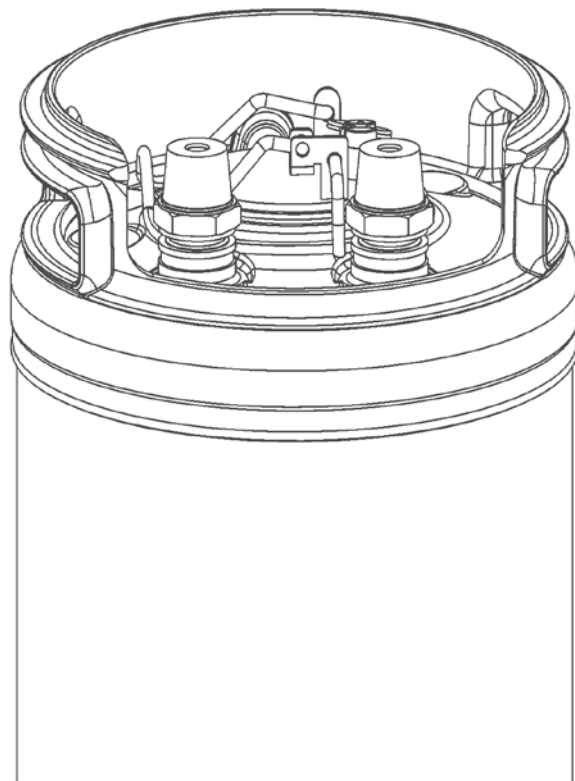


We understand water.



Mixed-bed cartridge | desaliQ

Operation manual

grünbeck

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Translation of the original operation manual

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1 About this manual

1.1 Other applicable documents

The following documents shall be deemed as applicable documents for the desaliQ mixed-bed cartridge:

The manuals of all accessories used shall apply.

1.2 Target group

This manual is intended for specialist installers and owners/users.

1.3 Storage of documents

Keep this manual and all other applicable documents, so that they are available when needed. Make sure that your specialist installer enters the proper start-up in the start-up log.

1.4 Symbols used



This symbol identifies information and instructions that you must comply with for your personal safety as well as to avoid damage to property.



This symbol identifies instructions that you must comply with in order to avoid damage to property.



This symbol identifies important information about the product or its handling.



This symbol identifies work that may only be carried out by a specialist installer. In Germany, the installation company must be registered in an installation directory of a water supply company acc. to §12(2) AVB Wasser V (German Ordinance on General Conditions for the Supply of Water).



Tasks with this symbol may only be performed by Grünbeck's technical service/authorised service company or by specialist installers trained by Grünbeck.



This symbol identifies work that may only be carried out by electronically trained personnel according to the VDE guidelines or according to the guidelines of similar local institutions.

1.5 Typographical conventions

The following typographical conventions are used in this manual:

1.5.1 Instructions

Single-step instructions or instructions where the sequence of the actions is unimportant are indicated as follows:

▶ Action

Multi-step instructions where the sequence of the actions must be observed are indicated as follows:

1. First action
 - a First step of the first action
 - b Second step of the first action
2. Second action

Results of an instruction are indicated as follows:

» Result

1.5.2 Lists

Bullet symbols used:

- First bullet point (level 1)
 - First bullet point (level 2)
 - Second bullet point (level 2)
- Second bullet point (level 1)

1.6 Validity of the manual

This manual applies to the following products:

Mixed-bed cartridges of the desaliQ:BA product series, green marker tape.

- Mixed-bed cartridge desaliQ:BA 6
- Mixed-bed cartridge desaliQ:BA 12
- Mixed-bed cartridge desaliQ:BA 13
- Mixed-bed cartridge desaliQ:BA 16
- Mixed-bed cartridge desaliQ:BA 20

Mixed-bed cartridges of the desaliQ BA VARIO mini product series, without marker tape.

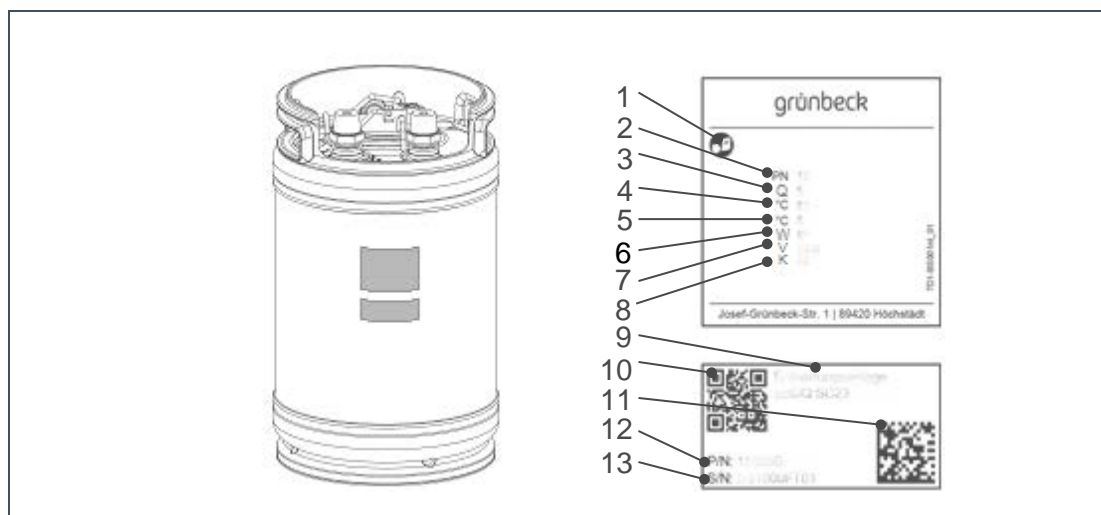
- Mixed-bed cartridge desaliQ:BA 12 VARIO mini
- Mixed-bed cartridge desaliQ:BA 16 VARIO mini

Mixed-bed cartridges of the desaliQ:PA product series, blue marker tape.

- Mixed-bed cartridge desaliQ:PA 6
- Mixed-bed cartridge desaliQ:PA 12
- Mixed-bed cartridge desaliQ:PA 13
- Mixed-bed cartridge desaliQ:PA 16
- Mixed-bed cartridge desaliQ:PA 20

1.7 Type plate

The type plate is located on the front of the mixed-bed cartridge. Please specify the data shown on the type plate in order to speed up the processing of your enquiries or orders.



Item	Designation	Item	Designation
1	Observe operation manual	8	Capacity
2	Nominal pressure	9	Product designation
3	Nominal flow	10	QR code
4	Ambient temperature	11	Data matrix code
5	Water temperature	12	Order no.
6	Material	13	Serial no.
7	Volume		

Therefore, enter the necessary information in the table below to have it readily available whenever necessary.

Product designation: _____

Order no.: _____

Serial no.: _____

2 Safety

2.1 Safety measures

- Carefully read this manual before operating your product.
- Install the product in a frost-free room. Otherwise, the system may suffer irreparable damage. Water damage may occur as a result.
- Only use genuine spare parts for maintenance or repair. If unsuitable spare parts are used, the warranty for your product will be void.
- Only have persons working on your system that have read and understood the present manual and that are qualified to do such work due to their vocational training.
- Only operate the product if all components are installed properly.
- Safety equipment must never be removed, bridged or otherwise tampered with.

2.2 Safety information

This manual contains information and instructions that you must comply with for your own personal safety as well as to avoid damage to property. The information and instructions are highlighted by a warning triangle and have the following structure:



CAUTION: Type and source of danger.

- Possible consequences
 - ▶ Preventive measures
-

The following signal words were defined subject to the degree of danger and may be used in the present document:

- **DANGER** means that serious or fatal injuries will occur if the corresponding precautionary measures are not taken.
- **WARNING** means that serious or fatal injuries may occur if the corresponding precautionary measures are not taken.
- **CAUTION** means that minor injuries may occur if the corresponding precautionary measures are not taken.
- **NOTE** (without a warning triangle) means that damage to property may occur if the corresponding safety measures are not taken.

2.3 Regulations

When installing and starting up the system, amongst others, comply with the following regulations and guidelines:

- Statutory regulations on environmental protection
- Provisions of the employers' liability insurance companies
- DIN EN 1717

2.4 Responsibilities of the specialist installer and/or the specialist company

Comply with the following instructions to ensure the proper and safe functioning of the product:

- Only perform activities described in this manual.
- Perform all activities in accordance with all applicable standards and regulations.
- Brief the owner/user on the function and operation of the product.
- Advise the owner/user of the maintenance of the product.
- Inform the owner/user about possible dangers that can arise during the operation of the product.

2.5 Responsibilities of the owner/user

Comply with the following instructions to ensure the proper and safe functioning of the product:

- Only entrust qualified experts such as specialist installers or specialist companies with installation, start-up and maintenance.
- Have the product explained to you by the specialist installer.
- Only perform activities described in this manual.
- Do not carry out any activities that are explicitly marked for a specialist installer.
- Only use this product as intended.
- Make sure that the required inspection and maintenance work is carried out.
- Keep this manual.

2.6 System-specific safety instructions



WARNING: Explosive reactions if you try to regenerate the ion exchanger resin yourself by a mix of nitric acid and other strong oxidants.

- Danger to life, at any rate severe injuries.
 - ▶ Do not try to regenerate the ion exchanger resin yourself.
 - ▶ Send in the mixed-bed cartridge to Grünbeck's technical service/authorised company (refer to www.gruenbeck.com) for regeneration.
-



CAUTION: Large mixed-bed cartridges may tip over.

- Risk of injury due to the tipping over of a large mixed-bed cartridge.
 - ▶ Make sure the installation site is safe and secure. If a large mixed-bed cartridge is placed in close proximity to a walkway, secure the mixed-bed cartridge against tipping over by anchoring it with a chain.
-



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairments of the components.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
 - ▶ Immediately remove corrosion by polishing and remedy the cause of the corrosion.
-



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairment of the components due to the use of chlorine or chlorine-containing cleaning agents.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
 - ▶ Only clean the external surfaces of the product. To do so, use a cloth moistened with water.
-



NOTE: The installation room must have a floor drain. Floor drains that discharge to a lifting system do not work in case of a power failure.

- Possible flooding of the rooms if no floor drain is provided.
 - ▶ Install a water stop device.
-

2.7 Packaging, transport, storage and installation



Do not dispose of the yellow plastic screw caps of the cartridge's lid. Use these plastic screw caps as protection in case of possible periods of standstill or during transport.



NOTE: Accidental escape of water due to missing leakage protection.

- Water damage during transport and storage.
 - ▶ Only transport and store the product in an upright position:
-

Only transport and store the product:

- In its genuine packaging
- Right side up
- Depressurised

Transport, store and install the product free from:

- Strong heat
- Frost
- Direct sunlight
- Chemicals, dyes, solvents and their vapours

3 Product description

3.1 Intended use

The desaliQ mixed-bed cartridges are designed to produce ultra-pure water and can be used in the following sectors:

- Full demineralisation of raw water
- Residual demineralisation of partially demineralised permeate originating from reverse osmosis systems

3.2 Foreseeable misuse

The desaliQ mixed-bed cartridges **cannot** be used in the following sectors:

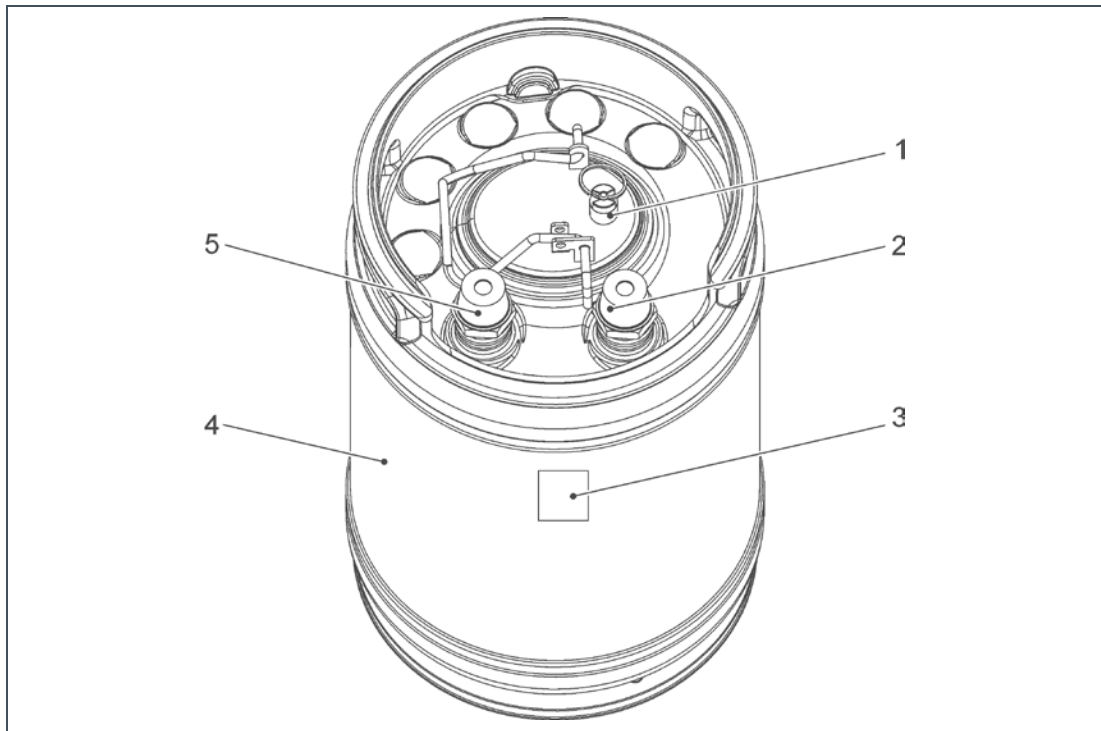
- Treatment of raw water to be used as drinking water
- Operation with gas cushions



WARNING: Explosive reactions if you try to regenerate the ion exchanger resin yourself by a mix of nitric acid and other strong oxidants.

- Danger to life, at any rate severe injuries.
 - ▶ Do not try to regenerate the ion exchanger resin yourself.
 - ▶ Send in the mixed-bed cartridge to Grünbeck's technical service/authorised service company (refer to www.gruenbeck.com) for regeneration.
-

3.3 Product components



Item	Designation	Item	Designation
1	Venting device	4	Mixed-bed cartridge
2	Raw water connection	5	Pure water connection
3	Type plate		

3.4 Accessories



You can retrofit your product with additional accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt for more details (refer to www.gruenbeck.com).

3.4.1 Accessories for heating water


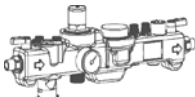
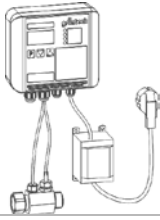
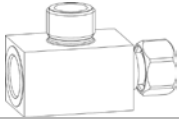

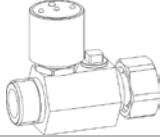

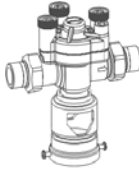
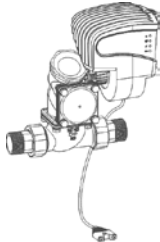


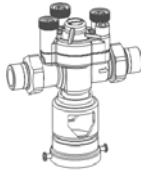
Figure	Designation	Order no.:
	GENO-therm® hose set	707 850
	GENO-therm® filling device Basic	707 120
	GENO-therm® filling device Komfort	707 130
	Basic with, among other features, built-in system separator; Komfort with, among other features, built-in system separator and conductivity meter	

Figure	Designation	Order no.:
	GENO®-Multi LF Conductivity meter desaliQ adapter ¾" with connection hoses DN 20 for conductivity meter	702 842
	desaliQ adapter ¾" Adapter for conductivity meter	703 576
	GENO®-therm solenoid valve, complete Solenoid valve	707 055
	GENO®-therm conductivity measuring cell with adapter Conductivity measuring cell	707 195
	Water meter with connection material	702 845
	Euro-system separator GENO® DK 2-Mini	133 100
	GENO®-STOP 1" Protection from water damage. For additional versions, please inquire.	126 875
	GENO-therm® case Basic Sortimo case GENO-therm® hose set Water meter with connection material GENO-therm® conductivity measuring cell with adapter	707 160
	GENO-therm® case Premium Sortimo case GENO-therm® hose set Water meter with connection material Conductivity meter GENO®-Multi-LF	707 170

3.4.2 Accessories for membrane technology

Figure	Designation	Order no.:
	Euro-system separator GENO® DK 2-Mini	133 100
	desaliQ connection kit	703 575
	Conductivity meter D 100 LED (0 - 100 µS)	703 530
	Conductivity meter D 10 AN (0 - 10 µS)	703 545
	Conductivity meter D 100 AN (0 - 100 µS)	703 535
	Conductivity meter D 10 ANR (0 - 10 µS)	703 555
	Conductivity meter D 100 ANR (0 - 100 µS)	703 540

3.5 Functional description

3.5.1 Physical

Via an internal distribution system, a mixed-bed resin is steadily flown through from top to bottom. Thanks to a collection element at the bottom of the mixed-bed cartridge, the fully demineralised water is directed to the pure water outlet of the mixed-bed cartridge via a riser pipe.

3.5.2 Chemical

Mixed-bed resins consist to one part of a highly acid cation exchanger resin and to the other part of a highly alkaline anion exchanger resin. In the mixed-bed cartridges, these two components are completely mixed already.

The cation exchanger resin removes all positively charged ions, the so-called cations, from the raw water. All cations contained in the raw water such as calcium, magnesium and sodium are exchanged for H⁺ ions.

The anion exchanger resin is used in full demineralisation to filter off negatively charged ions, the so-called anions. All anions such as nitrate, phosphate, sulphate, chloride and hydrogen carbonate contained in the water are exchanged for OH⁻ ions.

Full demineralisation removes almost all undesired components from the inlet water. Thanks to the highly alkaline anion exchanger resin, silicic acid and carbon dioxide are also filtered off. The H⁺ and OH⁻ ions generated during the exchange process combine to H₂O. The result of the full demineralisation principle is pure water.

3.5.3 Demineralisation of raw water

The desaliQ mixed-bed cartridge is mainly used for the full demineralisation of raw water. The raw water is directed to the inlet of the mixed-bed cartridge via an optional system separator and fine filter.

3.5.4 Secondary treatment of permeate

The residual demineralisation of permeate originating from reverse osmosis systems represents an additional application. In this case, the mixed-bed cartridge is installed downstream of the reverse osmosis system. Due to the residual demineralisation now taking place, the permeate conductivity may be further reduced.

4 Installation



The installation may only be carried out by a specialist.

4.1 Requirements with regard to the installation site

- ▶ Comply with the instructions on packaging, transport, storage and installation (refer to chapter 2.7).
- ▶ In case of raw water containing coarse dirt, you must install a coarse filter upstream of the inlet.
- ▶ Set up the required connections prior to the installation. Dimensions and connection data (refer to chapter 10).



CAUTION: Danger due to mechanical energy! System parts may be subject to overpressure.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
- ▶ Install a suitable pressure reducing device in the pressurised line upstream of the mixed-bed cartridge.
- ▶ Install a safety valve in the pressurised line upstream of the mixed-bed cartridge, which is approved for the specified pressure range.
- ▶ Make sure that the opening pressure set on the safety valve does not exceed the maximum permissible operating pressure indicated on the type plate.



NOTE: Risk of contaminated drinking water if the system separator is missing.

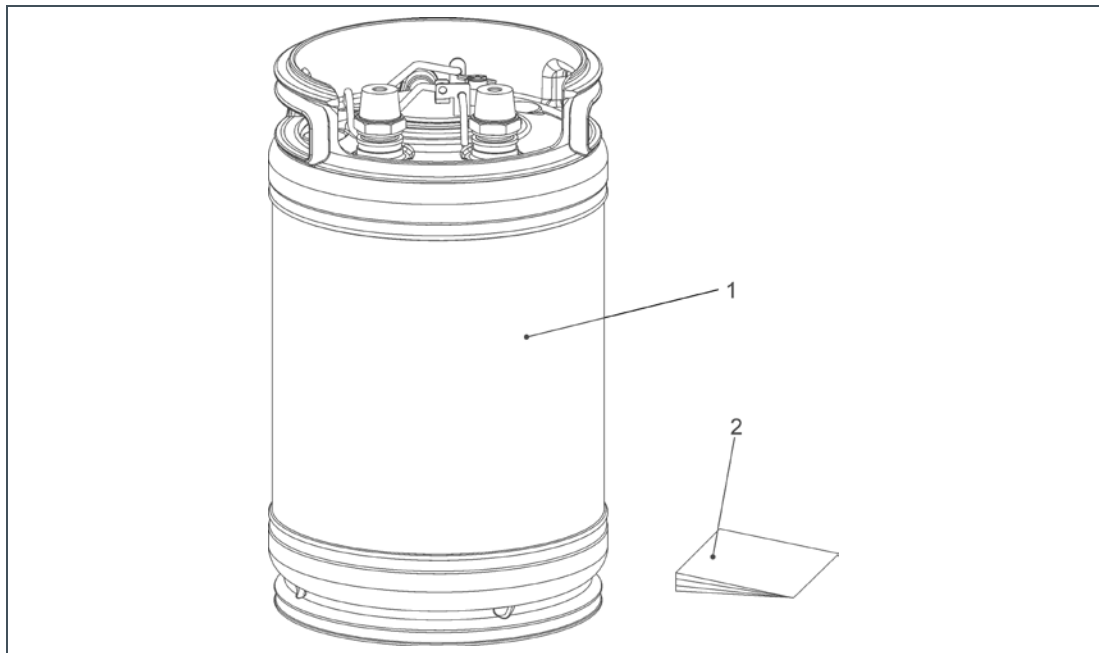
- The mixed-bed cartridges are not intrinsically safe. If the mixed-bed cartridges are installed without a filling device and there is no system separator downstream of the water connection to the house, then there is a risk of the drinking water becoming contaminated.
- ▶ Install a system separator upstream of the mixed-bed cartridge.



NOTE: The installation room must have a floor drain. Floor drains that discharge to a lifting system do not work in case of a power failure.

- Possible flooding of the rooms if no floor drain is provided.
- ▶ Install a water stop device.

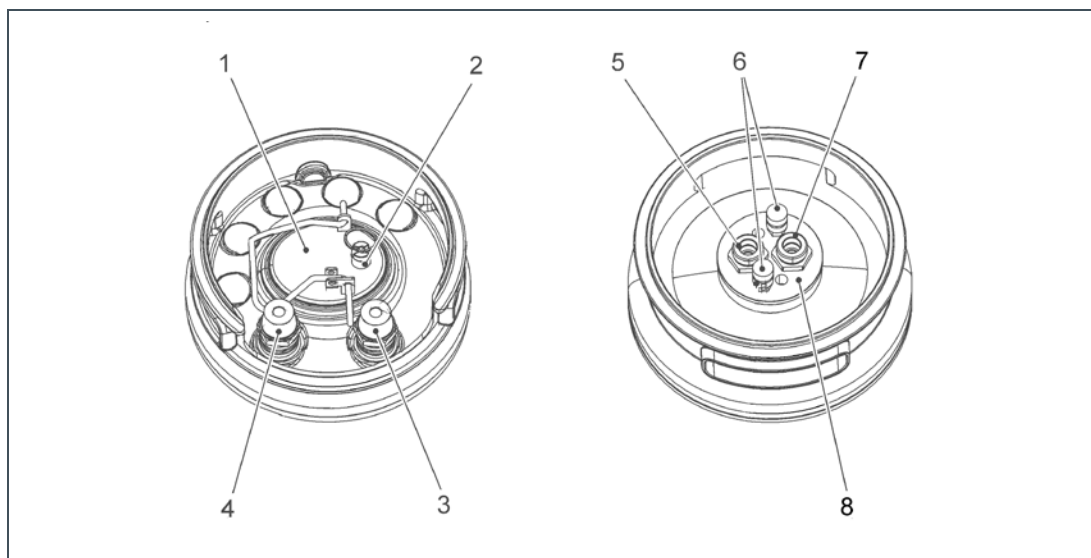
4.2 Checking the scope of supply



Item	Designation	Item	Designation
1	Filled mixed-bed cartridge	2	Operation manual

Check the scope of supply for completeness and possible damage.

4.3 Installing the product



Mixed-bed cartridge desaliQ		Mixed-bed cartridge desaliQ:BA VARIO mini 16 only	
Item	Designation	Item	Designation
1	Lid of mixed-bed cartridge desaliQ	5	Raw water inlet, marked
2	Venting device with ring eyelet	6	Venting device with knurled screws
3	Raw water inlet, marked	7	Pure water outlet
4	Pure water outlet	8	Lid of mixed-bed cartridge desaliQ:BA VARIO mini 16

Using residential applications as an example, the sequence of the devices in the direction of flow is the following:

- Coarse dirt filter, if required
- Water meter
- Fine filter, if required
- System separator, optional
- Shut-off valve on raw water side
- Mixed-bed cartridge desaliQ installed at the filling device or installed directly.
- Shut-off valve on pure water side
- Distribution pipes or devices to be protected



CAUTION: Danger due to mechanical energy! System parts may be subject to overpressure.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
 - ▶ Install a suitable pressure reducing device in the pressurised line upstream of the mixed-bed cartridge.
 - ▶ Install a safety valve in the pressurised line upstream of the mixed-bed cartridge, which is approved for the specified pressure range.
 - ▶ Make sure that the opening pressure set at the safety valve does not exceed the maximum permissible operating indicated on the type plate.
-



CAUTION: Danger due to hot surfaces because of high water temperatures – depending on the application of the mixed-bed cartridge.

- Risk of burns in case of temperatures of more than 55 °C.
 - ▶ Observe the warning sticker “hot surfaces” on the mixed-bed cartridge.
 - ▶ Do not touch the mixed-bed cartridge without appropriate, protective clothing.
 - ▶ Only move the mixed-bed cartridge using the carrying handles.
-



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
 - ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.
-



NOTE: Incorrect installation of the connection hoses at the mixed-bed cartridge possible: The mixed-bed cartridge does not have a non-return valve.

- The mixed-bed cartridge cannot reach its full capacity.
 - ▶ Make sure to connect the mixed-bed cartridge properly.
-

4.3.1 Installation at a filling device

Connect the connection hoses of the mixed-bed cartridge to the filling device:

1. Close the shut-off valves on the raw and pure water side.
2. Connect the raw water hose to the raw water inlet at the mixed-bed cartridge.
3. Connect the pure water hose to the pure water outlet at the mixed-bed cartridge.

4. Connect the raw water hose to the raw water outlet at the filling device.
5. Connect the pure water hose to the pure water inlet at the filling device.

Fill the mixed-bed cartridge with water.



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
- ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.

1. Open the venting device at the lid of the mixed-bed cartridge.
 - **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the mixed-bed cartridge a full turn to the left.
 - **For all other desaliQ mixed-bed cartridges:** Pull the ring eyelet at the venting device and turn it by 90°.
2. Open the shut-off valve on the raw water side.
3. Leave the venting device at the lid of the mixed-bed cartridge open until the mixed-bed cartridge is completely filled with water.
4. Close the venting device at the lid of the mixed-bed cartridge.
 - **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the mixed-bed cartridge a full turn to the right.
 - **For all other desaliQ mixed-bed cartridges:** Turn the ring eyelet by 90° and let it snap into the cavity.

Vent the installation:



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
- ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.

1. Open the venting device at the GENO-therm® filling device.
2. Leave the venting device open until the installation is completely filled with water.
3. Close the venting device at the GENO-therm® filling device.
4. Open the shut-off valve on the raw water side.
5. Let the mixed-bed cartridge run in normal operation for a short time.
6. Pay attention to clearly audible gurgling noises.
7. Vent the mixed-bed cartridge and the installation once again if gurgling noises are audible.

4.3.2 Installation without filling device



In order for the water pipe to be properly connected to the protective-equipotential bonding on both sides of the product, we recommend establishing a corresponding electrical bypass according to DIN VDE 0100 540.

Connect the mixed-bed cartridge to the installation:

1. Close the shut-off valves on the raw and pure water side.
2. Place the mixed-bed cartridge in a way that the type plate is clearly legible.
3. Connect the raw water hose to the raw water inlet at the mixed-bed cartridge.
4. Connect the pure water hose to the pure water outlet at the mixed-bed cartridge.
5. Connect the raw water hose to the raw water outlet of the installation.
6. Make sure that there is a free outlet at the free end of the pure water hose for the water escaping during the work.

Fill the mixed-bed cartridge with water:



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
 - ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.
-

1. Open the venting device at the lid of the mixed-bed cartridge.
 - **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the cartridge a full turn to the left.
 - **For all other desaliQ mixed-bed cartridges:** Pull the ring eyelet at the venting device and turn it by 90°. Open the valve on the raw water side.
2. Leave the venting device at the lid of the mixed-bed cartridge open until the mixed-bed cartridge is completely filled with water.
3. Close the venting device at the lid of the mixed-bed cartridge.
 - **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the mixed-bed cartridge a full turn to the right.
 - **For all other desaliQ mixed-bed cartridges:** Turn the ring eyelet by 90° and let it snap into the cavity.

Connect the mixed-bed cartridge to the pure water inlet of the installation.

1. Bring the free end of the pure water hose to the same height as the pure water inlet of the installation.
2. Close the valve on the raw water side.
3. Connect the pure water hose to the pure water inlet of the installation.
4. Open the valve on the raw water side.
5. Open the valve on the pure water side.
6. Let the mixed-bed cartridge run in normal operation for a short time.
7. Pay attention to clearly audible gurgling noises.
8. Vent the mixed-bed cartridge and the installation once again if gurgling noises are audible.

5 Start-up

5.1 Preparations

Following the installation, measure the residual conductivity of the treated water on the pure water side with an optional conductivity meter. To do so, use a GENO®-Multi LF conductivity meter or another type of conductivity meter. If the maximum conductivity limit - in general 50 $\mu\text{S}/\text{cm}$ - is undershot considerably, the start-up can be completed.

If the maximum conductivity limit is not undershot considerably immediately, operate the mixed-bed cartridge without consumer for a few minutes while measuring the residual conductivity several times. The values of the residual conductivity should be decreasing continuously. If this is not the case, please contact Grünbeck's headquarters or your local Grünbeck technical service/authorised service company directly (refer to www.gruenbeck.com).

5.2 Handing over the product to the owner/user

Inform the owner/user about the need for inspections and maintenance (refer to chapter 7.1).

6 Operation



CAUTION: Danger due to hot surfaces because of high water temperatures – depending on the application of the mixed-bed cartridge.

- Risk of burns in case of temperatures of more than 55 °C.
 - ▶ Observe the warning label “hot surfaces” on the mixed-bed cartridge.
 - ▶ Do not touch the mixed-bed cartridge without appropriate, protective clothing.
 - ▶ Only move the mixed-bed cartridge using the carrying handles.
-

- ▶ Observe the intervals for inspection and maintenance (refer to chapter 7.1).

During operation - outside the scheduled intervals for inspection and maintenance - your intervention is not required.

7 Cleaning, inspection, maintenance



CAUTION: Danger due to hot surfaces because of high water temperatures – depending on the application of the mixed-bed cartridge.

- Risk of burns in case of temperatures of more than 55 °C.
- ▶ Observe the warning label “hot surfaces” on the mixed-bed cartridge.
- ▶ Do not touch the mixed-bed cartridge without appropriate, protective clothing.
- ▶ Only move the mixed-bed cartridge using the carrying handles.

7.1 Intervals

The following tasks must be carried out in compliance with DIN EN 806-5:

Task	Interval	Execution
Inspection	2 months	Owner/user
Maintenance	6 months	Owner/user or installation company

7.2 Cleaning



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairment of the components due to the use of chlorine or chlorine-containing cleaning agents.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
- ▶ Only clean the external surfaces of the product. To do so, use a cloth moistened with water.



NOTE: Do not clean the product with cleaning agents containing alcohol or solvents!

- Such substances damage the components made of plastic.
- ▶ Only clean the external surfaces of the product. To do so, use a cloth moistened with water.



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairment of the components.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
 - ▶ Immediately remove corrosion by polishing and remedy the cause of the corrosion.
-

7.3 Inspection



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
 - ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.
-



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairment of the components.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
 - ▶ Immediately remove corrosion by polishing and remedy the cause of the corrosion.
-

- ▶ Measure the residual conductivity of the pure water by means of a conductivity meter.
 - ▶ Notify Grünbeck's technical service/authorised service company shortly before the maximum permissible conductivity limit - in general 50 µS/cm - will be exceeded.
 - ▶ Check the installation for leaks.
-



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
 - ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.
-



CAUTION: Risk of injury due to corrosion at the mixed-bed cartridge and damage and functional impairment of the components.

- Risk of injuries and damage to property due to escaping water and unexpected movement of system parts.
- ▶ Immediately remove corrosion by polishing and remedy the cause of the corrosion.

-
- ▶ Check the installation for leaks.
 - ▶ Measure the residual conductivity of the pure water by means of a conductivity meter. Have the resin regenerated if you detect that the limit value has been exceeded.

7.3.1 Shut-down



Comply with the instructions on packaging, transport, storage and installation (refer to chapter 2.7).



CAUTION: Danger due to hot surfaces because of high water temperatures – depending on the application of the mixed-bed cartridge.

- Risk of burns in case of temperatures of more than 55 °C.
- ▶ Observe the warning label “hot surfaces” on the mixed-bed cartridge.
- ▶ Do not touch the mixed-bed cartridge without appropriate, protective clothing.
- ▶ Only move the mixed-bed cartridge using the carrying handles.



CAUTION: Danger due to escaping hot water during venting – depending on the application of the mixed-bed cartridge.

- Risk of scalding.
- ▶ Let the mixed-bed cartridge and affected system components cool down prior to assembling/disassembling them.

1. Open the venting device at the lid of the mixed-bed cartridge.

- **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the mixed-bed cartridge a full turn to the left.
- **For all other desaliQ mixed-bed cartridges:** Pull the ring eyelet at the venting device and turn it by 90°.



NOTE: Danger to the operator or to delicate electronic components nearby due to splashing water.

- Risk of injury to the operator and destruction of electronic components.
 - ▶ Only make modifications on unpressurised installations.
-

2. Wait for some minutes until the pressure in the mixed-bed cartridge has been relieved.
3. Unscrew the connection hoses at the mixed-bed cartridge.
4. Close the venting device at the lid of the mixed-bed cartridge.
 - **For mixed-bed cartridge desaliQ:BA 16 VARIO mini only:** Turn the two white, knurled screws at the lid of the mixed-bed cartridge a full turn to the right.
 - **For all other desaliQ mixed-bed cartridges:** Turn the ring eyelet by 90° and let it snap into the cavity.
5. Screw the yellow plastic caps onto the connections.



Send the exhausted mixed-bed cartridge to Grünbeck's technical service/authorised service company in your area (refer to gruenbeck.com).

7.4 Spare parts



NOTE: Danger of damaging the installation if unsuitable parts are used.

- Risk of functional impairment, malfunctions and loss of warranty.
 - ▶ Only use genuine parts.
-

You may order spare parts and consumables from your local Grünbeck representation (see www.gruenbeck.com).

7.5 Wearing parts



NOTE: Danger of damaging the installation if unsuitable parts are used.

- Risk of functional impairment, malfunctions and loss of warranty.
 - ▶ Only use genuine parts.
-

Seals are wearing parts.



Although these parts are wearing parts, we grant a limited warranty period of 6 months.

8 Troubleshooting

If malfunctions do occur that cannot be remedied with the instructions given below, contact Grünbeck's technical service/authorised service company (refer to www.gruenbeck.com).

- ▶ Have your system data handy (refer to chapter 1.7).

Troubleshooting	Explanation	Remedy
No flow.	For mixed-bed cartridge desaliQ:BA 16 VARIO mini only: Inlet line and pure water line have been mixed up. The non-return valve blocks.	Interchange inlet and pure water line at the lid of the mixed-bed cartridge.
	The shut-off valves are not open completely.	Completely open the shut-off valves.
The exchanger capacity is low.	A water softener or a phosphate system is installed upstream.	Connect the mixed-bed cartridge directly to the raw water network.
	Raw water loaded with sealing or soldering grease.	You may want to install an activated carbon filter upstream.
	The raw water quality has changed.	Replace the current system size for a more powerful mixed-bed cartridge.
	Contaminated raw water.	Install a filter upstream and wait for the flushing of the lines to be completed.
	Pipe break/pipe repair	Put the system out of operation and thoroughly flush the pipes after the repair work has been completed.
	Raw water is hot water.	The inlet water temperature must not exceed 80 °C max.
	The mixed-bed cartridge has not been fully vented.	Completely vent the mixed-bed cartridge.
The residual conductivity increases rapidly after a long period of operational downtime.	The mixed-bed cartridge is exhausted.	Immediately send in the exhausted mixed-bed cartridge for regeneration.
	Re-ionisation has occurred.	Let the water drain without using it until the residual conductivity decreases.

Troubleshooting	Explanation	Remedy
The flow rate is very low.	The hose line is bent.	Re-lay the hose line.
	The hose line is clogged.	Disconnect the hoses from the system and thoroughly flush them.
	The iron content in the raw water is high.	Notify a specialist installer.
The flow rate is too high.	The interior flow stabiliser is defective.	Notify a specialist installer.
	For mixed-bed cartridges desaliQ:BA 20/PA 20 only:	Reduce the flow via the shut-off valve on the raw water side.
The residual conductivity has exceeded the limit value.	The mixed-bed resin is exhausted.	Immediately send in the mixed-bed cartridge containing the exhausted mixed-bed resin for regeneration.

9 Disposal

- Do not dispose of the packaging, the product and the accessories with the household waste.
- Comply with the applicable national regulations for disposal.
- Make sure that the packaging, the product and the accessories are disposed of properly.

10 Technical specifications

10.1 Mixed-bed cartridge desaliQ:BA

Mixed-bed cartridge desaliQ:BA	6	12	13	16	20
Order no.:	707 450	707 460	707 470	707 480	707 490

Connection data					
Nominal connection diameter	3/4"	3/4"	3/4"	3/4"	3/4"

Performance data						
Nominal pressure					PN 10	
Flow at Δp 1 bar	[l/h]	480	850	1050	1080	1200
Capacity at a desired residual conductivity of < 10 $\mu\text{S/cm}$	[l]	215	460	1040	1560	2080
Capacity at a desired residual conductivity of < 50 $\mu\text{S/cm}$	[l]	340	800	1650	2475	3300
Nominal flow	[m ³ /h]	0.6	1.2	1.3	1.6	2.0

Dimensions and weights						
Volume of cartridge	[l]	13.5	28.5	58.7	85	115
Filling volume of mixed-bed resin	[l]	12.5	25	50	75	100
Diameter	[mm]	240	240	410	410	410
Height	[mm]	400	755	605	820	1065
Weight on delivery	[kg]	12	23	48	68	89

General					
Max. water temperature ^{a)}	[°C]			80	
Max. ambient temperature	[°C]			40	

^{a)} Prolonged periods of use with water temperatures exceeding 60 °C may damage the resin. A regeneration is no longer possible then.

Calculation example 1:

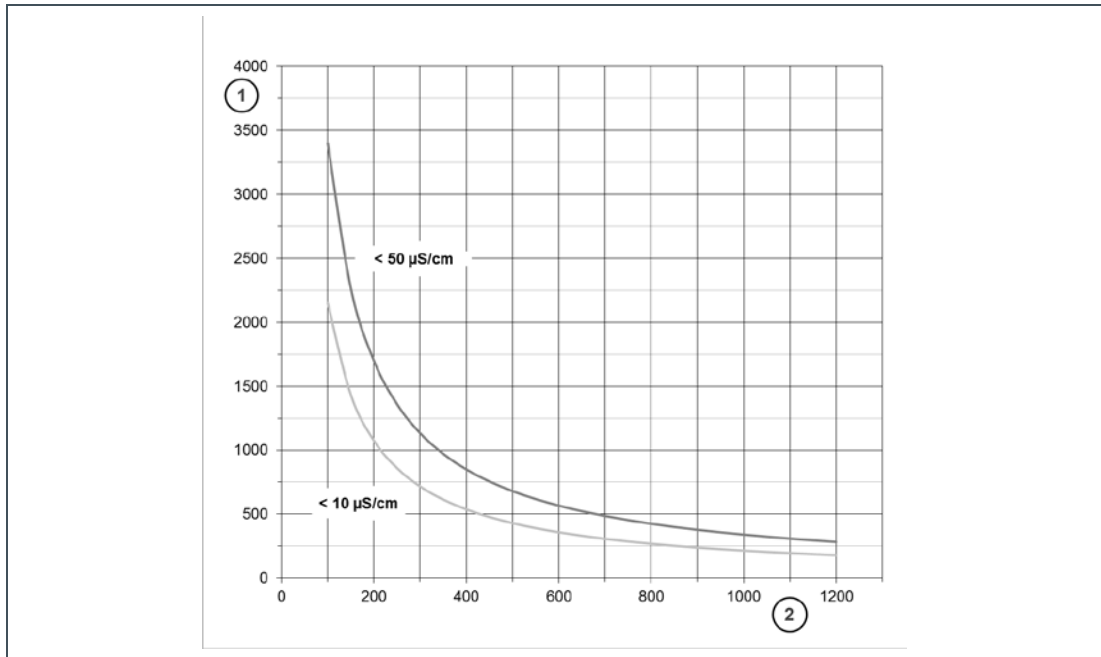
- Conductivity of the filling water: 500 $\mu\text{S/cm}$
- Mixed-bed cartridge used: Mixed-bed cartridge desaliQ:BA 6
- $215/500 = 0.43 \text{ m}^3$ (corresponds to 430 litres at 10 $\mu\text{S/cm}$)
- $340/500 = 0.68 \text{ m}^3$ (corresponds to 680 litres at 50 $\mu\text{S/cm}$)

Calculation example 2:

- Conductivity of the filling water: 300 $\mu\text{S/cm}$
- Mixed-bed cartridge used: Mixed-bed cartridge desaliQ:BA 13
- $1040/300 = 3.47 \text{ m}^3$ (corresponds to 3470 litres at 10 $\mu\text{S/cm}$)
- $1650/300 = 5.50 \text{ m}^3$ (corresponds to 5500 litres at 50 $\mu\text{S/cm}$)

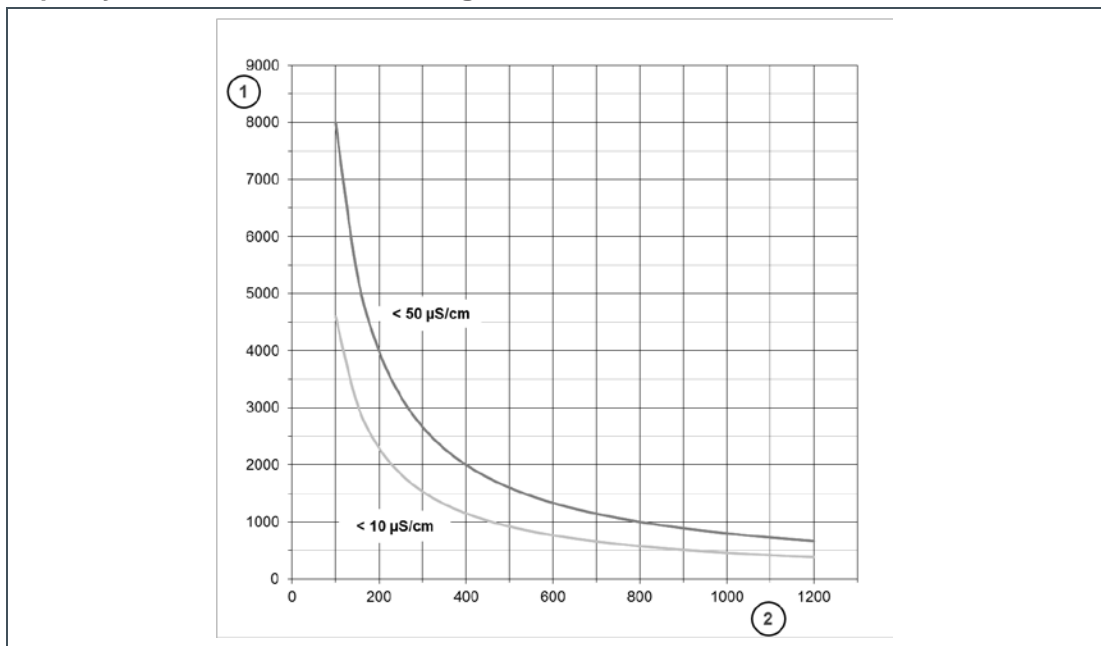
10.1.1 Capacity curves

Capacity curve of mixed-bed cartridge desaliQ:BA 6



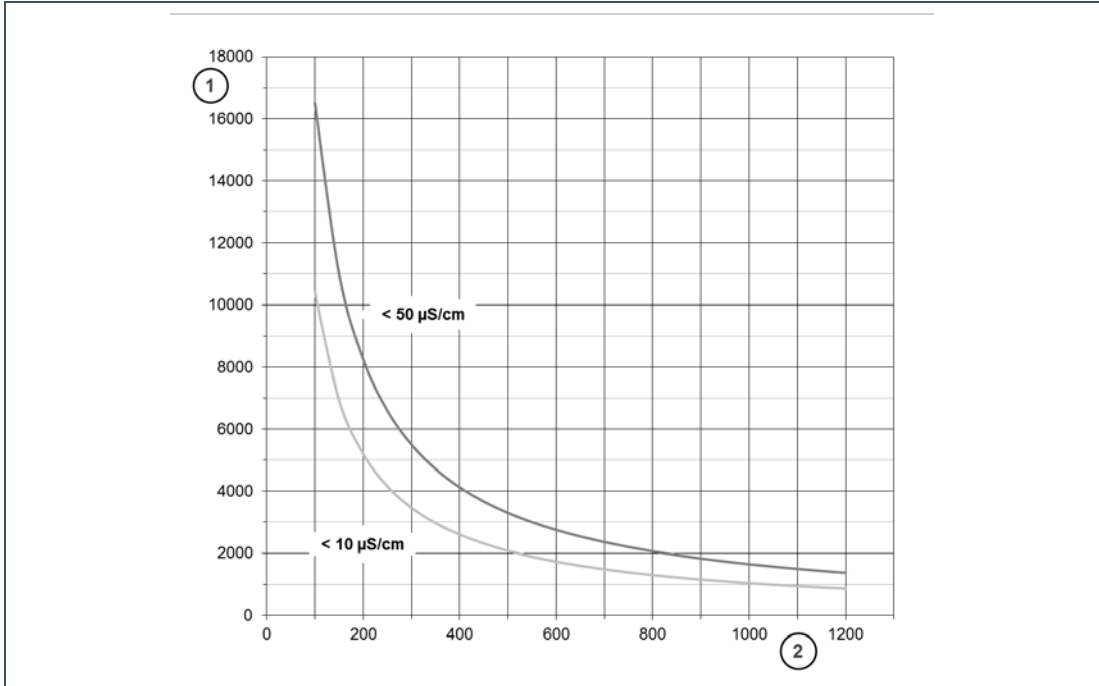
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

Capacity curve of mixed-bed cartridge desaliQ:BA 12



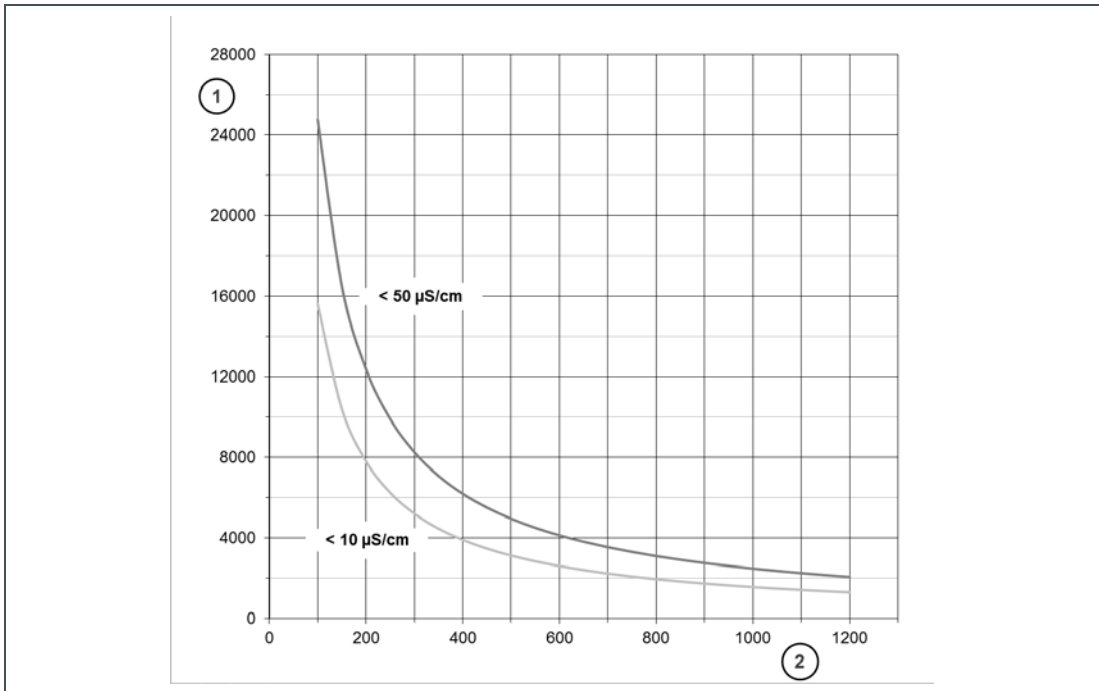
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

Capacity curve of mixed-bed cartridge desaliQ:BA 13



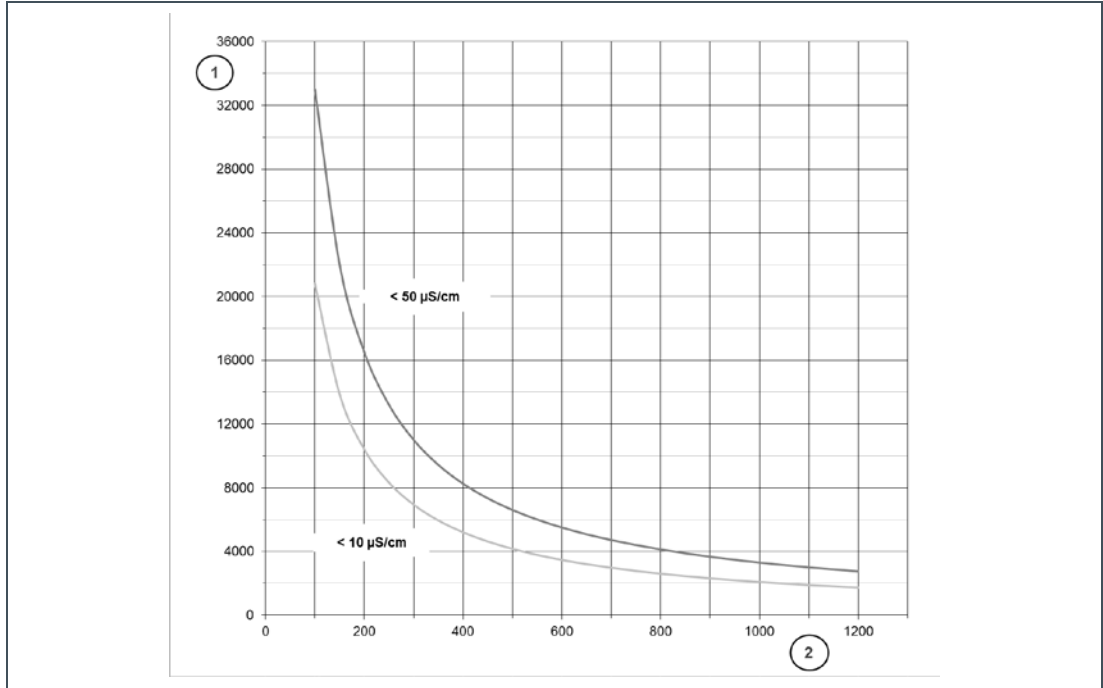
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in $\mu\text{S/cm}$

Capacity curve of mixed-bed cartridge desaliQ:BA 16



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in $\mu\text{S/cm}$

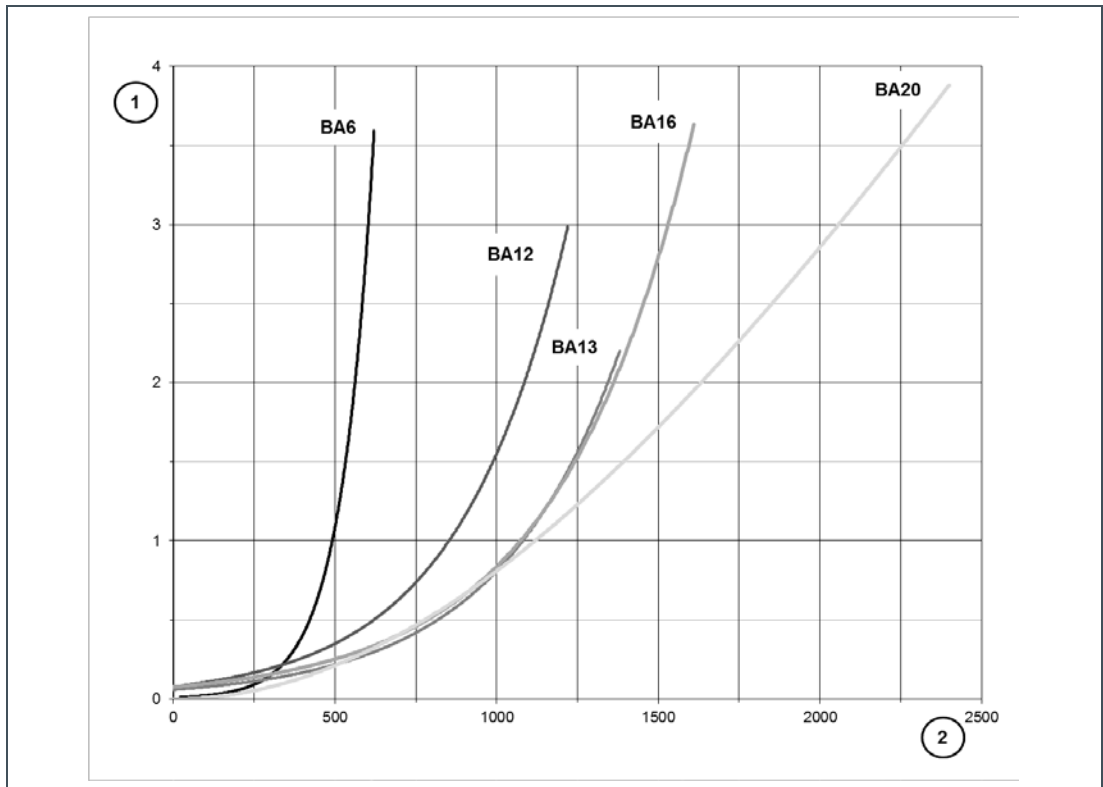
Capacity curve of mixed-bed cartridge desaliQ:BA 20



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

10.1.2 Pressure loss curves

Pressure loss curves of mixed-bed cartridges desaliQ:BA



Item	Designation	Item	Designation
1	Pressure loss in bar	2	Flow in l/h

10.2 Mixed-bed cartridge desaliQ:BA VARIO mini

Mixed-bed cartridge desaliQ:BA VARIO mini	12	16
Order no.:	707 465	707 485

Connection data		
Nominal connection diameter	¾"	¾"

Performance data		
Nominal pressure		PN 10
Flow at Δp 1 bar	[l/h]	850
Capacity at a desired residual conductivity of < 10 $\mu\text{S/cm}$	[l]	460
Capacity at a desired residual conductivity of < 50 $\mu\text{S/cm}$	[l]	800
Nominal flow	[m ³ /h]	1.2

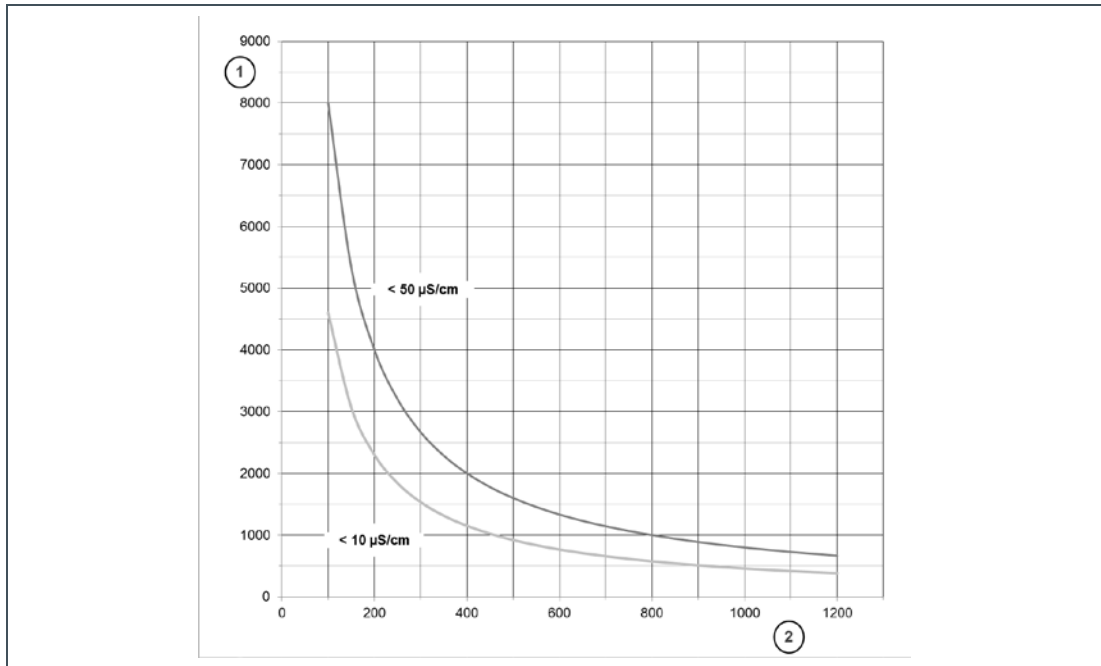
Dimensions and weights		
Volume of cartridge	[l]	28.5
Filling volume of mixed-bed resin	[l]	25
Diameter	[mm]	240
Height	[mm]	755
Weight on delivery	[kg]	23

General		
Max. water temperature ^{a)}	[°C]	80
Max. ambient temperature	[°C]	40

- b) Prolonged periods of use with water temperatures exceeding 60 °C may damage the resin. A regeneration is no longer possible then.

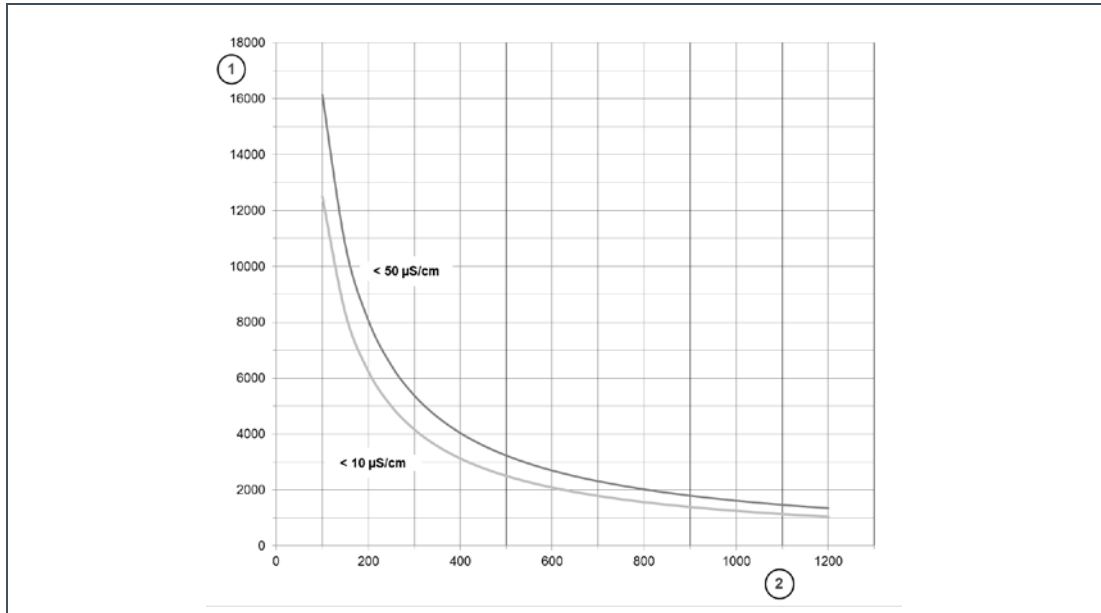
10.2.1 Capacity curves

Capacity curve of mixed-bed cartridge desaliQ:BA 12 VARIO mini



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

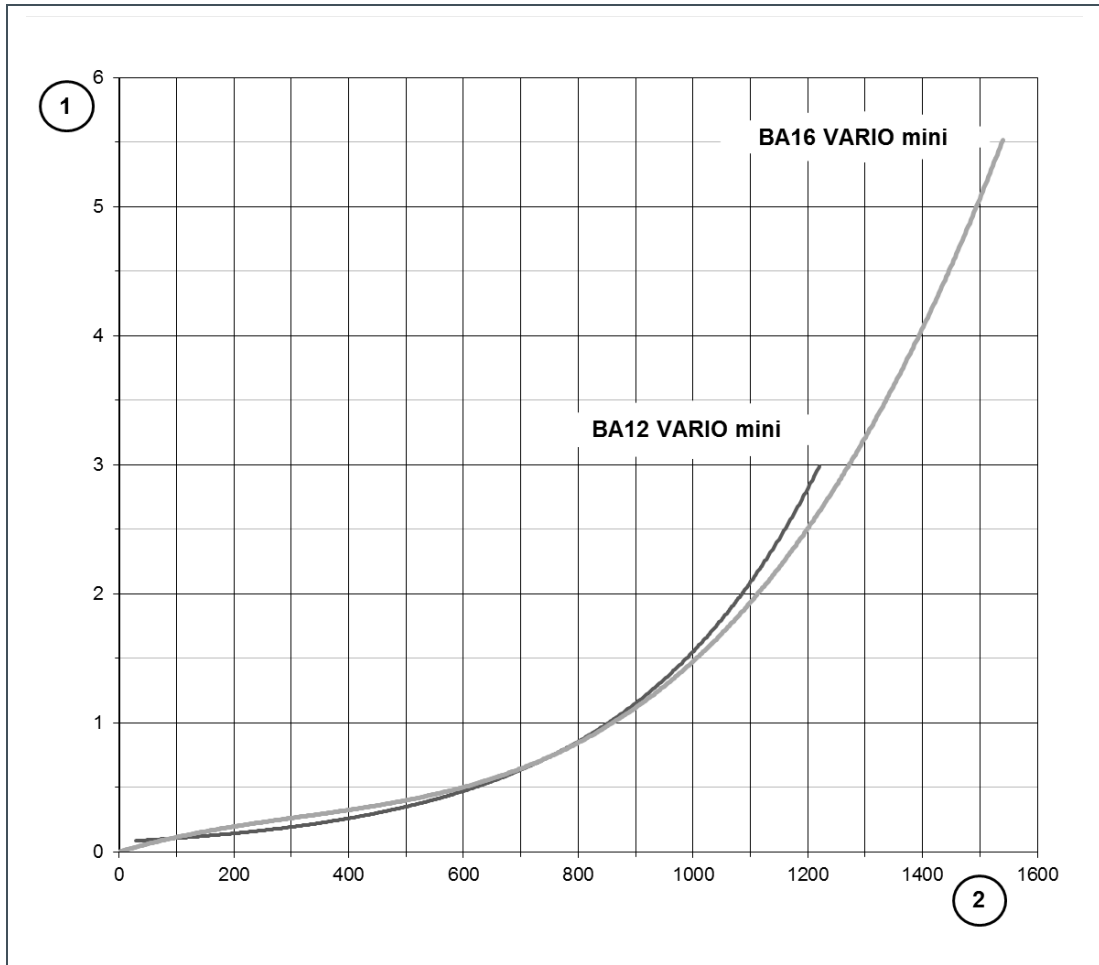
Capacity curve of mixed-bed cartridge desaliQ:BA 16 VARIO mini



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

10.2.2 Pressure loss curves

Pressure loss curves of mixed-bed cartridges desaliQ:BA VARIO mini



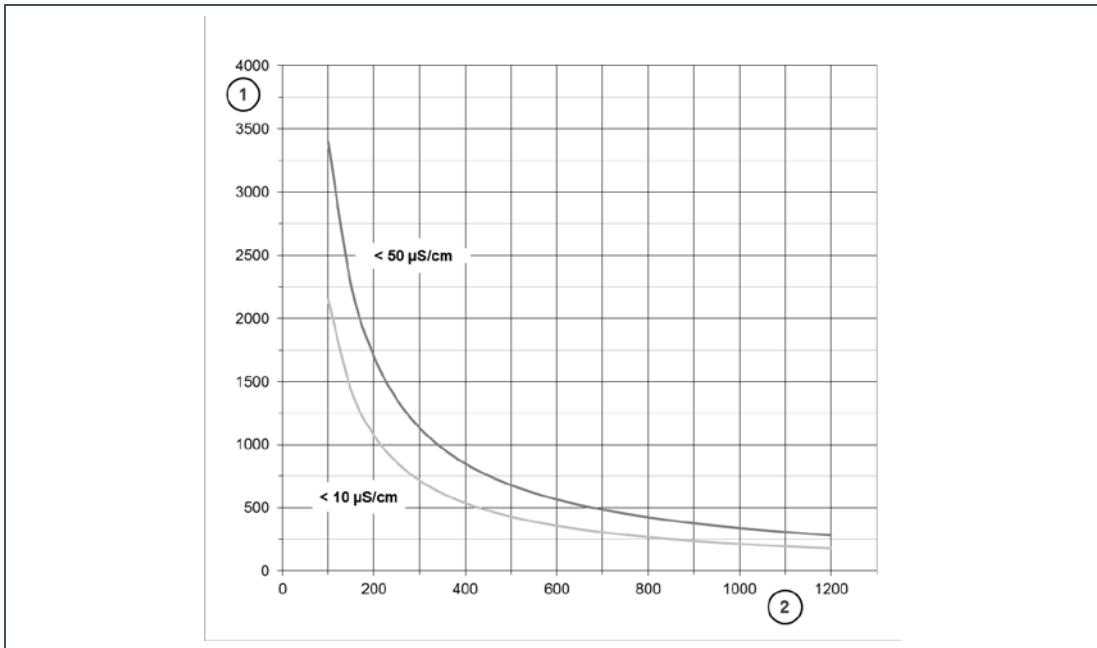
Item	Designation	Item	Designation
1	Pressure loss in bar	2	Flow in l/h

10.3 Mixed-bed cartridge desaliQ:PA

Mixed-bed cartridge desaliQ:PA	6	12	13	16	20	
Order no.:	703 655	703 665	703 675	703 685	703 695	
Connection data						
Nominal connection diameter	¾"	¾"	¾"	¾"	¾"	
Performance data						
Nominal pressure	PN 10					
Flow at Δp 1 bar	[l/h]	480	850	1050	1080	1200
Capacity at a desired residual conductivity of < 10 μS/cm	[l]	215	460	1040	1560	2080
Capacity at a desired residual conductivity of < 50 μS/cm	[l]	340	800	1650	2475	3300
Nominal flow	[m³/h]	0.6	1.2	1.3	1.6	2.0
Dimensions and weights						
Volume of cartridge	[l]	13.5	28.5	58.7	85	115
Filling volume of mixed-bed resin	[l]	12.5	25	50	75	100
Diameter	[mm]	240	240	410	410	410
Height	[mm]	400	755	605	820	1065
Weight on delivery	[kg]	12	23	48	68	89
General						
Max. water temperature	[°C]				30	
Max. ambient temperature	[°C]				30	

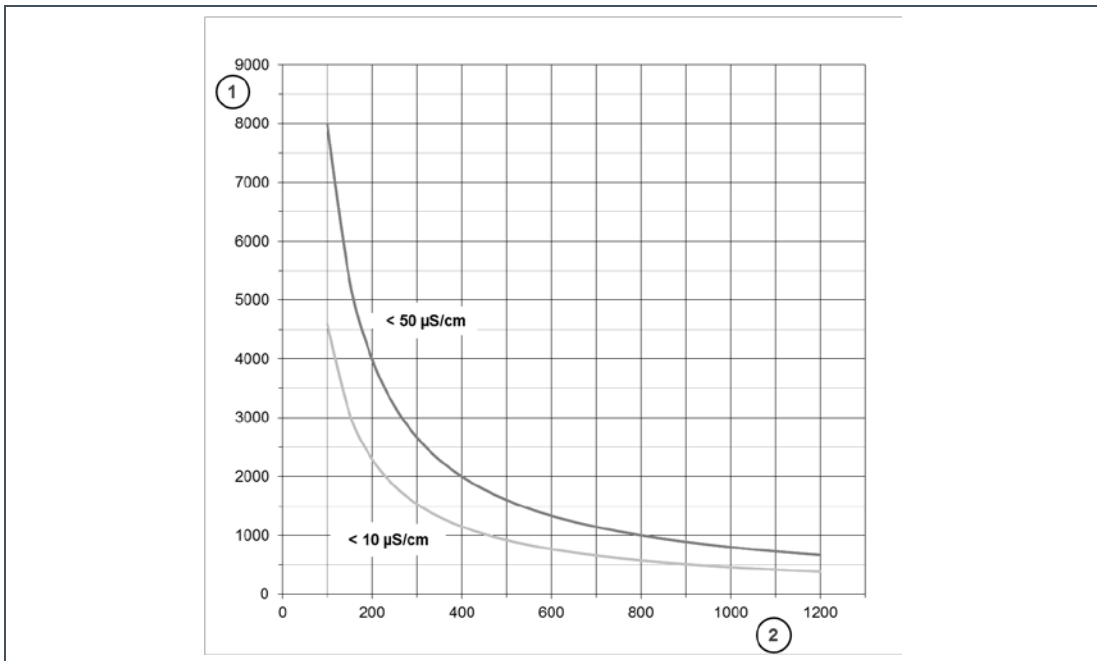
10.3.1 Capacity curves

Capacity curve of mixed-bed cartridge desaliQ:PA 6



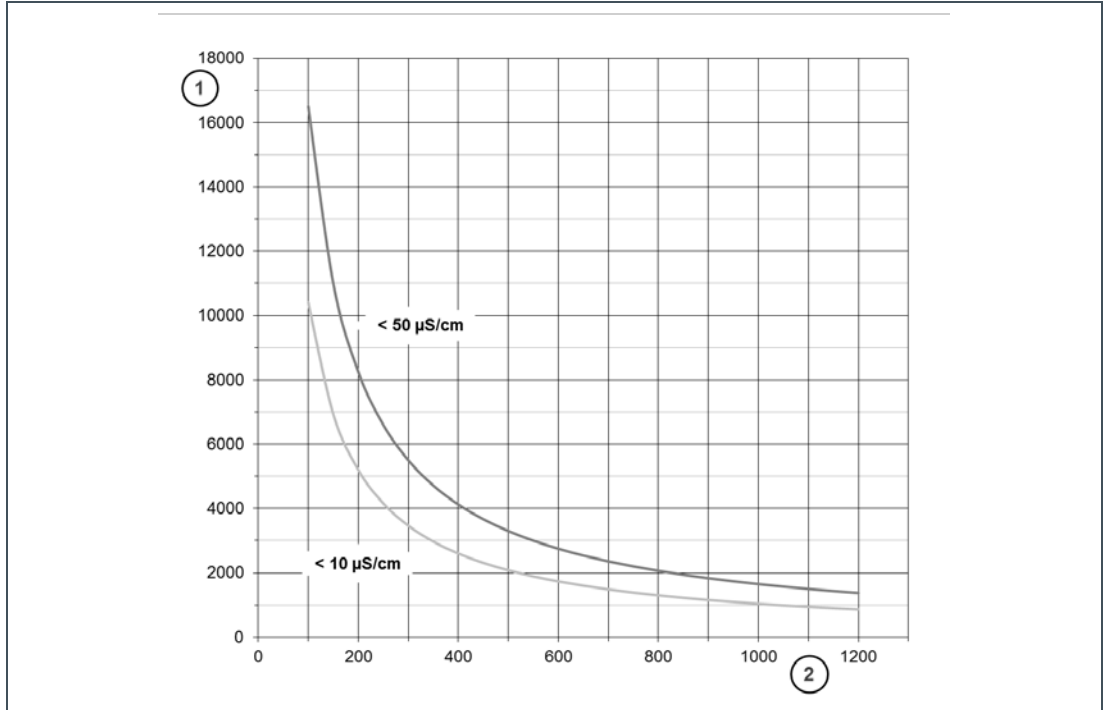
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in $\mu\text{S/cm}$

Capacity curve of mixed-bed cartridge desaliQ:PA 12



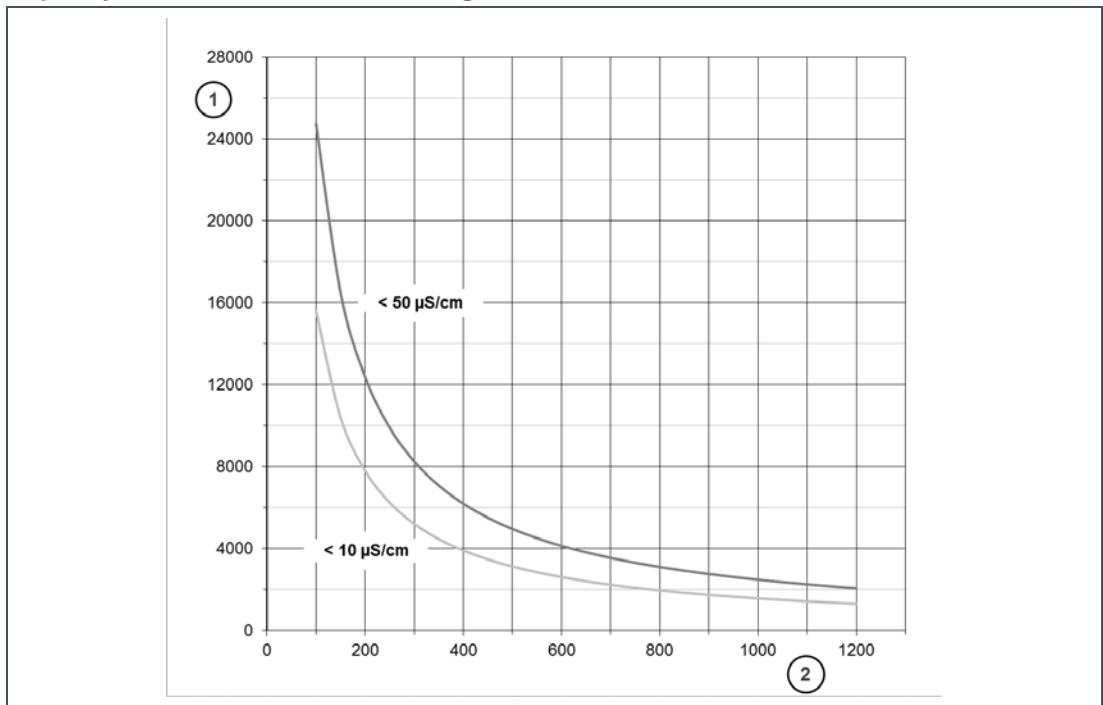
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in $\mu\text{S/cm}$

Capacity curve of mixed-bed cartridge desaliQ:PA 13



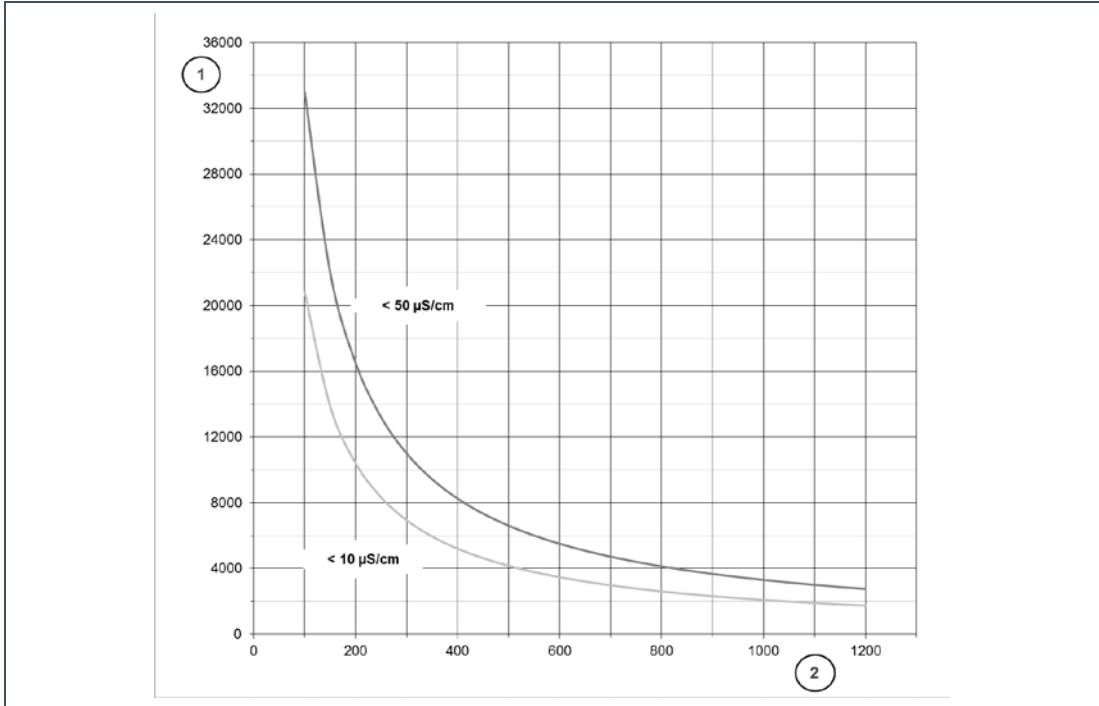
Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

Capacity curve of mixed-bed cartridge desaliQ:PA 16



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

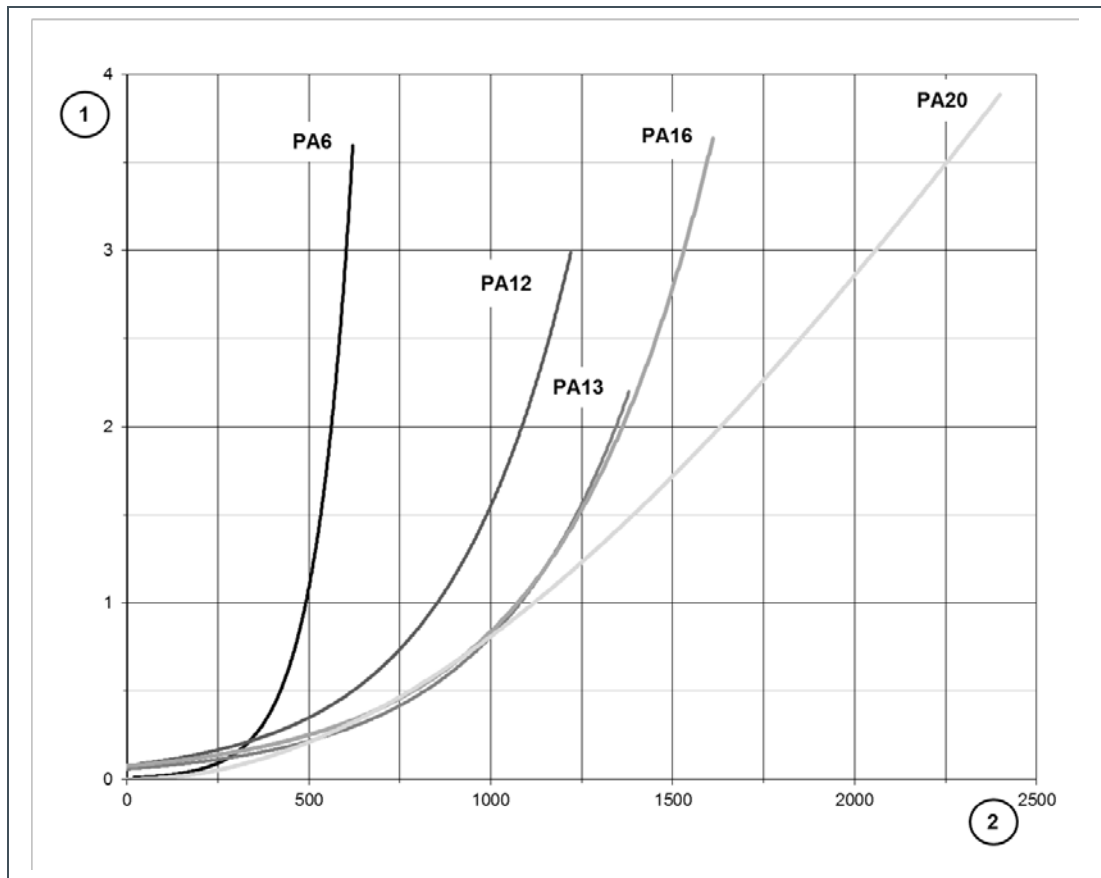
Capacity curve of mixed-bed cartridge desaliQ:PA 20



Item	Designation	Item	Designation
1	Volume of demineralised water in l	2	Raw water conductivity in µS/cm

10.3.2 Pressure loss curves

Pressure loss curves of mixed-bed cartridges desaliQ:PA



Item	Designation	Item	Designation
1	Pressure loss in bar	2	Flow in l/h

11 Other information

11.1 Explanation of terminology

Permeate	Permeate is a term used in membrane technology and, in particular, in reverse osmosis. The water freed of e.g. hardness forming ions or heavy metals by means of filtration is called permeate.
Raw water	Raw water is the untreated water prior to treatment.
Pure water	Pure water is the term used for the water after treatment.
Drinking water	Drinking water is any water that is intended to be used in the domestic environment for drinking and all other food preparation purposes, for personal hygiene and cleaning as well as for cleaning objects that do not only temporarily come into contact with foodstuffs or the human body.
Reverse osmosis	<p>In the osmosis process, two liquids with different loads are separated by a cell membrane. Following the principle of the Brownian motion, the molecules of the liquids move to the less concentrated solution, thus generating an osmotic pressure.</p> <p>In case of reverse osmosis or RO, the process is reversed. In order to produce highly pure water, a pressure is generated on the loaded side that is much higher than the pressure on the unloaded side. Thus, a pressure-induced diffusion of the liquid's molecules through the cell membrane to the unloaded side is generated.</p>

Start-up log

Customer

Name:

Address:

Start-up

Installer:

Service technician:

Company:

Work time certificate (no.):

Date/signature:

Installation/Accessories

Drinking water filter (make/type):

Drain connection acc. to
DIN EN 1717

Floor drain available:

Safety devices:

Operating values

Water pressure	bar
----------------	-----

Water meter reading	m ³
---------------------	----------------

Raw water conductivity	µS/cm
------------------------	-------

Remarks

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