



OPERATING INSTRUCTIONS FOR SAFETY VALVES

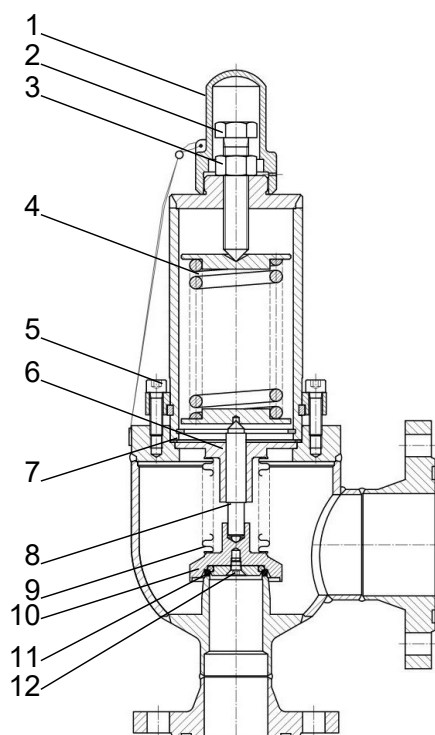
SVUA P (444), SVUB P (442)

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1 Overview of types

SVUA P (type 444)	Seat seal using PTFE ring
SVUB P (type 442)	Seat seal by means of elastomer O-ring



1 Cap	2 Adjustment screw
3 Lock nut	4 Compression spring
5 Bonnet bolts (socket head cap screws ISO 4762)	6 Stem guide
7 Bonnet gasket (flat gasket K)	8 Stem
9 Bellows	10 Valve disc
11 Seat seal (O-ring S)	12 Valve disc screw (countersunk screw ISO 7046)

2 Technical characteristics

Body material	Selection acc. to AD-2000, Series W
Steel (St)	P235GH, S235JR, S355J2

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

When using screws of property class 8.8.

PS	DN		SVUA P (type 444)						SVUB P (type 442)					
		TS (MWT)	-60	-40	-25	-10	+50	+180	-50	-40	-25	-10	+50	+110

PS	DN		SVUA P (type 444)						SVUB P (type 442)					
		[°C]												
25	50/80	PS (MWP)	6.25	12.5	18.75	25	25	25	6.25	12.5	18.75	25	25	25
28	50/80	[bar]	7	14	21	28	28	28	7	14	21	28	28	28
25	65/100		6.25	12.5	18.75	25	25	25	6.25	12.5	18.75	25	25	25
28	65/100		7	14	21	28	28	28	7	14	21	28	28	28

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 50/80, DN 65/80, DN 80/80	DN 65/100, DN 80/100, DN 100/100
For steam / gas	Kdr (α_w) [-]	0.71	0.68
For liquid	Kdr (α_w) [-]	-	-
Narrowest flow cross-section	[mm ²]	1385	2942
Set pressure	pset [bar]	8–28	9–28

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 full-lift safety valves are suitable for use in refrigerant circuits for industrial refrigeration systems as discharge or overflow valves. Full-lift safety valves are safety devices to protect the refrigeration system or its components against impermissible pressure stress (see also EN 378 Part 2). They comply with the AD2000 code.

5 Functional description

AWP full-lift safety valves begin to open as soon as the response pressure is reached. They open within a 5% pressure increase up to the design-limited lift. 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 442 and 444 are equipped with a back-pressure-compensating metal bellows, i.e. the valves operate independently of back pressure (response 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).

5. 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).**
6. Provide sufficient space on the bonnet / hood side for the disassembly of the bonnet / hood. For valves with nominal diameter DN 50/80 approx. 130 mm, for valves with nominal diameter DN 65/100 approx. 230 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/sealing unit/stem

1. Remove the lead seal and seal wire.
2. Loosen bonnet bolts (socket head cap screws M10x35 [ISO 4762]). Use a wrench with size 8 for this. **NOTICE! This does not affect the compression spring setting.**
3. Remove bonnet bolts, remove hood.
4. Remove the flat gasket K, stem and sealing unit from the body.
5. Unscrew the valve disc screw M8x12 (countersunk screw ISO 7046) and remove and replace O-ring S. Screw in the countersunk screw and secure it, e.g. with thread-locking compound. **NOTICE! In the event of damage to the sealing unit or stem guide, they are always replaced together with a new stem.**
6. Clean the individual parts before final assembly.
7. Lightly oil the stem (e.g. with ANTICORIT 5F).
8. Check the presence and correct seating of the ball in the centring points on the stem and valve disc. If necessary, stick the ball into the centring of the stem using low-temperature grease.
9. Then insert a new flat gasket K and fit the hood such that the tip of the stem engages in the centring point on the spring plate. Pull the stem slightly out of the stem guide if necessary to allow for secure centring.
10. Tighten the bonnet bolts (socket head cap screws M10x35 [ISO 4762]) evenly and crosswise. Wrench size: 8, tightening torque: 49 Nm. **NOTICE! After each disassembly of the internal parts, install a new O-ring S. Check the set pressure [pset] after every parts replacement.** A dwell time of 48 hours in the assembled state must be ensured before checking. The setting of the response pressure [pset], the lead sealing of the adjustment screw and the issuing of a setting certificate must be carried out by a TÜV expert.

7.2 Replacing the compression spring

1. Remove the lead seal and seal wire.
2. Loosen bonnet bolts (socket head cap screws M10x35 [ISO 4762]). Use a wrench with size 8 for this. **NOTICE! Leave the sealing unit or stem guide and stem untouched.**
3. Remove bonnet bolts, remove hood.
4. Remove flat gasket K from the body.
5. Unscrew the cap from the bonnet using a wrench size 46, loosen lock nut M20 (EN 4032) anti-clockwise using a wrench size 30 and unscrew adjusting screw M20x110 (ISO 4017) using a wrench size 30.
6. Remove retaining ring with suitable assembly pliers DIN 5256 ZGJ. Dimensions of the retaining ring: DN 50/80 = 92x3, DN 65/100 = 120x4

7. Insert new compression spring according to spare parts list, lightly oiled. Before final assembly, clean individual parts of the bonnet and lightly oil the bonnet in the area of the bonnet gasket.
8. Then insert a new flat gasket K and fit the hood such that the tip of the stem engages in the centring point on the spring plate. Pull the stem slightly out of the stem guide if necessary to allow for secure centring. The bonnet bolts (socket head cap screws M10x35 [ISO 4762]) must be tightened evenly and crosswise. Wrench size: 8, tightening torque: 49 Nm. **NOTICE! Re-adjust the set pressure [pset] after every compression spring replacement.** A settling time of 48 hours in the assembled state must be ensured before checking. The adjustment of the set pressure [pset], the sealing of the adjusting screw and the issuance of a setting certificate must be carried out by an expert from the Technical Inspection Associations (TÜV).

7.3 Checking and correcting the set pressure

1. Remove the lead seal and seal wire.
2. Unscrew the cap from the bonnet using a wrench size 46 and loosen lock nut M20 (EN 4032) anti-clockwise using a wrench size 30.
3. Increase the set pressure by turning the adjusting screw clockwise, and decrease the set pressure by turning it anti-clockwise (wrench size: 30). **NOTICE! Observe the set pressure range of the compression springs.**
4. 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%)

The setting of the response pressure [pset], the lead sealing of the adjustment screw 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 (flat gasket K) and the seat seal (O-ring S). In addition to all seals, the repair kits also contain the stem, the ball and the complete sealing unit with bellows, seat washer and valve disc screw, as well as the bonnet bolts.

Type	Nominal size	Seal kit	Repair kit	Cap
442	DN 50/80	44200.15.5/00019	44200.15.5/00029	16402.15.3180001
	DN 65/100	44200.17.5/00019	44200.17.5/00029	16402.15.3180001

Type	Nominal size	Seal kit	Repair kit	Cap
444	DN 50/80	44400.15.5/00019	44400.15.5/00029	16402.15.3180001
	DN 65/100	44400.17.5/00019	44400.17.5/00029	16402.15.3180001

The compression springs listed below are suitable for both type 442 (SVUB) safety valves and type 444 (SVUA) safety valves.

Nominal size	Compression spring	Pressure range
DN 50/80	44331.15.5008093	8 – <9
	44331.15.5009103	9 – <10
	44331.15.5011123	11 – <12
	44331.15.5013153	13 – <15
	44331.15.5016183	16 – <18
	44331.15.5018223	18 – <22
	44331.15.5022253	22 – <25
DN 65/100	44331.17.5009103	9 – <10
	44331.17.5010123	10 – <12
	44331.17.5012143	12 – <14
	44331.17.5014163	14 – <16
	44331.17.5016173	16 – <17
	44331.17.5017203	17 – <20
	44331.17.5020213	20 – <21
	44331.17.5021253	21 – <25

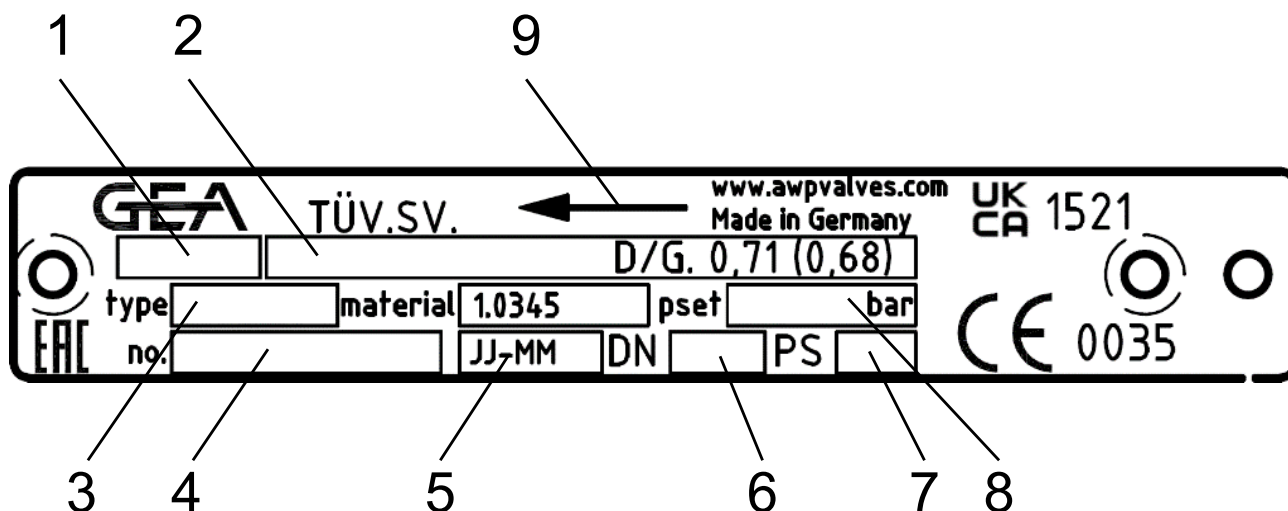
The spare part numbers mentioned apply to the standard version of the valves. For valves in a different design (other body and / or O-ring material), different item numbers may apply.

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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