



OPERATING INSTRUCTIONS FOR SAFETY VALVES

SVUA (448), SVUB (446)

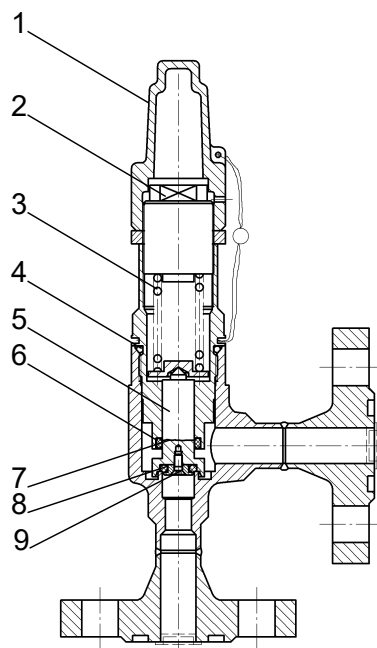
Table of contents

1 Overview of types	4
2 Technical characteristics	4
2.1 Pressure/temperature operating limits.....	4
2.2 Operating media	5
2.3 Certified coefficient of discharge	5
3 Safety instructions	5
3.1 General safety instructions	5
3.2 Conditions for safe use	6
4 Application	6
5 Functional description.....	6
6 Installation.....	6
7 Maintenance	7
7.1 Changing the O-ring S/PTFE ring	7
7.2 Replacing the compression spring	7
7.3 Checking and correcting the set pressure.....	7
8 Transport, storage and disposal.....	8
9 Warranty	8
10 Spare parts.....	8
11 Marking.....	9
12 Note on residual hazards in accordance with Pressure Equipment Directive 2014/68/EU	10

1 Overview of types

SVUA (type 448)	Seat seal using PTFE ring
SVUB (type 446)	Seat seal by means of elastomer O-ring with welding ends, flange ends, screwed ends, soldering ends.

The figure shows a valve with flange connections. However, the components listed are part of all safety valves of types 446 and 448, regardless of their connection type. Similarly, the mode of operation is the same for all safety valves of types 446 and 448, regardless of their connection type.



1 Cap	2 Adjustment screw
3 Compression spring	4 Bonnet gasket (O-ring D)
5 Stem	6 PTFE ring
7 Valve disc	8 Seat seal (O-ring S)
9 Valve disc screw (countersunk screw ISO 7046)	

2 Technical characteristics

Body material	Selection acc. to AD-2000, Series W
Stainless steel	X5CrNi18-10 1.4301 or equivalent
Flange material:	
Steel	P250GH 1.0460 P355NL1 1.0566 or equivalent
Stainless steel	X6CrNiTi18-10 1.4541 or equivalent

2.1 Pressure/temperature operating limits

Pressure/temperature operating limits:

PS: Max. allowable operating pressure in bar

TS: Permissible operating temperature in °C corresponding to the permissible operating pressures (PS)

PN: Nominal pressure rating

PN	DN		SVUA (type 448)					SVUB (type 446)				
		TS (MWT) [°C]	-60 ²⁾	-60 ¹⁾	-10	+50	+180	-50 ²⁾	-50 ¹⁾	-10	+50	+110
25	8 – 15	PS (MWP) [bar]	18.7	25	25	25	25	18.7	25	25	25	25
40	8 – 15		30	40	40	40	40	30	40	40	40	40
63	8 – 15		47.2	63	63	63	63	47.2	63	63	63	63

1) Load case I (low-temperature steel, stainless steel)

2) Load case II (acc. to AD2000-W10) (Steel)

Permissible ambient temperature range -35 °C to +55 °C

2.2 Operating media

The valves described here are suitable for operation with refrigerants in accordance with EN 378 Part 1, e.g. NH₃, R22, R134a, R290 (propane). R507 or mixtures with refrigeration machine oil as well as for neutral, gaseous and liquid media and glycol-based brines.

2.3 Certified coefficient of discharge

Certified coefficient of discharge		DN 8/10	DN 10/10	DN 15/15, DN 15/20 DN 15/25, DN 20/20 DN 20/25, DN 25/25
For steam / gas	K _{dr} (α _w) [-]	0.57	0.57	0.57
For liquid	K _{dr} (α _w) [-]	-	-	-
Narrowest flow cross-section	[mm ²]	78	78	78
Set pressure	p _{set} [bar]	5–63	5–63	5–63

For pressure ranges of the compression springs, see spare parts list.

Installation position: vertical in accordance with AD2000 data sheet A2 and horizontal.

External leakage: <15g refrigerant per year, seat leakage: <5g refrigerant per year.

3 Safety instructions

3.1 General safety instructions

NOTICE

Danger from improper handling!

Risk of property damage.

- ▶ Do not install valves with transport or storage damage.
- ▶ Valves must be free of axial forces, bending moments, and torsional moments and must not serve as fixed points for pipework.
- ▶ In the event of oxy-fuel welding or brazing, the flame must not touch the valve.
- ▶ Keep the interior of the valves free of contamination.
- ▶ Opening or closing the valves with a valve wheel wrench or other lever-extending objects is not permissible.
- ▶ Only dismantle valves when the pipework is depressurised, evacuated, and sufficiently ventilated.

3.2 Conditions for safe use

NOTICE

- ▶ The safety devices must be permanently and conductively connected to the overall system; the overall system can be earthed individually or integrated into the building's equipotential bonding. The equipotential bonding must be checked by the operator at regular intervals.
- ▶ Outlets to safety devices should not be opposite other branches.
- ▶ Protect safety valves against harmful external influences (e.g. weather conditions) that may inhibit function.
- ▶ Permanently protect safety valves made of unalloyed body parts against corrosion.
- ▶ Avoid transmission of vibrations to the safety valve.
- ▶ Discharge lines must be dimensioned and routed, taking into account local operating conditions, so that static and dynamic reaction forces as well as thermal stresses can be safely absorbed. At safety devices where the escape of a flammable medium creates direct or indirect hazards for persons or ignition sources in the vicinity, suitable protective measures must be taken (e.g. discharging into a safe environment).
- ▶ The recommended explosion limitation measures or the recommendations for wearing personal protective equipment within the meaning of the product safety data sheets must be strictly observed and complied with when loosening screw connections or relaxing the pressure spring.
- ▶ Repair measures on the safety devices may only be carried out by the device manufacturer.
- ▶ Replacement of the safety device may only be carried out when the system and its lines are in a safe, depressurised state. For flammable gases such as propane, butane, methane, etc., low-sparking tools must be used for this purpose.
- ▶ When using ammonia as a refrigerant, special safety measures must be observed (see also safety data sheet).
- ▶ After installation of the safety valve, a leakage test must be carried out by a competent person. The response pressure must be checked at regular intervals using the setting certificate.

4 Application

AWP standard safety valves are intended for use as discharge valves in refrigerant circuits of industrial refrigeration systems. They are safety devices for protecting the refrigeration system or its components against impermissible pressure stress (see also DIN 8975 Part 7). They comply with the equipment regulations of the Technical Inspection Associations (TÜV).

5 Functional description

AWP normal safety valves begin to open as soon as the response pressure is reached. They open within a 10% pressure increase up to the design-limited stroke. If the pressure falls again, they begin to close as soon as the set response pressure is reached and close fully within a pressure reduction of 10% below the response pressure. Valves of types 446 and 448 operate independently of back pressure (opening pressure = set pressure [pset]). To guarantee the Kdr value, the back pressure [abs] must not exceed 25% of the response pressure [abs].

6 Installation

1. Clean pipework and system components before installation.
NOTICE! The deviation from parallelism or perpendicularity of the welding ends or flange facings must not exceed 1°. Connecting flanges must be axially aligned. Components with transport or storage damage must not be installed. After removing the pipe plugs, the component can be welded in or installed. Observe the direction of flow (see arrow on the nameplate).
2. **NOTICE! When using modern welding processes (e.g. TIG, CO2 arc welding), do not dismantle weld-in valves.**
3. Tighten the mounting screws and nuts in a crisscross pattern and evenly.
4. When blowing off into the atmosphere, keep the discharge pipes as short as possible. They must not have any sharp bends. The bend radius must be at least 3 x OD (outside pipe diameter).

- When filling the oil or water seal, ensure that no oil or water enters the safety valves. **NOTICE! Shut-off devices before and after the safety valve are prohibited, with the exception of change-over valves (for exceptions, see DIN 8975, Part 7, Point 8).**
- Provide sufficient space on the bonnet / hood side for the disassembly of the bonnet / hood (approx. 50 mm).

7 Maintenance

AWP safety valves operate maintenance-free. If functional defects occur, repair is possible. During the warranty period, repairs may only be carried out by AWP or, with their consent, by the system operator's trained maintenance personnel. AWP recommends checking safety valves every 5 years. After each response (accident case), the set pressure [pset] and the tightness at the seat must be checked. **NOTICE! Maintenance on valves only when installed.**

7.1 Changing the O-ring S/PTFE ring

- Loosen the bonnet anti-clockwise. Use a wrench with size 30 for this. **NOTICE! The setting of the compression spring is not affected. Do not break the seal! Watch out for any residual refrigerant escaping. Leave the bonnet loose in the body until pressure is fully equalised. Only unscrew it after this.**
- Unscrew the bonnet and remove the internal parts attached to it.
- Remove O-ring D and stem from the body.
- Unscrew the valve disc screw (countersunk screw M3x8, ISO 7046), remove and replace O-ring S.
- Remove the PTFE ring with a suitable tool (e.g. screwdriver) and carefully and evenly press in the new ring with your thumb.
- Clean all individual parts before final assembly. Then pull a new O-ring D onto the bonnet and screw in the bonnet (wrench size: 30, tightening torque: 70 Nm)

7.2 Replacing the compression spring

- Remove the lead seal, unscrew the cap from the bonnet and loosen the clamping ring by turning it anti-clockwise.
- Hold the adjustment screw with an open-ended spanner. See the following table for the wrench sizes:

	Cap	Clamping ring	Adjustment screw
Nominal size	DN 8-15	DN 8-15	DN 8-15
Wrench size	19	30	19

- Unscrew the adjustment screw anti-clockwise and replace the compression spring according to the spare parts list.
- Clean all individual parts before assembly. **NOTICE! Re-adjust the set pressure [pset] after every compression spring replacement.** A settling time of 48 hours must be ensured between assembly, during which the compression spring is pre-tensioned, and the adjustment of the response pressure. The setting of the response pressure [pset], the lead sealing of the cap and the issuing of a setting certificate must be carried out by a TÜV expert.

7.3 Checking and correcting the set pressure

- Remove the lead seal, unscrew the cap from the bonnet and loosen the clamping ring by turning it anti-clockwise. Hold the adjustment screw with an open-ended spanner. See the table for the wrench sizes:

	Cap	Clamping ring	Adjustment screw
Nominal size	DN 8-15	DN 8-15	DN 8-15
Wrench size	19	30	19

2. Increase the set pressure by turning the adjusting screw clockwise, and decrease the set pressure by turning it anti-clockwise. **NOTICE! Observe the set pressure range of the compression springs (see spare parts list).**
3. Check the response pressure by loading the valve from the valve inlet (DN1) with compressed air or a permissible operating medium at the level of the response pressure. The valve opens. Trigger the valve three times. (Set pressure tolerance [pset] = +3%, -1%)
4. Then check the reseating pressure by lowering the pressure. When a pressure 10% below the response pressure is reached, the valve must be fully closed.

The setting of the response pressure [pset], the lead sealing of the cap and the issuing of a setting certificate must be carried out by a TÜV expert.

8 Transport, storage and disposal

AWP components are transported protected against impact and covered with foil.

- Storage must take place in dry rooms.
- Ensure that the connection ports are sealed intact.
- Contamination of any kind must be kept away from the interior.
- The external surfaces are provided with a corrosion protection coating for dry storage at room temperature, which is effective for at least 1 year.
- The corrosion protection coating CELEROL® Reaktionsgrund 918 is a good adhesion promoter for 1- and 2-component top coats.
- Dismantle for disposal.
- Collect lubricants during dismantling. The materials must be separated from one another and disposed of in accordance with local regulations.

9 Warranty

Unless agreed otherwise, the statutory warranty provisions apply. For further information, please also refer to our General Terms and Conditions, available on our website awpvalves.com.

10 Spare parts

The seal kits listed below contain the bonnet gasket (O-ring D), seat seal (O-ring S) and the spring-energised PTFE ring. In addition to seals, the repair kits also contain the stem, seat washer and valve disc screw.

Type	Nominal size	Seal kit	Repair kit	Cap
446	DN 8 – 15	44600.10.5/00019	44600.10.5/00029	36302.10.3180001
448	DN 8 – 15 (pset <36 bar)	44800.10.5/00019	44800.10.5/00029	36302.10.3180001
448	DN 8 – 15 (pset ≥ 36 bar)	44836.10.5/00019	44836.10.5/00029	36302.10.3180001

The compression springs listed below are suitable for both type 446 (SVUB) safety valves and type 448 (SVUA) safety valves for the nominal sizes of DN 8 bis DN 15.

Compression spring	Pressure range
562004	5 – <8

Compression spring	Pressure range
562020	8 – <12
562021	12 – <20
562023	20 – <28
562065	28 – <36
562066	36 – <45
44551.07.5045633	45 – 63

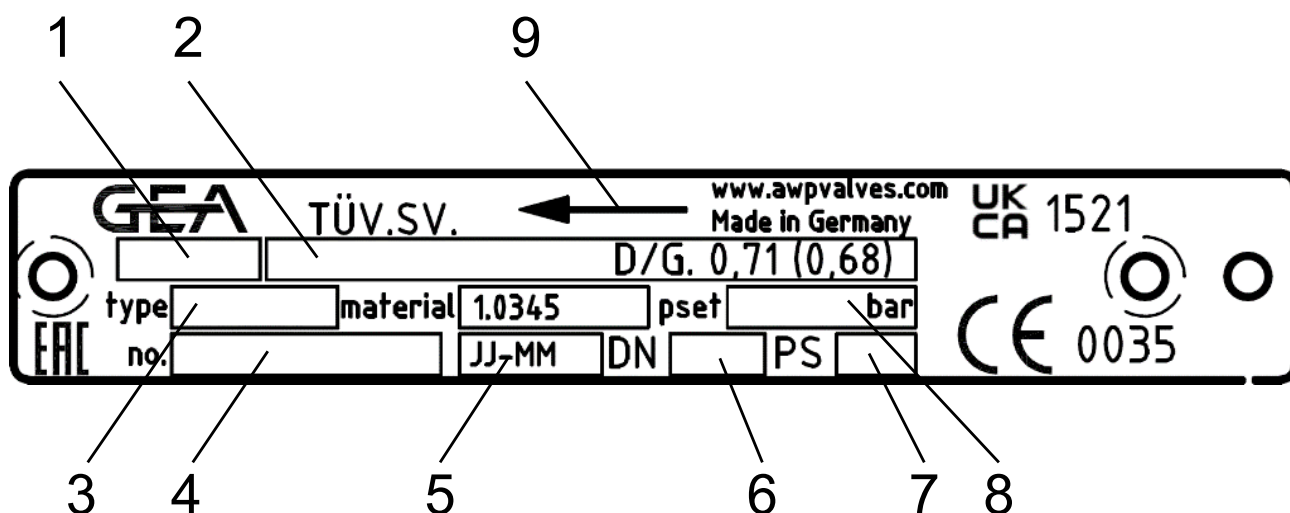
The spare part numbers mentioned apply to the standard version of the valves. For valves in a different design (other body and / or O-ring material), different item numbers may apply.

In case of doubt, please contact our Sales Support either via our website awpvalves.com/contact or by email to info@awpvalves.com. The most reliable method to correctly identify the required spare part is to send a photo of the nameplate on which the serial number of the valve is clearly visible.

11 Marking

Nameplate

The marking of AWP safety valves is carried out in accordance with Pressure Equipment Directive 2014/68/EU.



1 Type designation	2 Component identification (breakdown below)
3 Type number	4 Serial number
5 Manufacturing time (YY-MM)	6 Nominal size (DN)
7 Pressure rating (PS)	8 Set pressure
9 Flow direction	

Component marking

TÜV.SV.xx-xxx.xx.D/G/F.0,xx.x

1 2 3 4 5 6 7

1	SV = safety valve
2	Year of component test / retest
3	Component test number
4	Narrowest flow diameter upstream of the valve seat [mm]
5	Applicable for: D = steam, G = gas, F = liquids
6	Certified coefficient of discharge (α_w)
7	Set pressure pset [bar]

12 Note on residual hazards in accordance with Pressure Equipment Directive 2014/68/EU

Residual risks that cannot be avoided by the manufacturer exist due to:

NOTICE

- ▶ Do not loosen bonnets (without authorisation) during operation.
- ▶ Do not incorrectly assemble flange connections (inlet and outlet flanges, flanged bonnets).
- ▶ Contamination in the operating medium or improper handling of internal components can lead to damage to the seat seal.
- ▶ Non-compliance with the operating limits and manufacturer's regulations according to these operating instructions.

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