide for a condensate separator).
- If an extended supply line to the safety relief valve is used, the supply line must be self-draining.
- Pay attention to the direction of flow (marking arrow).

8.2 Assembly

NOTICE

Note

Before starting installation and commissioning:

– Check the current system status (pressure, temperature, medium).
– Check the valve for visible external and internal damage.
– Check the valve function through manual lifting.
– Check the valve housing inside for residues.

Proceed as follows to install the safety valve:

1. Prior to installation, clean all the dismounted individual parts of the safety valve.
2. Remove the rests of the screw locking fluid from the threads of the valve rod.
3. Mount the safety valve analogously in reverse order to the removal procedure.

9 Trouble shooting

DANGER

Danger - Dangers of electric current!

During assembly work, the power supply may malfunction.

– A regular inspection of the electrical components must be carried out by a qualified electrician.

- All faults must be checked and repaired immediately.
- The work required may only be carried out by qualified personnel in compliance with the safety instructions.

Fault	Possible cause	Measures
Safety relief valve does not open	• Valve seat jammed	• Lift valve manually and clean valve seat
	• Pressure not sufficient for opening.	• Check the pressure setting
	• Lifting/opening process is blocked	• Check the mobility of the valve rod (lift valve manually)
(pneumatic)	• Compressed air supply not sufficient.	• Compressed air with a pressure of at least 5 bar should be applied. • Check the compressed air hose.
	• Malfunction of solenoid valve or electrical control faulty.	• Check the solenoid valve.
Safety relief valve does not close	• Lifting nut is screwed against the housing	• Screw the lifting nut upwards
	• Solid body in the valve seat out of line.	• Clean valve housing and seat
	• Actuator spring blocked or broken	• The defective actuator may only be repaired by the manufacturer
(pneumatic)	• Pressure bleeding defective	• Check the solenoid valve
	• Sealing defective	• Change sealings

10 Maintenance

10.1 Maintenance

ATTENTION

Note

Inspection and maintenance work must be carried out by properly trained personnel only.

Use only original spare parts and original accessories to yield full functionality of the system/component. Damage resulting from the use of non-original parts and non-original accessories will void any warranty or liability on the part of Albert Handtmann Armaturenfabrik GmbH & Co. KG.

WARNING

Warning – general danger!

Pressurised liquid, steam or gas constitutes a danger at connection points.

– Check the current system status (pressure, temperature, medium).
– All maintenance work must always be performed while depressurised and cleaned.

CAUTION

Caution – functional impairment or material damage!

Jamming will impair the switching process of the valve.

– Safety relief valves must be lifted manually or pneumatically at periodical intervals.
– The pressure springs are designed for load changes > 1 month.
Based on experience this corresponds to an operating time of 10-15 years.
The condition of the pressure springs should be checked in this time.
– A function check must be performed.

10.2 Inspection and Maintenance Intervals

CAUTION

Caution – functional impairment or material damage!

If the valve is not checked or maintained at regular intervals, this can lead to malfunction or major functional disruption.

– Visual inspections must be carried out on an ongoing basis every 1-2 weeks.
>> Check electrical power supply and pneumatic supply
>> Check for leakage, check valve functions.
– To ensure that the safety relief valve is ready for operation and functionally reliable, it should be checked every six months as part of the general internal

maintenance procedure. The maintenance intervals depend on the operating conditions and must be determined by the plant operator.

– If, for maintenance purposes, protection devices have been attached or if supply and exhaust lines to the safety relief valve blocked, the protection devices must be disassembled and line blockages must be removed.
– **Ensure that a function check is always performed on the safety relief valve following maintenance work.**

10.3 Function Checks

Warning - general hazards!

Make sure that there aren't any persons in the hazardous area of the exhaust line. (Attach a warning sign if required).

Also refer to the chapter "Safety Instructions".

Pneumatic lifting

1. Apply compressed air to the pneumatic actuator to lift the safety valve.
   The safety valve must open (lifting motion) and blow off.
2. Relieve the pneumatic actuator of pressure.
   The test has been completed.

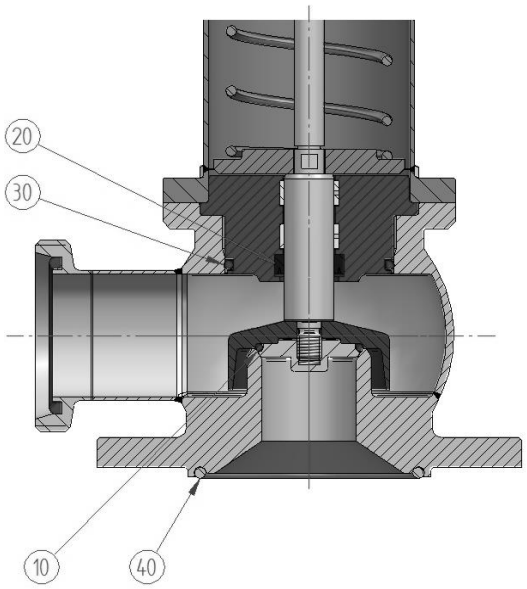
Pressurizing

1. Pressurize the piping system / tank with a gas pressure slightly above the set pressure of the safety valve.
   The safety valve must open (lifting motion) and blow off.
2. Reduce the gas pressure of the piping system / tank to the normal or operating pressure.
   The test has been completed.

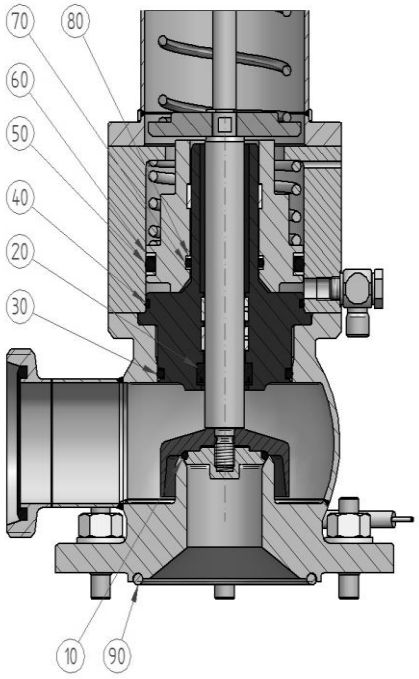
Manual lifting

1. First, turn the lifting nut clockwise against the actuator and then turn another 1-2 turns.
   This will lift the valve disk and the valve will blow off.
2. To close the valve, turn the lifting nut anticlockwise up to the cap nut (or to the proximity switch).
   The test has been completed.

10.4 Seals



Manual safety relief valve - Type 33501, 33502, 33503, 33521



Pneumatic safety relief valve - Type 33601, 33602, 33603, 33621

		Designation	Qty.
Manual safety relief valves **Type 33501, 33502, 33503, 33521**	10	O-ring for valve seat	1
	20	Internally lipped seal	1
	30	O-ring for housing	1
	40	O-ring for flange	1

		Designation	Qty.
Pneumatic safety relief valves **Type 33601, 33602, 33603, 33621**	10	O-ring for valve seat	1
	20	Internally lipped seal	1
	30	O-ring for housing	1
	40	O-ring for piston guide	1
	50	O-ring for piston	1
	60	Support rings	2
	70	O-ring for piston	1
	80	Support rings	2
	90	O-ring for flange	1

10.5 Spare parts

ATTENTION

Note

Use only manufacturer-approved spare parts.

Type	DN 15	DN 25	DN 40	DN 50	DN 65	DN 80
33501	033501.00015LE 033501.00015LV	033501.00025LE 033501.00025LV	033501.00040LE 033501.00040LV	033501.00050LE 033501.00050LV	033501.00065LE 033501.00065LV	033501.00080LE 033501.00080LV
33503	---	---	033503.00040LE 033503.00040LV	033503.00050LE 033503.00050LV	033503.00065LE 033503.00065LV	033503.00080LE 033503.00080LV

Type	DN 15	DN 25	DN 40	DN 50	DN 65	DN 80
33601	033601.00015LE 033601.00015LV	033601.00025LE 033601.00025LV	033601.00040LE 033601.00040LV	033601.00050LE 033601.00050LV	033601.00065LE 033601.00065LV	033601.00080LE 033601.00080LV
33603	---	---	033603.00040LE 033603.00040LV	033603.00050LE 033603.00050LV	033603.00065LE 033603.00065LV	033603.00080LE 033603.00080LV

Note: LE - EPDM
LV - FKM/FPM/Viton

11 Additional Equipment

11.1 Heating insets

Activation of the heating cartridge: ≤ 0°C Ambient temperature

Valve type	DN	Wiring diagram №	Heating capacity [W]	Amperage [A]	Heating insets			
					Quantity	Connection voltage [V]	Rated power [W]	Part №
33501, 33521 33601, 33621 33502, 33602	15 – 65 15 – 65 50	11 125E29	23	0.96	1[1)]	24	23	105373
33501, 33521 33601, 33621 33503 33603	80 80 40 – 80 40 – 80	11 125E31	46	1.92	2[1)]			

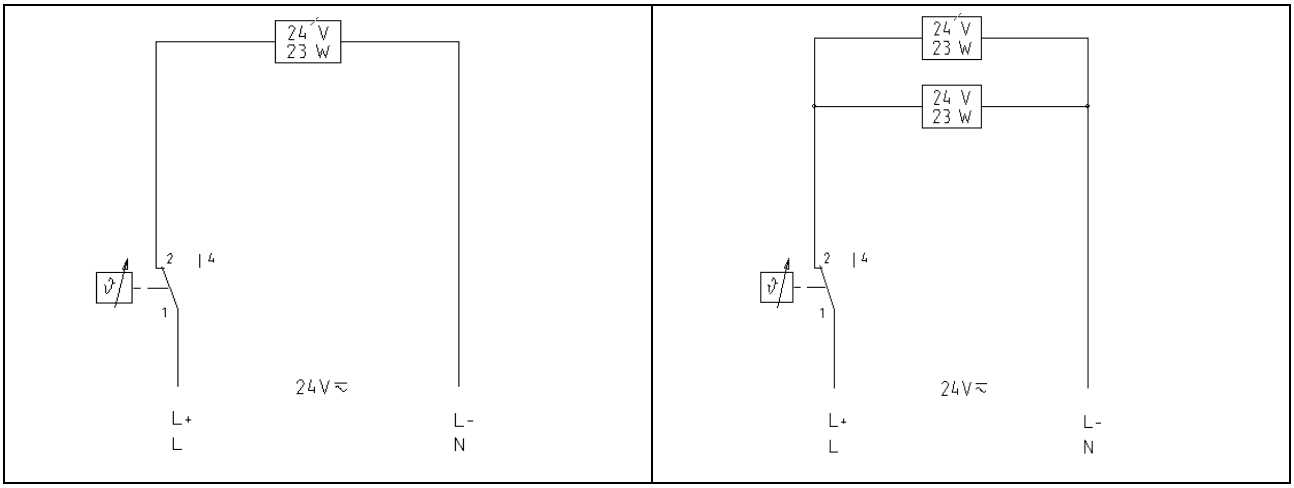


Fig. 2: 11 125E29 11 125E31

Symbols:

24 V 23 W — Heating inset (Ø 6,5 x 40) [1)]

Temperature control [2)]

[1)] The heating insets are accommodated in corresponding heating segments.

[2)] The thermostat, part no. 106838, cannot turn on / off the heaters directly at 24V DC (direct current). Therefore, the switching process needs to be decoupled technically.

12 Disposal

ATTENTION

Note

Dispose of the component/assembly/system in an environmentally friendly manner according to country-specific specifications.

Find out how to dispose of the individual materials.

Dispose of all resulting parts in such a way that damage to health and the environment is excluded.

If necessary, ask your environmental officer.

ATTENTION

Note

Dispose of the packaging materials in an environmentally safe manner according to country-specific specifications.

Packaging can consist of the following materials:

Wood/polyethylene foil (PE foil)/paper and or cardboard/plastic/steel strips.

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Ideas for the future.

Albert Handtmann Armaturenfabrik GmbH & Co. KG • Arthur-Handtmann-Straße 11 • 88400 Biberach an der Riss • Germany
Tel.: +49 7351 342-0 • Fax: +49 7351 342-4480 • sales.fittings@handtmann.de • www.handtmann.de