

Heaty Smart Box

Treatment unit



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Introduction

1.1 Brief information Heaty Smart Box

The water treatment unit Heaty Smart Box is a device for the initial filling of heating and cooling systems (without inhibitors) with water and for the treatment of water in heating and cooling systems (without inhibitors) in the bypass process. Magnetite filtration also takes place during treatment.

Use of the unit for purposes other than those for which it is intended may have an adverse effect on the safety of persons and lead to poor-quality process results.

Read these operating instructions carefully and take note of the information on safety, operation and maintenance.

1.2 Conditions of use

To use the unit properly, observe the following instructions:

- Before starting work, make sure that the heating or cooling system corresponds to the recognised state of the art.
- Observe the regulations on the construction, commissioning, design and filling of heating and cooling systems.
- When filling heating and cooling systems, operate the unit with a flow pressure of the drinking water pipe of at least 1.5 bar.
- When treating water or filling a heating or cooling system for the first time without a bypass process, demineralised water (deionised water) may cause existing deposits to be removed. Possible resulting damage is due to the already existing deposits.
- Always flush and clean heating and cooling systems in accordance with EN 14336 if you do not use the unit in the bypass process.
- The manufacturer does not guarantee compliance with the guide values if there are additives such as inhibitors, glycols, acids and cleaners or bacteria in the system.
- Drain the residual water completely from the unit after work to protect it from frost damage.
- The installer is responsible for preparing and handing over the documentation in accordance with the relevant country-specific guidelines (e.g. VDI 2035, Ö-Norm H 5195-1 or SWKI BT 102-1). The operator is responsible for maintaining the documentation.

1.3 Target group

These operating instructions are intended for persons who work with or on the unit:

- Operating personnel
- Maintenance and repair personnel

Qualifications of the target group

The target group of the operating instructions must have at least the following qualifications:



- Operating personnel: **Instructed person**
An instructed person is someone who has been instructed about the tasks assigned and the possible dangers in the case of improper behaviour, who
 - instructed,
 - trained, if necessary, and
 - has been instructed about the necessary safety devices and protective measures.
- Maintenance and repair personnel: **Skilled person**
A skilled person is a person who is able to assess the assigned work and recognise possible hazards on the basis of technical training, knowledge and experience as well as knowledge of the relevant regulations.

1.4 Conventions

Warnings and other notes

In the operating instructions, notes are weighted differently and marked with a pictogra.

Warnings are structured as follows:

Symbol	Signal word	Meaning
	DANGER	Warning notice: Imminent danger. Death or serious injuries <u>are</u> the consequence.
	WARNING	Warning notice: Potentially dangerous situation. Death or serious injury <u>may</u> result.
	CAUTION	Warning notice: Possibly dangerous situation. Minor or slight injuries <u>may</u> result.
	NOTE	Warning notice: Notes that must be taken into account for optimum results and safe operation of the equipment.

- **Signal word**
Indicates the severity of the hazard.
- **Type and source of danger**
Describes what caused the hazard or damage and its effect.
- **Cause and effect**
Describes what is the cause of the hazard or damage and its effect.
- **Remedy**
Describes how the hazard can be prevented from occurring.

Example of a warning notice



DANGER

Risk of injury from improper use

Improper use of the Heaty Smart Box can endanger persons and property.

- Only use the appliance for its intended purpose as described below.
-

Instructions for action

Instructions for action are numbered consecutively to indicate the order of the individual steps. Results of actions (if any) are written directly below.

Example:

- 1 This is the first step.
- 2 This is the second step.
 - ▶ This is the result of the second step.

Operating and control elements

Operating elements, e.g. buttons and switches, and control elements, e.g. buttons on the control panel, are marked in **bold**.

Example: The **emergency stop button** is located on the control panel.

1.5 Manufacturer's address

UWS Technologie GmbH

Sudetenstraße 6
91610 Insingen
GERMANY

Internet : www.uws-technologie.de

E-Mail : info@uws-technologie.de

Telefon : +49 9869 91910-0

Fax : +49 9869 91910-99

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Safety instructions

The Heaty Smart Box appliance has been designed and manufactured in compliance with applicable legal regulations and in accordance with recognised safety rules. The appliance corresponds to the state of the art at the time of its initial commissioning. Nevertheless, dangers may arise for the operator, for other persons, for the appliance itself and for other material assets.



NOTE

For safe handling of the appliance, observe the safety instructions in this section and the warnings in other sections of this operating manual.

2.1 General information

The unit may only be installed, operated and maintained by qualified personnel trained in safety technology.

Persons involved in the commissioning, operation, maintenance, repair, dismantling and disposal of the unit must have read and understood the operating instructions and, in particular, the safety instructions.

The operating instructions must be kept in a safe place and must be available at all times to persons working with or on the unit.

2.2 Intended use

In order to use the unit as intended, it is necessary to be familiar with the operating instructions and to comply with all the instructions, maintenance and inspection regulations contained therein.



DANGER

Danger to life or risk of serious injury

Mechanical and electrical hazards occur during operation of the unit. To prevent personal injury due to these dangers, you may only use the appliance as intended.

The unit may only be used as intended as follows:

For the initial filling of heating systems and cooling systems (without inhibitors) with water and for the treatment of water in heating systems and cooling systems (without inhibitors) using the bypass method.

The following further specifications apply:

- **Heating and cooling systems**

The unit is intended for very small systems (therme, etc.), e.g. in multi-family houses with floor heating systems. The unit types must be selected depending on the system output (see section „8 Technical data“ on page 35).

- **Further tasks**

In addition to initial filling and treatment, the unit can also perform magnetite filtering in the treatment process.

- **Initial filling / bypass preparation**

In order to achieve the required values during initial filling and preparation, the unit may only be filled with Vadion pH-Control mixed-bed resin.

- **Operation**

The unit may only be operated and maintained by persons who are sufficiently qualified and authorised.

- **Maintenance and servicing**

The unit may only be operated with intact safety devices. Safety devices must be checked regularly for correct condition and proper function.

- **Wartung und Instandhaltung**

General inspection and cleaning work must be carried out by instructed persons. Maintenance, servicing and repair work may only be carried out by qualified specialists.

2.3 Non-intended use

The unit may only be used in the ways described in section „2.2 Intended use“ on page 10. Any other use may endanger persons and property and is prohibited.

Uses that are not intended include:

- Use for purposes other than the initial filling of heating systems and cooling systems (without inhibitors) with water and the treatment and magnetic filtering of water in heating systems and cooling systems (without inhibitors).
- Connection to heating or cooling systems with deviating system capacity
- Operation in potentially explosive atmospheres as defined by the ATEX Directive
- Operation with defective or missing safety devices
- Servicing and maintenance in the absence of safety devices without increased safety measures
- Operation by unqualified or insufficiently qualified personnel

2.4 Dangers during transport and installation

2.4.1 Transport

During transport and installation of the unit, dangers may arise due to heavy and tipping parts. To avoid this, observe the following safety instructions:

- Transport the unit free of impact and shocks.
- During transport, secure the unit with suitable means against tipping and falling over. Do not remove any transport locks until after the unit has been set up.

2.4.2 Installation

The unit may only be installed by authorised and trained specialists. Improper installation can cause injury to persons. To avoid this, observe the following safety instructions:

- Wear suitable personal protective equipment during work (see section „2.6 Personal protective equipment“ on page 16).
- Do not place heavy objects on the machine.
- Set up the unit on a level and sufficiently load-bearing surface.

- When connecting the unit to the mains, make sure that the mains voltage corresponds to the specifications on the rating plate.
- Have the mains connection and the earthing of the unit carried out by qualified personnel in accordance with national regulations.
- Use an all-pole switch with a distance of at least 3 mm between the contacts to connect the unit to the power supply.
- Install a high-sensitivity differential switch (0.03 A) for additional protection against electric shock.
- Route cables and hoses so that there is no risk of tripping.
- If tripping hazards cannot be avoided, mark the tripping hazards clearly.
- Carry out adjustment work or simple repairs in consultation with the manufacturer.
- Do not make any modifications to the appliance or to the water and power lines.
- Position the unit so that the motor of the circulation pump is sufficiently ventilated.

2.5 Dangers during operation and maintenance

2.5.1 Mechanical hazards

The unit consists of moving or heavy components. This can cause injury to persons. To avoid this, observe the following safety instructions:

- Exercise caution when replacing heavy parts:
 - Wear suitable safety shoes.
 - Secure the unit against tipping and slipping
- When carrying out maintenance work on supplier components, observe the relevant documentation of the manufacturers concerned.
- Do not reach with your hand into rotating or moving parts of the appliance when it is in operation.

2.5.2 Dangers due to hot surfaces

Parts of the unit heat up during operation. There is a risk of burns if there is direct contact with hot surfaces. To avoid this, observe the following safety instructions:

- Do not touch hot lines and the housing of the circulation pump when the unit is switched on, but only after it has been switched off and cooled down.
- Wear suitable protective gloves if you have to touch hot parts or carry out work on hot parts.

2.5.3 Dangers due to electric current

The unit is operated with electric current. Touching live components can result in dangerous injuries or death. To avoid this, observe the following safety instructions:

Disconnect the main power supply before working on electrical equipment

- Unplug the main power supply before working on electrical equipment.
- Ensure that the mains cable is equipped with an appropriate blocking device for maintenance protection (lockout tagout).

Liquids

- Be careful when handling liquids. Penetration of liquids may cause short circuit or electric shock

Connection data

- Observe the specified electrical connection data (see section „8 Technical data“ on page 35).

Covers of the electrical components

- Do not open the covers while the unit is switched on or in operation.
- Do not remove covers even when the unit is switched off when wiring work or checks are being carried out.

2.5.4 Hazards in handling the circulation pump

The unit uses a circulation pump, which poses various hazards. To avoid property damage and injuries, observe the following safety instructions:

- Only use the unit in accordance with the technical data (see section „8 Technical data“ on page 35).
- Only use the unit to pump water from heating and cooling systems.
- Do not leave the unit unattended during operation or ensure that unauthorised persons do not have access to the unit.
- Switch the unit off and disconnect the mains plug from the socket before carrying out maintenance and servicing work.
- Do not operate the unit with closed ball valves at the inlet and outlet of the unit or the composite container.
- Check the area around the unit for leaks and remove any leaking liquids.
- Protect the pump from environmental influences such as splash water or dust.

2.5.5 Dangers due to operating materials

The unit contains a mixed bed resin that must be replaced regularly. Skin or eye contact may cause irritation or even visual disturbances.

To avoid this, observe the following safety instructions:

- Observe the information in the safety data sheet.
- Wear suitable personal protective equipment when working to avoid skin and eye contact with the mixed bed resin:
 - Safety glasses
 - Protective gloves

2.6 Personal protective equipment

To work safely with the unit, you must wear various personal protective equipment. In the following list and in the corresponding places in the document you will find information on the required personal protective equipment.

The following Personal Protective Equipment is required when working with the unit:

- Protective gloves
- Safety goggles
- Protective work shoes







2.7 Warning and information signs

Places where there is a potential danger under certain conditions are marked with warning and information signs.

- Do not remove warning and information signs.
- Replace damaged or removed warning and information signs immediately.

The following warning and information signs are located on the unit:

Sign	Meaning	Sign	Meaning
	Warning of electrical voltage		Warning of magnetic field
	Hot surface warning		No access for persons with pacemakers or implanted defibrillators

3

Device description

The Heaty Smart Box filling unit is a device for the initial filling of heating systems and cooling systems (without inhibitors) with water and for the treatment of water in heating systems and cooling systems (without inhibitors) in the bypass process. In addition, the unit takes over magnetite filtering during the treatment process.

The following section describes the unit with its components and operating elements.

3.1 The unit at a glance



Fig. 3-1: Overview of the components of the unit (interior view)



Fig. 3-2: Overview of the components of the unit (exterior view)

- A Extendable carrying/pulling handle
- B Water meter
- C Magnetic flow filter
- D Filling unit Heaty Smart Box
- E Treatment inlet
- F LED measuring cell
- G Switch box
- H Connection hose
- I Circulation pump
- J Output preparation
- K Main switch
- L Cable pocket

3.2 Main switch

The main switch is used to switch the circulation pump on or off to start or stop the preparation.

3.3 Treatment outlet with connection hose

Via the outlet, treated and filtered water flows from the filling unit through the connection hose back into the circuit of the heating or cooling system.

3.4 Circulation pump

The circulation pump conveys the water through the unit. For more information on the circulation pump, see the manufacturer’s documentation (see section „9.4 Circulation pump Heaty Smart Box documentation“ on page 43).

3.5 Magnetic flow filter

The magnetic flux filter filters components such as black iron oxide sludge and magnetic residues out of the water. For more information on the magnetic flow filter, see section „9.3 Magnetic flow filter“ on page 41.

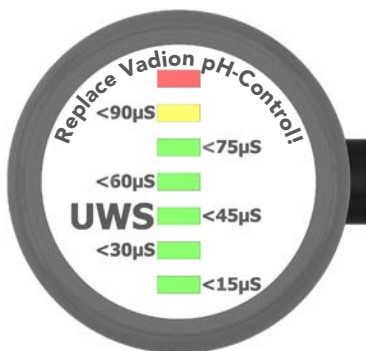
3.6 Treatment input with connection hose

Via the input treatment/filtration, the water flows through the connection hose into the filling device where it is treated. The treatment input is equipped with a water meter to read off the water quantity when a heating or cooling system is filled for the first time.

The Heaty Smart Box filling unit essentially consists of a composite container that holds the mixed bed resin. The container is integrated into a wheeled case.

In the mixed bed resin of the composite container, water treatment takes place by ion exchange until the capacity of the mixed bed resin is exhausted.

The measuring cell with LED display shows the remaining capacity of the mixed-bed resin. The colours of the LED display have the following meanings:



Colour of the LED display	Conductivity (µS/cm)	Meaning
Green	<15	Capacity very good
	<30	Capacity good
	30 - <75	Capacity sufficient
Yellow	<90	Capacity insufficient, replace mixed bed resin promptly (see p.28)
Rot	>90	Capacity exhausted, replace mixed bed resin immediately (see p.28)

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Transport, installation and commissioning

4.1 Transport

Observe the following instructions during transport:

- Secure the unit with suitable aids against slipping and tipping over.
- Only move the Smart Box when the quick-release fasteners of the lid of the filling device are closed.
- When transporting the unit, only load it at suitable points.
- Remove the transport devices after transport.

4.2 Installation and commissioning

To avoid damage to the unit or injury to persons, observe the following instructions during installation and commissioning:

- Installation and commissioning may only be carried out by instructed specialists from a recognised specialist trade company in the sanitary, heating and air-conditioning industry, taking into account the necessary safety measures.
- Inspect the unit for completeness and possible transport damage before starting installation. The following components are included in the scope of delivery:
 - Unit as per order, pre-assembled
 - Hose set
 - Operating instructions
 - Maintenance key Magnetic flow filter
- Set up the unit on a firm and level surface.
- Do not install the unit in areas where there is a risk of frost.
- Lay cables, hoses and lines in such a way that there is no risk of tripping. Mark unavoidable tripping hazards.
- Connect the unit properly to the power supply and observe the electrical connection data (see section „8 Technical data“ on page 35).

The unit is intended for temporary connection to a heating or cooling system. Observe the following instructions when connecting the unit:

- Before connecting the unit, familiarise yourself with the specific structure of the heating or cooling system. Contact the manufacturer if you need assistance.
- Ensure that the installation work is carried out professionally and that the result complies with the relevant rules and regulations.

In the bypass method, a partial volume flow of the water of a heating or cooling system is routed via the unit. The following illustration shows an example of connecting the unit using the bypass method:

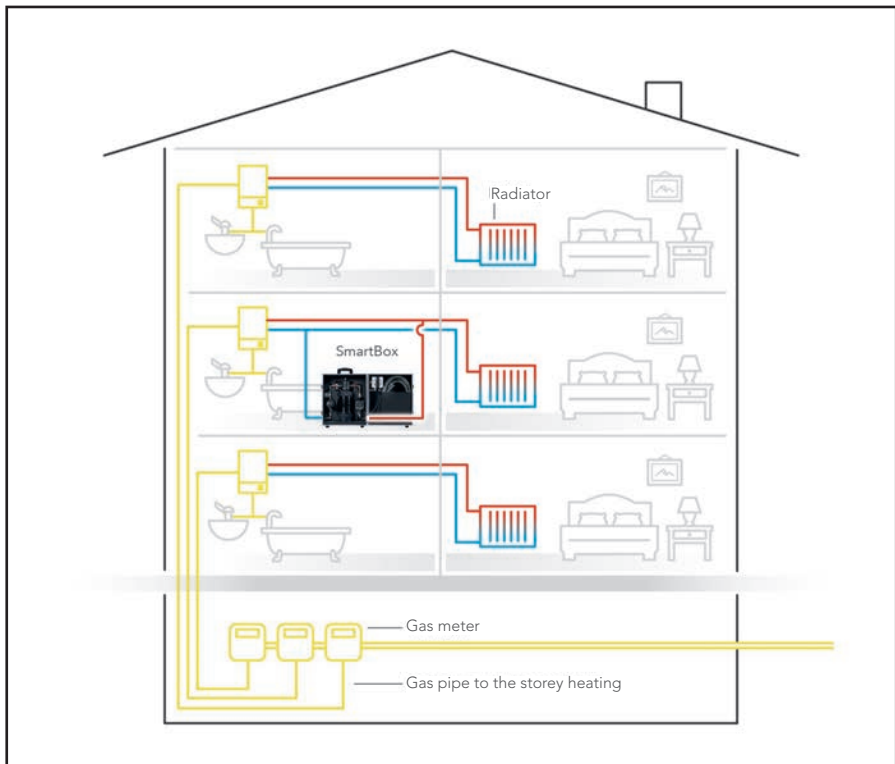


Fig. 4-1: Connection diagram bypass method

5

Operation

In the following section you will find instructions on how to operate the unit.



NOTE

Operating elements

The controls referred to in the text are explained in section „3 Unit description“ on page 17.

5.1 Preparing the unit for operation

To prepare the unit for operation, proceed as follows:

- 1 Rinse the unit after a longer standstill period. To do this, open all valves, connect the unit to a drinking water line and open the drinking water line.



NOTE

Rinse over a drain

Rinse the appliance over a drain to allow the escaping water to drain off.

- 2 Connect the machine to the power supply by plugging the mains plug into a socket.



NOTE

When connecting, observe the electrical connection data (see section „8 Technical data“ on page 35).

- ▶ The unit is ready for operation.

5.2 Connecting and operating the unit



CAUTION

Risk of injury due to improper connection.

Improper connection can cause hot liquids to escape or damage to the unit.

- Make connections to the heating or cooling system in a depressurised state. To do this, connect the corresponding fittings to the heating or cooling system.
 - Select the connection points in the pipe system of the heating or cooling system so that they are far enough apart to avoid a short circuit.
 - Install a 3/4" size connection spigot at each of the connection points in the heating or cooling system's piping system.
 - Only use hoses that are designed for the pressure of the heating or cooling system. The hoses provided are designed for a pressure of up to 8.0 bar.
-

The following sections tell you how to connect and operate the unit.

5.2.1 Filling



NOTE

Checking the heating or cooling system before initial filling

Before you fill a heating or cooling system with the unit for the first time, observe the following instructions:

- Flush and clean the heating or cooling system according to EN 14336 and record flushing and cleaning.
 - Measure the conductivity and water hardness of the raw water and enter the values in the system log.
 - If the raw water is softened, measure the conductivity and use the conversion tables to estimate the capacity of the unit (see section „9 Applicable documents“ on page 37).
 - Please note that the use of a softening system can lead to an increased conductivity of the drinking water.
 - Make sure that the drinking water pipe has a flow pressure of at least 1.5 bar when filling heating or cooling systems. If this value is not reached, the capacity of the unit may be impaired.
 - The drinking water must be free of suspended matter. If necessary, connect an appropriate filter system upstream.
 - Observe the instructions for reducing conductivity during operation.
 - Make sure that a filling combination is installed on the unit before the inlet for first fillings (see section „6.4 Spare parts and accessories“ on page 31). Observe the regulations of the responsible water supply companies.
 - The use of a system separator can lead to a pressure loss of approx. 1 bar. Use a suitable pressure boosting system if the system pressure must be higher than the flow pressure of the drinking water pipe.
-

To fill a heating or cooling system with water for the first time without bypassing, proceed as follows:

Prerequisite

- The unit is prepared for operation as described in section „5.1 Preparing the unit for operation“ on page 21. Also observe the instructions in section „4 Transport, installation and commissioning“ on page 19.

Procedure



Fig. 5-1: Connection diagram for filling

- 1 Open the case and use the supplied hoses to connect the drinking water connection on the system separator to the unit inlet.
- 2 Connect the output of the filling device to the heating or cooling system using a suitable hose. →
- 3 Open the drinking water pipe.



NOTE

Volume flow and temperature

The volume flow through the unit is limited by the integrated flow regulator. You can fully open the shut-off on the drinking water pipe. The drinking water must not exceed a temperature of 25° C.



NOTE

LED function

At the beginning of the process, the individual LEDs are checked (light organ). If the Vadion pH-Control has been replaced, the LED display of the measuring cell may light up red. In this case, continue the process for approx. 5 minutes. If the display of the LED measuring cell does not change, bleed the measuring cell or check the measuring cell with a manual measuring device to rule out a fault. If there is no error, the capacity of the mixed-bed resin is exhausted and the mixed-bed resin must be replaced.

► The heating or cooling system is filled with treated water.

- 5 Check the water quantity at the water meter and close the drinking water pipe when the desired water quantity is reached. Enter the water quantity in the system logbook.
- 6 Close all valves and disconnect the hoses from the heating or cooling system.
- 7 Put the heating or cooling system into operation.
- 8 Measure the conductivity and the pH value of the water and enter the measured values in the system log.

5.3 Switching off the unit in an emergency

To switch off the unit in an emergency, proceed as follows:

- 1 Press the **main switch**
or
Pull the mains plug out of the socket.
 - ▶ The unit is switched off.
- 2 Eliminate all reasons that caused the unit to switch off.

To switch the unit on again after an emergency, proceed as described in the sections „5.1 Preparing the unit for operation“ on page 21 and „5.2 Connecting and operating the unit“ on page 22.

5.4 Switching off the unit and disconnecting it from the heating or cooling system

To switch off the unit and disconnect it from the heating or cooling system after completing the preparation, proceed as follows:

- 1 Press the **main switch** to switch off the circulation pump.
- 2 Let the unit cool down.
- 3 Close the fittings on the heating or cooling system, depressurise the unit and disconnect the unit's hoses from the heating or cooling system.
- 4 Empty the residue from the hoses into a drain.
- 5 If you want to store the appliance or take it out of operation:
 - Open all valves on the magnetic flow filter.
 - Remove all connection hoses.
 - Empty the composite container.



Maintenance and servicing

To ensure trouble-free operation of the unit, the unit must be kept in a clean and functional condition. Furthermore, regular visual and functional checks must be carried out in order to detect and rectify any damage at an early stage.



CAUTION

Risk of injury due to improperly performed maintenance work

The unit may only be serviced by specialist personnel trained in safety technology.

Carry out the following steps before any maintenance and servicing work:

- Switch off the unit.
- Disconnect the unit from the mains.
- Take suitable measures to secure the unit against being switched on again.
- Also observe the safety instructions in section „2 Safety instructions“ on page 10.

6.1 Maintenance schedule

The following table contains an overview of the maintenance work to be carried out regularly:

Interval	Activity	Responsibility
Daily before starting work or on a new construction site	Check magnetic flux filter and depending on the Change depending on the degree of contamination	Operating personnel
	Check the nozzles of the suction lance and head filter for damage and blockage and clean or replace if necessary.	Operating personnel
	Check flow restrictor for blockage	Operating personnel

Interval	Activity	Responsibility
Monthly	Check hoses for leaks and damage and replace if necessary.	Operating personnel
Half-yearly	Check the fastening and status of the unit as well as welded and screwed connections.	Operating personnel
Annual	Check warnings and markings on the unit	Operating personnel
	Check sieve seal (union nut on the right, outlet) and replace if necessary.	Operating personnel

6.2 Maintenance work

6.2.1 Change mixed bed resin



NOTE

Handling mixed bed resin

Observe the following points when handling the mixed bed resin:

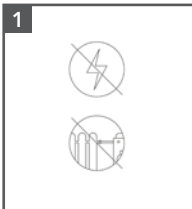
- Do not store the mixed bed resin openly as it will lose capacity.
 - Use the outer packaging of the refill pack to dispose of the replaced-mixed bed resin.
 - Change the mixed bed resin over a drain so that the water separated from the replaced mixed bed resin can drain off.
 - Wear appropriate personal protective equipment (goggles, gloves).
-

Wenn das Mischbettharz verbraucht ist, gehen Sie wie folgt vor:

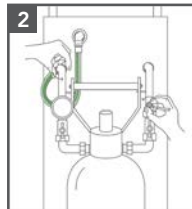


NOTE

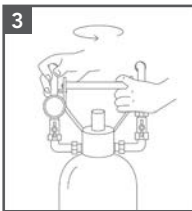
The resin can be changed anywhere. This makes it possible to continue filling immediately.



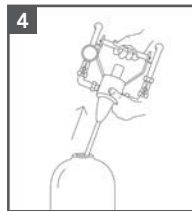
1. Make sure that the appliance is switched off and disconnected from the mains and the heating or cooling system.



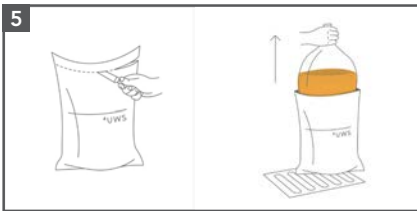
2. Remove the hoses from the unit and open all valves to drain the unit.



3. Turn the 3-way head on the handle anticlockwise to release the 3-way head.



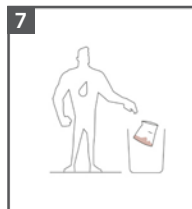
4. Pull the 3-way head with the suction lance out of the composite container.



5. Remove the refill pack of mixed bed resin from the outer packaging and place the outer packaging over a drain.



6. Empty the exhausted mixed bed resin from the composite container into the outer packaging:

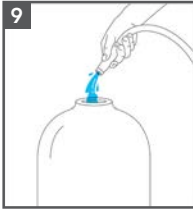


7. Dispose of the mixed bed resin and empty the remaining water into a drain.

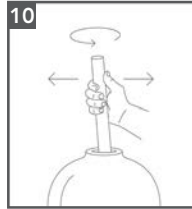
► The used mixed bed resin is retained by the outer packaging while the water flows into the drain.



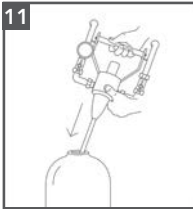
8. Open the refill pack with mixed bed resin and fill it into the composite container using a funnel. If necessary, compact the mixed bed resin by shaking or circling the composite container.



9. Fill the composite container with water to a height of about 2 cm below the thread.



10. Stir the mixed bed resin with a pipe or other suitable tool to make it easier to insert the 3-way head with suction lance.



11. Insert the 3-way head with suction lance back into the composite container.



12. Hand-tighten the 3-way head clockwise.

► The mixed bed resin has been changed and the filling device is working at its full capacity again.



NOTE

Close the packaging

Storing the resin openly will greatly reduce its capacity!



Video instruction
resin change

6.2.2 Cleaning the magnetic flux filter

For information on cleaning the magnetic flux filter, see section „9.3.3 Cleaning“ on page 42.

6.3 Regular internal inspection

Certain parts of the unit are additionally inspected and maintained at regular intervals and maintained:

- Circulation pump

The inspection dates must be coordinated by the operator.

6.4 Spare parts and accessories

The following spare parts for the unit are available from the manufacturer:

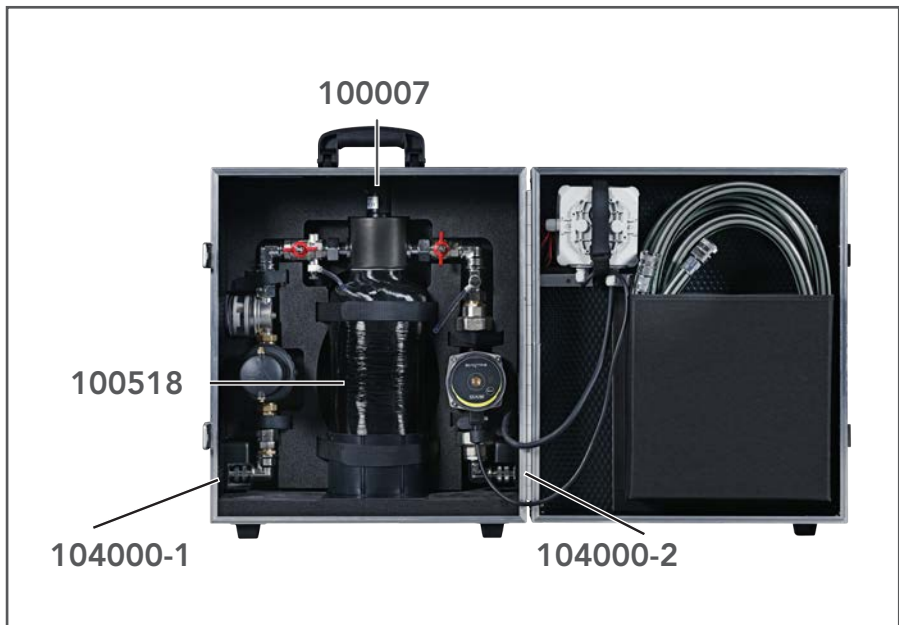


Fig. 6-1: Spare parts Heaty Smart Box

Article no.	Designation
100007	LED measuring cell
100518	Composite container (4 ltr.) without 3-way head
104000-1	Output side Heaty Smart Box
104000-2	Output side Heaty Smart Box pump

The following accessories are available for the unit from the manufacturer:

Article no.	Designation
100041	Funnel
100047	Measuring case „PROFI“
100055-2	Refill pack mixed bed resin (Vadion pH Control 4 ltr.)
300900	UWS filling combination 1/2“ incl. system separator

7

Disassembly and disposal



CAUTION

The appliance may only be dismantled by authorised and qualified personnel who are familiar with the hazards.



NOTE

Regulations and laws

Observe the local regulations and laws for the disposal of environmentally harmful substances.

- The unit may only be dismantled by authorised specialist personnel.
- Observe the safety instructions in the operating instructions in section „2 Safety instructions“ from page 10.
- Do not touch any live components.
- Wear suitable personal protective equipment.
- Only use suitable and tested lifting equipment.

Injuries can be caused by:

- Live components
- Heavy components that fall down after being released
- Sharp edges

7.1 Skilled personnel

Qualified personnel must take the following points into account:

- Observe the safety instructions in these operating instructions.
- Wear suitable personal protective equipment.
- Only use suitable and tested lifting equipment.
- Use suitable means of transport and keep transport routes clear.

Switch off the unit and disconnect it from the power supply before starting work.

7.2 Disassembly

To dismantle the unit, proceed as follows:

- 1 Switch off the unit and disconnect the power supply from the mains.
- 2 Discharge energy storage devices such as springs or capacitors, if any.
- 3 Make sure that any residual pressures have been relieved.
- 4 Disassemble the unit into its components using suitable tools.

7.3 Disposal

Dispose of assemblies and operating materials properly and in an environmentally friendly manner.

Observe the legal and company regulations.



Technical data

In this section you will find technical data on the unit in general as well as on the applications and components used.

8.1 General data Heaty Smart Box

	Heaty Smart Box
Article number	104000
Max. Filling capacity*	240 l/h
Min. flow pressure	1.5 bar
Max. Operating pressure	4.5 bar
Max. Operating temperature	80 °C
Height / Width / Depth (approx.)	570 mm / 480 mm / 300 mm
Weight (approx.)	24 kg
Mixing bed capacity	4 l
Capacity at 420 µS/cm to < 100**	600 l
Power supply	230 V

8.2 Komponenten

8.2.1 Magnetflussfilter

Manufacturer	ADEY Professional Heating Solutions, Cheltenham (UK)
Type	MagnaClean® Atom 2
Internal water temperature	3°C to 95°C
Maximum working pressure	up to 3 bars
KV value	5.12 m³/h
liquid capacity	80g

For more information on the magnetic flux filter, see section „9.3 Magnetic flux filter“ on page 41.

8.2.2 Circulating pump

	Heaty Smart Box
Maximaler Betriebsdruck	8 bar
Umgebungstemperatur	-40 °C to 40 °C
Maximale Anlaufhäufigkeit	40/h
Maximale Medientemperatur	110 °C
Maximaler Durchsatz	3.2 m³/h



Applicable documents

These operating instructions apply together with the following documents:

- Safety data sheet Vadion pH-Control
- Capacity calculator for filling devices, see manufacturer's homepage: <http://uws-technologie.de/services/berechnungstool/>
- Measured values and conversion tables, see „9.1 Measured values and conversion tables“ on page 37
- Determining the capacity, see „9.2 Determining the capacity“ on page 40
- Information on the magnetic flux filter, see „9.3 Magnetic flux filter“ on page 41
- „9.4 Heaty Smart Box circulation pump documentation“ on page 43

9.1 Measured values and conversion tables

9.1.1 Corrosion rate

Oxygen, acids and dissolved salts cause corrosion in the heating or cooling system. The speed of corrosion depends on the amount of dissolved substances in the water, which can be assessed by measuring the conductivity.

The following guide values apply for estimating the speed of corrosion with the help of conductivity:

Conductivity [$\mu\text{S}/\text{cm}$]	Corrosion rate
0–100	braked
100–350	very slowly
350–500	slow
500–1.000	accelerated
1.000–2.000	greatly accelerated
>2.000	very much accelerated

9.1.2 Lime content and water hardness

By measuring the conductivity, the lime content and the water hardness can be roughly estimated. The following table illustrates the correlations:

Conductivity [$\mu\text{S}/\text{cm}$]	Lime content [$\text{g}/1,000 \text{ l}$]	Classification Water hardness
<100	<35	desalinated
100	50	very soft
200–300	100-150	soft
400–500	200-250	medium hard
600–800	300-400	hard
900–1,000	450-500	very hard

The following table serves to determine the exact water hardness:



NOTE

This conversion is only applicable if the water is not softened and does not contain any chemical additives.

In the case of softened water, measurement via the hardness drop method is necessary. Hand-held measuring devices do not provide meaningful values for softened water.

Conduc-tivity [μS/cm]	Hard-ness [°dH]	Hard-ness [°fH]	Lime content [g/1,000 l]	Conduc-tivity [μS/cm]	Hard-ness [°dH]	Hard-ness [°fH]	Lime content [g/1,000 l]
<100	<1	<2	<35	1,120	32	57	560
105	2	5	53	1,155	33	59	578
140	4	7	70	1,190	34	61	595
175	5	9	88	1,225	35	62	613
210	6	11	105	1,260	36	64	630
245	7	12	123	1,295	37	66	648
280	8	14	140	1,330	38	68	665
315	9	16	158	1,365	39	69	683
350	10	18	175	1,400	40	71	700
385	11	20	193	1,435	41	73	718
420	12	21	210	1,470	42	75	735
455	13	23	228	1,505	43	77	753
490	14	25	245	1,540	44	78	770
525	15	27	263	1,575	45	80	788
560	16	28	280	1,610	46	82	805
595	17	30	298	1,645	47	84	823
630	18	32	315	1,680	48	85	840
665	19	34	333	1,715	49	87	858
700	20	36	350	1,750	50	89	875
735	21	37	368	1,785	51	91	893
770	22	39	385	1,820	52	93	910
805	23	41	403	1,855	53	94	928
840	24	43	420	1,890	54	96	945
875	25	45	438	1,925	55	98	963
910	26	46	455	1,960	56	100	980
945	27	48	473	1,995	57	101	998
980	28	50	490	2,030	58	103	1,015
1,015	29	52	508	2,065	59	105	1,033
1,050	30	53	525	2,100	60	107	1,050
1,085	31	55	543	2,100	60	107	1,050

9.2 Determining the capacity

The capacity of the unit indicates the amount of water of a certain conductivity that can be treated with a mixed bed resin filling. The capacity depends on various factors such as the water temperature, the chemical composition or the flow pressure.



NOTE

Online capacity calculator

As an alternative to these diagrams, you can use the capacity calculator for filling devices on the manufacturer's homepage:
<https://uws-technologie.de/berechnungstools/>

9.3 Magnetic flux filter

In this section you will find drawings and the characteristic curve of the built-in magnetic flux filter.

9.3.1 Drawings Atom 2

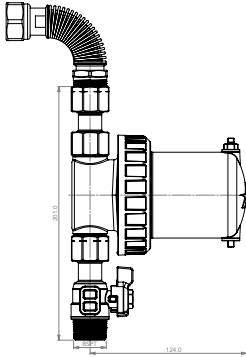


Figure 9-1: View of magnetic flux filter Adey Atom from the side

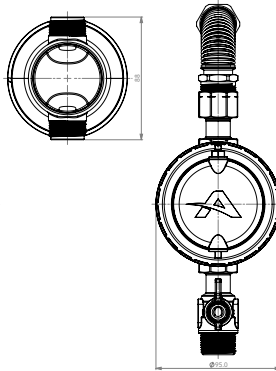


Figure 9-2: View of magnetic flux filter Adey Atom from above

9.3.2 Characteristic curve

The flow resistance diagram of the magnetic flux filter shows the following characteristic curve:

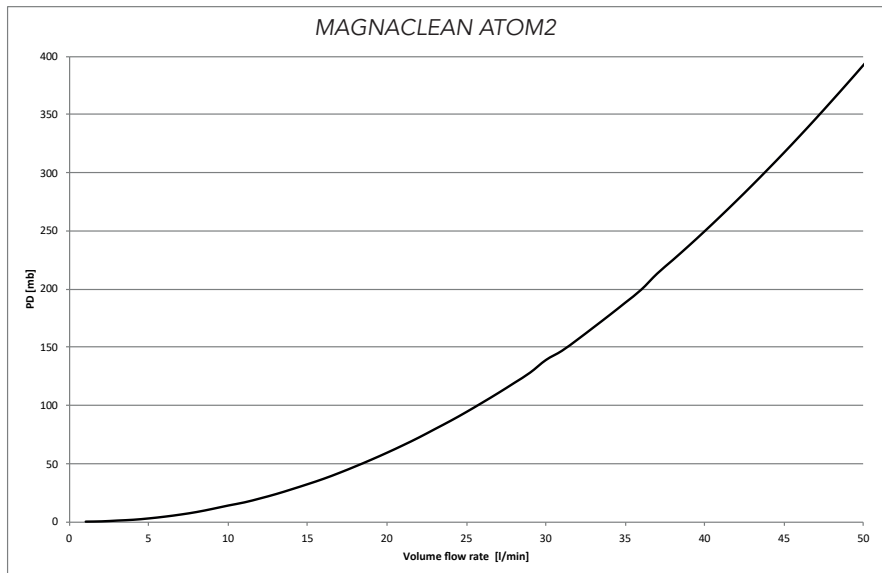


Figure 9-3: Characteristic curve magnetic flux filter Adey Atom 2

9.3.3 Cleaning

To clean the magnetic flux filter, proceed as follows:

9 Top: Ventilation opening
Below: Drain valve

10 Top: Ventilation opening
Below: Drain valve

13 IC1+ Rapid OTECTOR

14 IC1+ Rapid OTECTOR

17

Zeichenerklärung

- Valves open
- Valves closed
- Ventilation
- Drainage

9.4 Documentation Heaty Smart Box circulation pump

On the following pages you will find relevant excerpts from the manufacturer's documentation for the circulation pump installed in the unit.

3. PRODUCT DESCRIPTION

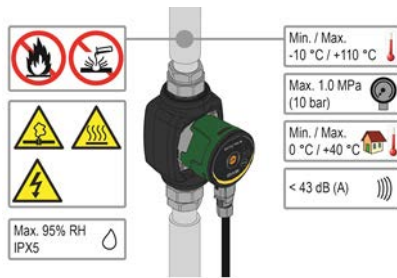


Figure 1: Pumped liquids, warnings and operating conditions

The circulators in the EVOSTA2 and EVOSTA3 series represent a complete range of circulators. These installation and operating instructions describe EVOSTA2 and EVOSTA3 models. The type of model is indicated on the pack and on the identification plate.

The table below shows the EVOSTA2 and EVOSTA3 models with built-in functions and features.

Functions/features	EVOSTA 2	EVOSTA 3
Proportional pressure	•	•
Constant pressure	•	•
Constant curve	•	•
Dry-running protection		•
Automatic degassing		•

Table 1: Functions

4. PUMPED LIQUIDS

Clean, free from solids and mineral oils, not viscous, chemically neutral, close to the properties of water (max. glycol contents 30%)

5. APPLICATIONS

EVOSTA2, EVOSTA3 series circulators allow integrated adjustment of the differential pressure which enables the circulator performance to be adapted to the actual requirements of the system. This determines considerable energy saving, a greater possibility of control of the system, and reduced noise.

EVOSTA2, EVOSTA3 circulators are designed for the circulation of:

- water in heating and conditioning systems.
- water in industrial water circuits.
- domestic water **only for the versions with bronze pump body**.

EVOSTA2, EVOSTA3 circulators are self-protected against:

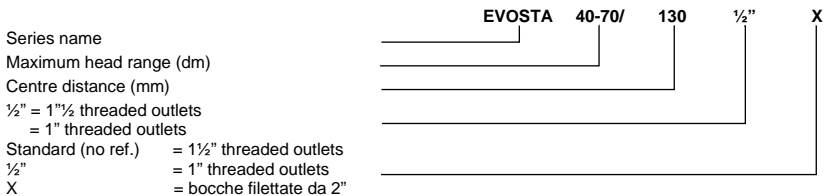
- Overloads
- Lack of phase
- Excess temperature
- Over-voltage and under-voltage

6. TECHNICAL DATA

Supply voltage	1x230 V(+/-10%), 50/60 Hz
Absorbed power	See electrical data plate
Maximum current	See electrical data plate
Grade of protection	IPX5
Protection class	F
TF Class	TF 110
Motor protector	No external motor protector is needed
Maximum environment temperature	40 °C
Liquid temperature	-10 °C ÷ 110 °C
Flow rate	See Table 3
Head	See Table 3
Maximum working pressure	1.0 Mpa – 10 bar
Minimum working pressure	0.1 Mpa – 1 bar
Lpa [dB(A)]	≤ 43

Table 2: Technical data

Designation index (example)



10. START



All the starting operations must be performed with the cover of the EVOSTA2, EVOSTA3 control panel closed.

Start the system only when all the electrical and hydraulic connections have been completed.

Avoid running the circulator when there is no water in the system.



As well as being at a high temperature and pressure, the fluid in the system may also be in the form of steam. **DANGER OF SCALDING!**

It is **dangerous to touch the circulator. DANGER OF SCALDING!**

Once all the electrical and hydraulic connections have been made, fill the system with water and if necessary with glycol (for the maximum glycol percentage see par. 4) and feed the system.

Once the system has been started it is possible to modify the operating modes to adapt better to the plant requirements (see par. **Error! Reference source not found.**).

10.1 Degassing the pump

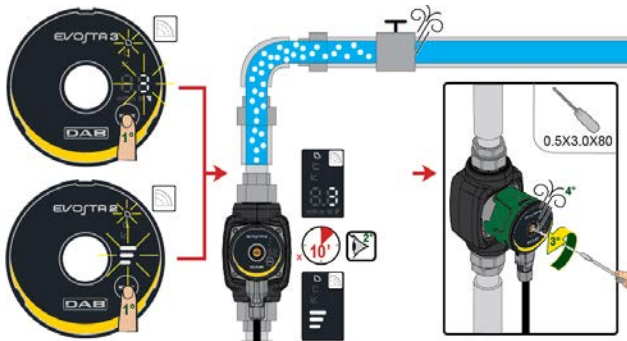


Figure 8: Venting of the pump

The pump is vented automatically through the system. It is not necessary to vent the pump before starting. Noise may be created due to the presence of air in the pump; if this happens, the noise stops after a few minutes.

By selecting speed 3 for a short time, rapid venting of the pump is obtained. The venting speed depends on the dimensions and design of the system. Once the pump has been vented, or when the noise has stopped, set the pump according to the recommendations.



The pump must never run when dry.

10.2 Automatic Degassing

Automatic degassing occurs only for the Evosta3 pump. Hold down the Mode key for 3" and the function starts: 1 minute at maximum speed, then it passes to the set mode.

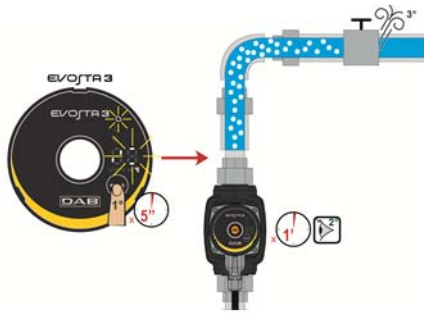


Figure 9: Automatic venting of the pump

11. FUNCTIONS

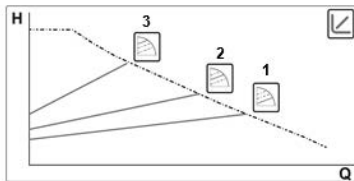
11.1 Regulating Modes

EVOSTA2, EVOSTA3 circulators allow the following regulating modes depending on plant requirements:

- Proportional differential pressure regulation depending on the flow present in the plant.
- Constant differential pressure regulation.
- Regulation with constant curve.

The regulating mode may be set through the EVOSTA2, EVOSTA3 control panel.

11.1.1 Regulation with Proportional Differential Pressure



In this regulating mode the differential pressure is reduced or increased as the demand for water decreases or increases.

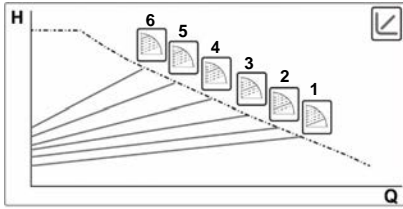
The Hs set point may be set from the display.

Regulation indicated for:

- Heating and conditioning plants with high load losses
- Plants with secondary differential pressure regulator
- Primary circuits with high load losses
- Domestic water recirculating systems with thermostatic valves on the rising columns



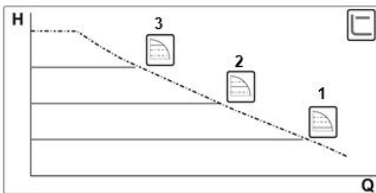
11.1.1.1 Regulation with Proportional Differential Pressure –Advanced Menu



Holding down the Mode key for 20" gives access to the Advanced Menu with the possibility of selecting from 6 curves with proportional differential pressure



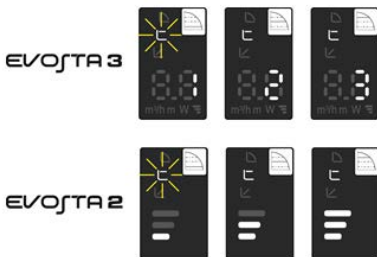
11.1.2 Regulation with Constant Differential Pressure



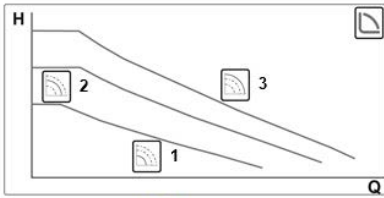
In this regulating mode the differential pressure is kept constant, irrespective of the demand for water, The Hs set point may be set from the display.

Regulation indicated for:

- Heating and conditioning plants with low load losses
- Single-pipe systems with thermostatic valves
- Plants with natural circulation
- Primary circuits with low load losses
- Domestic water recirculating systems with thermostatic valves on the rising columns



11.1.3 Regulation with constant curve



In this regulating mode the circulator works on characteristic curves at a constant speed.

Regulation indicated for heating and conditioning plants with constant flow.

12. CONTROL PANEL

The functions of EVOJTA2, EVOJTA3 circulators can be modified by means of the control panel on the cover of the electronic control device.

12.1 Elements on the Display




Figure 10: Display


- 1 Luminous segments indicating the type of set curve
- 2 Display showing the instantaneous power absorption in Watt, the flow rate in m^3/h , the head in metres and the set curve.
- 3 Key for selecting the pump setting
- 4 Luminous segments indicating the set curve

12.2 Graphic Display

12.2.1 Luminous segments indicating the pump setting

The pump presents nine setting options that can be selected with the  key. The pump settings are indicated by six luminous segments on the display.

12.2.2 Key for selecting the pump setting





Whenever the  key is pressed, the pump setting is changed. A cycle consists of pressing the key ten times.

12.2.3 Display Operation



Figura 11: Evosta3 Display

The Evosta3 circulator has a display that is able to show the following values.

	Height of the selected curve (1-2-3)
	Instantaneous power absorption in Watt
	Instantaneous head in m
	Instantaneous flow rate in m ³ /h

The values are shown in sequence for 3". Once the viewing cycle is ended, the display switches off and only the operating mode LED remains lit.

If the selection key is pressed within 10", the display performs 6 viewing cycles, then goes into stand-by.

If the key is pressed again within 10", the display performs 11 more viewing cycles to allow a greater reading time.

12.2.4 Settings of the pump operating mode



















	EVOSTA3	EVOSTA2	
1			Lower curve with proportional pressure, PP1
2			Intermediate curve with proportional pressure, PP2
3			Higher curve with proportional pressure, PP3
4			Lower curve with constant pressure, CP1
5			Intermediate curve with constant pressure, CP2
6			Higher curve with constant pressure, CP3
7			Lower constant curve, I
8			Intermediate constant curve, II
9			Higher constant curve, III

Table 6: Pump operating modes

13. FACTORY SETTINGS

Regulating mode: ↻ = Minimum proportional differential pressure regulation

14. TYPES OF ALARM

Alarm Description	
No. of curve height blinks	EVOSTA2
2 Blinks	TRIP: loss of motor control, may be caused by incorrect parameters, blocked rotor, disconnected phase, disconnected motor
3 Blinks	SHORT CIRCUIT: short circuit on phases or between phase and earth
4 Blinks	OVERRUN: software fault
5 Blinks	SAFETY: safety module error, may be caused by a sudden overcurrent or other hardware faults of the board
Alarm Code	
	EVOSTA3
E1	DRY RUN
E2	TRIP: loss of motor control, may be caused by incorrect parameters, blocked rotor, disconnected phase, disconnected motor
E3	SHORT CIRCUIT: short circuit on phases or between phase and earth
E4	OVERRUN: software fault
E5	SAFETY: safety module error, may be caused by a sudden overcurrent or other hardware faults of the board

Table 7: Types of Alarm

15. MAINTENANCE



Cleaning and maintenance activities must not be carried out by children (under 8 years of age) without supervision by a qualified adult. Before starting any work on the system, before starting to look for faults it is necessary to disconnect the power supply to the pump (take the plug out of the socket) and read the use and maintenance instructions.

16. DISPOSAL



This product or its parts must be disposed of in an environment-friendly manner and in compliance with the local regulations concerning the environment; use public or private local waste collection systems.

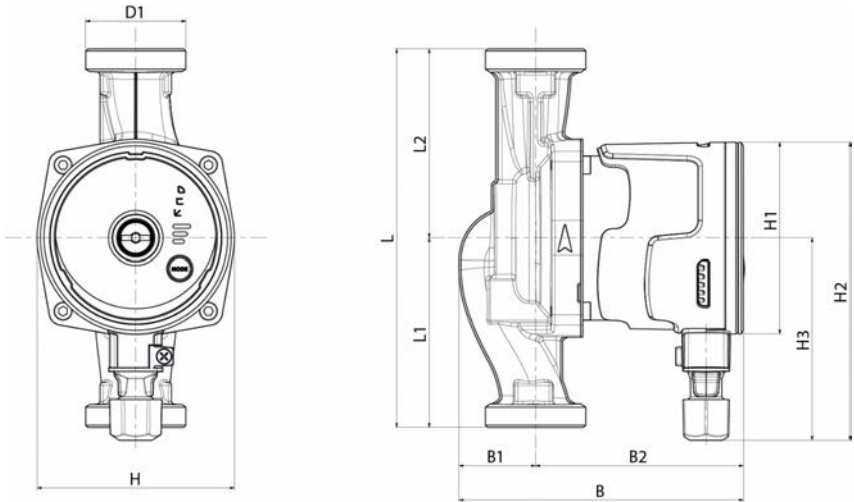
INFORMATION

Frequently asked questions (faq) on the ecodesign directive 2009/125/ec establishing a framework for the setting of ecodesign requirements for energy-related products and its implementing regulations: http://ec.europa.eu/enterprise/policies/sustainable-business/documents/ecodesign/guidance/files/20110429_faq_en.pdf

Guidelines accompanying commission regulations implementing the ecodesign directive: http://ec.europa.eu/energy/efficiency/ecodesign/legislation_en.htm - see "circulators"

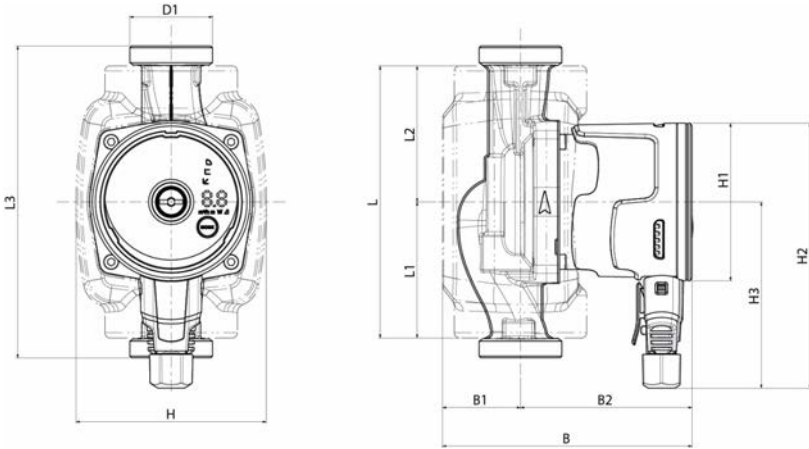
17. DIMENSIONS

Evosta 2 Dimensions



Mod.	L	L1	L2	B	B1	B2	D1	H	H1	H2	H3
EVOSTA2 40-70/80/130 (1/2") M230/50-60	130	65	65	135	36	99	1"	94	Ø91	142	96
EVOSTA2 40-70/80/130 (1") M230/50-60	130	65	65	135	36	99	1 1/2"	94	Ø91	142	96
EVOSTA2 40-70/80/180 (1") M230/50-60	180	90	90	135	36	99	1 1/2"	94	Ø91	142	96
EVOSTA2 40-70/80/180 (1 1/4") M230/50-60	180	90	90	135	36	99	2"	94	Ø91	142	96

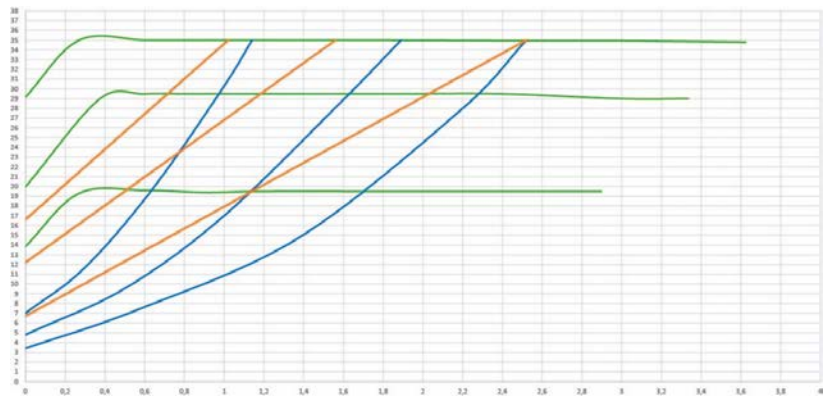
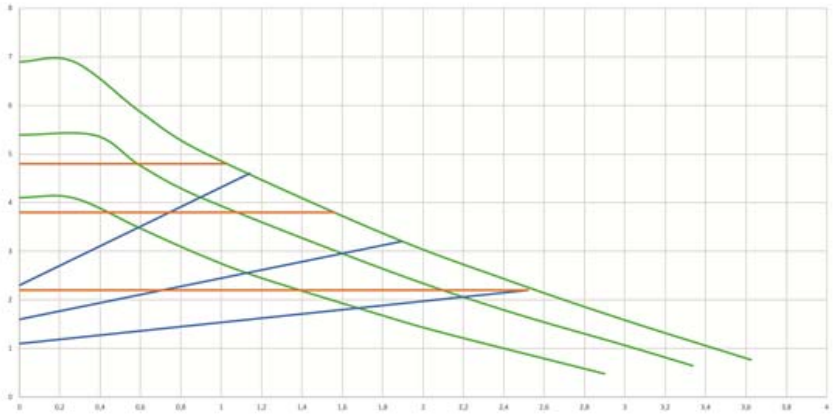
Evosta 3 Dimensions



Mod.	L	L1	L2	L3	B	B1	B2	D1	H	H1	H2	H3
EVOSTA3 40/60/80/130 (1/2") M230/50-60	157	78,5	65	130	144	45	99	1"	110	Ø91	153	107,5
EVOSTA3 40/60/80/130 (1") M230/50-60	157	78,5	65	130	144	45	99	1 1/2"	110	Ø91	153	107,5
EVOSTA3 40/60/80/180 (1") M230/50-60	157	78,5	90	180	144	45	99	1 1/2"	110	Ø91	153	107,5
EVOSTA3 40/60/80/180 (1 1/4") M230/50-60	157	78,5	90	180	144	45	99	2"	110	Ø91	153	107,5

18. PERFORMANCE CURVES

EVOSTA2 40-70/XXX



EG-Konformitätserklärung



EG-Konformitätserklärung

gemäß der EG-Maschinen-Richtlinie 2006/42/EG vom 17. Mai 2006, Anhang II A

Hiermit erklären wir, dass die nachstehend bezeichnete Maschine in ihrer Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinie 2006/42/EG entspricht. Bei einer mit uns nicht abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Hersteller:

UWS Technologie Hans-Georg Breitmoser
Sudetenstraße 6
91610 Innsingen
Telefon: 09869 919100
E-Mail: info@uws-technologie.de

Beschreibung der Maschine:

- Funktion: Heizwasserfüll- und Bypassgerät
- Typ: Heaty Smart Box
- Artikel Nr.: 104000
- Masse: 24 kg
- Baujahr: 2019
- Elektroanschluss: 230 V, 0,3 kW, 50/60 Hz
- max. Betriebsdruck: 6 bar
- max. Betriebstemperatur: 80 °C

Es wird die Übereinstimmung mit weiteren, ebenfalls für das Produkt geltenden Richtlinien/Bestimmungen erklärt:

- EMV-Richtlinie (2014/30/EU) vom 26. Februar 2014
- RoHS-Richtlinie (2011/65/EU) vom 08. Juni 2011

Angewandte harmonisierte Normen insbesondere:

- DIN EN ISO 12100 Sicherheit von Maschinen – Grundbegriffe, allgemein Gestaltungsleitsätze, Risikobeurteilung und Risikominderung
- DIN EN 349 Sicherheit von Maschinen, Mindestabstände zur Vermeidung des Quetschens von Körperteilen
- DIN EN 809 Pumpen und Pumpenaggregate für Flüssigkeiten — Allgemeine sicherheitstechnische Anforderungen
- DIN EN ISO 13857 Sicherheit von Maschinen – Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen
- DIN EN ISO 14118 Sicherheit von Maschinen – Vermeidung von unerwartetem Anlauf
- DIN EN ISO 14120 Sicherheit von Maschinen – Trennende Schutzeinrichtungen – Allgemeine Anforderungen an Gestaltung, Bau und Auswahl von feststehenden und beweglichen trennenden Schutzeinrichtungen
- DIN EN 60335-1 Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke — Teil 1: Allgemeine Anforderungen

Bevollmächtigter für die Zusammenstellung der Technischen Dokumentation:

Steffen Breitmoser, siehe Herstelleradresse

Ort/Datum:

Angabe zur Person des Unterzeichners:

Hans-Georg Breitmoser, Geschäftsführer

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