Operating Instructions
in compliance with
Pressure Equipment Directive 2014/68/EU

FAS Cast Check Valve

Please read these operating instructions carefully to ensure a safe operation and keep the same for further use.

Contents

Safety

The cast check valve, hereinafter referred to as valve, is designed for use in refrigeration/air conditioning systems referred to as systems hereinafter. It may only be put into service if installed into the system unchanged in accordance with these instructions and as a whole is compliance with the statutory provisions.

The valve incorporates state-of-the-art technology and has been built according to the applicable regulations. Great valve has been set upon the user's safety.

These operating instructions are integral part of the contract and shall be kept throughout the entire life of the valve.

Authorized personnel

Only trained and instructed personnel shall be allowed to do any work on the valve and system. As regards the qualification and expertise of the personnel the applicable rules and guidelines shall apply.

Residual hazards

Unavoidable residual hazards may emanate from the valve. Every person working on this device shall therefore carefully read these instructions.

To be observed are for example:
- the generally accepted safety regulations,
- EC directives,
- Norms (e.g. EN 378) and all national provisions.

Symbols used for safety information

DANGER!
Instructions on preventing imminent serious danger to persons.
Imminent most serious injuries or death as a possible consequence.
Any non-observance may lead to an immediate failure of the valve.

WARNING!
Instructions on preventing potential serious danger to persons.
Avoidable serious to very serious injuries or death as a possible consequence.
Any non-observance can cause the valve to fail.

CAUTION!
Instructions on preventing a minor danger to persons.
Minor, reversible injuries cannot be excluded.
Any non-observance may lead to a medium-term failure of the valve.

ATTENTION!
Instructions on preventing potential damage to equipment.
Minor, reversible injuries cannot be excluded.
Any non-observance may lead to a medium-term failure of the valve.

General safety information

These operating instructions are based on the safety requirements of DIN EN 378-2 and DIN EN 12284.

Instructions to prevent hazards in all cycles of service life:

DANGER!
Burst hazard if operated beyond the technical parameters.
Most serious injuries and immediate system failure possible.
Observe the technical parameters.

WARNING!
Damage due to improper handling.
Serious injuries and system failure possible.
Never use valves as transport, lifting or lashing point.

WARNING!
Any non-observance of the instructions may cause the valve to fail.
Avoidable serious to very serious injuries or death possible.
Installation, operation and maintenance by authorized trained personnel only.

WARNING!
Risk of service fluid to be released.
Depending on the kind of service fluid serious to very serious injuries or death possible.
Wear personal protective equipment (e.g. respirators, gloves).

CAUTION!
Very cold or very hot surface temperatures possible.
Frostbites/burns possible.
Wear personal protective equipment (e.g. respirators, gloves).

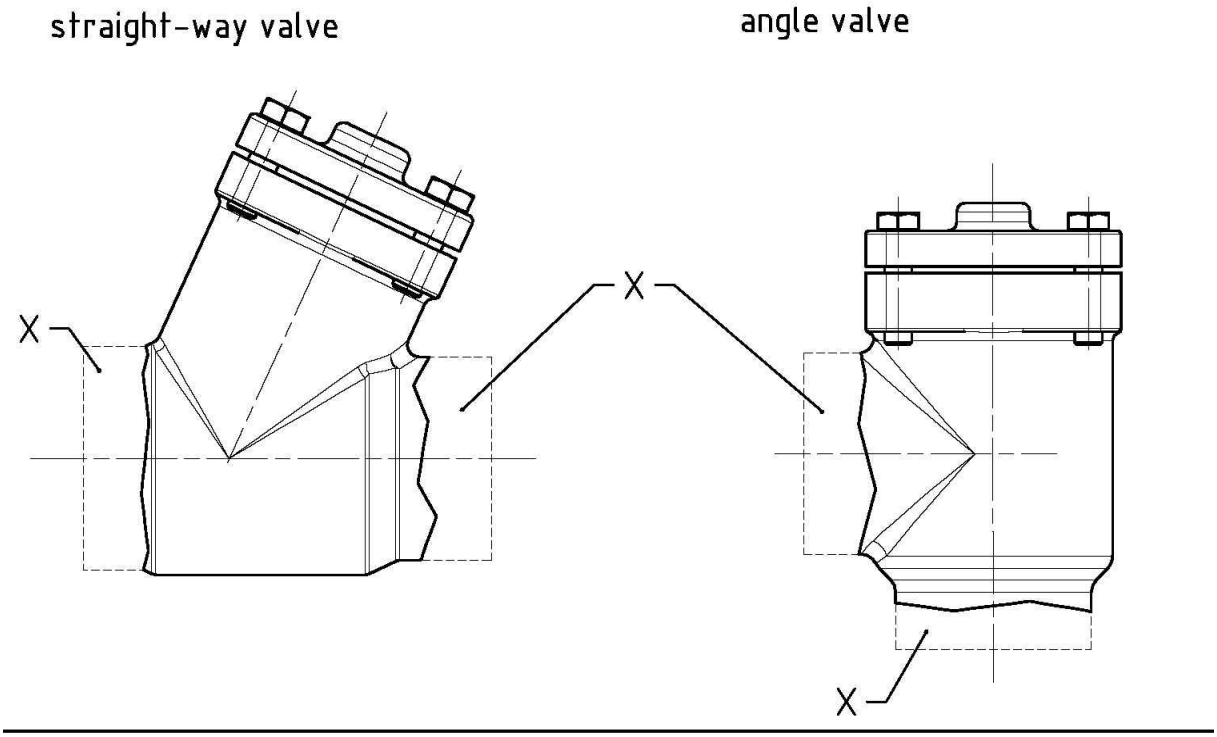
Other information

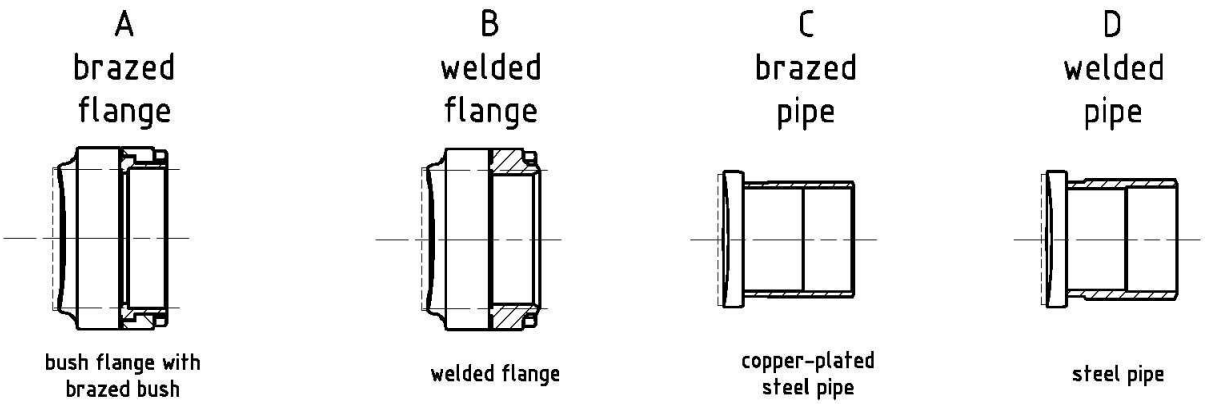
The information contained herein represents to the best of our belief our knowledge at the time when these instructions were prepared. It shall serve as code of practice to ensure a safe handling of the valve in transport, storage, installation, commissioning, maintenance and dismantling/disposal. A final decision as to whether the valve suits the purpose is to be taken by the user. This information shall not be deemed a warranty of quality.

Any modification of the valve and operation under other than the prescribed parameters shall not be allowed and will result in the loss of the conformity declaration and all liability claims.

Description of valve

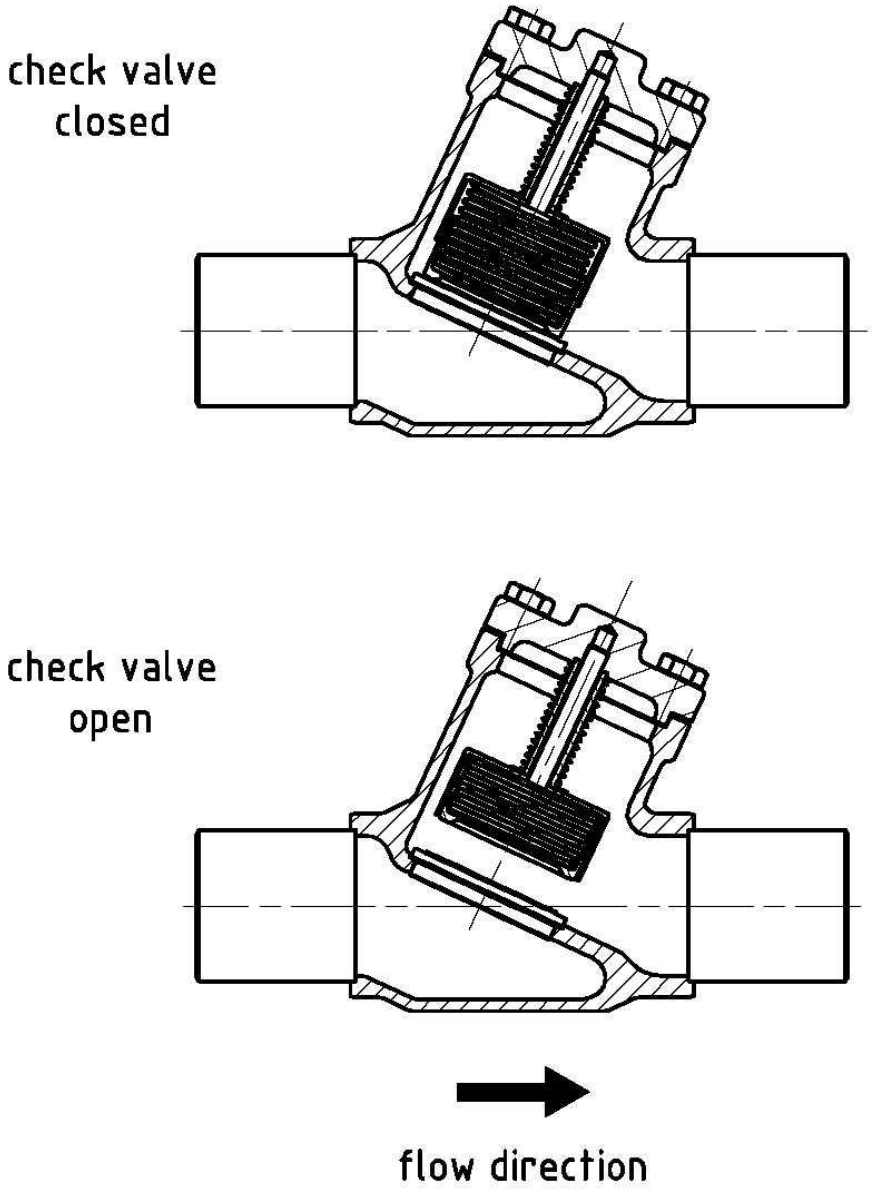
Construction types (combination options of connections)





Installation dimensions can be gathered from the AWA product catalogue and technical documents respectively.
The connecting options A through D are explained in more detail in "Design features".

Operating principle



Product description

Cast check valves are designed for use in refrigeration and air-conditioning systems and prevent the flow from returning. The valves are provided with double damping and can be used both on the high-pressure and low-pressure side.

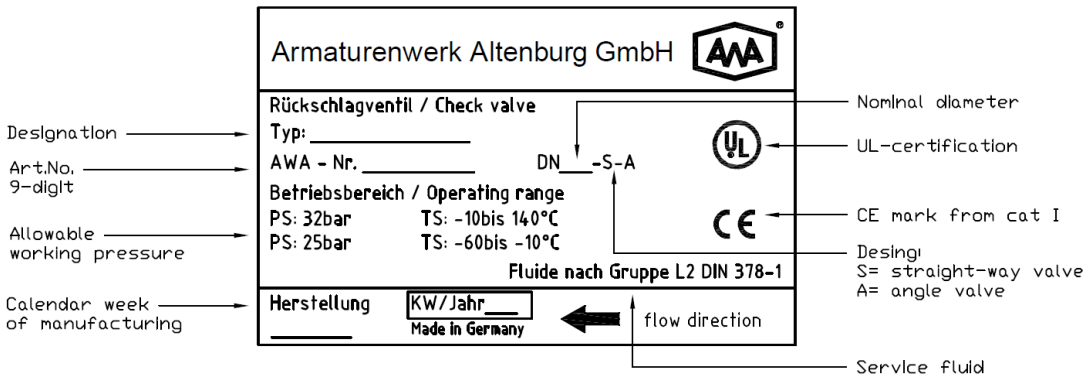
The arrow indicates the flow direction.

The low spring constant (approx.0.04bar) provides for high response sensitivity in closing and opening direction.

The valve is in compliance with DIN EN 12284:2003 and Pressure Equipment Directive 2014/68/EU.

Identification

The valve is identified by a name plate in accordance with DIN EN 12284 by name plate:



Technical parameters

Pressure/Temperature allocation:
Depending on the data given in the technical documentation.

Service fluids:
Refrigerants according to DIN EN 378-1 (2016), PED fluid group 1 and 2 and associated refrigerator oils according to DIN 51503-1.

Opening pressure differential:
As standard the opening pressure differential is about 0.04 bar. Other opening pressure differentials are possible on request.

Leakage test:
according to DIN 8964-3 (<4.1 g/a R-134a at 10bar)

Strength test:
according to DIN EN 12284 at 1.43-fold PS

Cleanliness of interior:
according to DIN 8964-1

Classification pursuant to Pressure Equipment Directive 2014/68/EU:
See information given in the technical documentation.
From category I components get the CE mark (and number of notified body if required).

Approval in conformity with UL 207:
File No. E 233523 for USA and Canada

Design features

- The material of the valve components and the manufacturing method are selected in conformity with the EN12284:2003 and Pressure Equipment Directive 2014/68/EU thus guaranteeing the reliability for the operating range indicated.

- The use of heat-resistant materials and connecting elements obviates the need of dismantling the valves when the system is installed (soldering and welding).

- The check valves come with metal sealing. The valve seat and piston are precision machined and thus designed for a long service life. The cylinder has got relief holes being shut by a disk/spring unit (additional damping).

- The interior parts of the valve are made of steel and stainless steel.

- The use for overflow applications with other than the given opening pressure differential is possible on request.

- Types of connection

  Connection "A" – Detachable brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1:2010 for Ø12 to Ø108mm. Inch-type pipes available on request. The flange connection is a tongue-and-groove system with fibre gasket.

  Connection "B"– Detachable welded connection for use of steel tube dimensions according to DIN EN 10220:2003-03. The flange connection is a tongue-and-groove system with fibre gasket.

  Connection "C" – Brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1:2010 for Ø12 to Ø108mm. Inch-type pipes available on request.

  Connection "D" –Welded connection for steel tube dimensions according to DIN EN 10220:2003-03.

- The valve comes with a 2-component base coat, grey. If transported and stored in dry condition this coat protects the valve against corrosion.

- Because of the service-friendly design spare parts (e.g. shut-off insert, gaskets, flanges) can be purchased separately.

Transport and Storage

Transport the valve by closed means of transport in the original packing protected against weather influences and store it in dry rooms.

Mounting

Principles

- The valve shall be arranged in the system so that it can be properly operated and maintained.

DANGER!
Damage of valve possible.
Serious injuries and system failure possible during operation.
Valve to be installed without additional loads (forces, vibrations). Cast manual shut-off valves must not be used as fixing points of pipes.

- In particular provisions shall be made for the nominal size-depedent removal space for the replacement of the cover flange assembly (cover flange, cylinder, spring and piston) according to the table below:

Nominal size	Cover flange assembly
DN 15	> 40 mm
DN 20/25	> 60 mm
DN 32/40	> 75 mm
DN 50	> 91 mm
DN 65	> 100 mm
DN 80	> 145 mm
DN 100	> 175 mm

- The valve must be integrated into the pipe on both sides. An outlet side open to the outside is not permitted!

- Only authorized personnel shall be allowed to mount the valve.

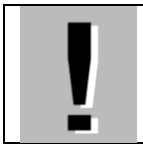
DANGER!
Any non-observance of these instructions may cause the valve/system to fail.
Most serious injuries and death possible.
Mounting and operation by personnel trained in refrigeration systems only.

- No modifications of the valve permitted. If modifications become necessary, they have to be agreed with the manufacturer prior to mounting

WARNING!
Product features may change.
Avoidable serious to very serious injuries or death possible.
Any modification of the valve has to be agreed with manufacturer in advance.

Mounting preparation

- When supplied the valve is closed and may come with additional protective means for transport. To avoid corrosion inside the valve and contamination, such protective means should be removed shortly before mounting.



ATTENTION!
Possible damage of interior components.
Malfunction due to oxidation/contamination of internal components.
Remove the transport protection shortly before mounting.

- Connections A & B only: Remove connecting parts (flange bolts, connecting flange, gasket). Safekeep these components for future use.

Connecting the pipe

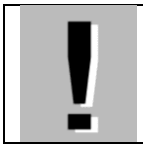
1. The pipe must be of a dimension that fits the valve. If not, use adapters.

2. Prepare the system connections so (bare metal and free from grease) that a high-quality joint can be achieved. Make sure there is no mechanical restraint.

3. With due regard to the flow direction scavenge the relevant pipe sections with shielding gas during brazing and welding. A cooling of the valve body is recommended for the C-type connection. Then, cool down the system connection in the air.

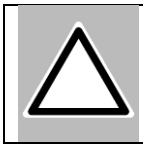
WARNING!
Damage of valve due to excessive heating possible.
Serious injuries and system failure during operation possible.
Never heat up system connection above 700°C.
Direct the flame away from valve.

WARNING!
Damage of valve (e.g. cracks) due to rapid cooling possible.
Serious injuries and system failure during operation possible. .
Allow the joint to cool down in the air.



ATTENTION!
Damage of internal components possible.
Malfunction due to oxidation / contamination of internal components.
Scavenge with shielding gas while doing the joining.

4. Clean the pipe connections rendered. Flux material residues are very corrosive and may cause long-term damage.



CAUTION!
Risk of increased corrosion and component damage.
Serious injuries and system failure possible during operation.
Properly clean the joint after joining.

5. Connections A & B only: Put together the connecting parts and pipes. Ensure a mechanically unrestrained mounting. Tighten the connecting flanges in a criss-cross manner in min. 2 stages applying the torques indicated (see chapter "Operation").

WARNING!
Any excessive torque or non-observance of the mounting order may cause failures.
Serious injuries and system failures possible during operation.
Observe the torques.

6. Depending on which condition is intended fully open or close the spindle.
Then, tightly screw on the protective spindle cap. If a subassembly is to be mounted, shut the pipe ends using dust caps until further use.

7. Depending on the nominal diameter the following torques apply to screws A2-70 (Nm):

Nominal size	Bolts Connecting flange	Bolts Cover flange
DN 15	M12 50 +10	M6 6 +2
DN 20/25	M12 50 +10	M8 15 +5
DN 32/40	M12 50 +10	M10 30 +5
DN 50	M12 50 +10	M12 55 +5
DN 65	M16 120+20	M16 120 +10
DN 80	M16 120+20	M16 120 +10

Commissioning

Principles

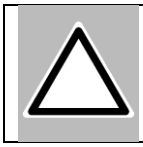
- The valve has already been tested for leakage and strength by the manufacturer.
- The valve and the system into which it is installed, may only be commissioned if they have been checked, with due regard to the intended mode of operation, for proper condition as to assembly, installation, set-up conditions and safe functioning.
- After mounting and initial start-up according to DIN EN 378-2:2012 the end user should check again for leakage and strength and an effective corrosion protection

Steps of commissioning

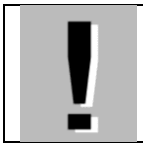
1. Check the system for resistance to pressure by suitable means (e.g. helium, dry nitrogen). .

DANGER!
Danger of bursting.
Most serious injuries possible.
The test pressure must not exceed the maximum allowable pressure (PS).
Strictly observe the safety information (e.g. DIN EN 378).

2. It is absolutely necessary to apply an anticorrosive coating that suits the operating conditions because the valve comes with a temporary corrosion protection only. Make sure that the name plate/fabrication data remains legible.



CAUTION!
Delayed failure due to corrosion possible.
Serious injuries and failure of system during operation possible.
Apply a suitable anticorrosive coat.



ATTENTION!
Loss of product conformity due to removal of name plate.
Loss of warranty claims.
Name plate shall remain legible.

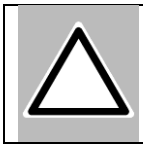
3. Evacuating and filling the system with refrigerant.

DANGER!
Danger of bursting if operated beyond the technical parameters.
Most serious injuries possible.
Observe the technical parameters of the valve.
Make sure the system is not filled with an excessive amount of refrigerant.

4. Depending on the intended operating condition either completely open or close the spindle. Then, put on the protective cap and tighten it applying the prescribed torque (see chapter "Mounting").

WARNING!
Any torque beyond the limits may lead to failure.
Serious injuries and system failure during operation possible.
Observe the torques.

5. Upon initial commissioning check the pipes for any abnormal vibration and record the operating data.



CAUTION!
Cracks of the piping and the valve due to dynamic loads possible.
Injuries and system failure during operation possible.
Avoid heavy vibrations. Take safety measures if need be.

Operation, Maintenance and Repair

Principles

- The valve is maintenance-free..
- As part of the regular system inspection it should be checked for corrosion/damage and operability and its proper condition restored if necessary.

WARNING!

Media contact possible, contact with hot/cold surfaces.
Burns, frostbites
Wear personal protective equipment as prescribed by national regulations during maintenance and inspections.

Repair

- If the valve needs repair, shut down the system, drain the refrigerant from the system (or system section) in an environmentally friendly manner and ventilate the system.

DANGER!

Refrigerant may escape.

Leaking refrigerant may cause most serious injuries.
For repairs the system must have the right temperature, free from refrigerant and sufficiently ventilated.

- For repairs use no other than original spare parts. For mounting/start-up follow these operating instructions. It is indispensable to do a leakage and strength test once again. AWA assumes no warranty for tightness after repairs.

WARNING!

Valve damage due to defective spare parts/mounting.
Avoidable serious injuries and system failure possible.
Use no other than original spare parts for repairs.

Dismantling and Disposal

Principles

- To dismantle the valve, shut off the system, remove the refrigerant from the system (or system section) in an environmentally friendly manner and sufficiently ventilate the system (or system section).

DANGER!
Possible escape of refrigerant.
Escaping refrigerant may cause most serious injuries.
For repairs the system must have the right temperature, free from refrigerant and sufficiently ventilated

WARNING!
Media contact possible, contact with hot/cold surfaces.
Burns, frostbites
Wear personal protective equipment as prescribed by national regulations during maintenance and inspections.

- The valve and its components can be recycled.

Valve body:	cast iron scrap
Internal parts of valve:	mixed steel scrap
Dust caps:	plastics (PE)

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