



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

Series881 Shut-off Valve



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





## Table of contents

Safety.....	4
Authorized personnel.....	4
Residual dangers.....	4
Symbols used for safety information .....	4
General safety information .....	5
Other information.....	5
Description of valve .....	6
Types.....	6
Operating principle .....	6
Product description.....	7
Identification .....	7
Technical parameters.....	7
Design features .....	8
Transport and Storage.....	10
Mounting.....	10
Principles .....	10
Mounting preparation.....	11
Connecting the pipe.....	11
Commissioning .....	12
Principles .....	12
Steps of commissioning.....	13
Operation, Maintenance and Repair .....	14
Principles .....	14
Repair .....	14
Dismantling and Disposal .....	15
Principles .....	15

## **Safety**

The Series881 shut-off 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 in compliance with the statutory provisions.

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

Keep these operating instructions 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**

	<p><b>DANGER!</b>            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.</p>
	<p><b>WARNING!</b>            Instructions on preventing potential serious danger to persons.            Avoidable serious to very serious injuries or death as a possible consequence.            Any non-observance may cause the valve to fail.</p>
	<p><b>CAUTION!</b>            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.</p>
	<p><b>ATTENTION!</b>            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.</p>

## 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:

	<b>DANGER!</b> Risk of bursting if operated beyond the technical parameters. Most serious injuries and immediate system failure possible. Observe the technical parameters.
	<b>WARNING!</b> Damage due to improper handling. Serious injuries and system failure possible. Never use the valves as transport, lifting or lashing points.
	<b>WARNING!</b> Risk of bursting if operated in an environment that produces stress corrosion. Most serious injuries and immediate system failure possible. Observe the ambient conditions for brass.
	<b>WARNING!</b> 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.
	<b>WARNING!</b> 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).
	<b>CAUTION!</b> Very cold or very hot surface temperatures possible. Frostbites/burns possible. Wear personal protective equipment (e.g. gloves, protective clothing).

## Other information

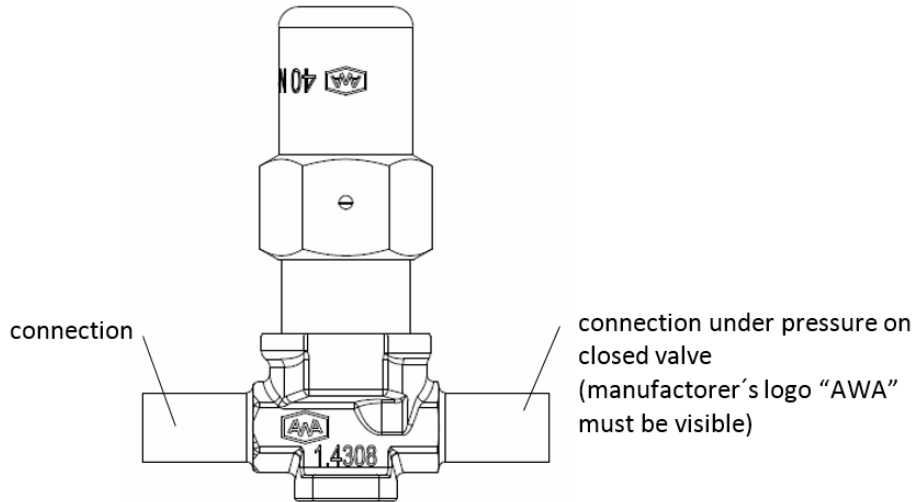
The information contained herein represents to the best of our belief our knowledge at the time when these instructions were prepared. They shall give you guidance how to safely handle the valve during transport, storage, installation, commissioning, maintenance and dismantling/disposal. A final decision 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 or a guarantee.

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

Manual shut-off valve for pipe installation straightway type

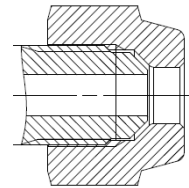
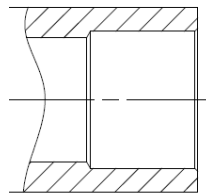
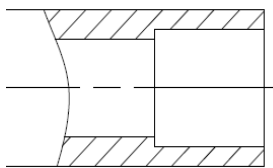


Connection for system

A Brazed connection - SAE

B Butt weld connection - WB  
Butt weld/Brazed connection - W/ODS

C Flare-type connection - SAE



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

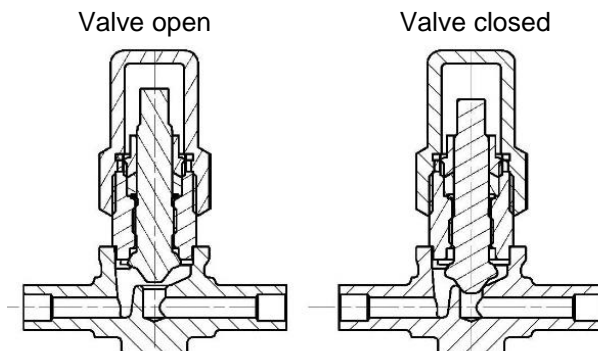
### Operating principle

Valve open means:

- Back seat closed
- Use as normally open straightway valve

Valve closed means:

- Valve seat closed
- Use as normally closed shut-off valve





## Product description

The valve is a straightway manual shut-off valve designed for refrigeration or air conditioning systems. It can be used for several pressure and temperature ranges.

Installation position and flow direction are optional.

The valve is to be operated with the spindle fully open or fully closed only. Spindle sealing is by a gland seal.

For protection against unauthorized operation the valve can be operated by means of a tool only.

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

## Identification

The valve is marked in accordance with DIN EN 12284:

- Manufacturer's logo
- Housing material
- AWA part number
- Maximum allowable working pressure PS in bar
- Coded year of manufacture

## Technical parameters

### Pressure- / Temperature allocation / Service fluids / Part numbers:

**Valves with connection "A" or "C"** – capillary brazed connection with copper pipe end (ODS) and or detachable threaded connection with 90° sealing cone (SAE)

Maximum allowable pressure PS: see tables below  
 Allowable temperature TS: -60 ... +150°C  
 Allowable service fluids: Refrigerant acc. to DIN EN 378-1 (2016): safety classes A1 through A3 and B1 (PED fluid groups 1 and 2)

Valves with 2x ODS connection Max. allowable pressure: 63bar		Valves with 2x SAE connection		
Part number	Dimension	Part number	Dimension	All. press.
881201000	ODS 6	881301000	SAE 1/4" (D6)	63bar
881202000	ODS 1/4"	881302000	SAE 1/4"	63bar
881203000	ODS 3/8"	881303000	SAE 3/8"	40bar
881204000	ODS 10	881304000	SAE 3/8" (D10)	40bar
881205000	ODS 12	881305000	SAE 1/2" (D12)	40bar
881206000	ODS 1/2"	881306000	SAE 1/2"	40bar
881207000	ODS 15	881307000	SAE 5/8" (D15)	40bar
881208000	ODS 16 (5/8")	881308000	SAE 5/8" (D16)	40bar
881209000	ODS 18			
881210000	ODS 3/4"			
881211000	ODS 22			
881212000	ODS 7/8"			

Valves with ODS-SAE connection			
Part number	Connection 1	Connection 2	Max. allowable pressure
881901000	ODS 6	SAE 1/4" (D6)	63bar
881902000	ODS 1/4"	SAE 1/4"	63bar
881903000	ODS 3/8"	SAE 3/8"	40bar
881904000	ODS 10	SAE 3/8" (D10)	40bar

**Valves with connection "B" – welded connection (WB); welded/brazed connection (W/ODS)**

Allowable pressure. PS: 63bar  
 Allowable temperature TS: -60 ... +150°C  
 Allowable service fluids: refrigerant acc. to DIN EN 378-1 (2016): PED fluid groups 1 and 2

Valves with 2x WB connection		Valves with 2x W/ODS connection	
Part number	Dimension	Part number	Dimension
881001000	WB 10.2	881101000	W10.2 / ODS 6
		881102000	W10.2 / ODS 1/4"
881003000	WB 13.5	881103000	W13.5 / ODS 3/8"
		881104000	W13.5 / ODS 10
881005000	WB 17.2	881105000	W17.2 / ODS 12
		881106000	W17.2 / ODS 1/2"
881008000	WB 21.3	881107000	W20 / ODS 15
		881108000	W21.3 / ODS 16 (5/8")
881010000	WB 26.9	881109000	W25.4 / ODS 18
		881110000	W25.4 / ODS 3/4"
		881111000	W30 / ODS 22
		881112000	W30 / ODS 7/8"

As regards part numbers not listed here see the technical documentation for the data of permitted service conditions.

**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 the interior:**

according to DIN 8964-1

**Classification pursuant to Pressure Equipment Directive 2014/68/EU:**

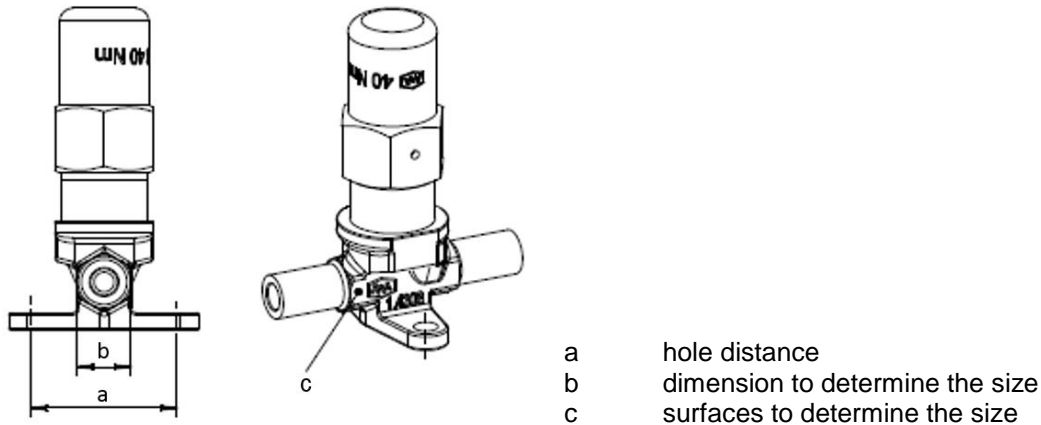
Article 4 (3)

## 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 housing material of stainless steel (1.4308 / 1.4301) provides for both a high degree of media compatibility and corrosion resistance.
- The hermetic connection of pressure-bearing housing and connection elements ensures maximum safety when it comes to external leakages.
- The use of heat-resistant materials and connecting elements guarantees that the valve can be brazed and/or welded when the system is installed.
- The valve spindle comes with a square for operation and has a metal back seat. The back seat is only effective when the valve is fully open. The Sealing between spindle and housing is by a graphite packing and an adjustable gland. The valve spindle cannot be screwed out of the valve.
- The valve is supplied with a highly leak-proof protective spindle cap of aluminium and aluminium seal ring as standard. The protective spindle cap are provided with a relief hole.



- The valve has a housing foot with 2 mounting holes to fix the valve.
- The valve is available in 4 sizes. The housing size is determined by the distance between the parallel surfaces at the housing.



Housing size	1	2	3	4
Dimension for size b [mm]	12	19	27 or 28	36 or 33
Hole distance a [mm]	32.5	45	65	65
Diameter of mounting hole [mm]	5.5	5.5	6.5	6.5

- Type of connection

The valve may have different connections.

**Connection "A"** – Brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1 for diameter 6 to 22mm and relevant inch-type dimensions. Designed as connection for inserting a copper pipe (ODS).

Short name: ODSxx (xx stands for relevant pipe size in mm or inch)

Example: Shut-off valve series881 2x ODS 1/2"

**Connection "B"** – But weld connection according to EN12627 to weld pipes according to DIN EN 10220 for diameter 13,5 to 30mm and relevant inch-type dimensions (W or WB). Additional with brazed capillary connection to render a brazed joint with copper pipes according to DIN EN 12735-1 for diameter 6 to 22mm and relevant inch-type dimensions (ODS).

Short name: WBxx, Wxx/ODSyy (xx stands for relevant outside diameter of the steel pipe and yy stands for relevant outside diameter of copper pipe in mm or inch)

Example: Shut-off valve serie881 2x WB21.3

Example: Shut-off valve series881 2x W21.3 / ODS16(5/8")

**Connection "C"** – Detachable threaded connection with 90° sealing cone according to flare connection principle (SAE J516, DIN 3866) designed as connection with male thread (SAEM) to connect a copper pipe with a cap nut or to mount the valve on a suitable counterpart.

Short name: SAExx (xx stands for relevant SAE size, if necessary complemented for metric nominal sizes of the pipe)

Example: shut-off valve series881 2x SAE 1/2"


## 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. Also make sure that loads from the piping are not transmitted to the valve.

	<b>DANGER!</b>			
	Damage to valve possible. Serious injuries and system failure during operation possible. Valve to be installed without additional loads (forces, vibrations etc.) Never use the valve as fixing points of pipes.			


- Provide a space of about 100mm for spindle actuation and removal of the protective spindle cap.
- A safe operation of the spindle (opening and shutting off) at the required torques must be possible.
- The torques (Nm) below shall be applied for spindle operation and screwing of the protective spindle cap.

Housing size	Spindle position		Gland	Prot. spindle cap
	Valve closed	Valve open		
1	15 +5	15 +5	12 +5	40 +10
2	15 +5	15 +5	15 +5	40 +10
3	25 +10	30 +10	15 +5	40 +10
4	30 +10	30 +10	15 +5	40 +10

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


	<b>DANGER!</b>			
	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 in writing prior to mounting.


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

## Mounting preparation

- When supplied the valve comes with additional protective means for transport. The protective spindle cap is pre-assembled and hand-tight. To avoid corrosion inside the valve and contamination, such protective means should be removed shortly before mounting. The valve spindle is in central position.

	<b>ATTENTION!</b> Possible damage to interior components. Malfunction due to oxidation/contamination of internal components. Wait to remove the transport protection until shortly before mounting.
---	--

- Connections "A" and "B" only: Remove the protective spindle cap and check whether the valve spindle is in central position. Before moving the spindle, loosen the gland seal by  $\frac{1}{4}$  turn. Do not screw on the protective spindle cap again and keep it until mounting is complete.

	<b>ATTENTION!</b> Damage to internal components possible. Malfunction of valve due to thermal overload. Spindle must be in central position for thermal joining methods.
---	---


## Connecting the pipe


- Connection "A" and "B"


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

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.


Scavenge the relevant pipe sections with shielding gas during brazing and welding. A cooling of the valve housing is recommended. Then, cool down the system connection in the air.

	<b>WARNING!</b> Damage to the valve due to excessive heating possible. Serious injuries and system failure during operation possible. Keep the heat source away from the valve housing.
---	--

	<b>WARNING!</b> Damage to valve (e.g. cracking) due to rapid cooling possible. Serious injuries and system failure during operation possible. Allow the joint to cool down in the air.
---	---

	<b>ATTENTION!</b> Damage of internal components possible. Malfunction due to oxidation of internal components. Scavenge with shielding g gas while doing the joining.
---	--

Clean the pipe connections made. Flux residues from brazing are very corrosive and may cause long-term damage. For stainless steel products observe the general rules to maintain the material properties (e.g. cleaning, passivation, tool selection).

	<b>CAUTION!</b> Risk of increase corrosion and component damage. Serious injuries and system failure during operation possible. Properly clean the joint after joining.
---	--

## 2. Connection "C"

For a screwed connection make sure that the connections match in terms of type and dimension and the necessary sealing elements are used.

Attention must be paid to a mechanically unrestrained mounting. To apply the necessary torque, use the wrench flats provided at the valve. Strictly observe the torques of the relevant screwed connection.

When it comes to screwed stainless steel connection it is in particular necessary to observe the general technical rules to avoid fretting (use release agents).

Nominal outside diameter -pipe EN 12735	Torque ( Nm)
6 mm / 1/4"	14 +4
10 mm / 3/8"	33 +9
12 mm / 1/2"	50 +12
15 /16 mm / 5/8"	63 +14



### **WARNING!**

Excessive torques or non-observance of the mounting order may cause failures delayed in time.

Serious injuries and system failure during operation possible.

Observe the torques and mounting order.

- Depending on which condition is intended fully open or close the spindle. Then, tighten the gland at the required torque (leakage check). Thereafter, screw on the protective spindle cap. If a subassembly is to be mounted, shut the pipe ends using dust caps until further use.

## 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 378-2:2016 by check again for leakage and strength and effective corrosion protection.

## Steps of commissioning

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



### **DANGER!**

Risk of valve 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. For stainless steel valves it may be necessary to apply corrosion protection depending on the operating conditions. Make sure that manufacturer's data remain legible.



### **CAUTION!**

Delayed failure due to corrosion possible.  
Serious injuries and system failure during operation possible.  
Apply of suitable corrosion protection necessary.



### **ATTENTION!**

Loss of product conformity due to loss of name plate/markings.  
Loss of warranty.  
Marking must be legible.

3. Evacuating and filling the system with refrigerant.



### **DANGER!**

Risk of bursting if operated beyond the technical parameters.  
Most serious injuries possible.  
Observe the technical parameters of the valve.  
Avoid excessive filling of the system with refrigerant.

4. Depending on the intended operating condition either completely open or close the spindle. (Note: loosen/tighten gland). Then, firmly screw the protective spindle cap.



### **WARNING!**

Any non-observance of the torques may cause failures.  
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 valve due to dynamic loads possible.  
Injuries and system failure during operation possible.  
Avoid heavy vibrations. Take safety measure 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.


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

- If the valve spindle is to be operated for system maintenance, carefully remove the protective spindle cap.

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


If it is not possible to achieve a pressure compensation, firmly screw the protective spindle cap again and apply the prescribed torque. If so, there is a malfunction of the valve and it will be necessary to check the gland or replace the valve (see Repair chapter).

- Then, arrange the spindle in the relevant position applying the necessary torque (loosen/tighten gland). It is imperative to perform a leakage test. Put the protective spindle cap in place again after the work has been completed.

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

### Repair

- If the intended function of the valve can no longer be ensured, switch off the system, drain the refrigerant from the system (or system section) in an eco-friendly manner and vent the system (system section).


	<p><b>DANGER!</b> Refrigerant may escape. Leaking refrigerant may cause most serious injuries. For repairs the system must have the right temperature, free from refrigerant and sufficiently vented.</p>
---	---


- The valve is beyond repair. A faulty valve must be removed from the system and replaced by a new one.
- Installation/commissioning must follow these operating instructions. It is imperative to perform another leakage and strength test.

## 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 vent the system (or system section).

	<b>DANGER!</b>
	Refrigerant may escape.
	Leaking refrigerant may cause most serious injuries.
	For repairs the system must have the right temperature, free from refrigerant and sufficiently vented.

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

- The valve and its components can be recycled:

Valve:	stainless steel
Copper pipe:	copper
Protective spindle cap:	aluminium
Dust cap:	plastics (PE)



**Armaturenwerk Altenburg GmbH**

Am Weißen Berg 30  
04600 Altenburg

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

Internet: <http://www.awa-armaturenwerk.de>  
E-Mail: [info@awa-armaturenwerk.de](mailto:info@awa-armaturenwerk.de)

Subject to change, as of: 08/2019  
Document 90000720 Revision 00