



Operating Instructions
in compliance with
Pressure Equipment Directive 2014/68/EU
and
Pressure Equipment (Safety) Regulation 2016,
UK Statutory Instrument 2016 No. 1105

Series884 Refrigerant Strainer



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

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Safety

The Series884 Refrigerant Strainer, hereinafter referred to as strainer, is designed for use in refrigeration/air conditioning systems, hereinafter referred to as systems. It may only be put into service if installed in the system unchanged in accordance with these instructions and in its entirety is in compliance with the statutory provisions.

The strainer 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.

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

Authorized personnel

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





Residual hazards

Unavoidable residual dangers may emanate from the strainer. 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 dangers to persons. Imminent most serious injuries or death as a possible consequence. Any non-observance may lead to an immediate failure of the strainer.
	WARNING! Instructions on preventing potential serious danger to persons. Avoidable serious to very serious injuries or death a possible consequence. Any non-observance may cause the strainer 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 strainer.
	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 strainer.

General safety information

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

Instructions to prevent hazards 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 strainers as transport, lifting or lashing points.
	WARNING! Any non-observance of the instructions may cause the strainer to fail. Avoidable serious to very serious injuries or death possible. Installation, operation and maintenance by authorized 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 as a consequence. 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

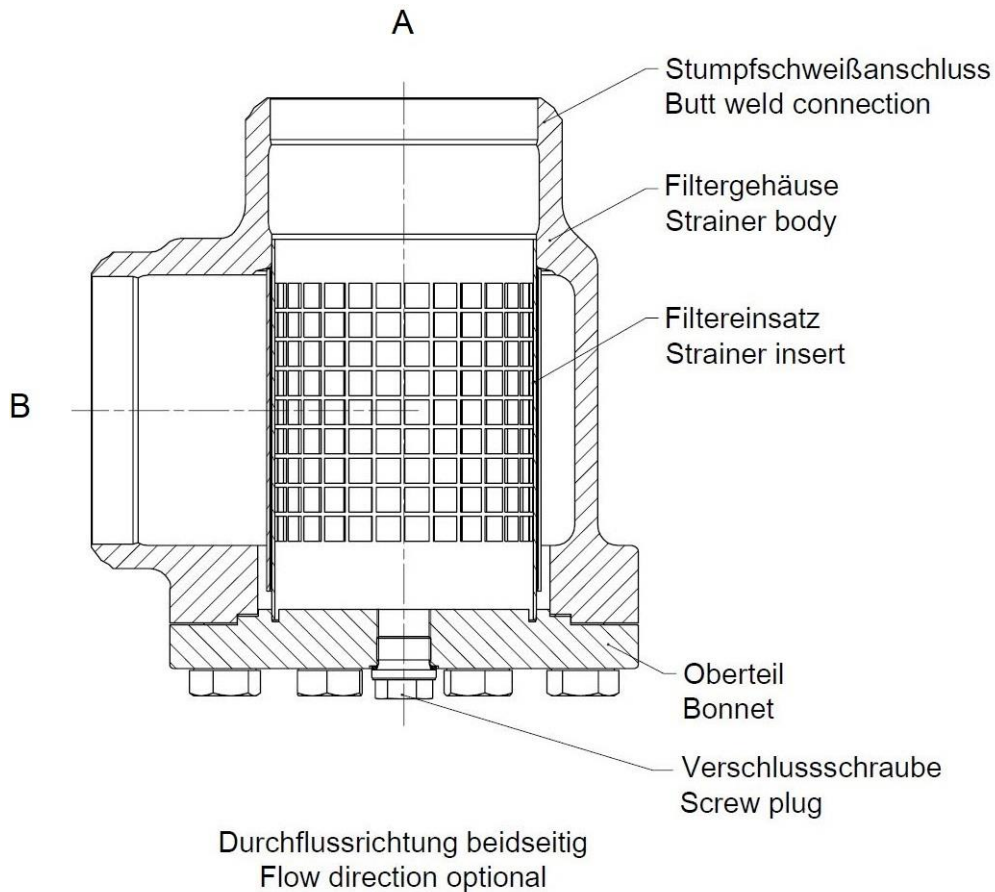
The information contained herein represents to the best of our belief our knowledge at the time when these instructions were prepared. It shall serve as code of practice to ensure a safe handling of the strainer in transport, storage, installation, commissioning, maintenance and dismantling/disposal.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

Any modification of the strainer 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 strainer

Types and operating principle

Strainer for pipe installation in angular form with replaceable strainer element.



The strainers come with two butt weld connections.

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".

Product description

The strainer has been designed for installation in refrigeration and air-conditioning systems. The strainer is available with different strainer cartridges.


The strainer consists of metal components only.

The strainer is in compliance with EN 12284, the Pressure Equipment Directive 2014/68/EU and the Pressure Equipment (Safety) Regulation 2016, UK Statutory Instrument 2016 No. 1105.

For the strainers DN125, DN150 and DN200 a type examination according to 2014/68/EU and PE(S)R 2016 module B is available.

Identification

The strainer is marked in accordance with EN 12284 by name plate:

Armaturenwerk Altenburg GmbH 	
Typ:	Strainer Serie884
AWA-Part-Nr.:	884xxxxxx
Size:	WBxxx
Material:	1.6220+QT / 1.1106
Screen mesh:	xxxMesh / xxxµm
Normal size:	DNxxx
Operating range:	PS -1...63 bar TS -40...150°C PS' -1...47 bar TS' -60...-40°C
Fluids:	Refrigerants EN378-1 (2016) PED Fluid group 1 and 2
Year of manufacture - Serial number: 2019-yyyy	
Made in Germany	

UK
CA 1521

CE 0090
EN12284

Technical parameters

Allowable pressure/ temperature / service fluids:

Maximum allowable pressure PS:	PS 63bar	PS'47bar
Allowable temperature TS:	TS -40 ... 150°C	TS' -60 ... 150°C
Permitted service fluids:	Refrigerant acc. to EN 378-1 (2016) PED fluid group 1 and 2	

Mesh size of the strainer inserts:

Standard: 100 mesh (149µm); deviating mesh sizes on request.

Leakage test:

according to DIN 8964-3 (<4,1 g/a R-134a at 10bar)

Strength test:

according to EN 12284 at 1.43fold PS (strainer housing and bonnet checked separately)

Cleanliness of interior:

according to DIN 8964-1

Classification pursuant to Pressure Equipment Directive 2014/68/EU and PE(S)R 2016:

Strainer DN25	Article 4 (3) respectively Part 1 Regulation 8
Strainer DN32 to DN100	Category II
Strainer DN125 to DN200	Category III



Design features

- The material of the strainer components and the manufacturing method are selected in conformity with the EN 12284, the Pressure Equipment Directive 2014/68/EU, the Pressure Equipment (Safety) Regulation 2016 and the RoHS Directive 2011/65/EU thus guaranteeing the reliability for the operating range indicated.
- The strainer housing material of cast steel (G20Mn5+QT) provides for both a high degree of media compatibility and corrosion resistance.
- The flow can pass the strainer in both directions.
- For maintenance purposes the strainer is provided with a metal-to-metal screw plug.
- The Series884 strainer is compatible with the Series880 housings. A subsequent change of the functional unit (Shut-off valve Series880, Shut-off valve Series880-1, Check valve Series885 as well as lockable check valve Series886) is possible in the respective nominal width.
- Types of connection:

Connection "2x WB" – Butt weld connection according to EN 12627 to weld on pipes according to EN 10220 for DN25 to DN100 as well as corresponding inch dimensions.

Example: Strainer cast Series884 - 2x WB88,9

Strainer size	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
Outside diameter of pipe [mm]	33,7	42,4	48,3	60,3	76,1	88,9	114,3	139,7	168,3	219,1
Wall thickness [mm]	2,6	2,9	2,9	4,0	4,0	4,5	4,5	5,6	6,3	7,1

- When supplied the strainer is painted. This coating provides corrosion protection until installation provided handling and storage takes place in dry condition.
- The service-friendly design makes it possible to purchase spare parts (strainer insert, seal ring, screw plug) separately.

Transport and Storage


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

Mounting

Principles

- The strainer shall be arranged in the system so that it can be properly installed, operated and maintained. Depending on the weight, installation aids must be provided.


Strainer size	DN25 – DN65	DN80	DN100	DN125	DN150	DN200
Strainer [kg]	< 5	9	16	27	41	68
Bonnet [kg]	< 2	3	5	8	14	24

	<p>DANGER! Damage to strainer possible. Serious injuries and system failure during operation possible. Strainer to be installed without additional loads (forces, vibrations etc.). Never use the strainer as fixing points of pipes.</p>
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- The removal space for assembly, cleaning or replacement of strainer insert shall be provided as shown in the table. It must be possible to apply the necessary torques in a safe manner.

Nominal size	Removal space
DN25 to DN100	> 200mm
DN125 to DN200	> 300mm

- The strainer is to installed with the screw plug showing downwards, alternatively also to the side.
- The flow can pass the strainer in both directions. The prescribed flow direction is the flow onto the bonnet (flow direction from A to B).
- Only authorized personnel shall be allowed to mount the strainer.

	<p>DANGER! Any non-observance of these instructions may cause the strainer/system to fail. Most serious injuries and death possible. Mounting and operation by personnel trained in refrigeration systems only.</p>
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- No modifications of the strainer permitted. If modifications become necessary, they have to be agreed with the manufacturer in writing prior to mounting.

	<p>WARNING! Product features may change. Avoidable serious to very serious injuries or death possible. Any modification of the strainer has to be agreed with manufacturer in advance.</p>
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Mounting preparation

- When supplied the strainer comes with additional protective means for transport. To avoid corrosion inside the strainer and contamination, such protective means should be removed shortly before mounting.



ATTENTION!

Damage to interior components possible.
 Malfunction due to oxidation/contamination of interior components.
 Wait to remove the transport protection until shortly before mounting.

- The strainer housing must be dismantled when welded into the pipe. The other components have to be stored in such a way that they protected against damage until use.

Connecting the pipe

- The pipe must be of a dimension that fits the strainer. 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.
- The welding procedure and the filler metal must be suitable for the material of the strainer housing (G20Mn5+QT [material number: 1.6220+QT]) and the material of the pipe. Then, slowly cool down the system connection in the air.



WARNING!

Damage to strainer (e.g. cracking) due to rapid cooling possible.
 Serious injuries and system failure during operation possible.
 Allow joint to cool down in the air.

- Clean the pipe connections made and interior of strainer. Welding residues may cause long-term damage due to corrosion or malfunctions.



CAUTION!

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

Assembling strainer components

For assembly of strainer proceed in the following order:

1. Place the strainer cartridge into the groove of the bonnet. The cartridge has got a light press-fit.
2. Clean the sealing surfaces of the strainer cartridge and the bonnet. Then, place the gasket onto the bonnet.
3. Carefully insert the bonnet with the attached strainer insert into the strainer housing. The strainer element must also be pushed into the housing seat. From DN125 to DN200, mounting bolts are recommended for centering the bonnet in the strainer housing.
4. Make the screw connection between the bonnet and the strainer housing. Initially screw the screws hand-tight into the strainer housing. Then, tighten the screws crosswise in min. 2 steps until the nominal size-dependent torque has been reached.
5. If dismantled beforehand, screw in the screw plug with seal ring again and tighten it.



ATTENTION!

Check components for damage and pollution prior to assembly.
 Malfunction due to component damage.
 Replace damaged components using original spare parts.

The following torques apply to the strainer assembly (Nm):

Strainer size	Screws bonnet	ScREW plug
DN25 – DN32	30 +10	50 +10
DN40 – DN50	50 +10	50 +10
DN65	120 +20	50 +10
DN80 – DN100	140 +20	140 +10
DN100	140 +20	140 +10
DN125 – DN150	280 +10	140 +10
DN 200	300 +10	140 +10



WARNING!

Any excessive torques or non-observance of the mounting sequence may cause failures.
 Serious injuries and system failure during operation possible.
 Observe the torques.

Commissioning

Principles

- The strainer housing and the bonnet have already been tested for leakage and strength by the manufacturer.
- The strainer 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 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 strainer bursting.
 Most serious injuries possible.
 The test pressure must not exceed the maximum allowable pressure (PS).
 Strictly observe the safety information (e.g. EN 378).

2. It is indispensable to apply an anticorrosive coating that meets the operating conditions. Make sure that the fabrication data remain legible.


CAUTION!

Delayed failures due to corrosion possible.
 Serious injuries and system failure during operation possible.
 Apply a suitable anticorrosive coating.


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 strainer.
 Avoid excessive filling of the system with refrigerant.

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



CAUTION!

Cracks of the piping and the strainer 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 strainer is maintenance-free.
- As part of the regular system inspection it should be checked for corrosion/damage/tightness 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 during maintenance and inspections as prescribed by national regulations.</p>

Replacing the strainer cartridge


- If the strainer cartridge needs to be cleaned or replaced, switch the system off, remove the refrigerant from the system (or system section) in an eco-friendly manner and vent the system (or section of system).
- Carefully open the screw plug. Because of the installation position of the strainer it cannot be avoided that contaminations and oil escape when the screw is removed. Collect and dispose the same in a proper manner.

	DANGER!
	<p>Refrigerant may escape. Leaking refrigerant may lead to most serious injuries. For repairs the system must have the right temperature, be refrigerant-free and sufficiently ventilated system.</p>

- Then, the strainer cartridge can be removed from the strainer housing by loosening the screws of the bonnet.
- Depending on the degree of contamination the strainer cartridge can be cleaned. Otherwise, use new original spare parts.

	ATTENTION!
	<p>Avoid damage to strainer cartridge. Malfunction or failure of system possible. Use intact strainer cartridges only.</p>


- Cleaning the strainer interior, the bonnet and the screw plug.

	ATTENTION!
	<p>Any remaining contaminations may cause damage. Malfunctions, leakages or failure of the system possible. Thoroughly clean the thread and strainer interior.</p>


- Then, assemble the strainer components as set out in the paragraph "Mounting the strainer components".
- Before the system is started again, perform the steps described for commissioning.

Repairs

- If a proper functioning of the strainer is no longer guaranteed, switch the system off, drain the refrigerant from the system (or system section) in an eco-friendly manner and vent the system (or system section).

	DANGER!
	<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>

- The strainer housing is beyond repair. A faulty strainer housing must be removed from the system and replaced by a new one.
- For repairs (strainer housing, strainer insert, gaskets, bonnet and screw plug)) use no other than original spare parts. When removing/installing the bonnet from the strainer, insert a new bonnet gasket.


	WARNING!
	<p>Strainer damage due to defective spare parts/mounting. Avoidable serious injuries and system failure possible. Use no other than original spare parts for repairs.</p>


- Install/commission according these instructions. It is imperative to carry out another leakage and strength test. No warranty is accepted by AWA for tightness in case of repair.

Dismantling and Disposal

Principles

- To dismantle the strainer, 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).

	DANGER!
	<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>

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

- The strainer and its components can be recycled:

Strainer housing, bonnet:	steel scrap
Strainer insert:	stainless steel scrap
Dust caps:	plastics (PE)



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