

Installation

SolvisLea 8.3 Premium

Air/water heating pump with SolvisBen or SolvisMax solar heating systems

- Installation
- Start-up
- Maintenance



1 Information About These Instructions

These instructions are intended for you as a technician from an installation company. You will find the specifications for installation, start-up and maintenance of the system here.

Please keep these instructions with the system so they can be referred to when necessary.

We recommend that you participate in a Solvis training course to ensure safe and proper installation.

As we are interested in improving our technical documentation, we appreciate feedback of any kind.

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A list of our international representatives is provided at www.solvis.com.

Please understand that the telephone numbers are reserved for use by our installers.

Interested system operators should contact their installer.

Symbols used



DANGER

Immediate danger, with serious health consequences and even death.



RISK OF FIRE

Immediate danger, with serious health consequences and even death.



WARNING

Danger, with potentially serious health consequences.



CAUTION

Possible risk of moderate or light injury.



CAUTION

Risk of damage to unit or system.



Useful information, notes and work tips.



Change of document, referring to another document.



Energy-saving tip with suggestions on how to save energy. This reduces costs and helps protect the environment.

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2 Notes

2.1 Safety notes and specifications



Observe the safety notes

This is primarily for your own safety.

- Make sure that you are familiar with the safety notes before beginning work.
- Observe and adhere to the applicable safety regulations and accident prevention regulations.



DANGER

Combustible refrigerant

Possibility of serious consequences for health due to the risk of fire and explosion.

- Follow the safety regulations on site!



DANGER

What to do if there is a risk of fire

- Immediately switch off the heating emergency switch.
- Shut off the fuel supply.
- Have a suitable fire extinguisher ready.



CAUTION

Observe instructions

Solvis is not liable for any damage resulting from non-observance of these instructions.

- Read the instructions carefully before operating or installing the system.
- Contact our Technical Sales department if you have any questions.



CAUTION

Do not make any unauthorised modifications

Otherwise, there is no guarantee that the system will function correctly.

- You must not make any changes to the components of the unit.
- Only use original spare parts.



Work to be performed by qualified technicians

- Only trained specialist companies may install or maintain the system.
- Only qualified electricians may work on electrical equipment.

Observe the following specifications

- DIN EN 12828 Heating systems in buildings
- DIN EN 1717 Protection of drinking water (d. w.)
- DIN 1988-100 Codes of practice for d. w. installat. (TRWI)
- DIN EN 806 Specifications for installations inside buildings conveying water for human consumption
- VDI 2035 Part 1, Prevention of damage in water heating installations - Scale formation
- VDI 2035 Part 2, Prevention of damage in water heating installations - Water corrosion
- Directives of the German Institute for Structural Engineering

- German Building Regulations (LBO)
- VDE 0100/IEC 60364 Erection of low voltage systems
- Low Voltage Directive 2006/95/EC.
- DIN EN 378 Refrigerating systems and heat pumps – Safety and environmental requirements
- IEC 60335 Part 2-40 (Particular requirements for electrical heat pumps)
- Chemicals Climate Protection Ordinance (ChemKlimaschutzV)

2.2 Output data according to EN 14511

The output data provided in the text, diagrams and technical data sheet was determined according to the measurement conditions of the EN 14511 standard. The output data for air-water inverter heating pumps at source temperatures $> -7^{\circ}\text{C}$ are partial load values, which deviates from this standard. The relevant percentage weighting in the partial load range can be found in EN 14825 and the EHPA seal of approval regulations.

The measurement conditions above generally do not fully correspond to the existing conditions of the system operator:

Deviations may be considerable depending on the measurement method chosen and the measurement conditions defined in the first paragraph of this section.

Other factors influencing the measured values are the measuring equipment, system configuration, system age and volume flows.

A confirmation of the specified output data is only possible if the measurement performed for this purpose is performed according to the measurement conditions defined in the first paragraph of this section.

2.3 Application range

Intended use

This system is intended only for heating purposes and for drinking water heating with optional solar support, as described in this document.

Operating this system for any other purpose is prohibited. Exceptions require express written approval or a statement from Solvis in advance.

The SolvisMax or SolvisBen and the SolvisLea 8.3 Premium heating pump can be used in new or old buildings with a heating or hot water requirement of up to 14 kW. They can also achieve heating flow temperatures of up to 65°C . Hot water tap temperatures of 60°C can be reached reliably. When using the heating pump as a hybrid system, even higher flow temperatures and, depending on the installed burner, up to 30 kW of heating or hot water output can be provided.



Heating pumps are usually only suitable as heat generators in a two-pipe heating system.

3 Scope of Delivery

The SolvisLea 8.3 Premium heating pump with matching accessories for outdoor installation.



Fig. 1: SolvisLea 8.3 Premium

The scope of delivery will depend on whether a package, an individual order or a retrofitting was ordered. The additional scope of delivery for the heating pump is specified in the respective installation instructions. Additional accessories are added to create an entire system.



All accessories are listed in the → *Solvis price list*.

Heating pump

- SolvisLea heating pump (integrated electrical auxiliary heater)
- Lea (TU-LEA) technical documents
- My SolvisLea system (ORD-LEA)*.

* Only included in the scope for individual orders

SolvisLea Premium technical documents

- SolvisLea 8.3 Premium installation instructions (MAL-LEA-P)
- SolvisLea 8.3 Premium quick guide for electrical installation (MAL-LEA-K-P).
- Installer operating instructions (BAL-SBSX-3-I)

My SolvisLea system (ORD-LEA) documentation

- Operating instructions for SolvisBen / SolvisMax 7 / SolvisLea with SovisControl 3 for customers (BAL-SBSX-3-K)
- Heating pump (PTK-ALH-WP) inspection and system booklet
- System log for filling heating water for Solvis systems (BRO-AO-ALH)
- SolvisLea (PTK-LEA-I) start-up report
- Heating pump maintenance report (PTK-WP-W)
- SolvisBen / SolvisMax 7 start-up report (PTK-HEFT-I)
- SolvisBen / SolvisMax 7 maintenance report (PTK-HEFT-W)
- Product data sheets for storage tanks, burners, heating pumps, controls and solar stations.

4 Installation Conditions and Transport

4.1 Transporting to the installation site

Pay attention to the centre of gravity of the unit during transport:

- The centre of gravity is located near the compressor
- Use suitable transportation equipment (for example, a stair climbing truck)
- Protect the unit from strong impacts during transport.
- If the unit has to be tilted during transport, this must be done only briefly via one of the long sides. The compressor (see → *fig. 21*) should always be on top.

- Reduce the noise level via acoustic measures such as lawn and planter areas, solid walls, fences, palisades, and so on.
- Avoid positioning between two closed walls and in corners and angles since these can mirror the source of noise.
- Use silent mode, especially at night.



More information about noise can be found in the → *Planning document (PUL-LEA-P)*.

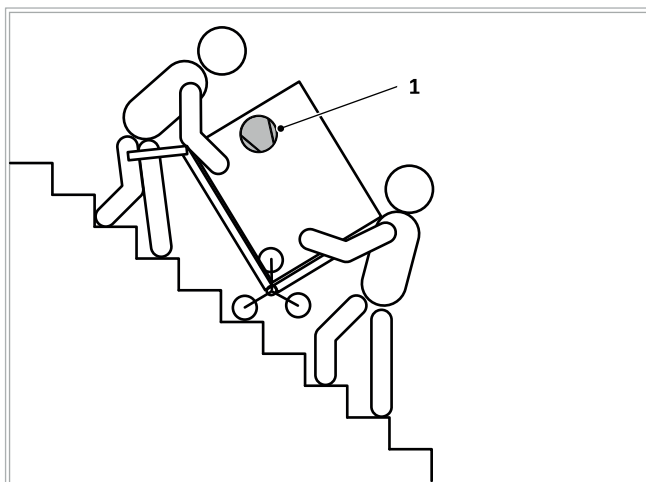


Fig. 2: Carrying the unit on stairs with the stair climbing truck

- The longer the unit is tilted, the more the refrigerant oil is distributed in the system.
- Wait approximately 30 minutes before operating the unit after tilting.

4.2 Noise insulation

When installing the unit, make sure that the unit is louder on the air intake and air discharge side than on the two closed sides.

Noise reduction measures

Please observe the following instructions when selecting the installation site.



For more information about the sound power level, see → *“Technical Data” section, page 26*.

- Do not install the heating pump next to living rooms or bedrooms.
- Pipe lead-throughs in walls and ceilings must be insulated against structure-borne noise.
- Do not connect heating pumps using rigid pipes. If necessary, use flexible hoses for decoupling.
- Avoid installation on surrounding, sound-reflecting floor surfaces. Use floor insulation panels if necessary.
- Avoid blowing air directly towards neighbours or against walls; acoustic reflection may occur on walls.

4.3 General installation

Store and install the units only in rooms with a surface area larger than 4 m². If this rule is not followed, the room may be filled with a combustible mixture in the event of a leakage.

Ensure that the installation location is suitable for operating the unit safely.

Maintain the following conditions

- The heating pump must be positioned horizontally.
- You must ensure that the unit is accessible for maintenance purposes.
- Keep the pipe length between the heating pump and the building as short as possible to minimise heat and pressure losses.
- Install hydraulic connection pipes thermally insulated in a protective conduit at a frost-resistant depth.
- Use flexible hoses for the hydraulic connection.
- Do not install the unit in, above or directly next to a shaft.
- If the heating pump is not installed near a wall and the main direction of the wind is on the supply side, a wind guard may need to be installed in front of the heating pump.
- Check if a building notice or building permit is necessary.
- Ensure that the antifreeze for the carrier pipes to the heating pump complies with applicable regulations.
- During winter, the unit must not be covered with snow or stand in water during heavy rainfall.
- The lower edge of the heating pump housing must be at least 10 cm above the max. snow depth.

- Take measures to reduce noise level.
- Structural changes and any subsequent enclosure of the heating pump are not permitted.
- Do not install the heating pump in structures that are closed on three sides. See → *fig. 3*
- If the unit is installed in an open area, the air intake on the intake side must be protected. In this case, install a protective wall against the wind.

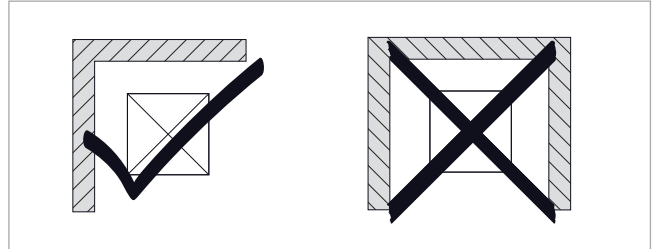


Fig. 3: Installation conditions near walls

Heat supply line

A prefabricated and insulated pipe system can be used for the connection between the heating pump and heating system. The heat supply line is connected to the flow and return of the heating pump via connector pieces (please order accessories separately).

The carrier line available from Solvis requires a bending radius of at least 250 mm (external diameter of the cable 68 mm) or 300 mm (external diameter of the cable 140 mm). If possible, it should only be routed in a frost-free area in the base and should only be used for short distances.

4.4 Safety and precautionary measures

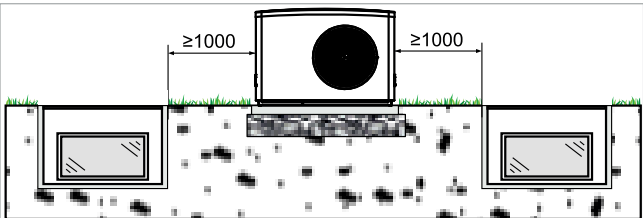
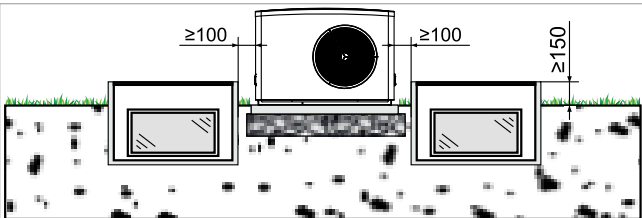
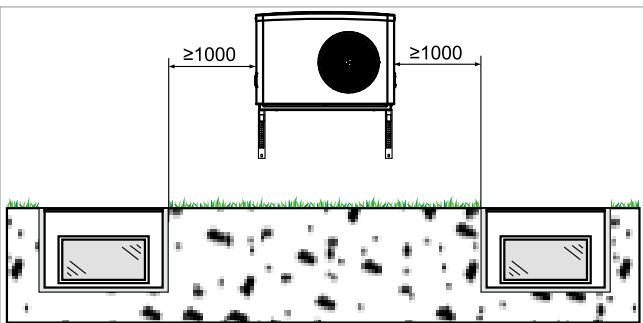
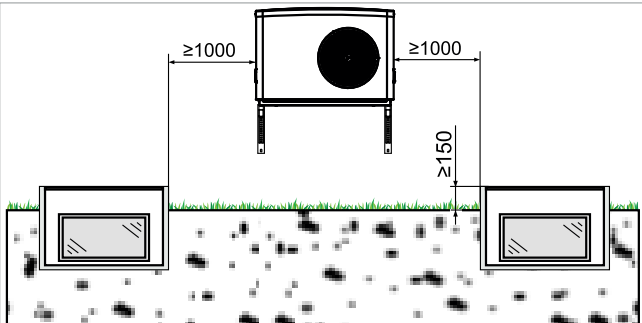
DANGER

Risk of suffocation when installed incorrectly

Refrigerants are heavier than air. In the event of leakages, the escaping refrigerant may enter into rooms below the installation location through open windows. Any refrigerant that escapes from the unit sinks down and displaces the air.

- Set up the unit at a sufficient distance from light shafts (maintain minimum distances).
- Ensure that the unit is not fitted in front of or above supply air, extraction air or other ventilation installations.

To ensure that the safety concept for the unit is complied with, the following minimum distances from light shafts apply:

Installation on foundation, light shaft at ground level 	Installation on foundation, light shaft above ground level 
Installation on console, light shaft at ground level 	Installation on console, light shaft above ground level 

4.5 Installing SolvisLea

Clearances

Minimum spacing to walls must be maintained to minimise noise pollution and for maintenance purposes (see → Fig. 4).

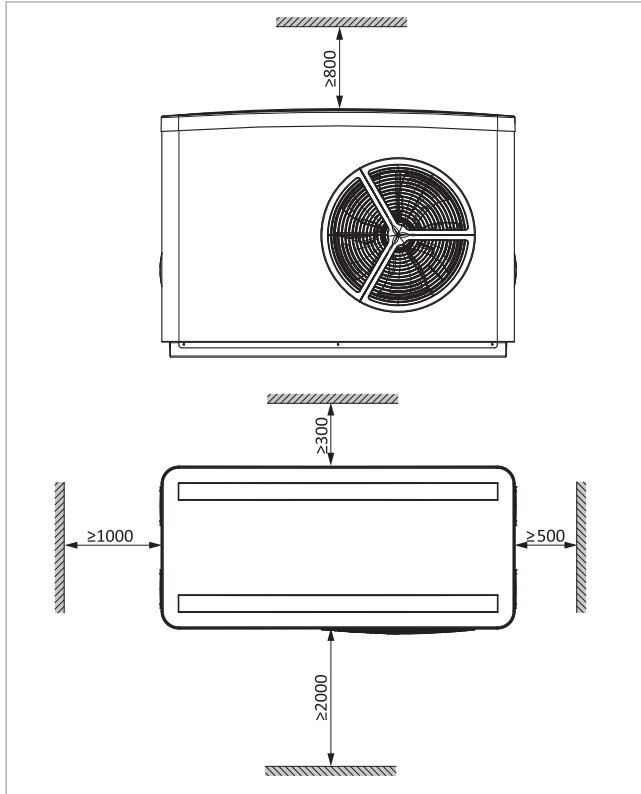


Fig. 4: Clearance to wall, SolvisLea

Base

The base on which the heating pump is installed should be horizontal, level, firm and durable. The frame of the heating pump should rest evenly. An uneven base can have an adverse effect on the noise behaviour of the heating pump. The heating pump must be accessible from all sides.

Recommended base: cast base, kerbstones or stone slabs. A recess (free space) must be provided in the base for the water and electrical installation pipes to be routed to the heating pump from below.

If the heating pump is not installed at ground level, a condensate drain-line heater must be installed (included with the stand console).

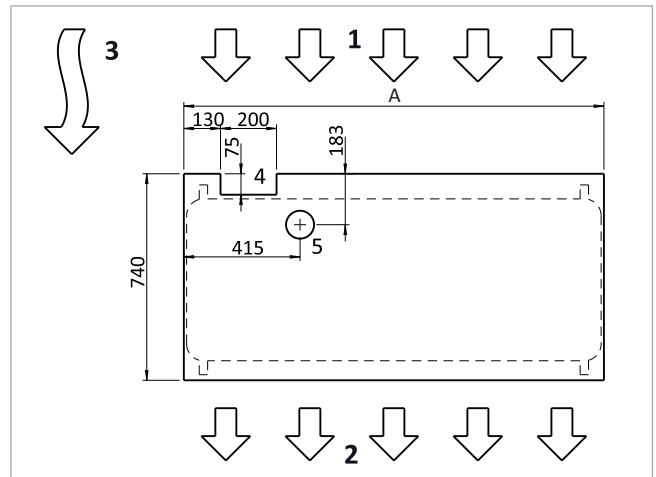


Fig. 5: Base for SolvisLea (view from above)

- A 1300
- 1 Air intake
- 2 Air discharge
- 3 Prevailing wind direction
- 4 Recess for supply pipes
- 5 Recess for condensate drain ($\varnothing \geq 70$ mm)

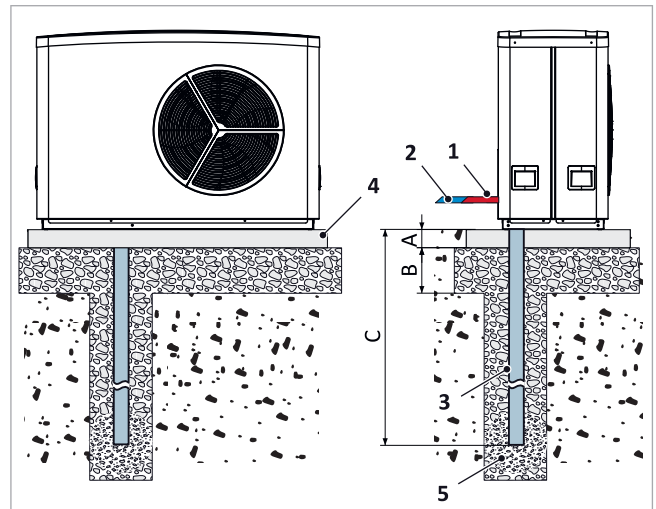


Fig. 6: Base for SolvisLea

- 1 Heating pump flow
- 2 Heating pump return
- 3 Condensate discharge
- 4 Concrete slab
- 5 Gravel bed
- A ≈ 100 mm
- B ≈ 300 mm
- C ≥ 800 mm

Condensate drain for flat base

The condensate drain pipe must run from the heating pump with a continuous downward incline. The diameter of the condensate connection on the heating pump is 29.6 mm. The condensate water is routed into the sewage

4 Installation Conditions and Transport

system via a frost-free drain or into a coarse gravel fill via a drainage pipe (leaching).

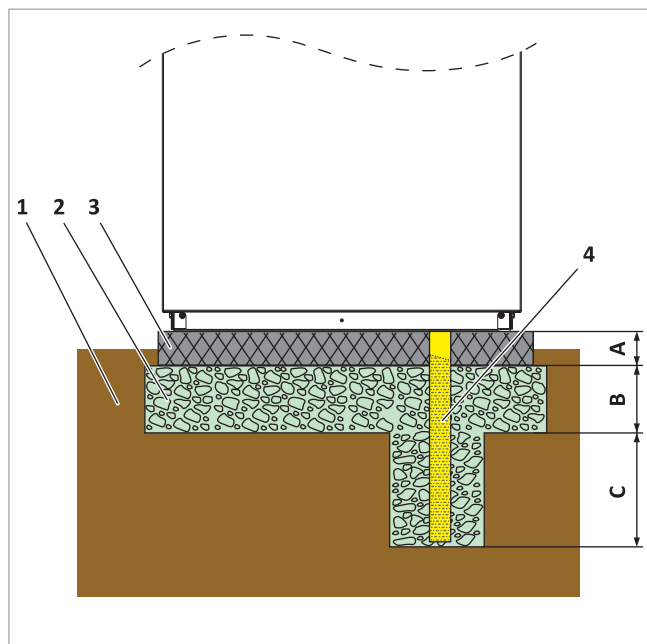


Fig. 7: Condensate drainage via leaching into a gravel bed

- | | | | |
|---|--------------------|---|------------------------|
| 1 | Soil | A | ≈ 100 mm |
| 2 | Coarse gravel fill | B | ≈ 300 mm |
| 3 | Concrete slab | C | ≥ 800 mm (frost depth) |
| 4 | Drainage pipe | | |

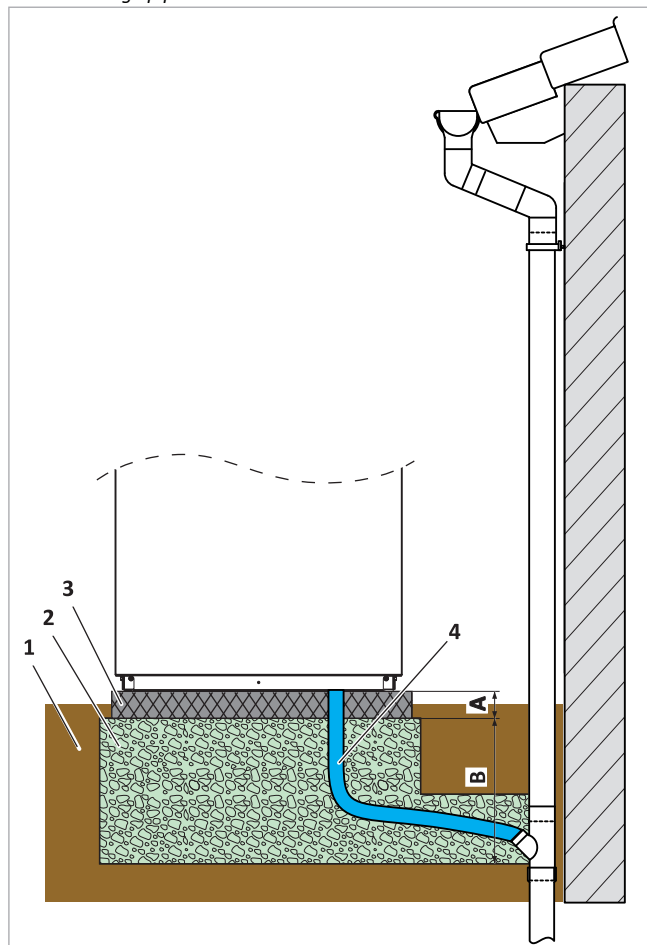


Fig. 8: Condensate drainage in the downpipe or drain

- | | | | |
|---|----------------------|---|----------|
| 1 | Soil | A | ≈ 100 mm |
| 2 | Coarse gravel fill | B | ≈ 800 mm |
| 3 | Concrete slab | | |
| 4 | Condensate discharge | | |

Bolting to the base

The heating pump must be screwed to the base to secure it.

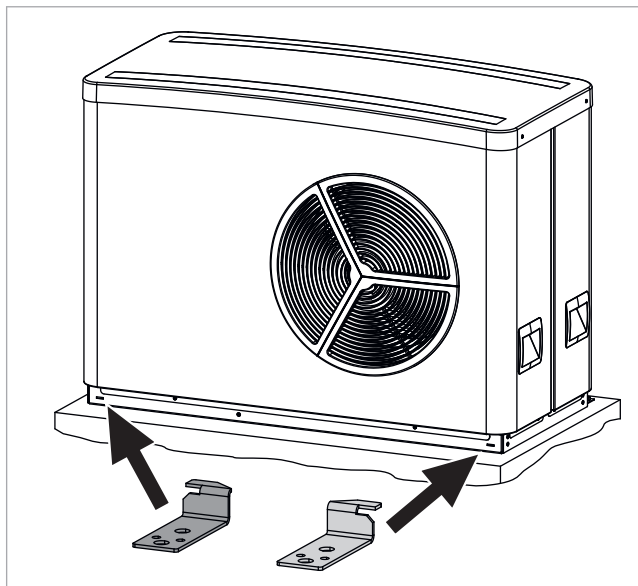


Fig. 9: Bolting to the base

Hook two brackets on each side into the oblong holes on the front and back. Ensure that the correct brackets are used for the left and right oblong holes.

Align the brackets so that the slot on the bracket is hooked into the unit.

Attach the unit to the base using the brackets and suitable dowels and screws. Do **not** use the screws that were used to secure the unit to the transport pallet.

Assembly console

See base for SolvisLea.



Connection set (ASS-ETL-LEA) or (ASS-ELT-WP-OH) and pipe set (ROS-LEA-2) cannot be used with the assembly console.

Condensate drain for assembly console

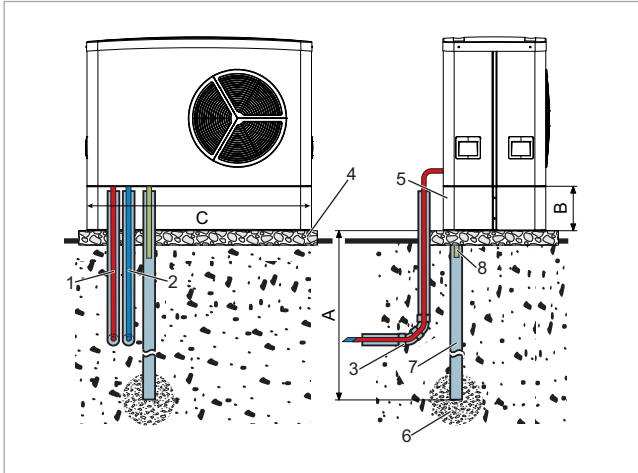


Fig. 10: Condensate drain for assembly console

- | | |
|---|----------------------------|
| 1 Heating flow | 7 Condensate drainage pipe |
| 2 Heating return | 8 Condensate discharge |
| 3 Installation pipe for the supply line | A Frost depth |
| 4 Base | B 245 |
| 5 Assembly console | C 1160 |
| 6 Gravel bed | |

Strip foundation

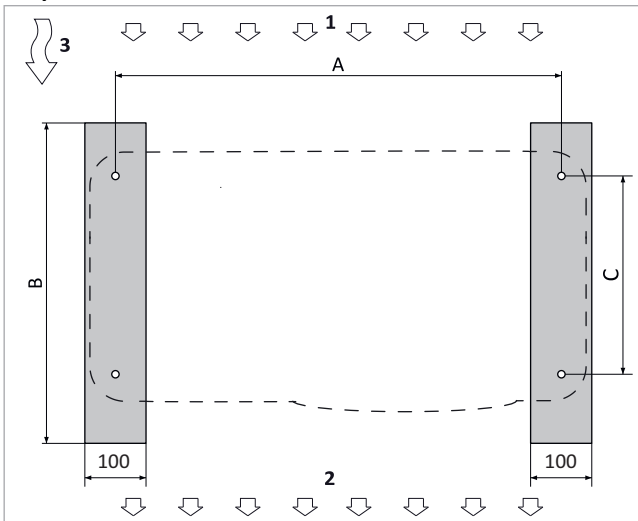


Fig. 11: Base for SolvisLea standing console (view from above)

- | | |
|-----------------------------|----------|
| 1 Air intake side | A 1160 |
| 2 Air discharge side | B 650 mm |
| 3 Prevailing wind direction | C 490 mm |

The strip foundation must be installed at ground level and equipped with a condensate drainage pipe. The space between the two foundation strips must be filled with gravel or crushed rock up to the upper edge of the strip foundation. The screw connections must be used to secure the device against tipping or sliding.

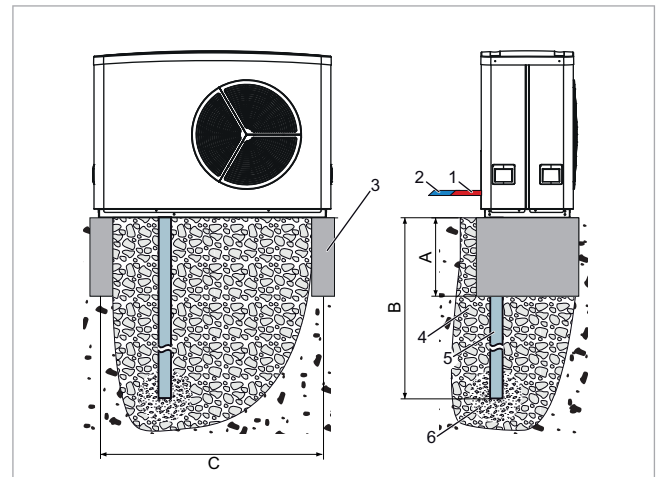


Fig. 12: SolvisLea mounted on strip foundation

- | | |
|---------------------------------|---------------|
| 1 Heating flow | 6 Gravel bed |
| 2 Heating return | A 300 |
| 3 Strip foundation (edge block) | B Frost depth |
| 4 Gravel | C 1160 |
| 5 Condensate drainage pipe | |

Standing console



Observe the following when mounting the unit on the wall or standing console:

- Static limits of the standing console used
- Install the provided condensate drain-line heater
- Refer to the dimension and connection drawing in the appendix for the clearances of the installation holes.

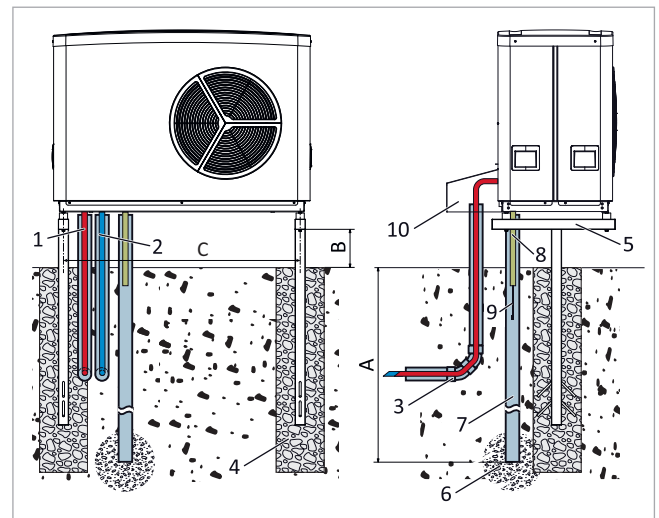


Fig. 13: SolvisLea mounted on standing console

- | | |
|---|--------------------------------|
| 1 Heating flow | 7 Condensate drainage pipe |
| 2 Heating return | 8 Condensate discharge |
| 3 Installation pipe for the supply line | 9 Condensate drain-line heater |
| 4 Base | 10 Protective cover |
| 5 Standing console | A Frost depth |
| 6 Gravel bed | B 300 mm |
| | C 1160 |

5 Installation

5.1 Flow and return connection


CAUTION

Foreign bodies, e. g. rust, sand or sealing material, can impair the operational safety of the heating pump.

- Thoroughly flush the pipe system before connecting the heating pump to supply lines.
- To protect against contamination, install a sludge separator on the return flow of the heating pump.


CAUTION
Observe the quality of the fill water

There may be damage due to limescale formation/corrosion in the heating system.

- The fill water for the heating system must meet the requirements of VDI 2035, parts 1 and 2.


CAUTION
When installing the system:

Failure to observe the following could lead to faults or even damage to the system.

- Ensure leak tightness when connecting the heating pump.
- Ensure that the heating flow and return flow are properly connected.
- Perform thermal insulation according to applicable regulations.
- Observe the internal pressure difference when designing the heating circuit. See → "Technical Data" section, page 26.

5.2 Plug connection


CAUTION
Potential damage to the plug connection

- Tighten the screw cap of the plug connections by hand.
- Do not use tools.

Prevent removal of plug connections.

To ensure that the plug connections are held securely, tubes with a surface hardness > 225 HV (e.g. stainless steel) must have a slot.

1. Use a pipe cutter to cut a slot approx. 0.1 mm deep at a defined distance from the end of the pipe.
- Pipe diameter 22 mm: 17 ±0.5 mm
 - Pipe diameter 28 mm: 27.5 ±0.5 mm

Functional principal of plug connections

The plug connections are equipped with a retaining element with stainless steel teeth and an O-ring for sealing. In addition, the plug connections have a "turn and lock" function.

By simply turning the screw cap by hand, the pipe is fixed in the connector and the O-ring is pressed onto the pipe for sealing.

Making a plug connection

CAUTION
Pipe ends must be free of burrs.

Otherwise, injuries or damage to the plug connections are possible.

- Only use a pipe cutter to shorten the pipes.

The connector must be in the unlocked position before insertion. In this position there is a narrow gap between the screw cap and the base body.

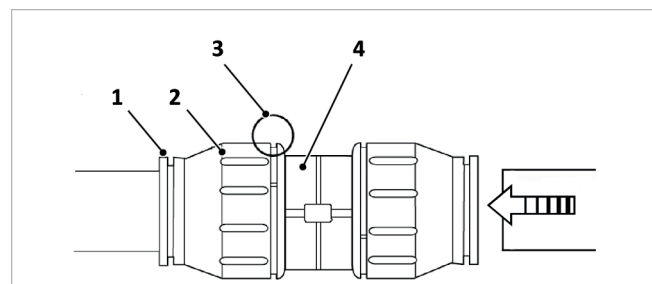


Fig. 14: Plug connection unlocked

- 1 Retaining element
- 2 Screw cap
- 3 Gap between screw cap and base body
- 4 Base body

Making a plug connection

1. Guide the pipe past the O-ring into the plug connection until the specified insertion depth is reached.
2. Tighten the screw cap hand-tight to the stop on the base body.

This will secure the plug connection.

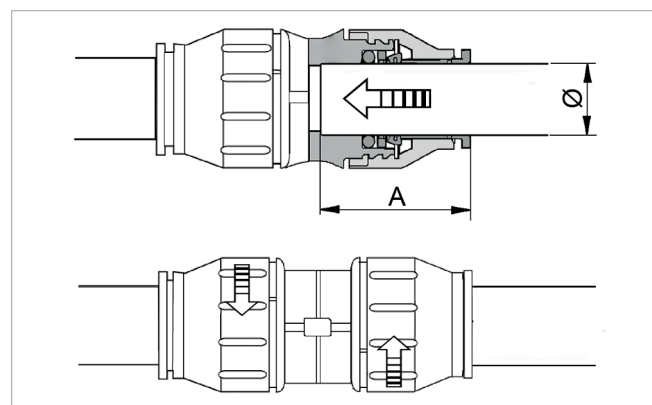


Fig. 15: Insert and lock the pipe.

- A Insertion depth 44 mm (only for pipe Ø 28 mm); 33 mm for pipe Ø 22 mm
- Ø Pipe diameter

Releasing plug connections
Releasing the plug connection

If it is necessary to release the plug connections at a later point in time, proceed as follows:

1. Loosen the screw cap anti-clockwise until there is a narrow gap of approx. 2 mm.
2. Press back the retaining element with your fingers and hold it firmly.
3. Pull out the inserted pipe.

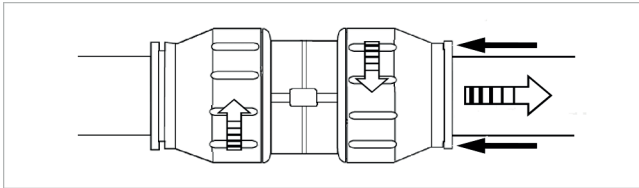


Fig. 16: Releasing the plug connection

5.3 SolvisLea and SolvisBen/SolvisMax hydraulic connection



Continue installation, see → *the installation instructions for the storage tank (MAL-MAX-7, MAL-BEN or MAL-BEN-LI-SL-WP) and the system diagram (ALS-MAX-7 or ALS-BEN).*



In order to simplify bleeding of the heating pump, BFD valves, shut-off valves and a safety group must be installed in accordance with the system diagram of the installation instructions mentioned above. Air can be safely removed from the pipe lines through the BFD valves with the aid of a flushing station. Likewise, an air separator can be used to permanently remove air.

5.4 Installing the SolvisLea

Installing the unit

1. Place the unit on the prepared base or console.



CAUTION

There may be foreign bodies in the pipeline system

The operational safety of the unit may be impaired.

- Before fitting the hot water connection, thoroughly flush the pipe system through with water.
- We recommend flushing, filling and depressurising the Solvis flushing station (FUES-SBS).

Connecting the supply lines of the heating pump

The flow and return are connected to the supply lines coming from the storage tank. We recommend using the hydraulic connections that are available as accessories (ASS-ETL-LEA), (ASS-ELT-WP-OH) or (ROS-LEA-2).

1. Press the hydraulic connections into the plug connection and secure them.
2. Alternatively: Mount the pipe with press fitting (28 mm on 1", for example) to the plug connections.

The connections on the heating pump are now prepared.

3. If necessary, mount a 1" connector piece to the supply lines.

4. Route the supply lines to the unit from below or from the side.
5. Connect the supply lines with flow and return flow to each other. Ensure leak tightness.

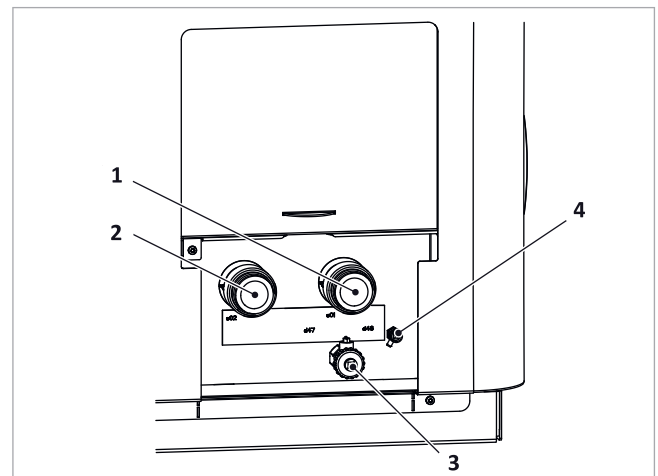


Fig. 17: SolvisLea: Hydraulic connection

- 1 Heating flow (plug connection)
- 2 Heating return (plug connection)
- 3 Draining
- 4 Bleeding

Ensuring condensate drainage

If the unit is placed on a base, the condensate drips freely into the condensate drainage pipe. Otherwise, proceed as follows:

1. If the unit is mounted on a console, attach a condensate hose to the condensate drain and route it to the drain.
2. Ensure that the condensate line is not bent.
3. Protect the condensate hose from frost by providing adequate thermal insulation. If necessary, provide trace heating. See → *"Electrical connection" section, page 15.*
4. After installing the condensate hose, check whether the condensate can drain off properly.

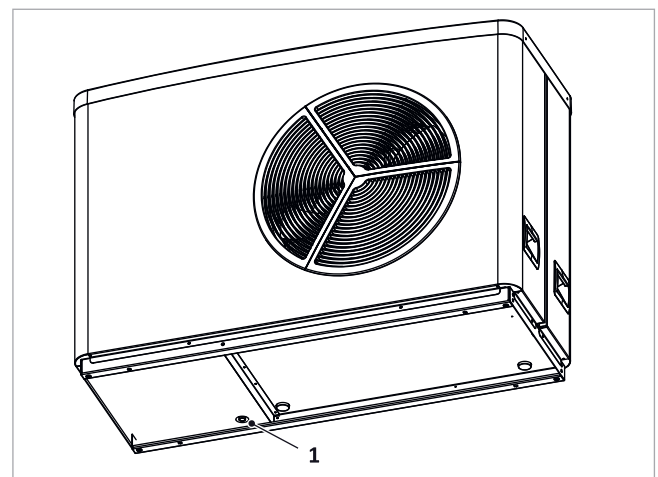


Fig. 18: SolvisLea: Condensate discharge

- 1 Condensate discharge

5.5 Filling the heating plant



WARNING

Safety valve installed in the unit

Only a safety valve with the same opening pressure ensures the function of the safety concept; otherwise, there is a risk of severe consequences for health.

- Do not replace the safety valve with a safety valve with a different opening pressure.
- Use only original spare parts.

A safety valve is installed in the unit. If the opening pressure is exceeded, the safety valve opens. The medium that escapes runs through a fitted hose and into the condensate tray.

Opening pressure [bar]	Tolerance [bar]
2.5	+0.15 -0.35

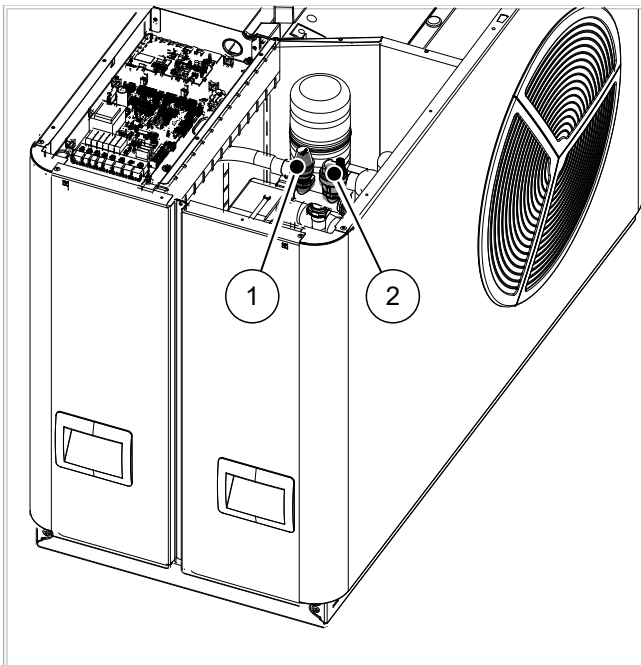


Fig. 19: SolvisLea 8.3 Premium

1 Safety valve

2 Automatic bleeder

Check whether the automatic bleeder is open to ensure that the heating plant is bled automatically.

Filling the plant

1. Fill the plant through the drain (→ fig. 17, 3) in accordance with the storage tank installation instructions.
2. Perform a pressure test after filling.
3. Insulate the pipe lines and valves in accordance with the German federal buildings energy act (GEG).

Bleeding the unit and heating plant

The hydraulic system of the loading circuit should preferably be bled using the Solvis flushing station (FUES-SBS).

1. Carefully bleed the pipe line system when filling the storage tank.

2. Open the automatic bleeder (→ fig. 19, 2) and remove the gases from the pipeline system on the heating pump by initiating bleeding; see → fig. 17 (4).
3. Finally, bleed the heating system at the highest point, at the radiators and at the underfloor heating.

5.6 Electrical connection

General information



DANGER

Hazard due to electric shock

This can result in injury or even cardiac arrest.

- Disconnect the system from the mains before carrying out work on it and ensure that it cannot be turned on again.
- When working on or near the inverter, wait 5 minutes after switching it off until the capacitors have discharged.



CAUTION

Country-specific regulations

Regulations can differ depending on the country and the region.

- These are to be observed and adhered to in order to ensure safe and faultless operation.
- If certain laws and regulations do not apply in a particular country, they are to be replaced by the country's own specific laws and regulations.



WARNING

In the event of incorrect mains connection

Contact voltages can be extremely hazardous.

- All mains connection work must be performed by authorised technicians.
- Work must be performed in compliance with relevant regulations, especially DIN VDE 0100/IEC 60364 (Erection of low voltage installations), accident prevention regulations and the guidelines of the responsible power supply company.
- Before connection, the current type and the mains voltage must be compared with the specifications on the unit nameplate.
- The minimum cross section of all connection pipes must be designed in accordance with the power consumption of the unit.
- Only operate the unit while observing the prescribed safety measures and information in these instructions.
- Incorporate the unit into the local equipotential bonding while observing the minimum cross section.
- Ensure that the phase is correct during multi-phase mains connection.
- FI circuit breakers for the heating pump must be AC/DC-sensitive (type B); type A FI circuit breakers might not trip correctly in some cases.



CAUTION

Prevent the system from being influenced by electromagnetic fields.

Risk of heating system malfunction or failure.

- Prevent electrostatic discharges.
- Keep strong electrical fields such as those created by mobile phones away from the heating system. These fields can cause sensitive electronic components to malfunction.



CAUTION

Criteria for line installation

Malfunction or failure of heating system possible.

- Check that all cable and plug connections are connected correctly.
- The bus and sensor lines must be routed separately from lines over 50 V to prevent the controller from being influenced by electromagnetic fields.
- Do not install control devices directly adjacent to control cabinets or electrical devices.
- The electrical lines must not come into contact with hot parts.
- If possible, run all lines in a cable channel and, if necessary, secure with strain relief devices.



CAUTION

Criteria for line length

Risk of heating system fault or failure.

- The total cable resistance for the sensor cables must not exceed 2.5 ohms. For cables with a cross section of 0.25 mm², this corresponds to a length of up to 5 m.
- For cross sections of 0.5 or 0.75 mm², the maximum cable length is 15 or 50 m.
- Sensor cables for temperature sensors should not be unnecessarily long. For very long cables, sensor correction can be performed to minimise the systematic variance errors.
- The sensor cable for volume flow encoders should not be longer than 10 m.



CAUTION

Observe ambient conditions

Malfunction or failure of system possible.

- Avoid ambient temperatures outside of the permitted range of 5°C to +50°C.
- Avoid dew condensation and an annual mean relative humidity higher than 75% (briefly 95%).

SolvisLea connection

Making the connection area accessible

1. Remove the screw on the connection area.

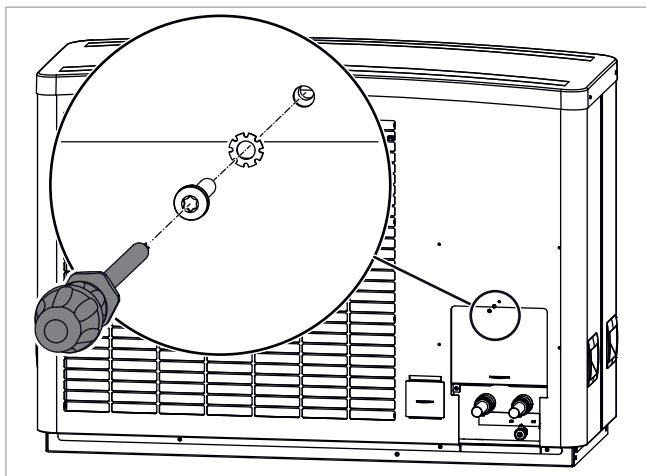


Fig. 20: Remove screw.

2. Slide cover upwards.

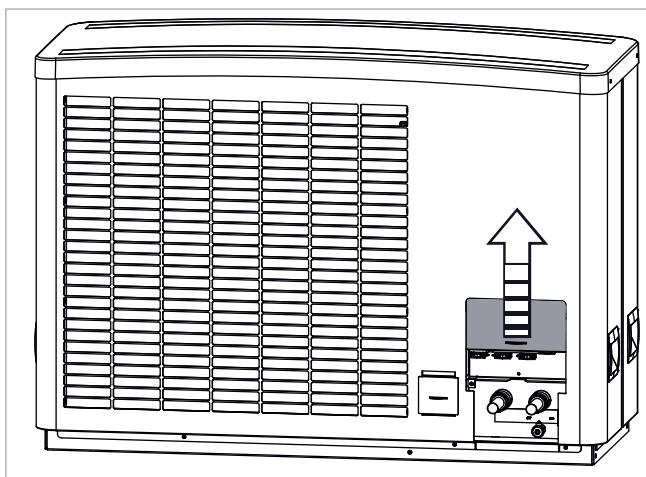


Fig. 21: Slide cover upwards.

3. Route the electrical lines through the strain relief devices (1) into the connection area (2).

If space behind the unit is limited, you can fold out the connection area.

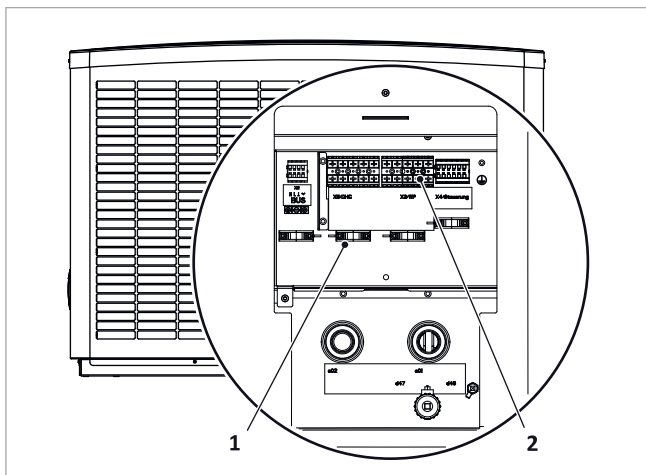


Fig. 22: Connection area

4. Remove the screw to fold out the connection area.

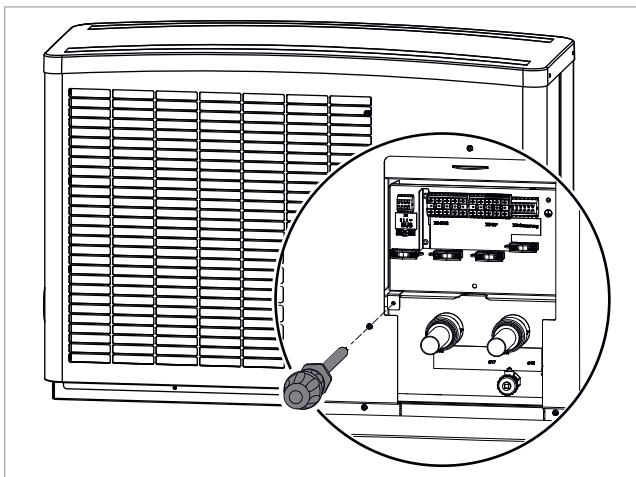


Fig. 23: Remove the screw on the connection area.

5. Fold the connection area to the side.

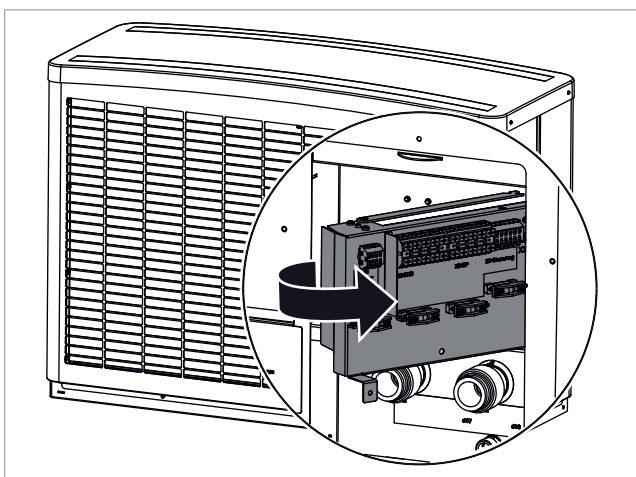


Fig. 24: Fold the connection area to the side.

6. Lock the connection area with the clamp.

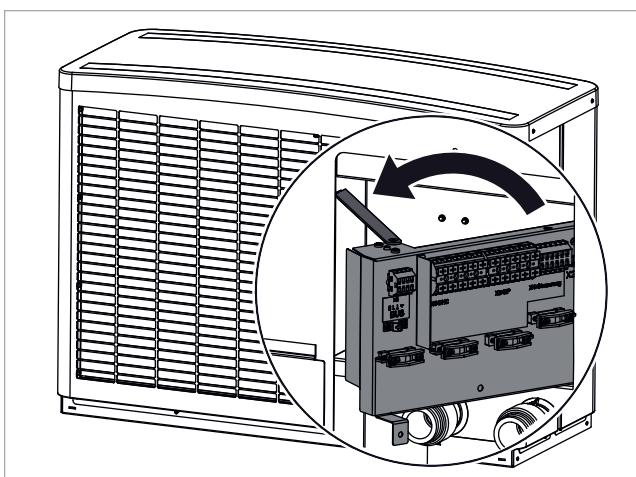


Fig. 25: Clamp the connection area.

Connecting the SolvisLea

1. Route the electrical connection pipes and signal cables either as underground cables or through separate conduits from the building to the heating pump.

- Strip 10 to 11 mm of the insulation from the wires of the electrical lines for the electrical emergency/auxiliary heating.
- Connect electrical cables according to the following figure.

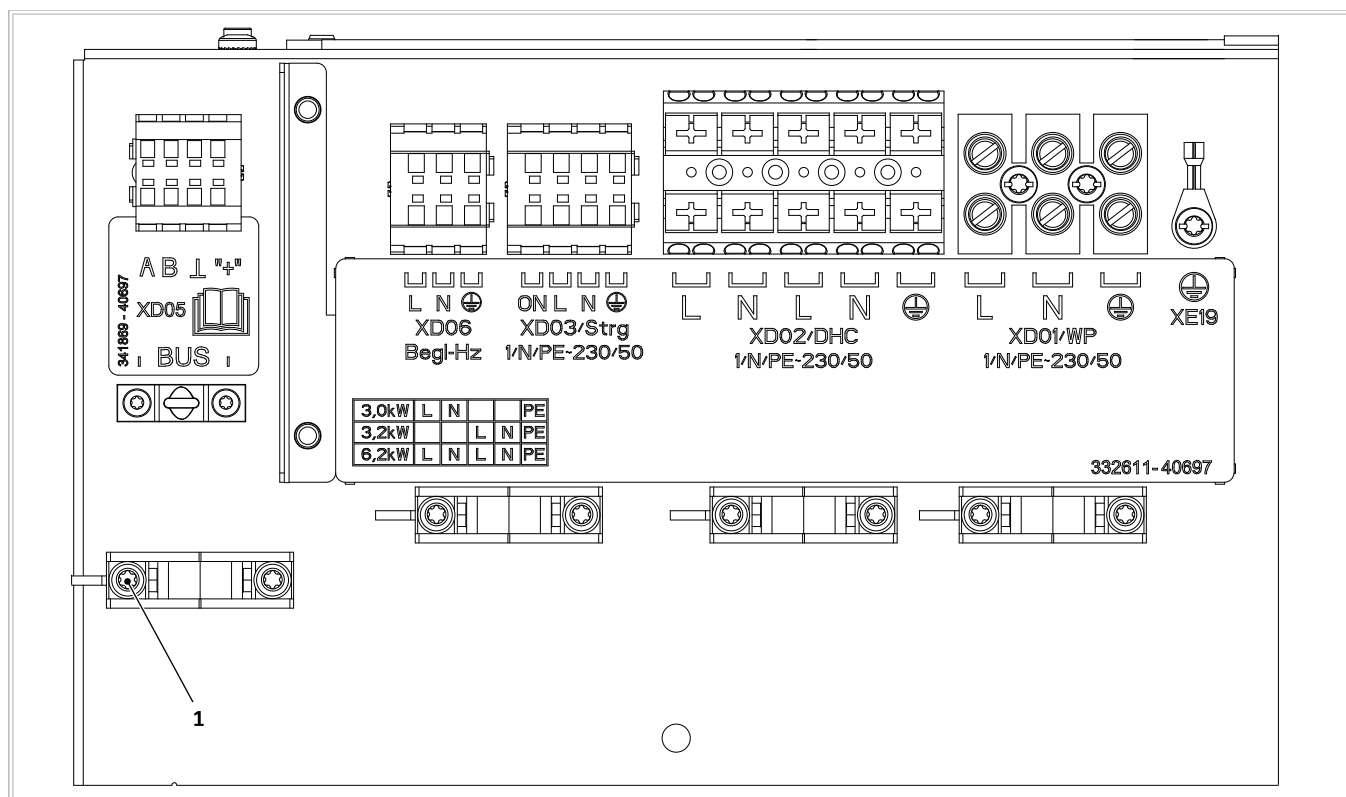


Fig. 26: SolvisLea 8.3 Premium: Connection area

1 Earth terminal for shielding the low-voltage cable

XD05 Low voltage safety (BUS)

- BUS A
- BUS B
- BUS ground
- BUS "+" (not connected)

XD06 Connection for trace heating

- Output: L, N and PE

XD03 Control voltage

ON (unused), mains connection: L, N, PE

XD02 Electrical emergency/auxiliary heating (DHC)

- 3.0 kW L1, N1 and PE
 - 3.2 kW L2, N2 and PE
 - 6.2 kW • L1, N1, L2, N2 and PE
- XD01 Compressor (WP)
- L, N and PE

- Check the function of the strain relief device.

Do not connect the earth terminal to the shield. The shield is already connected to the storage tank.



In monoenergetic systems always connect the emergency/auxiliary heating to ensure the trouble-free operation of the heating pump (antifreeze). For more information about switching off the auxiliary heating via the controller, see → *operating instructions* (BAL-SBSX-3-K).



CAUTION

Note when using hybrid systems

Otherwise, the system may be damaged.

- The electrical emergency/auxiliary heating must not be connected when using hybrid systems (bivalent-alternative operation).

Mounting and wiring the connection box

- Connect the BUS line to the connection box at the storage tank:

- Brown = GND (REF)
- White = A
- Green = B

The BUS line must be shielded on one side. The shielding is already connected to the storage tank.

Installing trace heating

The trace heating must be installed on a stand console, wall console or other raised base when mounted. For

5 Installation

this purpose, it is mounted on the condensate tray or condensate hose.

1. Route the trace heating into the condensate drainage pipe.

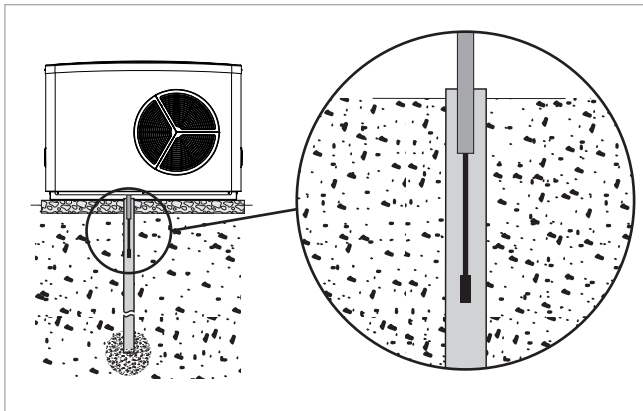


Fig. 27: Trace heating in the condensate drainage pipe

2. Open the connection area (see the section "Making the connection area accessible" → chapter "SolvisLea connection", page 16).
3. Run the electrical lines for the trace heating to the connection area from the bottom.
4. Establish the electrical connection for the trace heating.

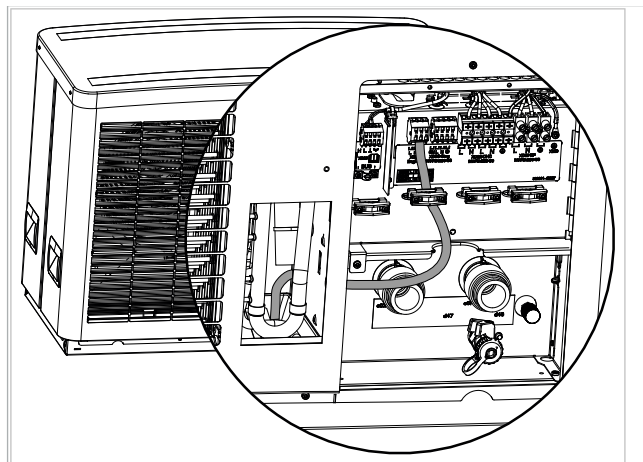


Fig. 28: Connecting to XD06

5. Close the connection area.

6 Start-Up

6.1 Prerequisites



CAUTION

Note the following before switching on:

- Disconnect the power supply for the heating pump and heating element on the fuse box before switching on the SolvisControl. This prevents damage to the compressor and heating element.
- Start up the heating pump aggregate 2 hours after installation and connection at the earliest to allow the refrigerant to settle.

Checking the start-up conditions

1. Check the correct voltage connection on the terminal box (fuses for the heating pump aggregate and, if necessary, electric emergency/auxiliary heating OFF).
2. Manually bleed the unit during and after filling.

For further information on bleeding, see the → *installation instructions (MAL-MAX-7, MAL-BEN or MAL-BEN-LI-SL-WP)*.

3. Check whether the heating system has been filled with the correct pressure.
4. Check that the buffer charging station is correctly connected.
5. Check the safety temperature limiter of the emergency/auxiliary heating.

The safety temperature limiter of the electrical emergency/auxiliary heating may be triggered at ambient temperatures below -15°C .

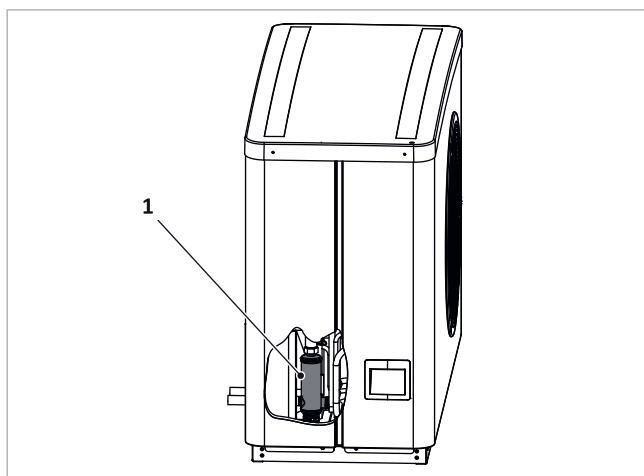


Fig. 29: SolvisLea: electrical emergency/auxiliary heating

- 1 Electrical emergency/auxiliary heating

Resetting the safety shutdown

If the safety temperature limiter has switched off the emergency/auxiliary heating, proceed as follows:

1. If necessary, eliminate the source of error.

2. Remove the side wall on the condenser side.
3. Reset the safety temperature limiter by pressing the reset button.

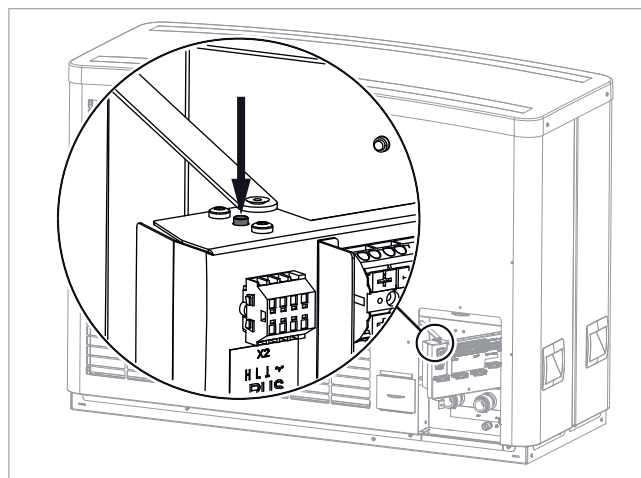


Fig. 30: Solvis Lea: reset button and emergency/auxiliary heating

- 1 Safety temperature limiter reset button

6.2 Starting up the heating pump aggregate

Switching on the heating system

1. **Switch off** the SolvisControl via the main switch.
2. Switch on the power supply for the heating pump and, if necessary, for the emergency/auxiliary heating on the fuse box (screw in fuses).
3. Switch on the SolvisControl via the main switch. (The system starts with the initialisation program and is then ready for operation).



The current sensor values are indicated on the SolvisControl in the “**System status**” window.



The systems folder includes a start-up report that must be filled out completely when starting up the system and kept together with the system.

Heating pump bivalence points

Heating pump	Bivalence point for ...		
	Water	Heating	Max. operation
SolvisLea 8.3 Premium	0 °C	-5 °C	-8 °C

7 Maintenance

7.1 General maintenance

Care instructions

In between annual maintenance work, we recommend that you check the general condition of the system on a regular basis. This helps to conserve the value of the system and ensure continuity of supply.

Dampen and wipe off visible surfaces with water and a neutral conventional household cleaner. Regular cleaning prevents dirt from setting and becoming difficult to remove.



For a description of maintenance, see the → “Maintenance” section in the installation instructions (MAL-MAX-7, MAL-BEN or MAL-BEN-LI-SL).

7.2 Heating pump maintenance



DANGER

Hazard due to electrical shock

This can result in injury or even cardiac arrest.

- Disconnect the unit before starting any maintenance and cleaning work from all poles of the power supply.
- After the unit has been disconnected from the power supply, voltage may still be present on the unit for a period of 2 minutes since the capacitors on the inverter still need to discharge.



CAUTION

Risk of injury due to rotation of the fan

- Disconnect the unit from the power supply before removing the casing on the fan side.



CAUTION

Note the following before servicing the heating pump:

- Maintenance of the heating pump aggregate requires that the air intake has no faults.
- Relevant accident prevention and safety regulations must be observed.
- Maintenance work or measurements on the cold circuit of the heating pump aggregate may only be carried out by authorised refrigeration specialists.
- Operate the heating pump aggregate with R454C refrigerant only.
- Some work is only possible when the heating pump aggregate is running.

The cooling circuits of the SolvisLea heating pumps do not require maintenance.

The EU Regulation Concerning Fluorinated Greenhouse Gases requires an annual leakage check for a cooling circuit that is hermetically sealed and a CO₂ equivalent of ten tons or more. This is not required for SolvisLea 8.3 Premium heating pumps.

However, some inspection and cleaning work must be performed on the heating pump aggregate on an annual basis.

Checking the heating pump

Regularly perform the following inspection and cleaning work:

1. Remove the side wall on the condenser side.
2. Clear the ventilation grid and evaporator fins of leaves and other impurities.
3. Check the function of the condensate drain and remove any dirt.
4. Check the safety temperature limiter of the heating elements. See → “Prerequisites” section, page 19.



CAUTION

Observe the temperatures

Potential damage to the unit

- Do not press the reset button until the heating element is not more than 65° C.

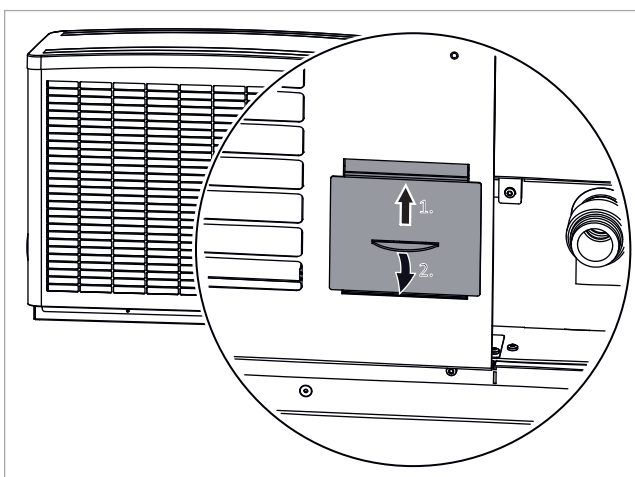


Fig. 31: Open the inspection shaft.

- A Inspection shaft cover
- Step 1 Slightly lift the cover.
- Step 2 Remove the cover.

For more information on remedying problems, see → “Troubleshooting” section, page 21

Switching on the heating pump aggregate

The heating pump can be switched on via the SolvisControl for maintenance purposes.



See the → “Switching on the heat generator for maintenance” section in the operating instructions (BAL-SBSX-3-I).

Performing maintenance

1. Perform maintenance and complete the maintenance report accordingly.



See → Heating pump (PTK-ALH-WP) inspection and system booklet and maintenance report (PTK-WP-W).

8 Troubleshooting



DANGER

Hazard due to electrical shock

This can result in injury or even cardiac arrest.

- Disconnect the unit before starting any maintenance and cleaning work from all poles of the power supply.
- After the unit has been disconnected from the power supply, voltage may still be present on the unit for a period of 2 minutes since the capacitors on the inverter still need to discharge.



CAUTION

Risk of injury due to rotation of the fan

- Disconnect the unit from the power supply before removing the casing on the fan side.

Reset button

If the heating pump was blocked due to a malfunction, it must be reset. This reset is triggered via the SolvisControl. See the operating instructions (BAL-SBSX-3-I).

Malfunctions on the heating pump aggregate

System/malfunction message	Possible cause	Note/remedy
"No power"	Fuse not switched on or has tripped	Reset fuses and heating pump on the controller.
"Volume flow error 1"	Load pump incorrectly connected or no electrical connection to the buffer charging station	Change the flow and return on the heating pump; check the electrical connection of the buffer charging station.
"Volume flow error 2"	Flow and return flow reversed on heating pump or storage tank, or buffer charging station installed upside down	Change the flow and return flow of the heating pump or rotate the buffer charging station.
No reaction from heating pump after switching on and no values visible in system status	Modbus connection plug is in wrong port of the SC-3 or no connection	Check that the plug is in the correct port of the SC-3 (on the right when viewed from behind) and that all connections between the storage tank and the heating pump are correct.
	Sliding switch incorrectly set	Check the sliding switch position on the IWS (see the section on checking the sliding switches on the IWS).
No reaction from heating pump after switching on, but values visible in system status	One phase failed	Check the fuses in the house terminal box or contact the responsible utility supply company.
	Blocking time of the energy supplier active	Check under "Others" => "System diagram" and wait until the blocking time has elapsed if necessary.
Loud hissing at the expansion valve	Lack of refrigerant in cold circuit	Please contact Solvis customer service.
	No supercooling of the refrigerant	
	Defective expansion valve	
Iced pressure compensation or iced expansion valve	Lack of refrigerant in cold circuit	Check the grid and/or evaporator fins and clean if necessary.
	Air supply impaired	
Frequent and long defrosting	Wind cools down the evaporator too much during the defrosting phase	Protect the intake side of the heating pump from strong wind via a protective wall when installed in the open.

8.1 Setting the switches



CAUTION

Ensure that there is no voltage.

An improper setting may result in damage to the electronics.

- Change the sliding switch only if the heating pump is disconnected from the power supply.

Checking the sliding switch

The sliding switch is located on the IWS.

1. Ensure that the sliding switch (WP type) is correctly set.
2. When using a hybrid system (bivalent-alternative operation):

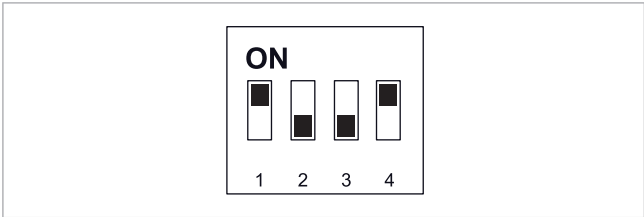


Fig. 32: WP-type sliding switch for hybrid systems

3. When using a monoenergetic system:

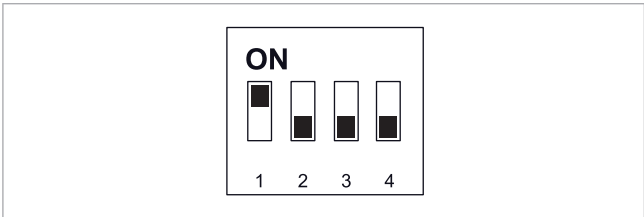


Fig. 33: WP-type sliding switch for monoenergetic systems

4. Ensure that the sliding switch (BA) is correctly set.

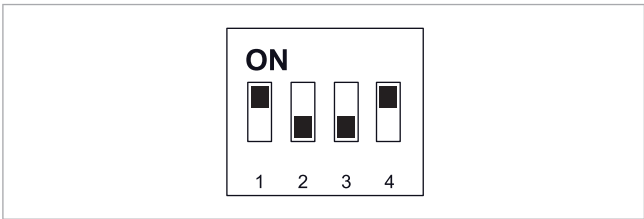


Fig. 34: BA sliding switch

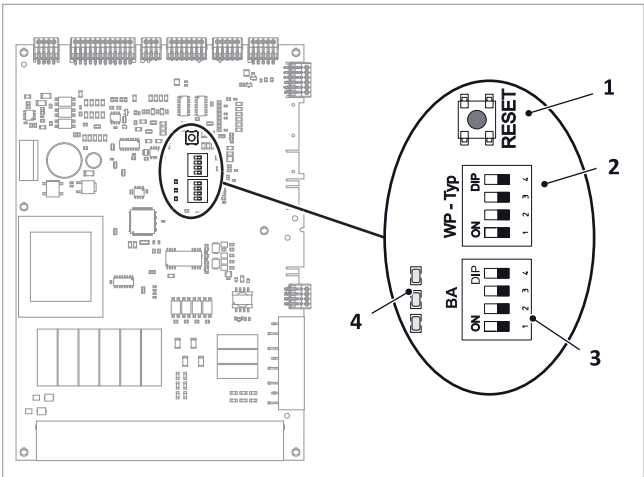


Fig. 35: SolvisLea Eco / SolvisLea 8,3 Premium IWS

- 1 Reset button
- 2 WP sliding switch
- 3 BA sliding switch
- 4 LED strip

Checking the rotary switch

1. The rotary switch on the gateway board must be set to 1.

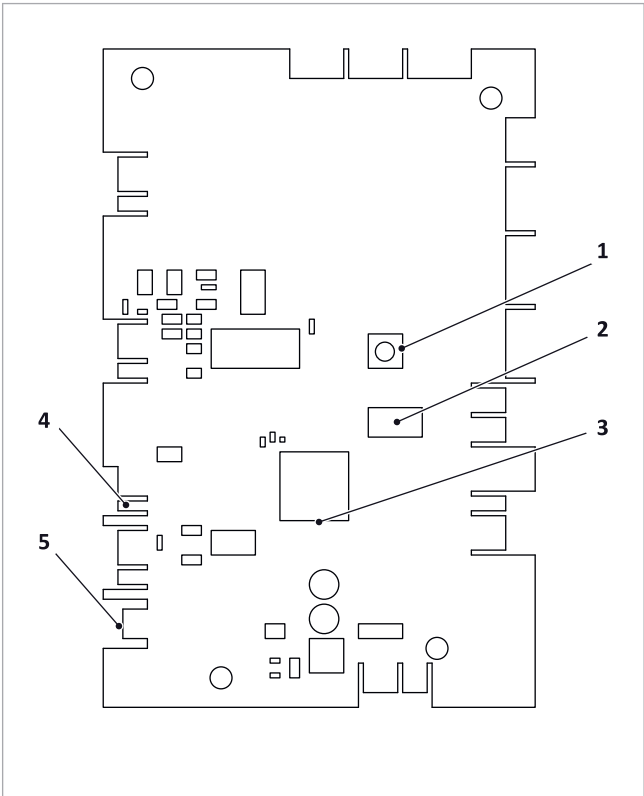
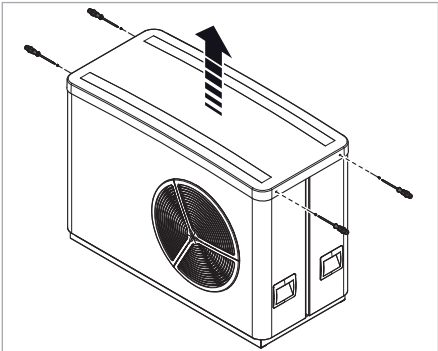
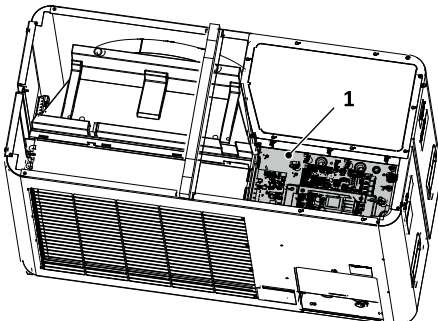
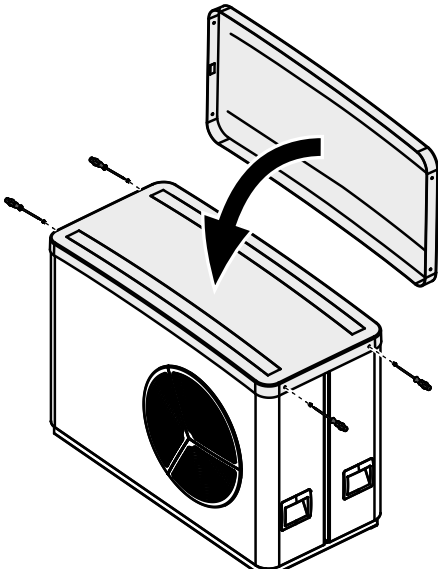


Fig. 36: Gateway board

- 1 Rotary switch
- 2 Sliding switch (do not change)
- 3 Rotary switch
- 4 CAN bus
- 5 Power supply (12 V DC)

Access to IWS/gateway board	SolvisLea
1. Loosen the 4 screws and remove the cover.	
2. The integrated heating pump controller (IWS) (1) is located on the right-hand side.	
After finishing the task: 3. Refit the cover. 4. Attach the cover with 4 screws.	

8.2 LED strip signals

LED strip (IWS) signals

LED	Display	Meaning	Remedy
Red LED (left)	Flashes	One-time malfunction; unit switches off and restarts after 10 minutes; LED goes out	Refer to the malfunction message on the SolvisControl display. For troubleshooting, see the "Troubleshooting" section in the operating instructions (BAL-LEA-I).
	Constantly on	More than 5 malfunctions within 2 hours of operation. The unit is permanently switched off and restarts only after a reset on the IWS. The internal malfunction counter will be reset. The unit can be put back into operation after 10 minutes. The LED goes out.	
Green LED (centre)	Flashes	The device initialises the connection to the gateway board	No action necessary
	Constantly on	Connection to the gateway board was established	
Green LED (right)	No function		

LED strip (gateway) signals

LED	Display	Meaning	Remedy
Red LED (left)	No function		
Green LED (centre)	Flashes	No communication with IWS	Check connection between IWS and gateway
	Constantly on	Connection to IWS was established	No action necessary
Orange LED (right)	Flashes	No communication with SC-3	Check the SC-3 port; check connection between the SC-3 and gateway board.
	Constantly on	Connection to the SC-3 was established	No action necessary

i For more information on the connection between IWS and the gateway board, see ➔ "Heating pump system wiring diagram" section, page 28.

9 Decommissioning

Disposal of materials

Properly and professionally dispose of this unit according to locally applicable regulation and laws.

Information about ElektroG

As per the regulations of the Electrical and Electronic Equipment Act (ElektroG), we are obliged to take back electrical and electronic equipment supplied by us and to reuse or dispose of it. We must also provide the following information:



Electrical and electronic equipment must not be disposed of with household waste! This is indicated by a waste bin symbol that is crossed out on a black bar. If the device can no longer be used, every end user is obliged to dispose of old devices separately from domestic waste, e.g. at a collection point in his or her local municipality/district. This ensures that the old equipment is recycled professionally and that negative effects on the environment are avoided.

In order to fulfil our disposal and reuse obligations, we belong to a comprehensive disposal system. Our registration number with the National Register for Waste Electric Equipment ("Stiftung Elektro-Altgeräte-Register") is: WEEE reg. no.: DE 63776771.

10 Technical Data

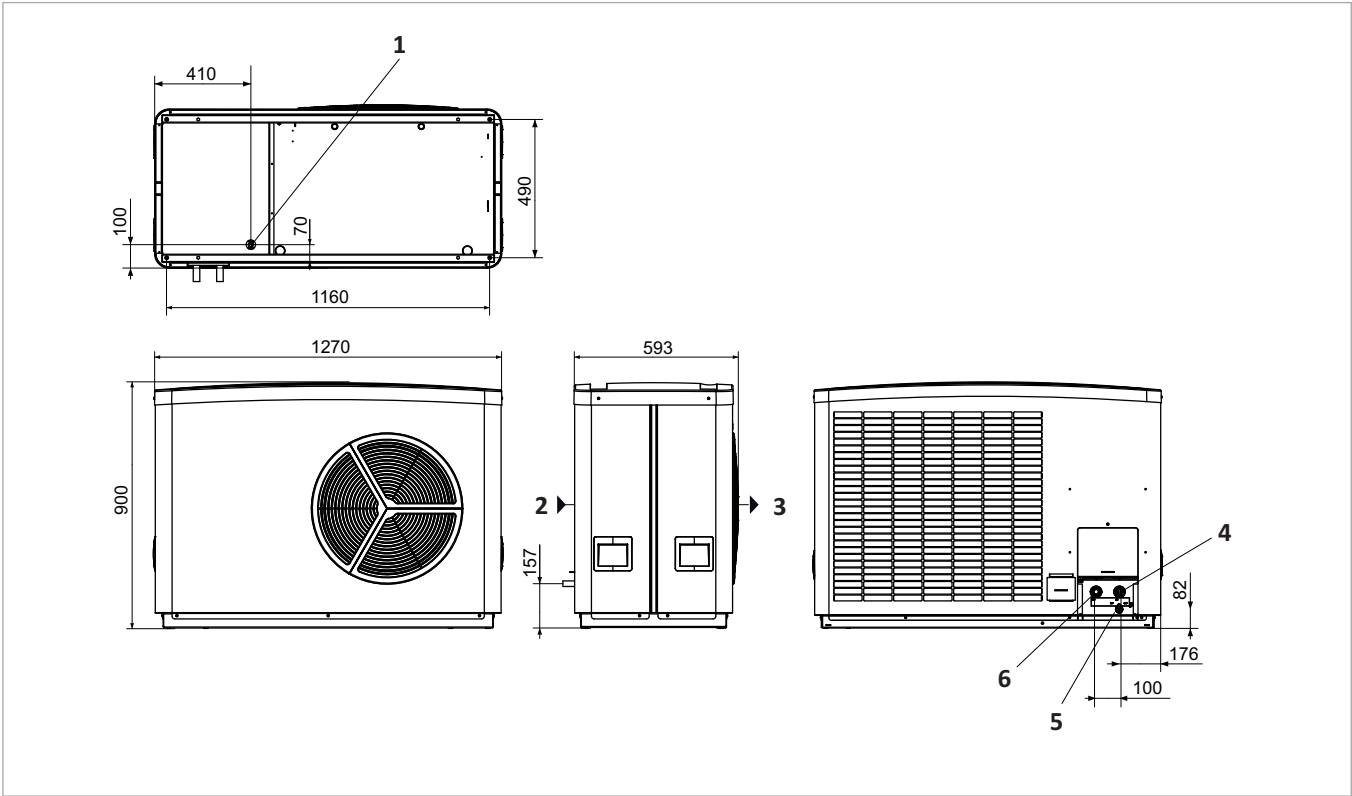


Fig. 37: Dimensions of the SolvisLea 8.3 Premium

- | | | | | | |
|---|---------------------------------------|---|-------------------------------------|---|----------------|
| 1 | Condensate drain, Ø 29.6 mm | 3 | Air intake, Ø 28 mm plug connection | 5 | Air discharge |
| 2 | Heating flow, Ø 28 mm plug connection | 4 | Drain | 6 | Heating return |

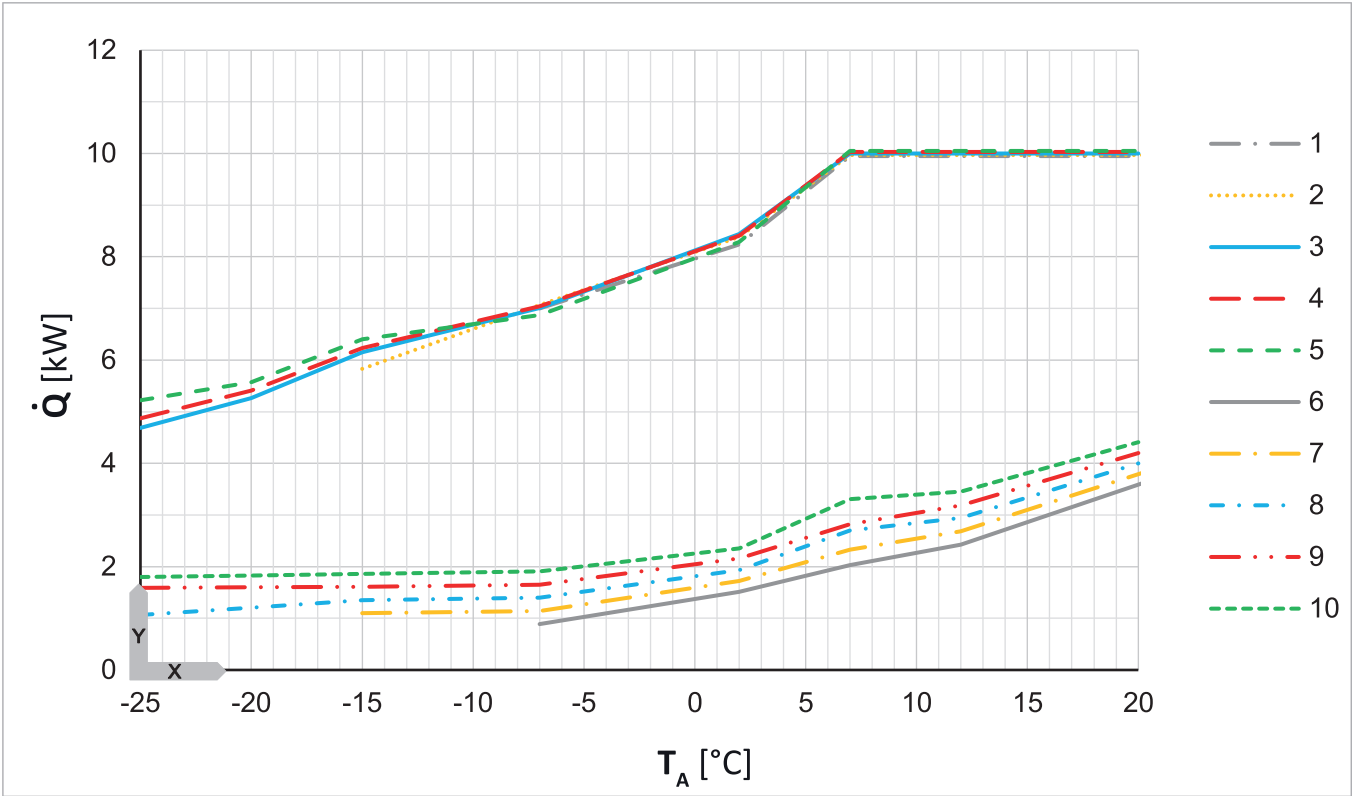


Fig. 38: Performance data diagram for SolvisLea 8.3 Premium

- | | | | | | |
|-----------|--------------------------|---|----------|----|----------|
| T_o | Outdoor temperature [°C] | 3 | max. W55 | 7 | min. W65 |
| $\dot{Q}$ | Heating output [kW] | 4 | max. W45 | 8 | min. W55 |
| 1 | max. W75 | 5 | max. W35 | 9 | min. W45 |
| 2 | max. W65 | 6 | min. W75 | 10 | min. W35 |

SolvisLea general technical data

Name	Unit	SolvisLea 8.3 Premium
Dimensions		
Height	[mm]	900
Width	[mm]	1270
Depth	[mm]	593
Design		
Condenser material	[-]	1.4401/Cu
Antifreeze protection	[yes/no]	Yes
Emergency heating power consumption	[kW]	6.2
Flow/return connection	[mm]	28
Condensate drain diameter	[mm]	29.6
Operating limits		
Heat source, min.	[°C]	-25
Heat source, max.	[°C]	40
Heating return, min.	[°C]	15
Heating return, max.	[°C]	75
Electrical data		
Max. power consumption (without emergency heating)	[kW]	5.4
Degree of protection	[-]	IP14B
Frequency	[Hz]	50
Start-up/operating power	[A]	2/24.00
Compressor protection	[-]	1 x B25
Emergency heating protection	[-]	2 x B16
Controller protection	[-]	1 x B16
Compressor phases	[-]	1/N/PE
Emergency heating phases	[-]	2/N/PE
Controller phases	[-]	1/N/PE
Emergency heating rated voltage	[V]	230

* Start-up/operating power for SolvisLea 11 kW: 4.0 / 7.9 A

Name	Unit	SolvisLea 8.3 Premium
Aggregate weight	[kg]	135
Refrigerant /GWP	[-]	R454C / 148
Refrigerant fill quantity/CO ₂ equivalent	[kg]/[t]	3 / 0.44
Volume flow, heat source side	[m ³ /h]	2250
Permitted operating overpressure, heating circuit	[MPa]	0.3
Internal pressure difference	[hPa]	88
Maximum installation height	[m]	2000

* GWP = Global Warming Potential (GWP₁₀₀), CO₂ equivalent in 100 years in [kg CO₂ per 1 kg R410A].

Noise level specifications

Noise specifications	SolvisLea 8.3 Premium
Sound power level (EN 12102)	48
Sound pressure level, 5 m clearance, open area	28
Sound power level, outdoor installation (max.)	59
Sound power level, outdoor installation, silent mode (70%)	51
Sound power level, outdoor installation, silent mode (max.)	47

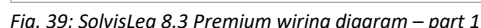
All specifications in dB(A)

Room heating energy efficiency η_s of the heating pumps based on time of year

Operating status	SolvisLea 8.3 Premium [%]
For average climatic conditions	
Low-temperature applications	193
Medium-temperature applications	153

SolvisLea performance data

Outdoor temperature/flow temperature	SolvisLea 8.3 Premium		
	Heat output	Power consumption	Coefficient of performance (COP)
	[kW]	[kW]	[-]
Minimum/maximum performance at operating point			
A7/W35	2.65/10.75		
A2/W35	2.10/8.30		
A-7/W35	2.05/6.87		
Performance at the operating point according to EN 14511			
A7/W35	3.31	0.61	5.42
A2/W35	4.3	1.00	4.30
A-7/W35	6.87	2.36	2.93
A-7/W55	7.01	2.97	2.36
A-7/W65	7.07	3.41	2.09
A-7/W75	7.00	3.82	1.83
A-15/W35	6.40	2.40	2.67
Rated heat output (P_{rated}) for average climatic conditions as per regulation (EU) no. 813/2013 & 811/2013			
P_{rated}	8		



X2	WP modbus connection	AL	Alternative
X3	WP mains	PE	Protective earth
X4	Controller mains	WWS	Hot water station
X5	DHC mains	Solar	Solar pump
X7	Trace heating	KBB	Cable harness
L	Phase	BR	Jumper
L'	Release phase from power supply company	AB DHC	Connection box, electrical auxiliary heater
A2	Integrated heating pump controller (IWS)	RSE	Ripple control receiver
N	Neutral conductor	PWM	Pulse width modulation (speed control)
LP	Load pump	HW-V	Hot water valve
M1	Heating pump compressor	WP	Heating pump
M6	Axial fan	SC-3	SolvisControl 3
UV	Switching valve	EPL	Expansion Board
PL	SolvisControl 3 mains circuit board	SG	SmartGrid board

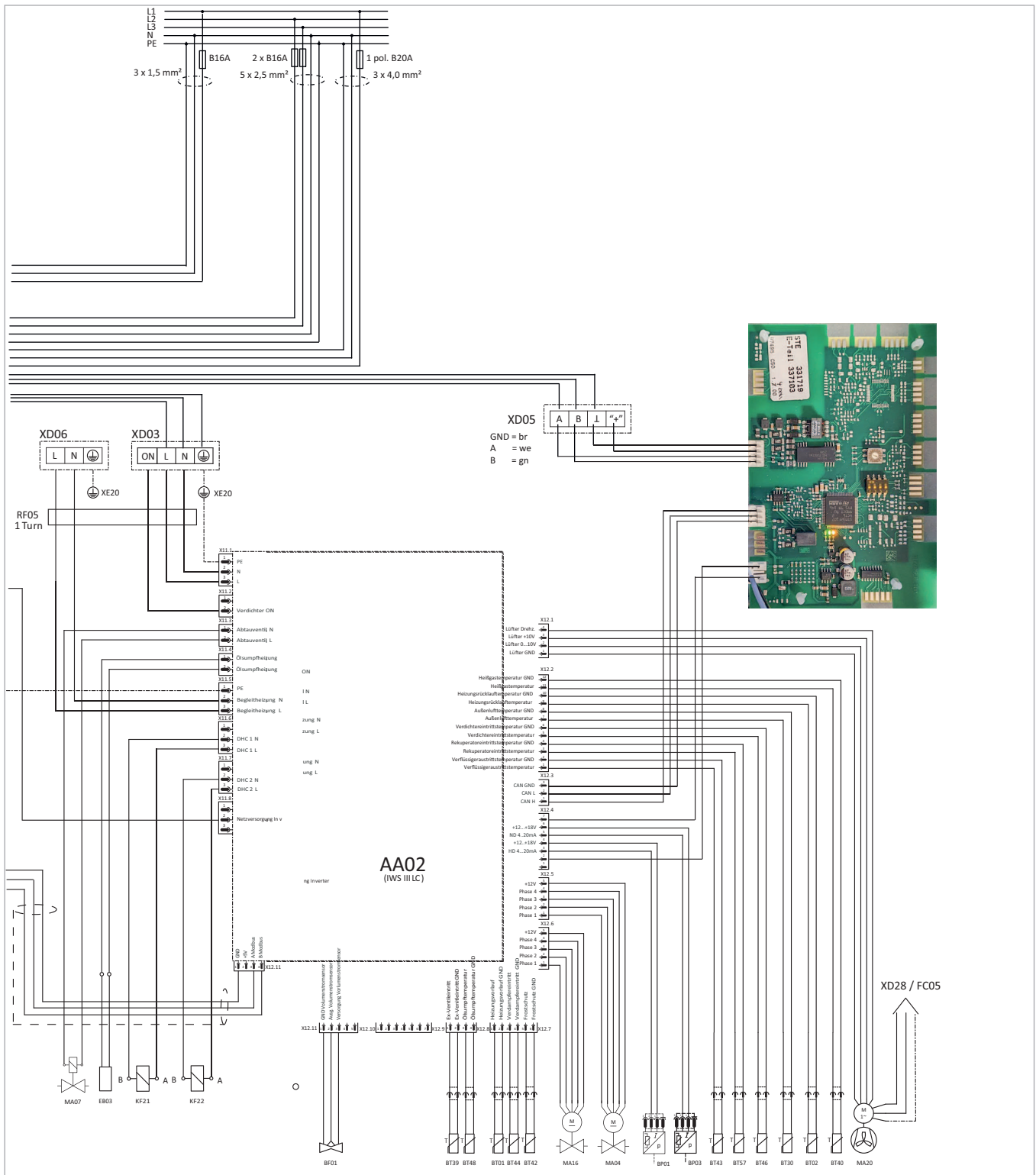


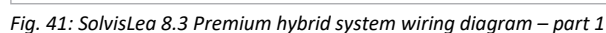
Fig. 40: SolvisLea 8.3 Premium wiring diagram – part 2

The diagram shown represents an overview of the system based on the information available to us. It does not replace detailed and specific planning. Please note: to ensure the system functions correctly, the installation, operating and maintenance instructions must be followed. When connecting a third-party boiler, do not rely solely on the information provided by Solvis – always consult the manufacturer of the boiler.



The shut-off and safety valves shown provide a rough guide only. Observe all the relevant standards, guidelines and technical rules at all times. This is the only way to ensure that installations are carried out correctly.

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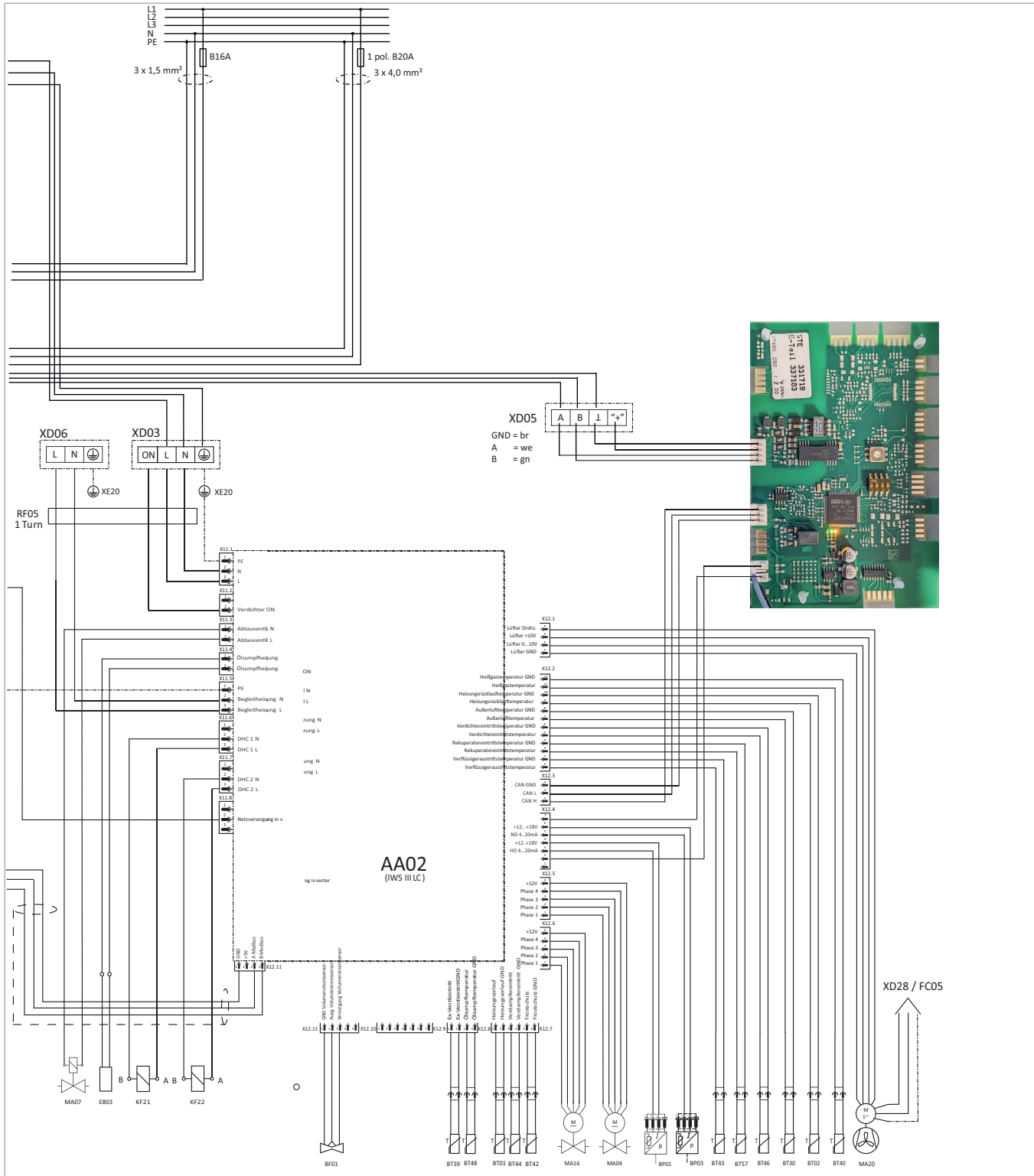


Fig. 42: SolvisLea 8.3 Premium hybrid system wiring diagram – part 2

The diagram shown represents an overview of the system based on the information available to us. It does not replace detailed and specific planning. Please note: to ensure the system functions correctly, the installation, operating and maintenance instructions must be followed. When connecting a third-party boiler, do not rely solely on the information provided by Solvis – always consult the manufacturer of the boiler.



The shut-off and safety valves shown provide a rough guide only. Observe all the relevant standards, guidelines and technical rules at all times. This is the only way to ensure that installations are carried out correctly.

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11.3 Accessories

All accessory parts must be selected individually and ordered separately.

Additional accessories and spare parts can be found in the Solvis price list.

Modbus cable, 15 m/30 m (KB-MOD-BUS-15 / 30)

Shielded and twisted cable for safe signal transmission from SC-3 to SolvisLea.

Pipe (RO-68-FLX-WP)

Thermally insulated, flexible single-pipe heat supply line for hydraulic connection of the air/water heating pump installed outside via the building system hydraulics. Version for direct installation in the ground available by the metre. A thicker insulation thickness is recommended if not installed in the ground.

Technical data:

- DN 32
- Minimum bending radius: 0.25 m
- Max. operating temperature: 95 °C
- External diameter: 68 mm

Rubber end cap (KP-68-WP)

To protect the insulation at the pipe ends and to seal components. Waterproof up to 0.3 bar. To fit the flexible pipe (RO-68-FLX-WP) with 68 mm external diameter.

Pipe (RO-140-FLX-WP)

Thermally insulated, flexible single-pipe heat supply line for hydraulic connection of the air/water heating pump installed outside via the building system hydraulics. Version for direct installation in the ground available by the metre. For increased insulation requirements.

Technical data:

- DN 32
- Minimum bending radius: 0.30 m
- Max. operating temperature: 95 °C
- External diameter: 140 mm

Attention: Note delivery times acc. to price list!

Rubber end cap (KP-140-WP)

To protect the insulation at the pipe ends and to seal components. Waterproof up to 0.3 bar. To fit the flexible pipe (RO-140-FLX-WP) with 140 mm external diameter.

Lea underground cable connection set (ASS-ETL-LEA)

For connecting the supply lines coming from the ground (RO-68-FLX-WP) with the SolvisLea connections and the 28 mm pipes of the storage tank. Includes powder-coated cover to protect against damage. Viega press system.

Wall duct, water-pressure tight (DF-DWD-68)

Wall duct for the heat supply line to seal against water pressure. To be inserted on the water side into the core drill hole or the lining pipe.

Technical data:

- For connection pipe, outer diameter 68 mm
- Core drill hole, 125 mm
- Water-pressure tight up to 0.5 bar

Wall duct, 2-way, water-pressure tight (DF-DWD-2-68)

Multi-way wall duct for two heat supply lines and two electric lines to seal against water pressure. To be inserted on the water side into the core drill hole (200 mm) or the lining pipe.

Technical data:

- For connection pipe, external diameter 2 x 68 mm and electric line 2 x 9 mm.
- Core drill hole, 200 mm
- Water-pressure tight up to 1.0 bar

Wall duct, water-pressure tight (DF-DWD-140)

Wall duct for the heat supply line to seal against water pressure. To be inserted on the water side into the core drill hole or the lining pipe.

Technical data:

- For connection pipe, outer diameter 140 mm
- Core drill hole, 200 mm
- Water-pressure tight up to 0.5 bar

Wall duct, not water-pressure tight (DF-NDW-68)

Wall duct for the heat supply line, for setting in concrete or masonry.

Technical data:

- For connection pipe, outer diameter 68 mm
- Core drill hole, 110 mm
- Length: 400 mm

Wall duct, not water-pressure tight (DF-NDW-140)

Wall duct for the heat supply line, for setting in concrete or masonry.

Technical data:

- For connection pipe, outer diameter 140 mm
- Core drill hole, 200 mm
- Length: 550 mm

Pipe set G1½ with cover (ROS-LEA-2)

Angled, rigid pipe set for connecting flexible hoses or underground pipes with screw connections. Includes powder-coated cover to protect against damage.

Lea 7/8.3/11/14 standing console (KS-LEA)

Stainless steel standing console for the SolvisLea 7, 11 and 14 and the SolvisLea 8.3 Premium. For setting into concrete strip foundations. Includes heating cable (1 m) and vibration damper. Mounting aid for installation in the defined clearance is included in delivery.

Heating cable 1 m / 2 m (KB-HZB-1 / 2)

Flexible, self-limiting heating band to keep the condensate drain free of frost. Required when the SolvisLea heating pump is installed in an elevated position on its own base, kerbs or similar.

Lea 7/8.3 P standing console (KS-LEA-7-8.3)

Console for raised installation of the SolvisLea 7 and SolvisLea 8.3 Premium heating pumps, for easier connection of the condensate drain or for installation in snowy areas. The height is 245 mm.



Cannot be used with the connection sets ASS-ETL-LEA and ROS-LEA-2.

Hose (SH-DR-WIG or SH-DR-GG)

Flexible connection hose for decoupling structure-borne noise when rigid pipes are otherwise used.

11.4 System diagram

See → *connection diagrams and system diagrams documents (ALS-BEN and ALS-MAX-7).*

11.5 Data sheets/certificates

Data sheets, e.g. on the refrigerant and compressor oil, can be provided by our application consultancy if required (see → *page 2* for telephone numbers).

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