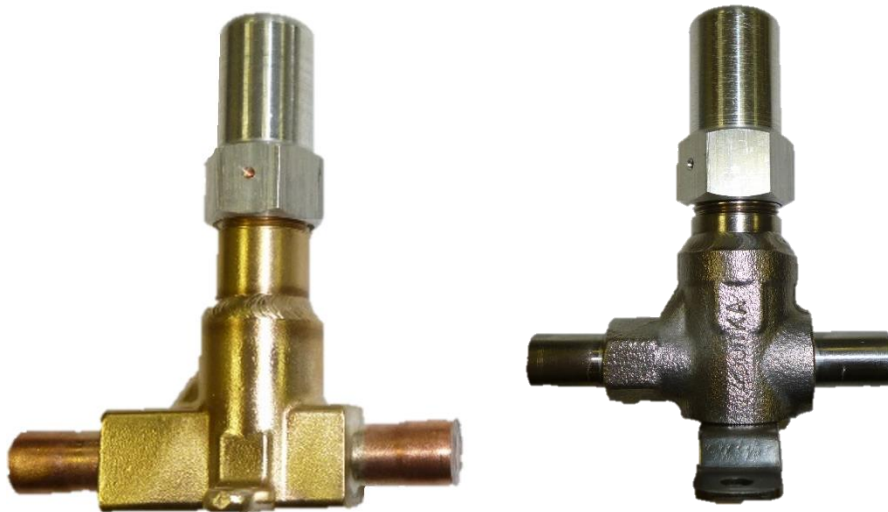




Operating Instructions
in compliance with
Pressure Equipment Directive 2014/68/EU

FAS Straight-Way Valve with Packing Gland



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



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Safety

The straight-way valve with packing gland, 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 dangers in all cycles of service life:

	DANGER! Risk of bursting 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 the valve as transport, lifting or lashing point.
	WARNING! Risk of bursting in an environment causing stress corrosion cracking. Most serious injuries and immediate system failure possible. Observe the environmental conditions for brass!
	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).

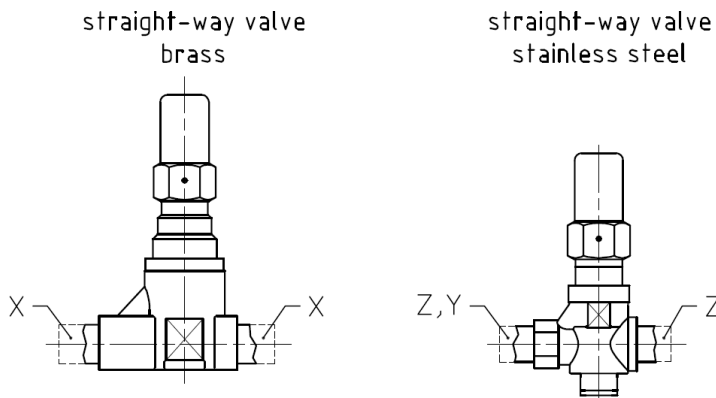
Other information

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.

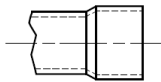
Description of valve

Types (possible valve connections)

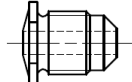


connection for straight valves
brass/stainless steel

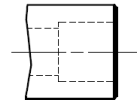
A
brazed connection
for X



B
flare coupling
male for Y



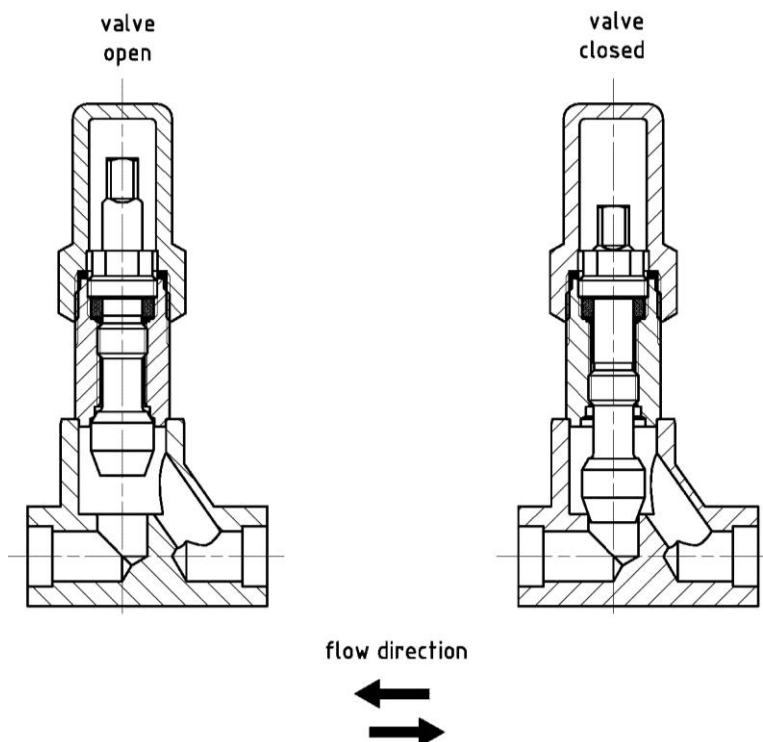
C
brazed/welded
connection
for Z



Installation dimensions can be gathered from the AWA product catalogue and technical documents respectively.

The connecting options A through C are explained in more detail in "Design features".

Operating principle





Product description

The straight-way valve with packing gland is a manual shut-off valve for refrigeration or air conditioning systems. For operation the spindle has to be fully open or fully closed. According to DIN EN 378-2 the valve can only be actuated by use of a tool/operating handle. When supplied the valve spindle is open.

The welded construction (body/valve top) of the straight-way valve has been designed for maximum working pressures of 60 bar (copper type) and 160 bar (stainless steel pipe) resp.

Any mounting position and flow direction can be chosen.

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

Identification

The valve is marked in accordance with DIN EN 12284 on the valve body as follows:

- Manufacturer's logo
- Type designation
- Date of manufacture
- Permissible pressure in bar
- Nominal diameter
- Housing material

Technical parameters

Pressure/Temperature allocation:

Depending on the data given in the technical documentation.

Service fluids:

Refrigerants according to DIN EN 378-1-2012, DGRL fluid group 2 and associated refrigerator oils according to DIN 51503-1.

On request other refrigerants can be permitted. It is explicitly indicated in the technical documentation.

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 (PED 2014/68/EU):

See information given in the technical documentation.



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 ensures brazing and/or welding of the valve when the system is installed.
- The stainless steel type is suitable for use of ammonium as fluid. It needs separate agreement, however.
- The valve spindle comes with a square for operation and has a back seat function. The back seat is only effective when the valve is fully open. Sealing between the spindle and the housing is by a graphite packing gland.
- As standard the valve is supplied with a highly leakproof protective spindle cap and a gasket ring. The protective spindle cap is provided with a relief hole and comes finger-tight.
- The valve has a body/base with 2 fixing holes.
- Types of connection in brass:

Connection "A" – brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1:2010 for dia. 10 to dia. 22mm. Inch-type pipes available on request.

Connection pipe material according to EN 12449 CW02A or CW107C (from 15mm connection).

- Types of connection in stainless steel:
Connection "B" – Detachable pipe flare fitting 90° with male connection to render a connection with copper pipes and union nut.

Size	Thread	Ø pipe inch / metric	
SAE 1/4"	7/16 - 20 UNF	1/4"	6
SAE 3/8"	5/8" - 18 UNF	3/8"	10

Connection "C" – Brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1:2010 for dia. 6 to dia. 12mm. Inch-type pipes available on request.

This connection also permits a welded joint with stainless steel pipe as per DIN EN 10216-5 for outside diameters between 6 and 16 mm.


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


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

	<p>DANGER! Damage of valve possible. Serious injuries and system failure possible during operation. Valve to be installed without additional loads (forces, vibrations). Valves must not be used as fixing points of pipes.</p>
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2. For spindle operation and protective spindle cap a removal space of 100 mm shall be provided.
3. A safe operation of the spindle (opening and shutting off) at the required torques must be possible.
4. Only authorized personnel shall be allowed to mount the valve.


	<p>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.</p>
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5. No modifications of the valve permitted. If modifications become necessary, they have to be agreed with the manufacturer prior to mounting.


	<p>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.</p>
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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 & C only: Arrange the spindle in central position. Before you move the spindle, loosen the gland by $\frac{1}{4}$ turn.


	ATTENTION!
	Damage of internal components possible. Malfunction of valve due to thermal overload. Centrally arrange the spindle for thermal joining processes.


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 is possible.
3. Scavenge the relevant pipe sections with shielding gas during brazing and welding. A cooling of the valve body is recommended for the A- and C-type connection. Then, cool down the system connection in the air.

The brass straight-way valve comes with copper connection pipes of CW107C (CuFe2P). The use of phosphorous-free brazing metal is required.


	DANGER!
	Brazed joint may be leaky and lacks strength. Serious injuries and system failure during operation possible. Use of silver filler for brazing without phosphorus.

	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. crack formation) 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 of internal components. Scavenge with shielding gas while doing the joining.

- Clean the pipe connections made. Flux material residues are very corrosive and may cause long-term damages.

	<p>CAUTION! Risk of increased corrosion and component damage. Serious injuries and system failure possible during operation. Properly clean the joint after joining.</p>
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- Depending on which condition is intended fully open or close the spindle. Then, tighten the gland applying the prescribed torque. 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.
- The following torques (Nm) apply to the brass-type valve.

Nominal size	Spindle closed	Spindle open	Protective spindle cap	Gland
DN 10/12	20 +5	12 +2	40 +10	12 +5
DN 15/16	30 +10	15 +2	40 +10	15 +5
DN 18/22	30 +10	15 +2	40 +10	12 +5

- The following torques (in Nm) apply for the stainless steel-type valve:

Nominal size	Spindle closed	Spindle open	Protective spindle cap	Gland
DN 6/10/12	15 +5	12 +2	40 +10	12 +5

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 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. 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.

3. Depending on the intended operating condition either completely open or close the spindle. (loosen/tighten the gland). 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.

4. 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 the valve should be checked for corrosion/damage and operability and its proper condition restored if necessary.

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

- If the valve spindle has to be operated for system maintenance, carefully remove the protective spindle cap. If no pressure compensation can be effected, put the protective spindle cap in place again and tighten it. If so, it indicates a malfunction of the valve and the system has to be stopped without delay.


	WARNING!
	<p>The protective spindle cap is pressure-proof and may be pressurized. Serious injuries possible. Slowly remove the protective cap of the spindle. Allow any service fluid escape from inside the cap if necessary.</p>

- Then, put the spindle in the correct position applying the necessary torques (see chapter Mounting) (loosen/tighten the gland). A leak test is absolutely necessary. Upon completion of work put the protective spindle cap in place again.

	DANGER!
	<p>Danger of valve bursting. Most serious injuries possible. The test pressure must not exceed the allowable pressure (PS). Always observe the safety regulations (e.g. DIN EN 378).</p>

Repair

- If the intended valve function can no longer be guaranteed, stop the system, discharge the refrigerant from the system (or section as the case may be) in an environmentally appropriate way and ventilate the system (or section).

	GEFAHR!
	<p>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.</p>

- Remove the valve from the system and replace it by a new one. Installation/start-up must be carried out as prescribed by the operating instructions. Repeated leakage and strength tests are indispensable.

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:	brass/stainless steel
Protective spindle cap:	aluminium
Dust caps:	plastics (PE)



Armaturenwerk Altenburg GmbH

Am Weißen Berg 30
D-04600 Altenburg
Germany

Telefon +49 (0) 3447-893-0
Telefax +49 (0) 3447-811-10

Internet: <http://www.awa-armaturenwerk.de>
E-Mail: info@awa-armaturenwerk.de

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