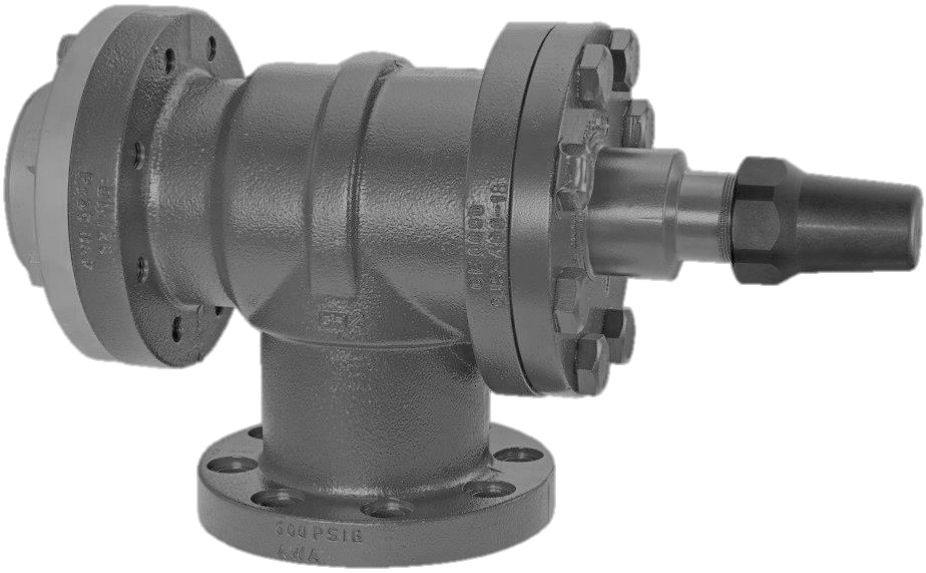
Operating Instructions
in compliance with
Pressure Equipment Directive 97/23/EC

AWA Cast Angle Valve DN125



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

Contents

Safety

The AWA Cast Angle Valve DN125, 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 dangers

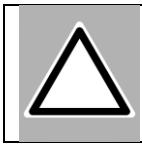
Unavoidable residual hazards may emanate from the valve. Every person working on this device shall therefore carefully read these instructions.

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

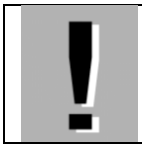
Symbols used for safety information

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!
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!
There is the risk that operating fluid is released.
Depending on the kind of operating fluid it may cause serious to very serious or even fatal injuries.
Wear personal protection equipment (e.g. respirator, gloves).

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

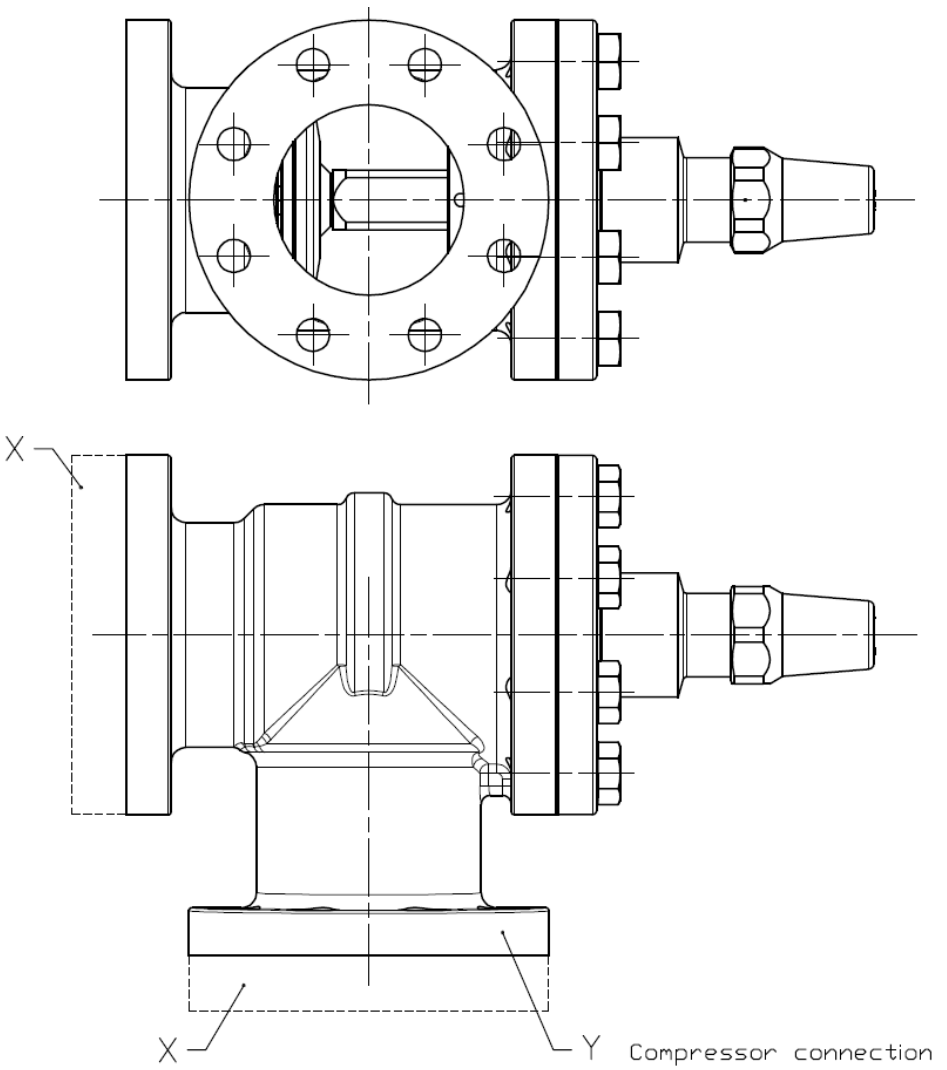
Other information

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.

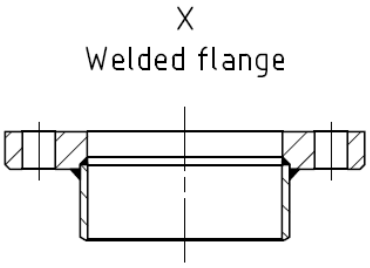
Any modification of the valve and operation under other than the prescribed parameters shall not be allowed and will result in the loss of the conformity declaration and all liability claims.

Description of Valve

Types (possible valve connections)

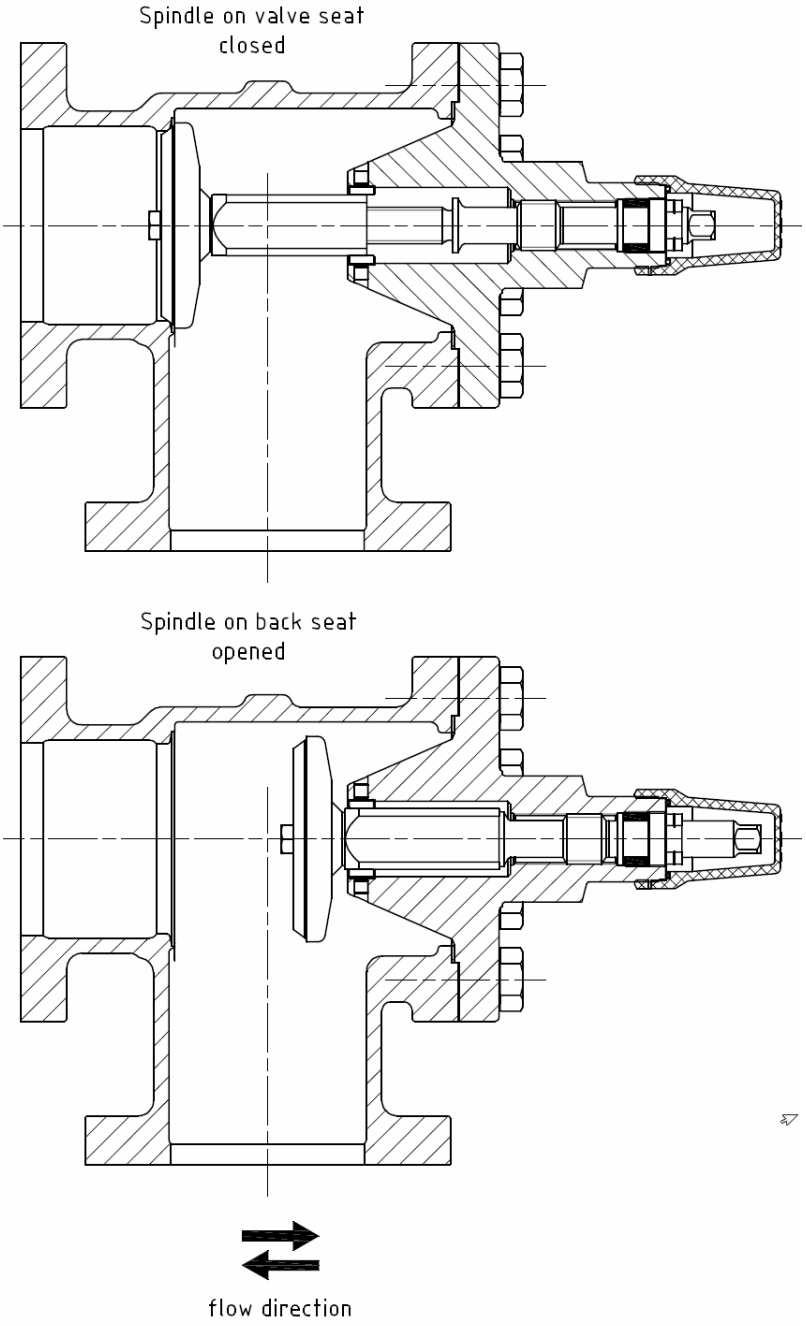


Connections for AWA Cast Angle Valve



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

Operating principle



Product description

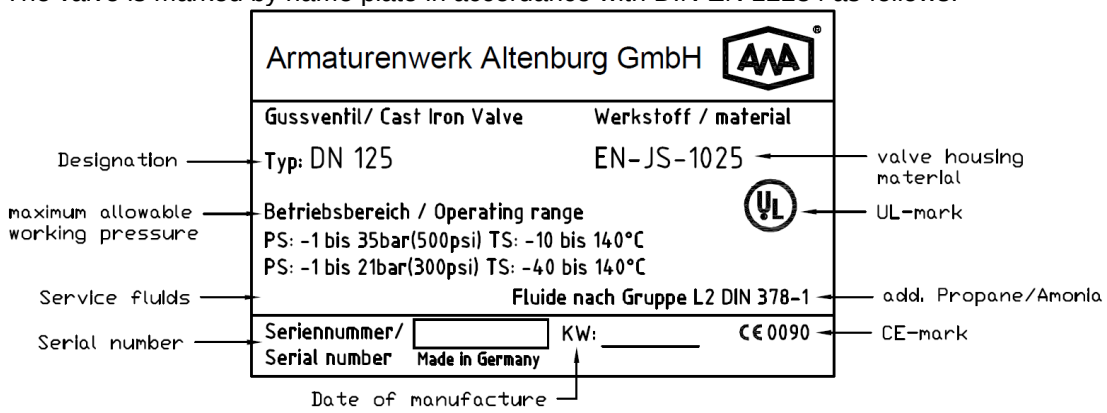
The AWA Cast Compressor Valve is an angle shut-off valve for refrigeration or air conditioning systems. For operation the spindle has to be fully open or fully closed. According to DIN EN 378-2 the valve can only be actuated by use of a tool. When supplied the valve spindle is closed.

Any flow direction can be chosen.

The valve is in compliance with DIN EN 12284:2003 and Pressure Equipment Directive 97/23/EC. A type approval certificate according to 97/23 EC Module B by TUEV Thueringen (ID of notified body 0090) is available for the valve (Cat. III for R290/R717).

Identification

The valve is marked by name plate in accordance with DIN EN 12284 as follows:



Technical parameters

Pressure/Temperature allocation:
PS 35bar at TS -10 … 140°C
PS 26bar at TS -40 … -10°C

Service fluids:
Refrigerant as per DIN EN 378-1-2012, PED fluid group 2 and relevant refrigeration compressor oils according to DIN 51503-1.
On request other refrigerants can be permitted (e.g. R290, R717). It is explicitly described 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 97/23/EC):

Nominal size	DN125
Standard design for refrigerants PED fluid group 2	Category II
Special design for refrigerants PED fluid group 1	Category III

Approval according to UL 207
The valve has been approved according to UL 207 for the American and Canadian market.

Design Features

- The material of the valve components and the manufacturing method are selected in conformity with the EN12284:2003 and Pressure Equipment Directive 97/23/EC thus guaranteeing the reliability for the operating range indicated.

- The system connection comes as detachable welded connection.
  The compressor connection is specifically adapted to the connecting conditions of the compressor manufacturer.

- The cover flange of the valve is demountable and protected against accidental loosening by two locking plates.

- On request the valve can be supplied for refrigerant of the PED fluid group 1 (e.g. propane, ammonium).

- For actuation the valve spindle is provided with a square and has a metal back seat function. The back seat is only effective when the valve is completely open. Sealing between the spindle and housing is rendered by a graphite packing and gland seal.

- The valve comes with an O-ring sealed protective spindle cap with relief hole as standard.

- Types of connection

  Connection of pipe – Detachable welded connection for use of steel tube dimension DN 125 according to DIN EN 10220:2003-03 for outside diameter of 139.7mm. The flange connection is flat sealing with fibre gasket.

  Connection of compressor – Flange connection for direct mounting with a counter flange (through holes 8 dia. 22 on pitch circle dia. 195mm).

- The valve comes with a prime coat. If handled and stored in dry condition it protects against corrosion until installation.

- The service-friendly design makes it possible to purchase spare parts separately (e.g. shut-off unit, gaskets, flanges, etc.).

Transport and Storage

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

Mounting

Principles

- The valve shall be arranged in the system so that it can be properly installed (weight 54kg), 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.

- The removal space for spindle operation, protective spindle cap and replacement of the cover flange module shall be in compliance with the table below:

Nominal dia.	Protective spindle cap	Cover flange module with protective spindle cap
DN125	150mm	300mm

- A safe operation of the spindle (opening and shutting off) at the required torques must be possible.

- The valve top needs not be removed for valve installation.

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

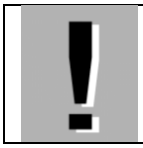
DANGER!
Any non-observance of these instructions may cause the valve/system to fail.
Most serious injuries and death possible.
Mounting and operation by personnel trained in refrigeration systems only.

- 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.

- For welding flange connection: Remove connecting parts (flange bolts, gasket). Keep these components safe until use.

Connecting pipe and compressor

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

2. Prepare the system connections so (bare metal and free from grease) that a high-quality joint is possible.

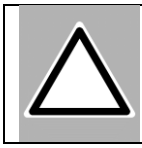
3. While welding the pipe connection scavenge the relevant pipe sections with shielding gas. If welding is carried out with the valve, make sure that the valve cone is in central position (loosen by ¼ turn prior to spindle actuation). We recommend cooling the valve body. Then cool the system connection in open air.

WARNING!
Damage of valve due to strong heating possible.
Serious injuries and system failure possible during operation.
Do not heat the internal parts of valve above 150°C.

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

4. Properly clean the pipe connections made.



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

5. The compressor connection must be in line with the data of the compressor manufacturer. Mount the valve at the compressor/mating part using the mounting material prescribed by the compressor manufacturer. Make sure there is no mechanical constraint. Then, make the flange connection to the system. Tighten nuts/screws crosswise in minimum two steps (see item 7) applying the given torque.

WARNING!
Excessive torques or non-observance of the installation order may cause a valve failure.
Serious injuries and system failure during operation are possible.
Observe the torques.

6. Depending on the intended operating state open or close the spindle completely the gland seal by ¼ turn before you move the spindle. Then, tighten the gland seal and put on the protective spindle cap. If there is only one connection at the valve shut the other connection with the dust cap until further use.

7. The following torques apply (Nm):

Nominal dia.	Spindle closed	Spindle open	Protective spindle cap	Bolts Connecting flange	Bolts Cover flange	Gland
DN 125	200 +10	100 +10	30 +5	M20 200 +10	M24 350 +10	80 +5

Commissioning

Principles

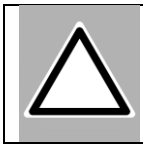
- The valve has already been tested for leakage and strength by the manufacturer.
- The valve and the system into which it is installed, may only be commissioned if they have been checked, with due regard to the intended mode of operation, for proper condition as to assembly, installation, set-up conditions 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

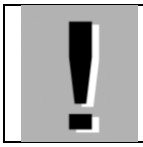
1. Check the system for resistance to pressure by suitable means (e.g. helium, dry nitrogen).

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. 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.



ATTETION!
Loss of product conformity if the name plate is removed.
Loss of warranty.
Name plate must remain legible.

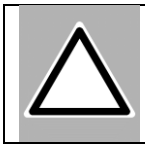
3. Evacuating and filling the system with refrigerant.

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. (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.

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.

- 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!
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.

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!
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).

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:	iron scrap
Welding flange:	iron scrap
Protective spindle cap:	plastics
Dust caps:	plastics (PE)

Armaturenwerk Altenburg GmbH
Am Weißen Berg 30
D-04600 Altenburg
Germany

Telephone +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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