

User manual

MELAdem[®] 40

Ion exchanger as of serial number 0640MD1961



EN

Dear customer,

We thank you for your confidence demonstrated by the purchase of this MELAG product. As an owner-run and operated family concern founded in 1951, we have a long history of successful specialization in hygiene products for practice-based use. Our focus on innovation, quality and the highest standards of operational reliability has established MELAG as the world's leading manufacturer in the instrument decontamination and hygiene field.

You, our customer are justified in your demand for the best products, quality and reliability. Providing **"competence in hygiene"** and **"Quality – made in Germany"**, we guarantee that these demands will be met. Our certified quality management system is subject to close monitoring: one instrument to this end is our annual multi-day audit conducted in accordance with ISO 13485. This guarantees that all MELAG products are manufactured and tested in accordance with strict quality criteria.

The MELAG management and team

<i>Symbol</i>	<i>Explanation</i>
	Indicates a dangerous situation which if not avoided could entail damage to the practice equipment or the water treatment unit.
	Draws your attention to important information

Content

1	METHOD OF OPERATION OF THE SYSTEM	4
2	DESIGN OF THE SYSTEM	5
3	INSTALLATION AND CONNECTION OF THE SYSTEM	6
3.1	Possible ways of installing and connecting the MELAdem 40	6
3.2	Pressure of tap water	6
3.3	Installation of the MELAdem 40 to a wall	7
3.4	Installation of MELAdem 40 to the Vacuklav 40 B+ / 44 B+	8
3.5	Connection of MELAdem 40 directly to the tap-water mains	10
3.5.1	Conformity with the hygienic stipulations of EN 1717	10
3.5.2	Connection to tap-water mains	10
3.6	Connection of the MELAdem 40 to the Vacuklav 40 B+ / 44 B+	12
3.8	Connection of MELAdem 40 to the Vacuklav 41 B+ / Vacuklav 43 B+	13
4	PUTTING INTO OPERATION	14
5	MAINTENANCE INSTRUCTIONS	14
5.1	Exchanging the mixed-bed-resin cartridges	15
5.1.1	Complete exchange of the mixed-bed-resin cartridges	15
5.1.2	Safe and water-tight closing of the cartridge housings	16
6	TECHNICAL DATA	17
7	ACCESSORIES AND SPARE PARTS	18

1 Intended use

The water treatment unit permits the production of demineralized (de-ionised) water. This requires tap water with drinking water quality. **Please note:** The water treatment unit does not provide low-germ water.

The water treatment unit is suitable for the supply of small steam sterilizers with feed water. Furthermore demineralized water can be extracted, e.g. with a spray gun.

The water treatment unit is intended for use in the medical field, e.g. clinics, medical and dental practices outside the patient environment

The water treatment unit MELAdem 40 is not a medical device as defined by the Medical Device Regulation.

2 Method of operation of the system

MELAdem 40 is a water treatment system that operates according to the ion-exchange process. The cartridges contained in the filter chamber are filled with mixed-bed resin. The cartridges are disposed of after they have become depleted: they are completely exchanged upon every replacement. The MELAdem 40 reduces the content of salt in untreated water by approx. 95-99 % (depending on the degree of depletion of the mixed-bed resin). All operational processes in the MELAdem 40 system are controlled by means of the pressure in the tap-water line.

MELAdem 40 can be directly connected to a MELAG steam sterilizer (for example, the MELAG Vacuklav or Euroklav models) to automatically supply the steam sterilizer with demineralized water. The MELAdem 40 can, however, also be used as a completely separate water-treatment system. The flow limit of 2 l/min must not be exceeded, however.

The MELAdem 40 may be installed onto the wall, in a lower cabinet, or directly at a steam sterilizer.

If the room in which the MELAdem 40 water treatment system is to be installed does not have an open drain in the floor (to catch overflow), we recommend using a MELAG waterstop valve (art. no. 01056). In the event of leaks or overflow during operation, the moisture sensors of the waterstop valve, installed on the floor, will activate a solenoid valve to shut off the tap-water supply.

IMPORTANT: If the MELAdem 40 water treatment system is out of operation, the user should close off the supply of the tap water system.

Increased requirements can be placed on the quality of the DI water (e.g. a low endotoxin content) for the decontamination of certain medical devices such as ophthalmic instruments. Comply with the following:

- In such cases, an additional filter system is required for the decontamination of DI water.
- It is possible that the drinking water has been contaminated by the water installation (domestic installation and pre-device periphery).
- Arrange for a check of the drinking water quality at the removal point or request a report (e.g. from the building management) before setting up and installing the device.
- Further information is available from the corresponding trade associations and their publications. If in doubt, contact your stockist or the pertinent professional association.

3 Design of the system

The MELAdem 40 mixed-bed resin system is delivered in pre-assembled form. Please see *Figure 1* for a description of the individual components of the MELAdem 40.

IMPORTANT: It is absolutely necessary to ensure the correct flow direction of the water. Please see *Figure 2* for the position of the incoming water feed and the outgoing supply points for the MELAdem 40.

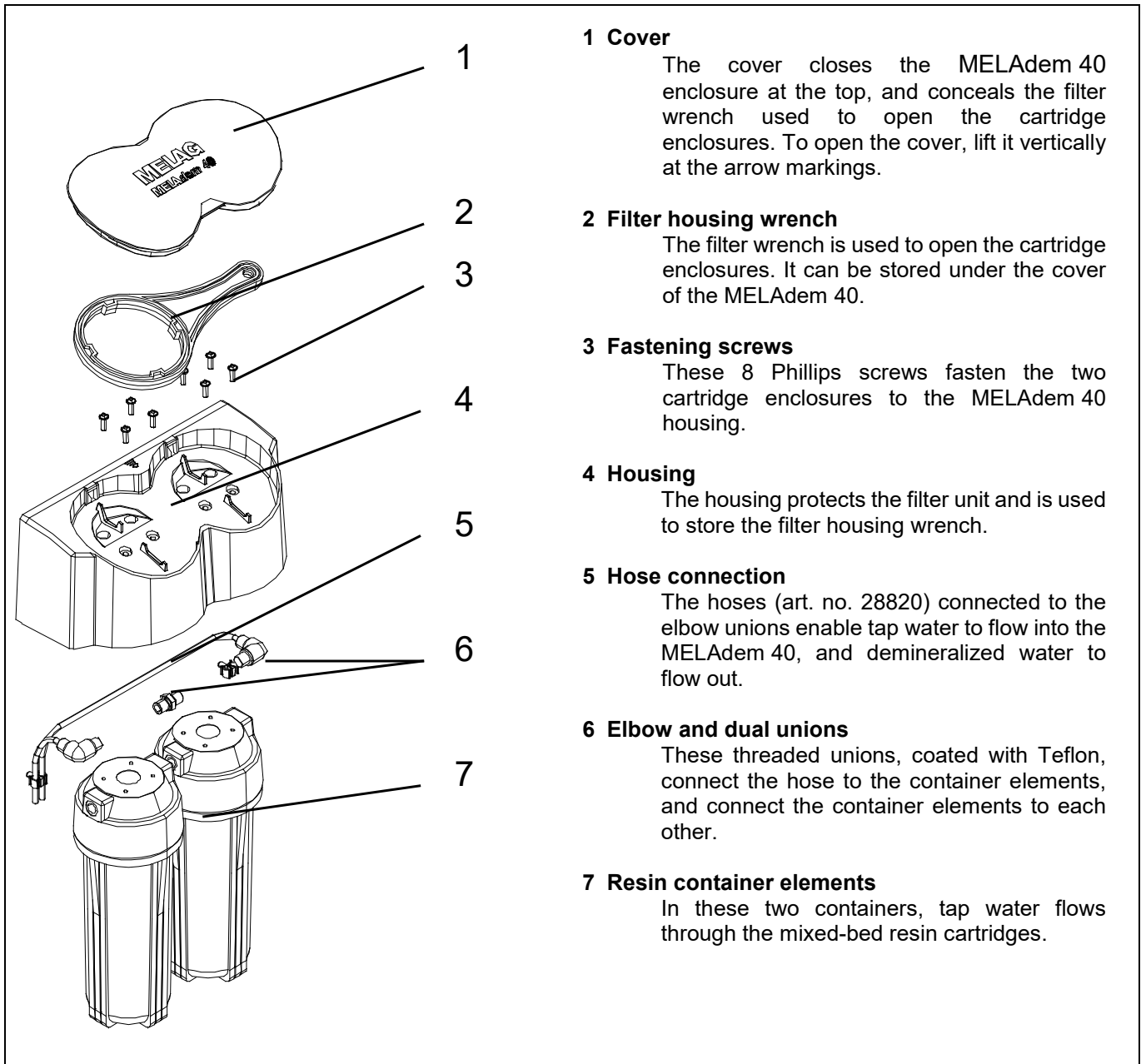
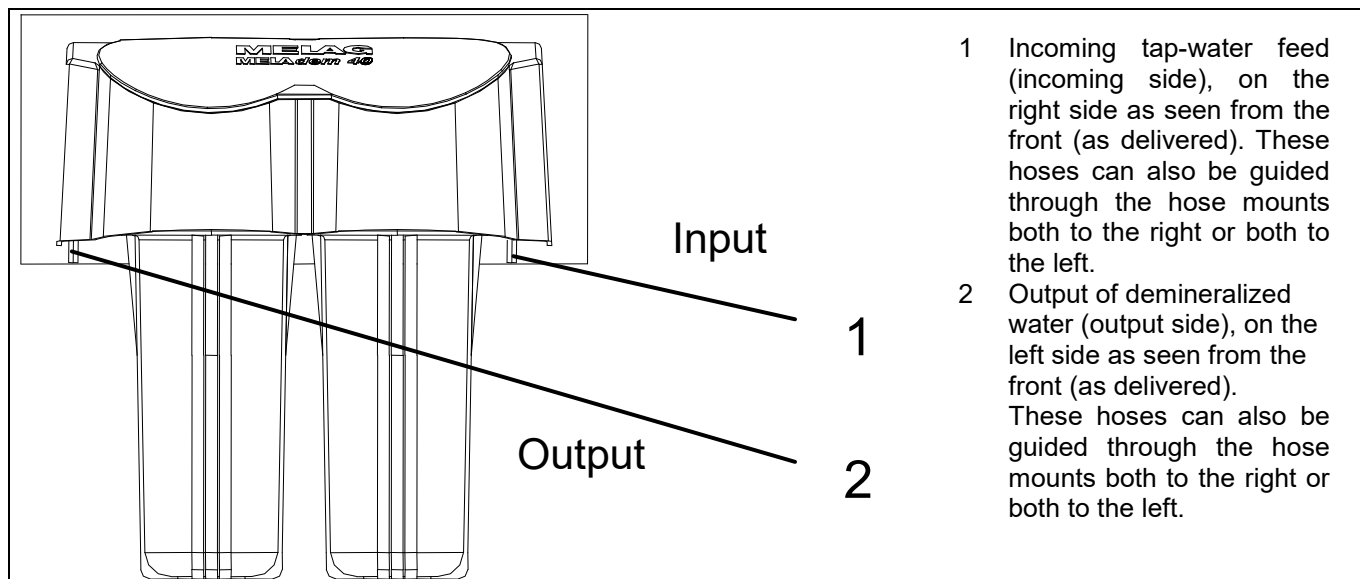


Figure 1: View of the interior of the MELAdem 40



- 1 Incoming tap-water feed (incoming side), on the right side as seen from the front (as delivered). These hoses can also be guided through the hose mounts both to the right or both to the left.
- 2 Output of demineralized water (output side), on the left side as seen from the front (as delivered). These hoses can also be guided through the hose mounts both to the right or both to the left.

Figure 2: Incoming and outgoing positions of the hoses

4 Installation and connection of the system

4.1 Possible ways of installing and connecting the MELAdem 40

The MELAdem 40 can be installed separately onto a wall, in a lower cabinet, or directly to a steam sterilizer. There are also different ways of connecting the MELAdem 40, depending on the type of steam sterilizer that it feeds. We will include the required accessory parts for your particular mode of connection, in accordance with the information in your order. Please now consult the list in section 7 “**Accessories and spare parts**” – and check to make sure that you have received all the parts in this list.

In this section 3 “**Installation and connection of the system**” – you need to pay attention only to the information which applies to your case. The **GUIDE TO INSTALLATION** in the table below will help you find the information you need.

Please pay attention to the following instruction: Before you set up the MELAdem 40 and connect it, please be sure by all means to read the other sections of this Operating Manual for the MELAdem 40, and be careful to follow the general instructions and warnings given there.

GUIDE TO INSTALLATION		
Type of installation	PLEASE SEE THE FOLLOWING SECTION FOR YOUR TYPE OF INSTALLATION / CONNECTION	PAGE
Wall installation	4.3 Installation of the MELAdem 40 to a wall	7
Vacuklav 40/44 B+	4.4 Installation of MELAdem 40 to the Vacuklav 40 B+ / 44 B	8
Type of connection		
Tap water line	4.5 Connection of MELAdem 40 directly to the tap-water mains	10
Vacuklav 40/44 B+	4.6 Connection of the MELAdem 40 to the Vacuklav 40 B+ / 44 B+	12
Vacuklav 41/43 B+	4.8 Connection of MELAdem 40 to the Vacuklav 41 B+ / Vacuklav 43 B+	13

The MELAdem 40 water treatment system must be installed in a clean place which is not subject to frost, and which can be properly ventilated. The connection of the components must be in accordance with the connection diagram (see the proper sections of this operating manual). The place of installation must be such that the MELAdem 40 water treatment system can be properly assembled and installed, operated, and later serviced and repaired.

NOTICE: Install the MELAdem 40 in such way that the temperature of the inlet hose cannot rise above 40 °C.

4.2 Pressure of tap water

In order to ensure proper functioning of the system, the pressure of the tap water from the building mains must be at least 1.5 bar. The maximum tap-water pressure may not be more than 10 bar.

4.3 Installation of the MELAdem 40 to a wall

NOTICE: Be sure to use mounting systems which are suitable for your type of wall. The mounting bolts must conform to the following specifications:

- Minimum diameter of the mounting bolts: M4
- Recommended and maximum diameter of the bolts: M5
- Maximum diameter of the bolt heads (flat heads): 12 mm

Use the inner (close-standing) mounting rails for the MELAdem 40 (see Fig. 3, no. 1). The interval between the holes drilled in the walls must be 118 mm (please use enclosed template for drilling). Make sure that the wall can carry the weight of the system (approx. 2.4 kg). Be sure to choose the proper fastening material, in accordance with the wall: for example, bolt anchor plugs with a diameter of 6 mm.

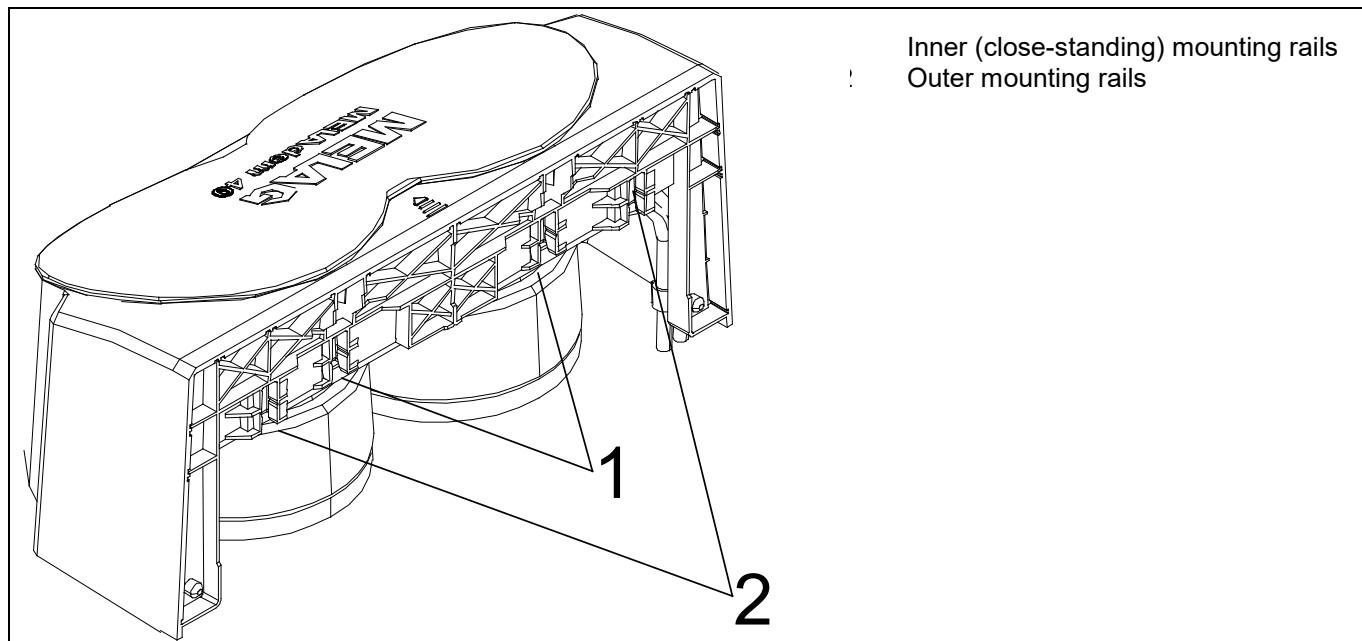


Figure 3: Types of Installation of MELAdem 40

Steps to follow for installation of MELAdem 40

1. **NOTICE:** There are two modes of fastening the MELAdem 40: an inner and an outer mounting. If the mounts are to be fastened to the wall, be sure to use the inner mounting mode (rails 1 above)!
2. Use the enclosed drilling template to mark the points for drilling. **PLEASE NOTE:** Be sure to mount the MELAdem 40 at the required height. Drill the holes in the wall. Warning: be careful of any cables or electric lines that may be in the wall!
3. Place the bolt anchor plugs into the drilled holes, and fasten the mounts to the wall (art. no.: 37106) by screwing in the bolts.
4. Hang the MELAdem 40 in place.

4.4 Installation of MELAdem 40 to the Vacuklav 40 B+ / 44 B+

To install the MELAdem 40 to the Vacuklav 40 B+ or to the Vacuklav 40 B+ or Vacuklav 44 B+, the mounting fixtures have already been attached to the steam sterilizer enclosure at the MELAG factory.

These mounting fixtures are concealed under cover pieces that can easily be removed by hand (see Figure 4). There is a notch at the lower side of these cover pieces that helps you in removing the covers. Use a flat tool or your fingernail to remove the cover pieces.

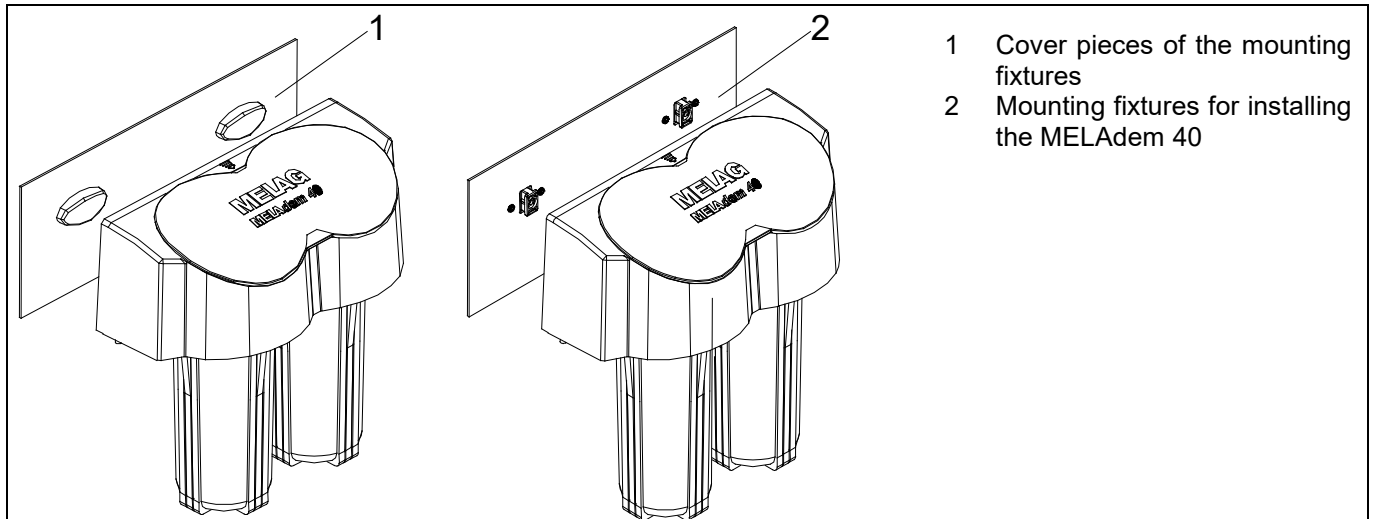


Figure 4: Removal of the cover pieces before mounting the MELAdem 40

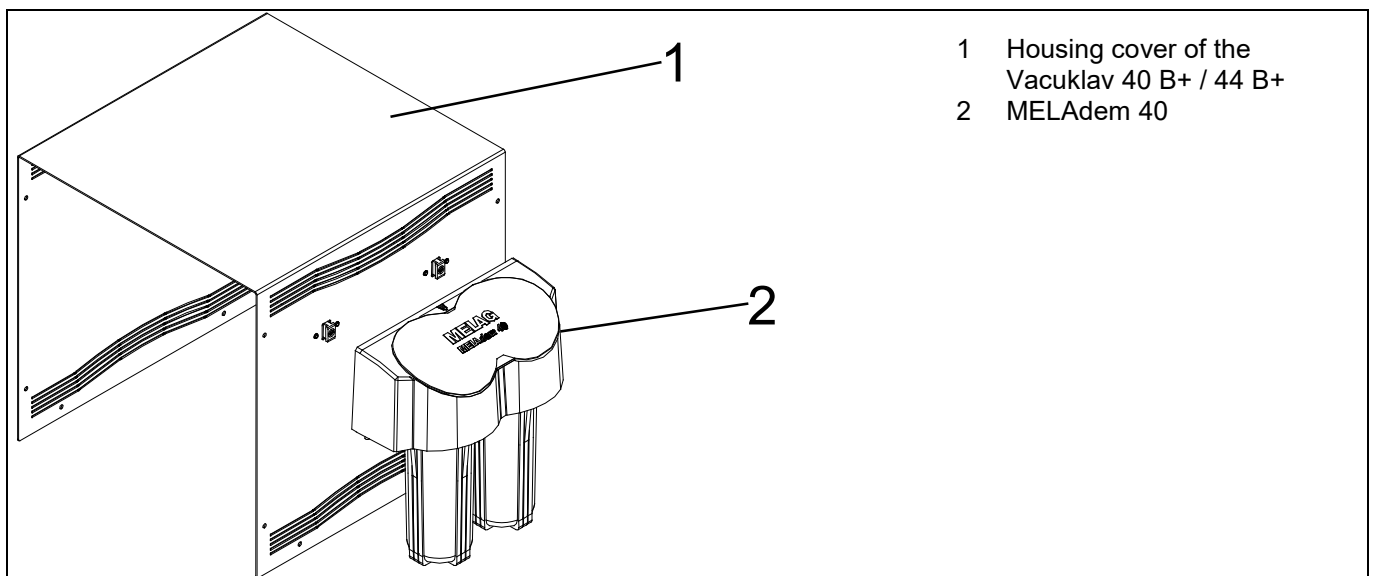


Figure 5: Position for hanging the MELAdem 40 to the Vacuklav 40 B+ / Vacuklav 44 B+

Steps to follow for installation of MELAdem 40

1. **PLEASE NOTE:** Since the mounting fixtures are already attached to the unit, it is not necessary to remove the housing from the steam sterilizer!
2. Remove the cover pieces from the mounting fixtures, as described above.
3. Hang the MELAdem 40 down into the mounting fixtures by sliding it vertically from above, and push it downward until it locks firmly into place (see Figure 5). The final position is shown in Figure 6 below.

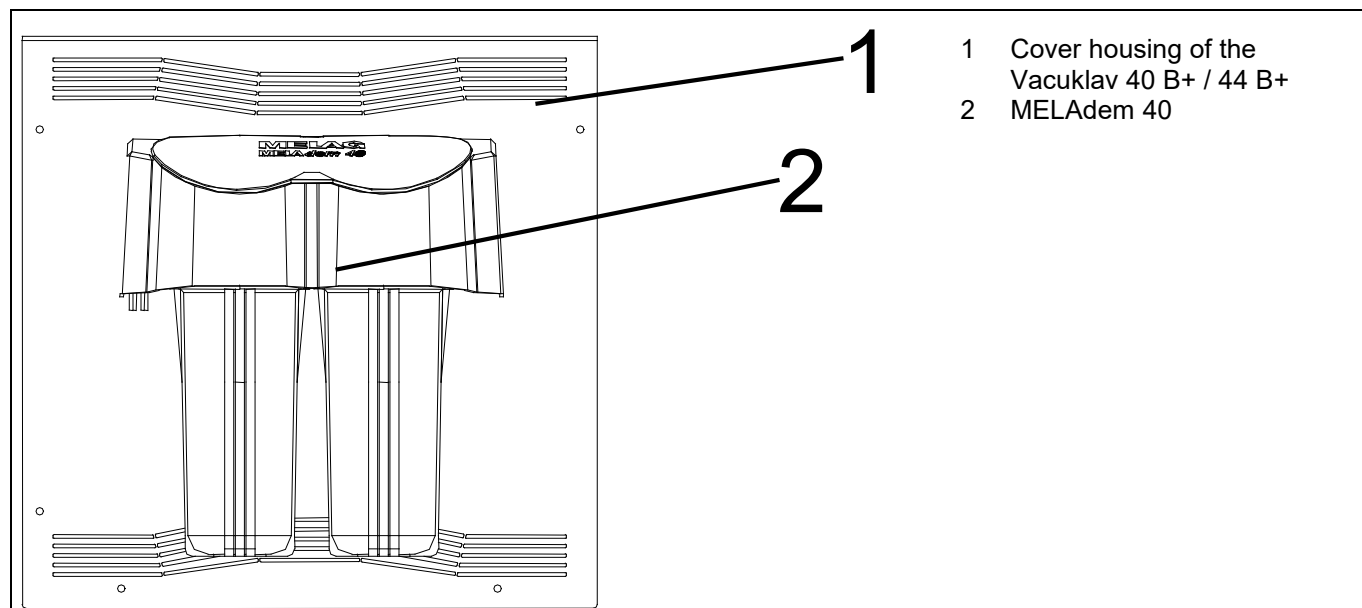


Figure 6: Correct position of MELAdem 40 on the housing of Vacuklav 40 B+ / Vacuklav 44 B+

4.5 Connection of MELAdem 40 directly to the tap-water mains

Increased requirements can be placed on the quality of the DI water (e.g. a low endotoxin content) for the decontamination of certain medical devices such as ophthalmic instruments. Comply with the following:

- ▶ In such cases, an additional filter system is required for the decontamination of DI water.
- ▶ It is possible that the drinking water has been contaminated by the water installation (domestic installation and pre-device periphery).
- ▶ Arrange for a check of the drinking water quality at the removal point or request a report (e.g. from the building management) before setting up and installing the device.
- ▶ Further information is available from the corresponding trade associations and their publications. If in doubt, contact your stockist or the pertinent professional association.

4.5.1 Conformity with the hygienic stipulations of EN 1717

You must connect your MELAdem 40 to the tap-water mains in accordance with EN 1717, in such a manner that your system will not contaminate the drinking-water network.

For protection of a drinking-water network to which a steam sterilizer is connected, EN 1717, part 4, stipulates that a combination of the following two units on the rear wall of the steam sterilizer must be installed: a return-flow inhibitor (non-return valve) together with a backsiphonage preventer. In many buildings, this protective equipment is already installed. To be sure, please consult your plumbing and installation specialists!

4.5.2 Connection to tap-water mains

In the building where the MELAdem 40 is installed, there must be a stop valve with a return-flow inhibitor (non-return valve) and with a 3/4" outside-thread connection, in the vicinity of the installation point. In order to support you to conform to the official stipulations in your installation of your MELAdem 40, regardless of the facilities in your building, we recommend one of the two models described below in Figure 11.

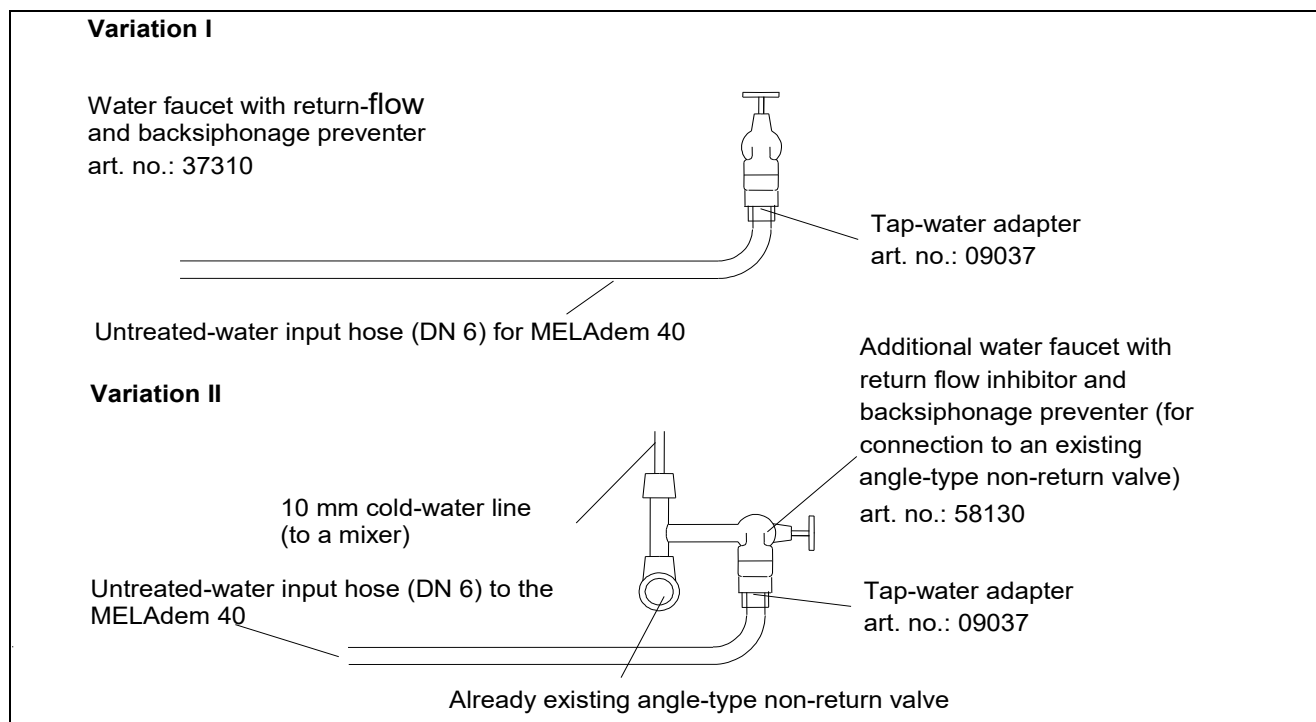


Figure 7: Two possibilities of connecting MELAdem 40 directly to the tap-water mains

Variation I: A separate water line (DN 15 nominal pipe size, with 1/2" coupling) already exists, or will be especially installed. Installation of a water faucet with integrated safety combination (art. no.: 37310).

Variation II: Cold water connection (for example, for a sink) with an angle-type non-return valve and hose (10 mm) already exists, or will be especially installed. Installation of an additional water faucet with integrated safety combination (art. no.: 58130), by direct installation to an existing angle-type non-return valve.

Instructions on the hose connections for the MELAdem 40

Use a hose-cutter, or a sharp knife, to cut 2 pieces in the required lengths from the hose included in the delivery (art. no.: 28820).

At the plastic fast-screw connections, use a plastic union nut to connect the hoses to the MELAdem 40 at the incoming water feed (this is the right connection, as seen from the front, when the printing "MELAdem 40" is visible). At the output water feed, this is the left connection, as seen from the front, when the printing "MELAdem 40" is visible. The first step is to slide the union nut onto the end of the hose. Then shove the hose until it will go no farther onto the socket of the fast-screw connections, on the right and left connections of the MELAdem 40. Then shove the union nuts up to the threads and screw them on finger-tight.

Make the connection of the free end of the hose to the water input, or to the consumer (depending on the installation variation selected: see Fig. 11). Use a metal fast-screw connection for this purpose. The first step here is to shove the metal union nuts onto the ends of the hoses, then push the hoses until they will go no farther onto the socket of each of the metal fast-screw connection. Then tighten the metal union nuts finger-tight, and then screw them about ¼ turn more with an open-end (engineer's) wrench.

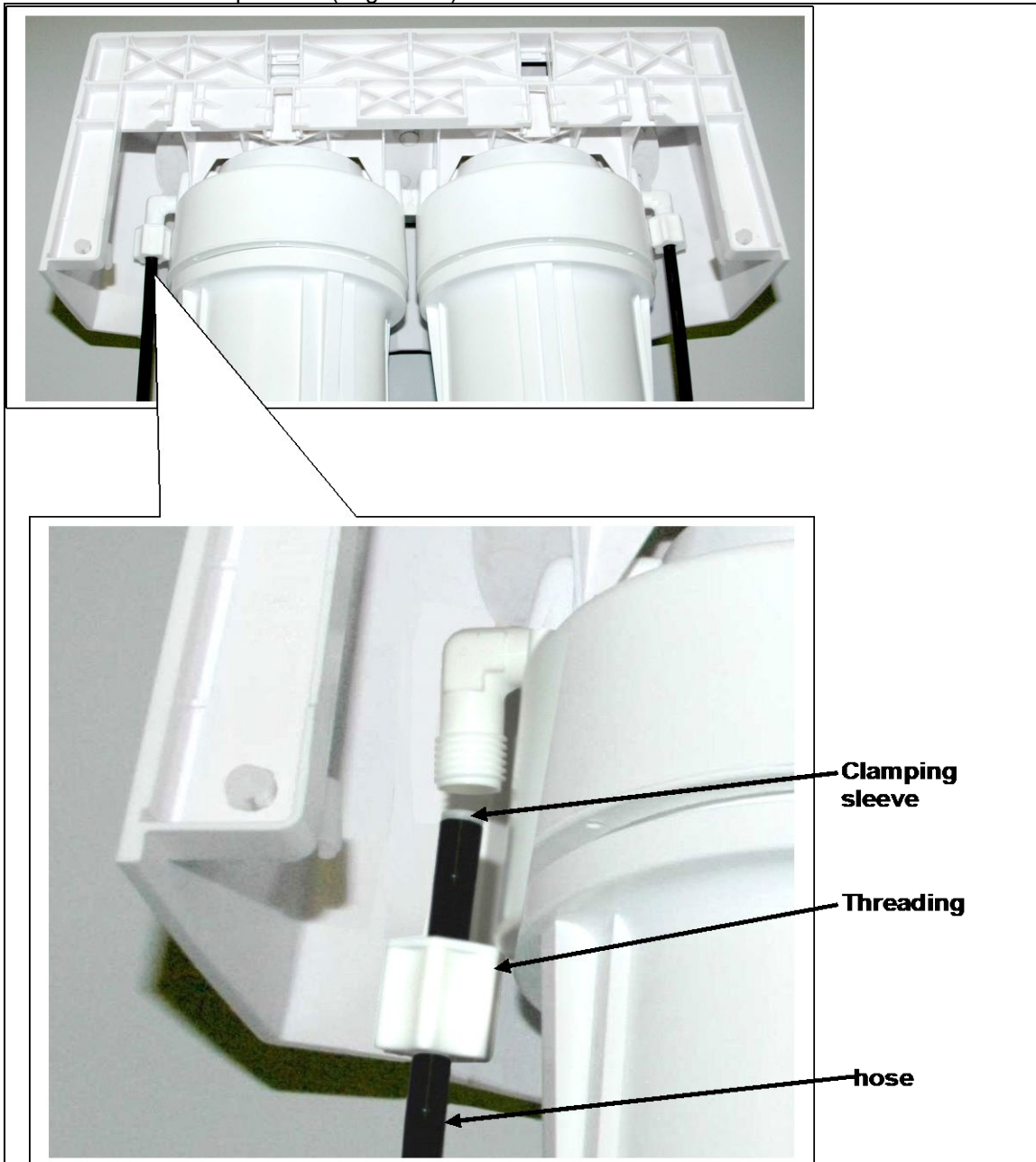


Figure 8: Threading connections of the hoses of MELAdem 40

The connection of the hoses at the MELAdem 40 to the tap water supply and to the steam sterilizer (depends to the installation variation as mentioned in the guide to installation in chapter 3.1) is made with plastic threaded

connections. The connection of the free hose ends to the water supply and the consuming device (depending on the installation version) is made by means of metal quick bolts. The metal nuts are put on the hose ends which then are pushed until touch on the respective metal quick bolts. The nuts are now screwed up by hand and finally tightened with a quarter turn by means of a wrench.

4.6 Connection of the MELAdem 40 to the Vacuklav 40 B+ / 44 B+

The connection between the components of the system is provided by the hose delivered with the equipment (outside diameter = 6 mm; hose-wall thickness = 1 mm; art. no.: 28820).

NOTICE: do not allow the plastic hose to be twisted or curled or mashed (compressed).

The MELAdem 40 is connected to the steam sterilizer according to the following diagram.

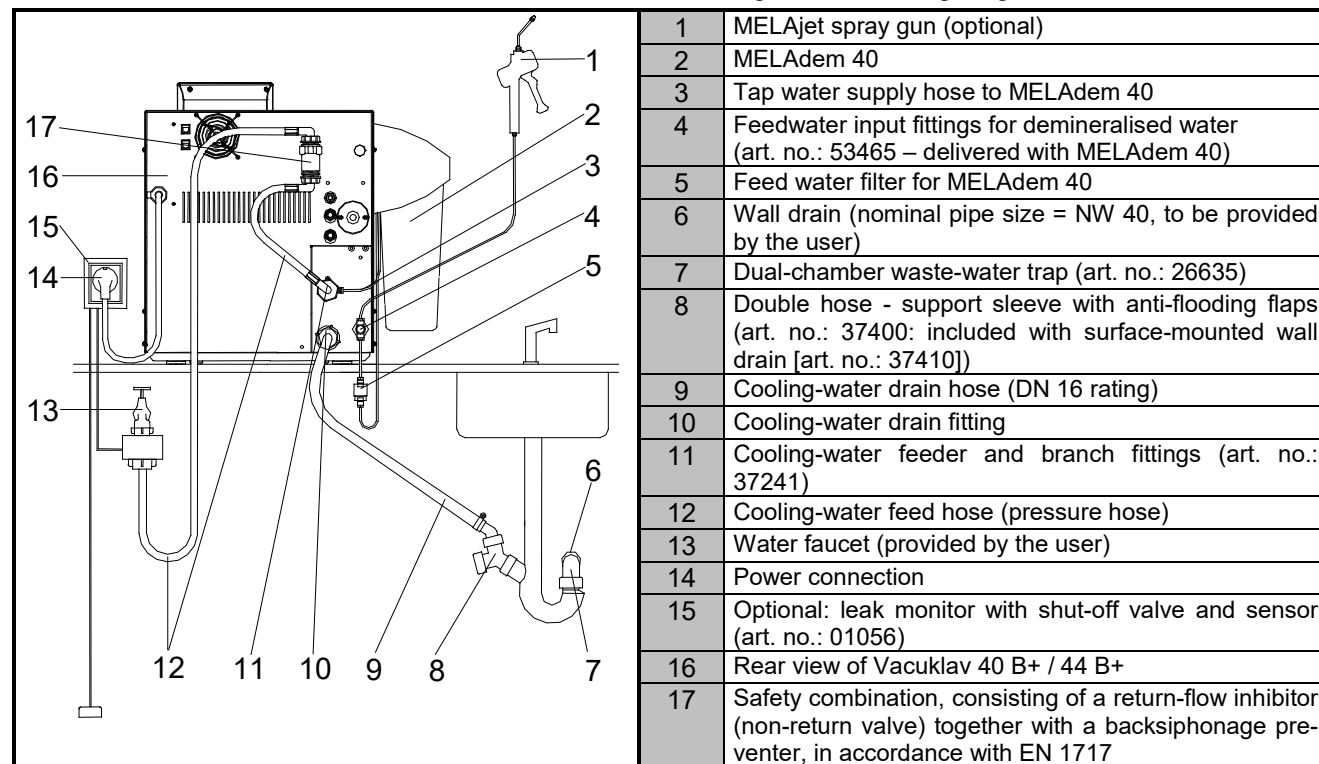


Figure 9: Connection of MELAdem 40 to the Vacuklav 40 B+ / 44 B+

Steps to follow for installation of MELAdem 40

1. Make sure that the MELAdem 40 has been correctly attached to the steam sterilizer, and that the mixed-bed-resin cartridges are properly installed.
2. Close the tap water line.
3. **Important Note:** Start the Vacuum Test program. Stop this program after it has run approx. 20 seconds. This will dispel the remaining water pressure in the system.
4. Unscrew the cooling-water feed hose (12) from the unit.
5. Screw the cooling-water branch fitting (11) into the unit. Screw the cooling-water feed hose (12) onto the cooling-water branch fitting (11).
6. Now attach the plastic hoses (3) to the MELAdem 40 (2). Attach the feed hose (11) to the MELAdem 40 to the left elbow fitting. Attach the output hose (3), from the MELAdem 40 to the steam sterilizer, to the right elbow fitting of the MELAdem 40.
7. Attach the MELAdem feed-water filter (5) in-line to the plastic hose.
8. Make sure that all line connections are tight, and that there are no leaks.
9. Open the tap water line.

If MELAdem 40 is installed directly to the water tap, we recommend using a MELAG waterstop valve (art. no.: 01056). In the event of leaks or overflow during operation, the moisture sensors of the waterstop valve, installed on the floor, will activate a solenoid valve to shut off the tap water supply.

With the spray pistol MELAJet (1) instruments can be cleaned or rinsed after disinfection with demineralized water before sterilization.

4.8 Connection of MELAdem 40 to the Vacuklav 41 B+ / Vacuklav 43 B+

The connection between the components of the system is provided by a pressure-proof hose (outside diameter = 6 mm; hose-wall thickness = 1 mm; delivered with the equipment; art. no.: 28820).

NOTICE: do not allow the plastic hose to be twisted or curled or mashed (compressed).

The MELAdem 40 is connected to the steam sterilizer according to the following diagram.

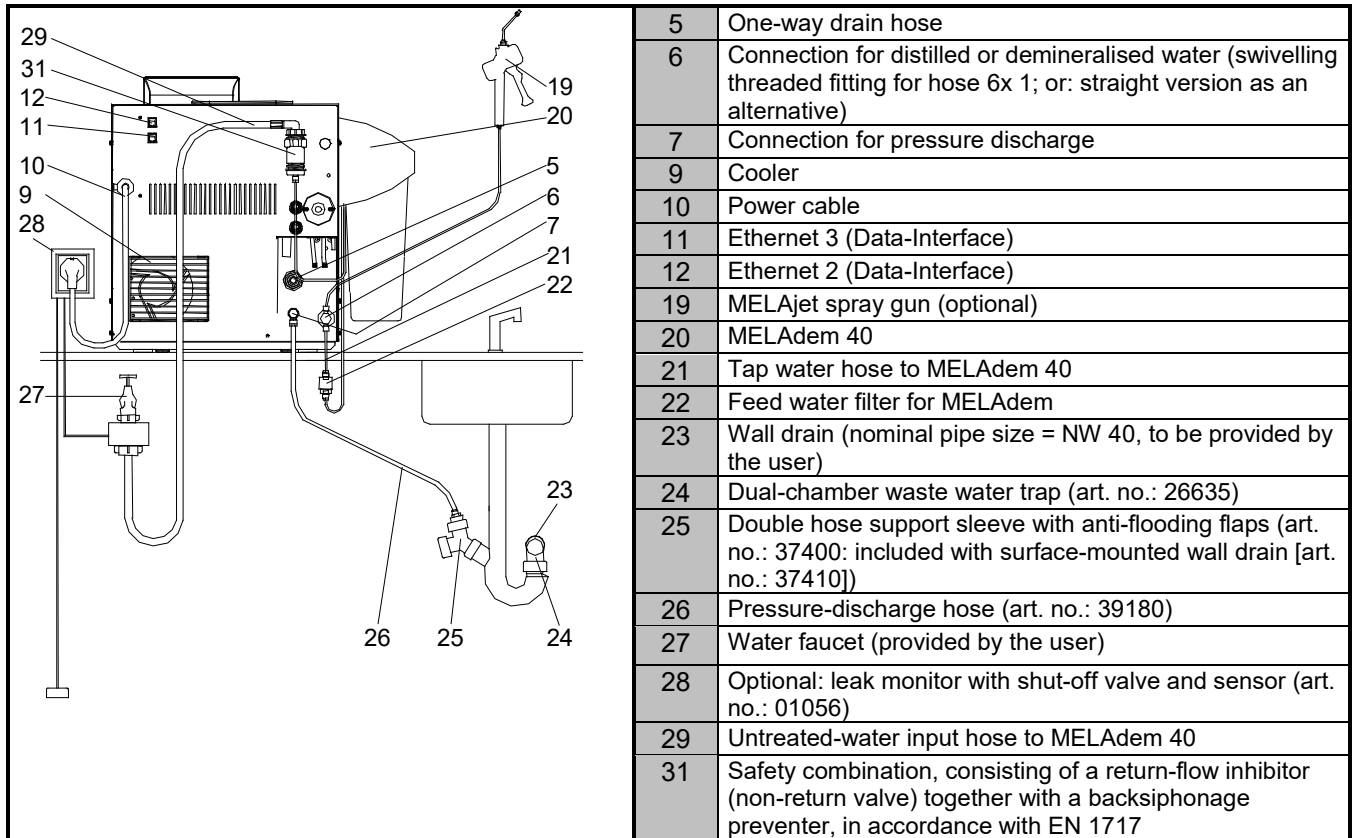


Figure 10: Connection of MELAdem 40 to the Vacuklav 41 B+ / Vacuklav 43 B+

Important: Before connecting a water-treatment unit to a steam sterilizer, be sure to empty the water-storage tank of the steam sterilizer.

The simplest installation: disconnect the feed hose for demineralized water from the water-storage tank connection, and directly connect the MELAdem 40 to the feed-water input (6).

Because of the different hose diameters, please replace the feed-water fitting (6, found on the unit with standard configuration) by the following: art. no. 53430 and 21140 (also the 2 copper seals, art. no.: 42360, delivered with the water-connection set, art. no.: 42360). In this example, the drain water (used feed water) is forced by pressure directly through the one-way drain hose (art. no.: 39180), and into the wastewater trap.

If MELAdem 40 is installed directly to the water tap, we recommend using a MELAG waterstop valve (art. no.: 01056). In the event of leaks or overflow during operation, the moisture sensors of the waterstop valve, installed on the floor, will activate a solenoid valve to shut off the tap water supply.

With the spray pistol MELAJet (1) instruments can be cleaned or rinsed after disinfection with demineralized water before sterilization.

Steps to follow for installation of the MELAdem 40:

1. Close the tap water line.
2. Connect the untreated-water input hose (29) of the MELAdem 40 to the tap-water network (27).
3. Screw the untreated-water input hose (29) to threaded connection (31). If you are using the MELAjet pistol, please use the MELAjet T-fitting (art. no.: 53465).
4. Now connect the plastic hose to the fast screw connections.
5. Make sure that all lines are tight, and that there are no leaks.
6. Open the tap water line.

PLEASE NOTE: Stand alone steam sterilizers store the used feedwater (waste water) in the waste water chamber of the storage tank. At Vacuklav 41 B/43 B+ hot waste water may run over the emergency overflow. Therefore the device needs to be connected to the siphon of the domestic water supply or the MELAG double chamber siphon. MELAG recommends this also for the Vacuklav 23 B+/31 B+.

This requires a connection set (art. no. 09033) or, when retrofitting, the separate retrofitting set (art. no. 26695). Further information regarding installation is to be found in the technical manual of the steam sterilizer.

5 Putting into operation

First carefully install the components. This includes the following: Install the new mixed-bed-resin cartridges by following the instructions for exchanging the cartridges (see section 6.1.1 below). Hook up the threaded hose connections. Place the MELAdem 40 into operation by carrying out the following steps:

- Open the tap water line and check if the MELAdem 40 has no leaks and that all hoses are connected tight.
- The first filling of the MELAdem 40 takes approx. 5 minutes (depending on water pressure from the tap). This first filling is necessary to provide enough treated water for the steam sterilizer or another consumer (for example, a MELAjet).
- Before first putting into operation, and after changing the mixed-bed-resin cartridges, be sure to run one empty sterilization cycle with the steam sterilizer, before the first full run with instruments in the machine.

6 Maintenance instructions

Be sure to perform the following maintenance work, in the time intervals given below, to assure satisfactory functioning of the system:

Interval	Maintenance work
Daily	Check the demineralised water with a conductivity measuring unit, the conductivity monitor, or by the built-in conductivity measuring unit in an steam sterilizer
6 months	Check the hoses and threaded connections to make sure that they do not leak. Check the hoses to make sure that they are not kinked (twisted) or swelled and that they are not mashed (compressed). Make sure the hoses have not become brittle with age. Also check the PUR hose at the MELAjet pistol, if existing.
Every 6 years	Exchange all hoses at the MELAdem 40 as well as at the MELAjet pistol with new hoses.
As needed	Exchange the resin in the container element after you have used approx. 120 litres of demineralised water from the unit. The exact amount will depend on the quality of the tap water. If the MELAdem 40 is connected to a steam sterilizer with a conductivity sensor (e.g., from the Vacuklav/Euroklav lines), then the indicator on the steam sterilizer display will show when the resin in the cartridge must be exchanged.

6.1 Exchanging the mixed-bed-resin cartridges

6.1.1 Complete exchange of the mixed-bed-resin cartridges

When the mixed-bed resin becomes exhausted, the output water quality will become poor. Exchange both of the mixed-bed-resin cartridges as follows:

- Close off the supply of tap water (i.e., turn off the faucet)
- **Warning! Important for pressure release:** If the system is connected to a steam sterilizer from the Vacuklav/Euroklav lines, start the program "vacuum test". Then interrupt the program after approx. 20 sec. by pressing the start/stop button. These measures will release the water pressure remaining in the systems. If the water treatment system is not connected to a steam sterilizer, then normal delivery of the water to the MELAjet will release the water pressure.
- Remove the cover of the MELAdem 40 to gain access to the filter wrench.
- Remove the wrench from the MELAdem 40 (see *Figure 11*).

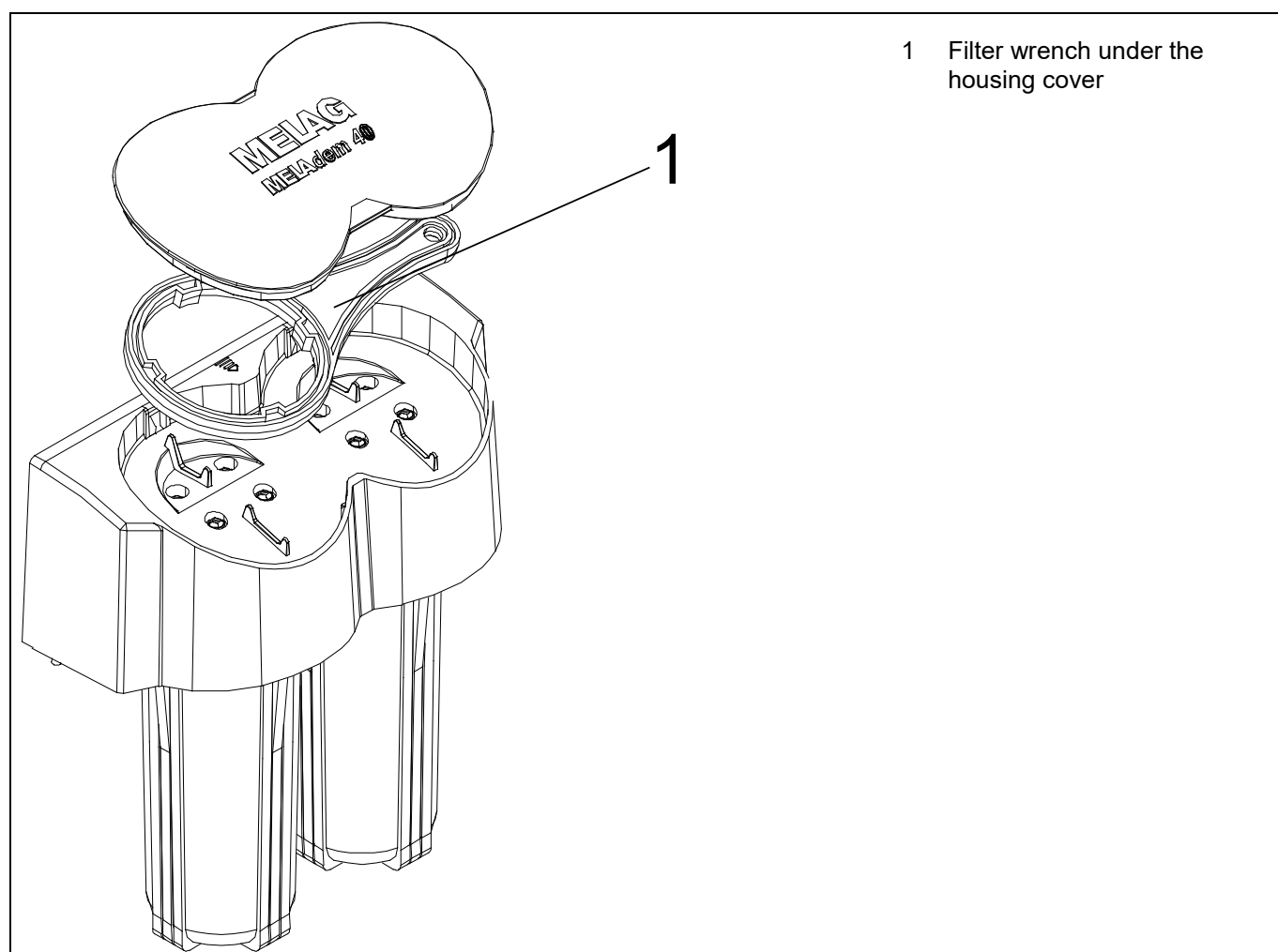


Figure 11: Removing the filter wrench

- Slide the wrench from the bottom onto the filter enclosure, and move it up toward the top as far as will go. Allow it to lock into place there. Open each of the container elements by turning the wrench clockwise (as seen from above): see *Figure 12*). As soon as the container elements can be easily turned, you can remove the wrench and unscrew the elements by hand for the last turns.
- Pull the container elements off, toward the bottom. The container elements can be completely full of water.
- Then remove the depleted mixed-bed resin cartridges. Dispose the mixed-bed resin cartridge as normal domestic waste.
- Rinse out the container elements thoroughly under flowing water.
- Remove the new cartridges from their plastic bags and place them vertically standing into the container elements
- Replace the filter wrench in the compartment under the cover of the MELAdem 40

6.1.2 Safe and water-tight closing of the cartridge housings

If you screw the cartridge housings (1) of the filters into the MELAdem 40 check if the complete system is water-tight. Take care for the hoses, the threaded connections and the MELAdem 40 housing.

For fastening the cartridge housings you must only use the wrench (2) delivered with MELAdem 40.

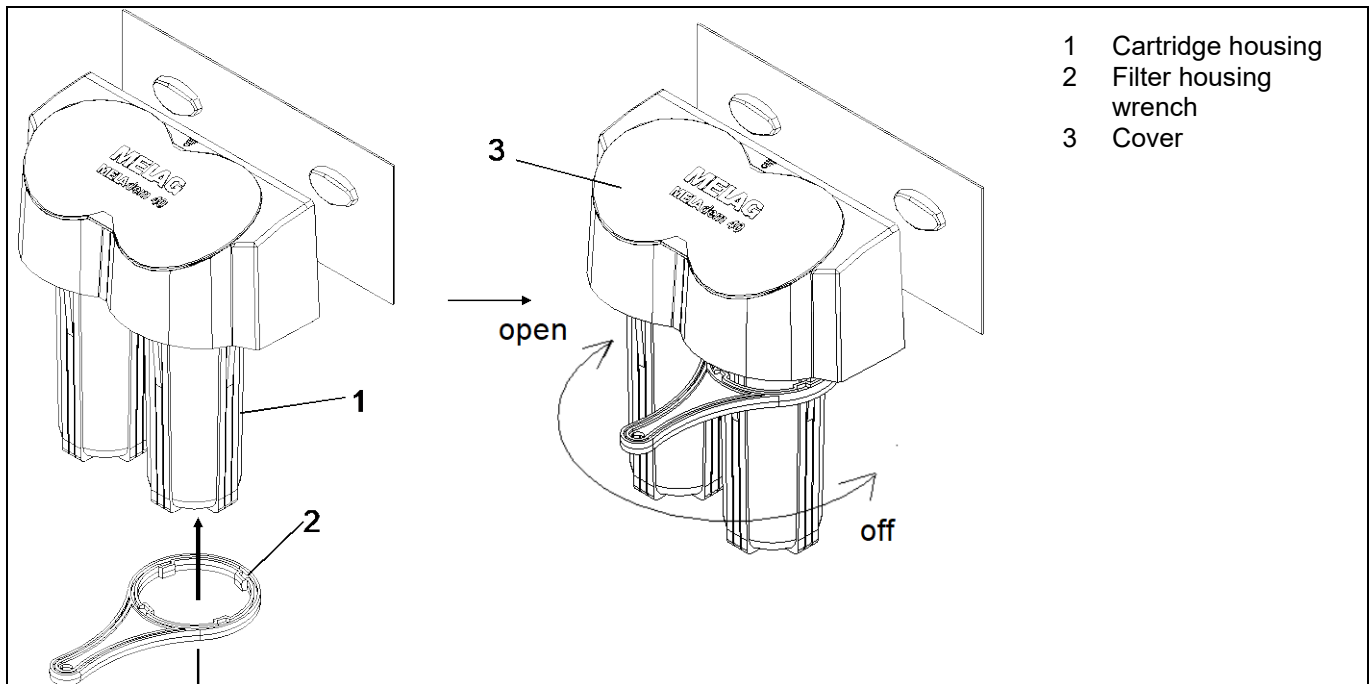


Figure 12: How to use the cartridge housing wrench

The safe and water-tight closing of the cartridge housings (1) has to be done as following:

- Screw the cartridge housing (1) in by hand first and then use the cartridge housing wrench (2), in order to tighten the cartridges gently (rotation anti-clockwise, as seen from above).
- Replace the filter wrench in the compartment under the cover (3) of the MELAdem 40.
- Check to make sure that all parts are tight.
- Open the tap water line.
- Check if the system is water-tight.
- Your MELAdem 40 is now ready for operation again.

7 Technical data

Model name	MELAdem 40
Dimensions (HxWxD)	35 x 31.5 x 15.5 cm
Weight (incl. mixed-bed resin cartridge)	approx. 3.7 kg (filled)
Amount of resin	approx. 2x 0.7 l (in total approx. 1.4 l)
Operating pressure	1.5 bar to 10 bar
Capacity	at 10 °dH: 210 l (depends on the water hardness and the conductivity of the local water)
Max capacity of float	for max. 2 l/min not higher than 40 µS/cm
Tap water temperature min./max.	5 °C / 40 °C
Tap water PH-value min./max.	5.0 / 9.0

8 Accessories and spare parts

Accessories/consumable material	pcs.	art. no.*
2 Cartridges, filled with ion exchange resin	2	61026
MELAtest 60 conductivity sensor	1	01060
MELAJet spray gun	1	27300
Seal for containers	1	37465
Connection parts	pcs.	art. no.*
Mounting set (for mounting on the wall or at a device housing)	1	37106
Water tap 3/4" with integrated safety combination	1	37310
Additional water tap with safety combination, for direct installation to an existing angle-type non-return valve	1	58130
Connection sets and fittings for the various models	pcs.	art. no.*
Water branch for MELAdem 40 to: Vacuklav 40 B+, 44 B+, Vacuklav 24 B+, 30 B+	1	37241
Connection set MELAdem 40 for: Vacuklav 41 B+, 43 B+, Vacuklav 23 B+, 31 B+	1	09033
Anschlusset MELAdem 40 für: Euroklav 23 VS+, 29 VS+	1	09031
Water tap adapter (3/4" to 1/4")	1	09037
Spare parts	pcs.	art. no.*
Fastener for hose	2	16070
Filter housing wrench	1	61050
Clamp sleeve	2	37475
Thread connection with nut for hose fastening	2	61040
Double nipple, 1/4", PVC	1	61030

*All specified articles are available via your specialist dealers.

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Original instructions

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Subject to technical alterations

