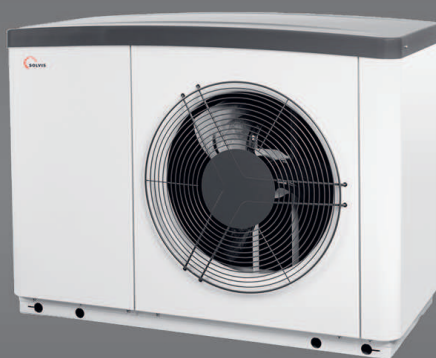


Installation

SolvisLea Eco

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

- Installation
- Start-up
- Maintenance



1 Information About These Instructions

This planning document contains basic instructions for the proper installation and operation of the system and system components.

We will give you tips on how to ensure that the system operates in an economical and environmentally friendly manner.

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.



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


Observe the safety notes

This is for your own safety

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


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.

- 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)

2.3 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.

As a rule, the above-mentioned measurement conditions do not completely 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.

2.2 Regulations

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.

3 Scope of Delivery

The compact SolvisLea Eco with matching accessories for outdoor installation.



Fig. 1: SolvisLea 8 kW Eco

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 Eco heating pump
- Technical documents for Lea Eco (TU-LEA-ECO)
- My SolvisLea system (ORD-LEA)*.

* Only included in the scope for individual orders

Standing console box

- Standing console for SolvisLea Eco

SolvisLea technical documents

- SolvisLea installation instructions (MAL-LEA)
- SolvisLea quick guide for electrical installation (MAL-LEA-KA).
- Installer operating instructions (BAL-LEA-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-LEA) inspection and system booklet
- System log for filling heating water for Solvis systems (BRO-AO-ALH)
- SolvisLea (PTK-LEA-I) start-up report
- SolvisLea (PTK-LEA-W) maintenance report
- 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 the recessed grips to carry the SolvisLea.
- To carry the SolvisLea Eco, either grip it under the base plate on the narrow sides (transverse sides) or push a sturdy pipe (max. 28 mm) through the holes in the unit frame.
- 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 should always be on top; see → Fig. 2 (1).

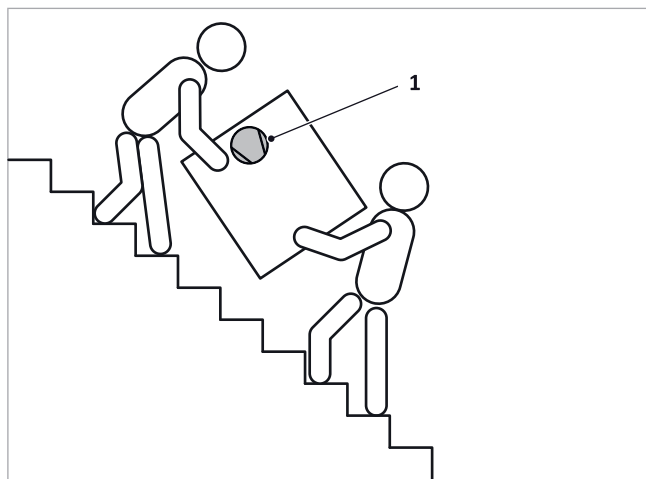


Fig. 2: Carrying on stairs

- 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 → “* only SolvisLea 8 kW Eco with SolvisBen HP or SolvisMax HP, ** Start-up/operating power for SolvisLea 11 kW: 4.0 / 7.9 A” section, page 21.

- 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.
- Air should not be blown directly towards neighbours or against walls; acoustic reflection may occur on walls.
- Reduce the noise level via acoustic measures such as lawn and planter areas, solid walls, fences, palisades, etc.
- 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).

4.3 General installation

Maintain the following conditions

- The heating pump must be positioned horizontally.
- 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 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.
- Take measure to reduce noise level.
- 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.

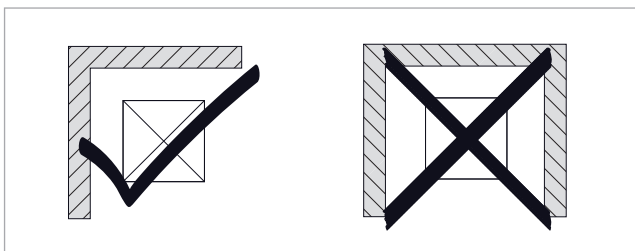


Fig. 3: Installation conditions near walls

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 Installing the SolvisLea Eco



WARNING

Ice can form at temperatures below the freezing point.

Failure to observe this can cause serious health damage.

- Avoid an incline of the gravel bed or surrounding area towards pavements.



CAUTION

Considerable amounts of water (condensate) can drip from the heating pump during operation.

Water damage is possible.

- A moisture barrier must be installed at the base of the building.

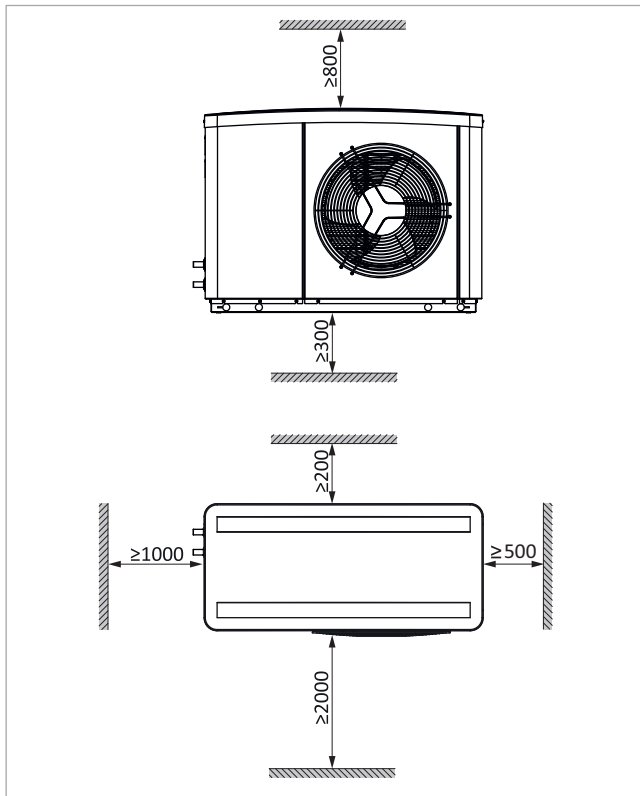


Fig. 4: Clearances to the wall, SolvisLea Eco

Standing console base

The base on which the heating pump is installed should be horizontal, level, firm and durable. The consoles 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 strip base, kerbstones or stone slabs.

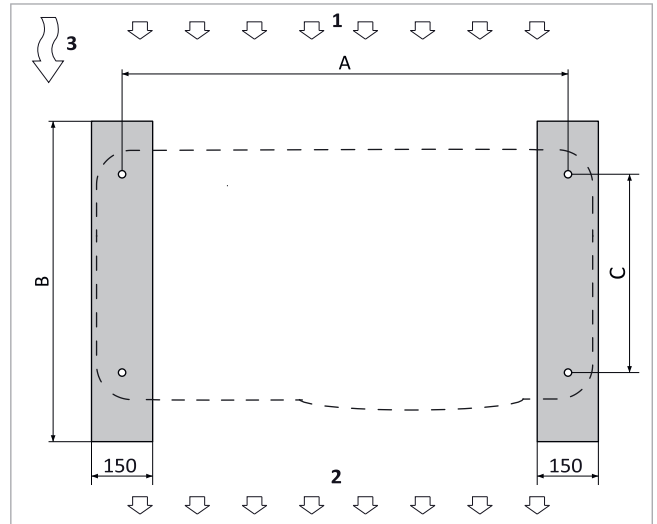


Fig. 5: Base for SolvisLea Eco standing console (view from above)

- | | | | |
|---|---------------------------|---|--------|
| 1 | Air intake side | A | 995 mm |
| 2 | Air discharge side | B | 500 mm |
| 3 | Prevailing wind direction | C | 408 mm |

Condensate drainage

A gravel bed must be built since the SolvisLea Eco drips if there is no condensate drain.

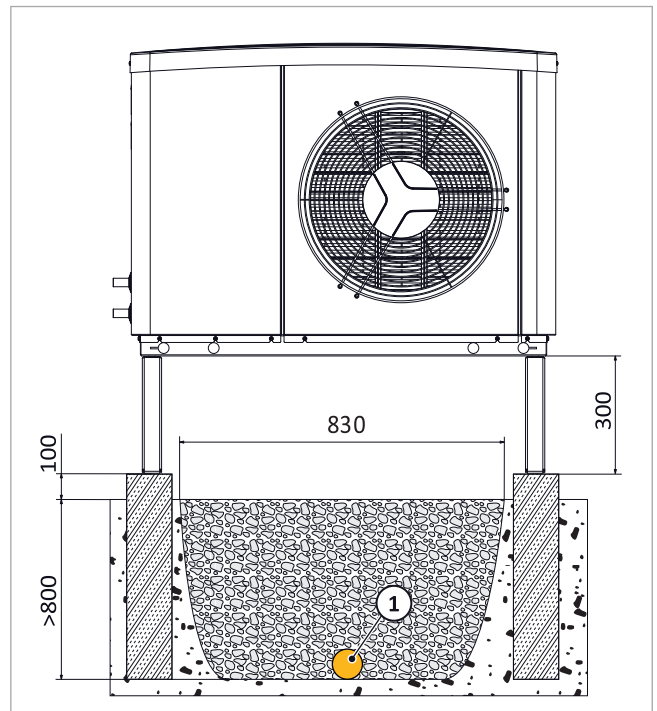


Fig. 6: Standing console condensate drain, SolvisLea Eco

- 1 Drainage pipe

Install a drainage pipe below the gravel bed to channel moisture away from the building.

4 Installation Conditions and Transport

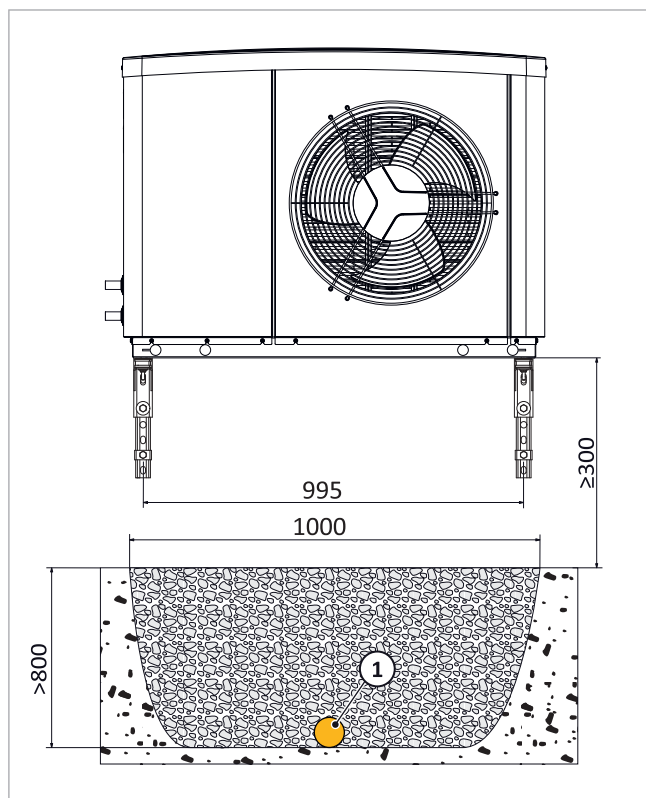


Fig. 7: Wall console condensate drain, SolvisLea Eco

1 Drainage pipe

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 21.

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.

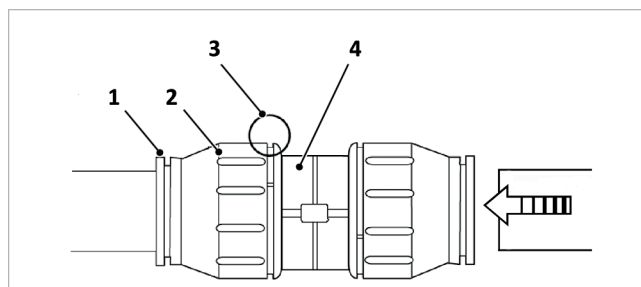


Fig. 8: Plug connection unlocked

- 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.

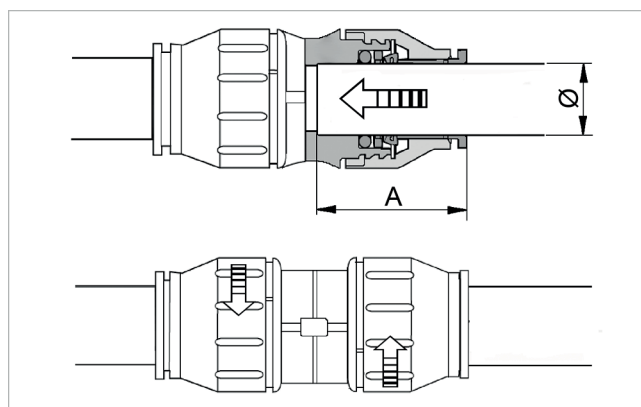


Fig. 9: Insert and lock the pipe.

- 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:

5 Installation

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.

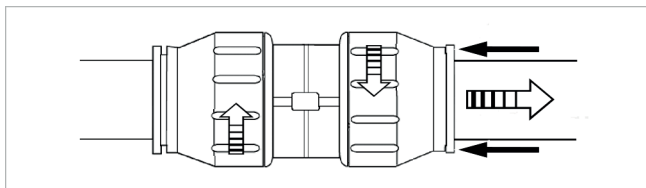


Fig. 10: Releasing the plug connection

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 SolvisLea Eco installation



CAUTION

Do not twist the copper connection pipes. Otherwise, damage to the unit may occur.

- Before connecting the copper connection pipes protruding from the heating pump, the supply lines from the storage tank must be aligned.

Installing the unit

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

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 (ASS-ELT-LEA-E) supplied in the box for the heating pump as well as those available as accessories. If on-site connections are used, they must be detachable.

1. Slide and secure the plug connection of the plastic brackets on the copper pipes.
2. Push the pipe section (minimum length 42 mm) with connector fitting with $\varnothing 22$ mm into the plastic bracket on the other side and secure.

The connections on the heating pump are now prepared.

3. Mount a 1" connector piece to each of 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.

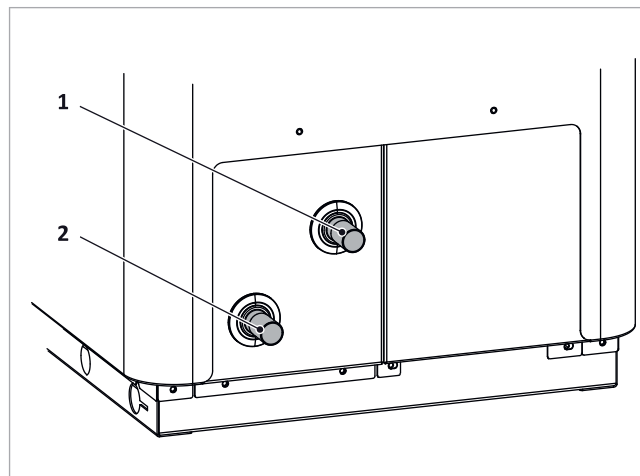


Fig. 11: SolvisLea Eco: Hydraulic connection

- 1 Heating flow (copper pipe $\varnothing 22$ mm)
- 2 Heating return (copper pipe $\varnothing 22$ mm)

Bleeding the unit

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. Remove the cap and EPS cover, see → Tab. "Access to IWS/gateway board" Sec. "Setting the switches", p. 16
3. Remove any gases from the pipe line system by turning the grey cap on the automatic bleeder.
4. If no more gas escapes, close the automatic bleeder.
5. Reassemble the EPS cover and cap in reverse order.

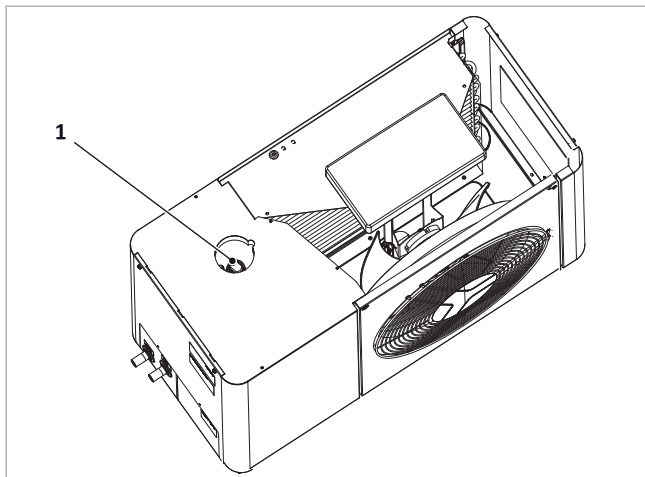


Fig. 12: SolvisLea Eco: position of the bleeder

1 Automatic bleeder

5.5 Electrical connection

5.5.1 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%).

5.5.2 SolvisLea Eco connection

Making the connection area accessible

1. Loosen and remove the two screws.
2. Slide the cover downwards.
3. Remove the cover by folding it to the right.

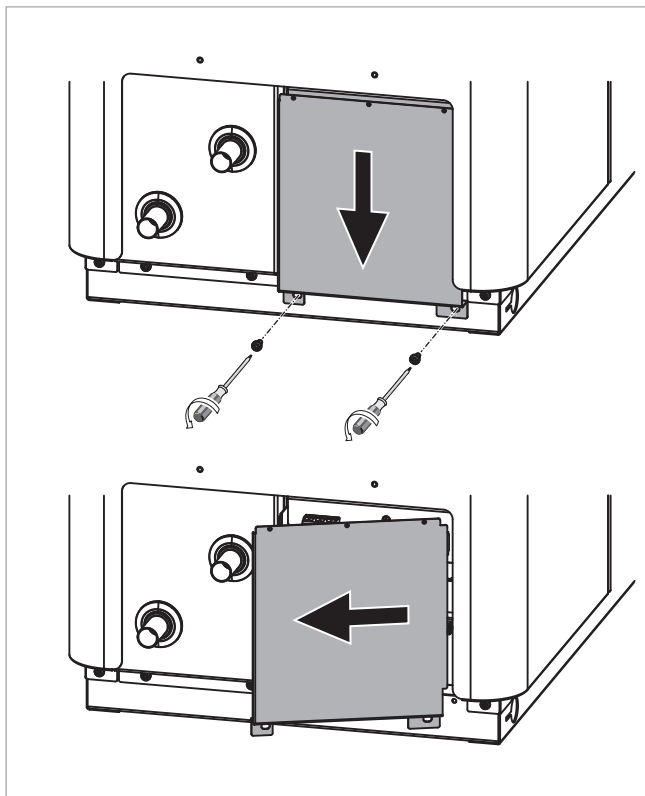


Fig. 13: Remove the cover.

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

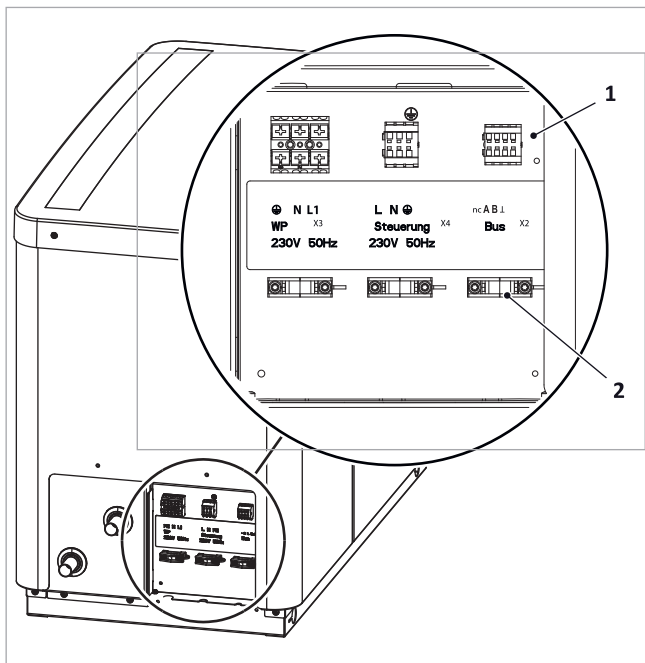


Fig. 14: Route the lines into the connection area.

Connecting the SolvisLea Eco

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

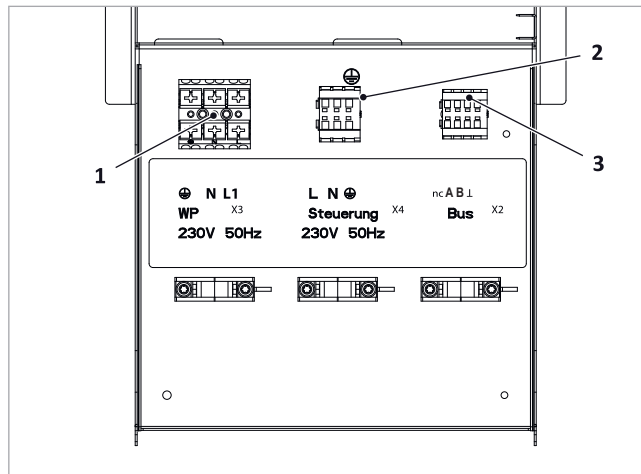


Fig. 15: SolvisLea Eco: Connection area

- 1 X3 compressor (inverter)
• PE, N and L1
- 2 X4 control voltage
• L, N and PE
- 3 X2 low voltage safety (BUS)
• Free, BUS A, BUS B and BUS EARTH

3. Check the function of the strain relief device.

Do not earth the shielding of the low-voltage cable with an earthing screw. The shielding is already connected to the storage tank.

Mounting and wiring the connection box

1. Connect the BUS line to the connection box at the storage tank:
 - Brown = GND
 - White = A
 - Green = B

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

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. **SolvisLea Eco only:** check whether the quick bleeder on the heating pump is open.
3. **Only bleed SolvisLea** manually during and after filling.

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

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

Bei Umgebungstemperaturen unter -15 °C kann es vorkommen, dass der Sicherheitstemperaturbegrenzer der elektrischen Not- / Zusatzheizung can be triggered at ambient temperatures below -15° C.

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.

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.

If necessary, wipe visible surfaces with water and a neutral conventional household cleaner.

You should clean the operator interface now and then with a damp cloth (do not use any cleaning agents).



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 R410A 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 required for the SolvisLea 11 kW and SolvisLea 14 kW heating pump models.

In addition, some inspection and cleaning work on the heating pump aggregate is required annually.

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.

For more information on remedying problems, see → *“Troubleshooting” section, page. 16*

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-LEA-I).*

Performing maintenance

1. Perform maintenance and complete the maintenance report accordingly.



See → *Heating pump (PTK-ALH-LEA) inspection and system booklet and maintenance report (PTK-LEA-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. A reset is triggered via SolvisControl.

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.
	Connector at output A12 of the mains circuit board/expansion board 5 (hybrid system) not connected	Check that the plug at the output (A12) or on the expansion board (5) is correctly connected.
	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 IWS is disconnected from the power supply.

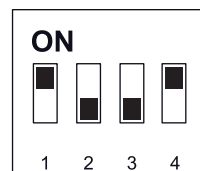


Fig. 16: WP type sliding switch

Checking the sliding switch

The sliding switch is located on the IWS.

1. Ensure that the sliding switch (WP type) is correctly set.

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

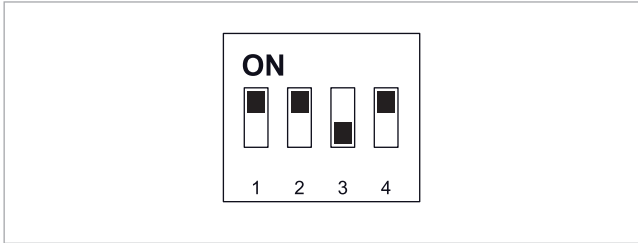


Fig. 17: BA sliding switch

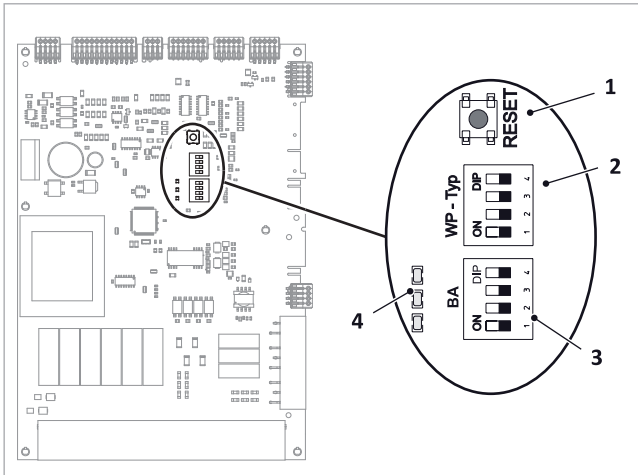


Fig. 18: SolvisLea Eco IWS

- 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.

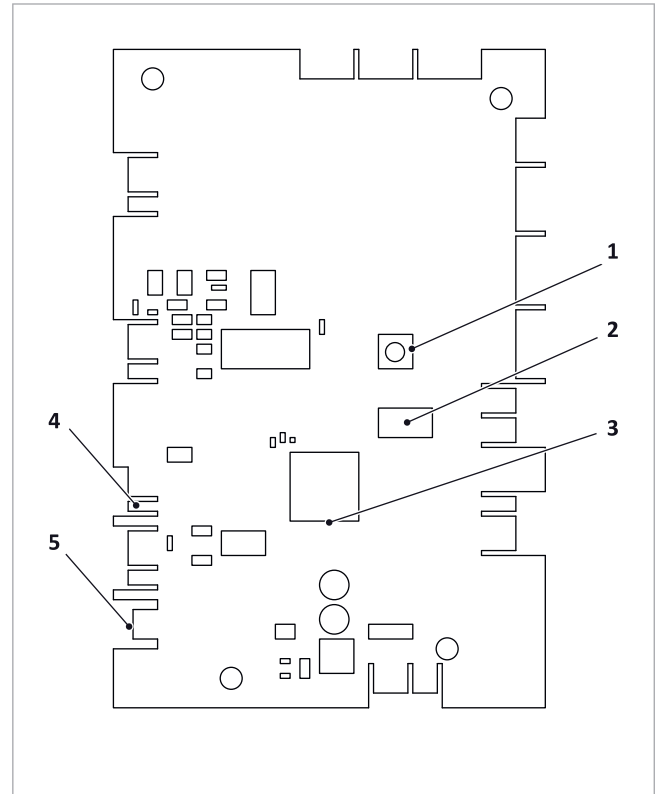
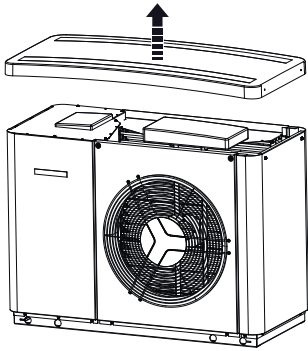
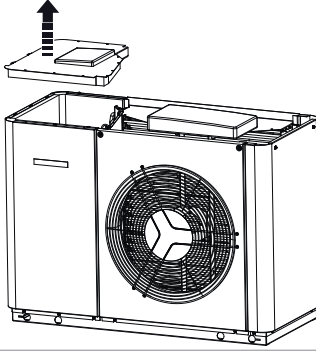
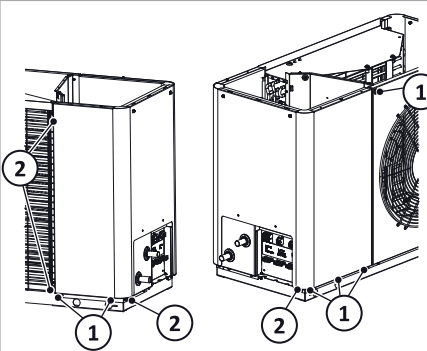
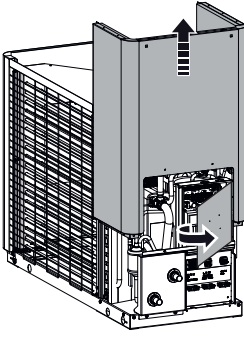
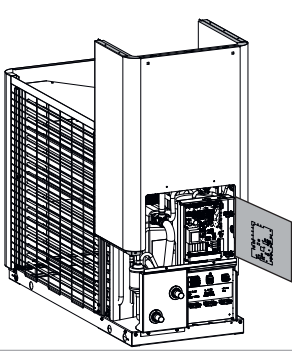


Fig. 19: Gateway board

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

8 Troubleshooting

Access to IWS/gateway board	SolvisLea Eco
1. Loosen the 4 screws and remove the cover.	
2. Expose the switch box.	 <i>Remove the sheet cover by removing the 4 screws.</i>
3. Loosen screws (1) and remove screws (2).	
4. Remove the entire side wall upwards. 5. Loosen and remove 2 screws on the cover. 6. Open the cover.	
7. Open to access. • The IWS and gateway board are located behind the door or at it.	

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



For more information on the connection between IWS and the gateway board, see ➔ "Wiring diagram" section, page 24.

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

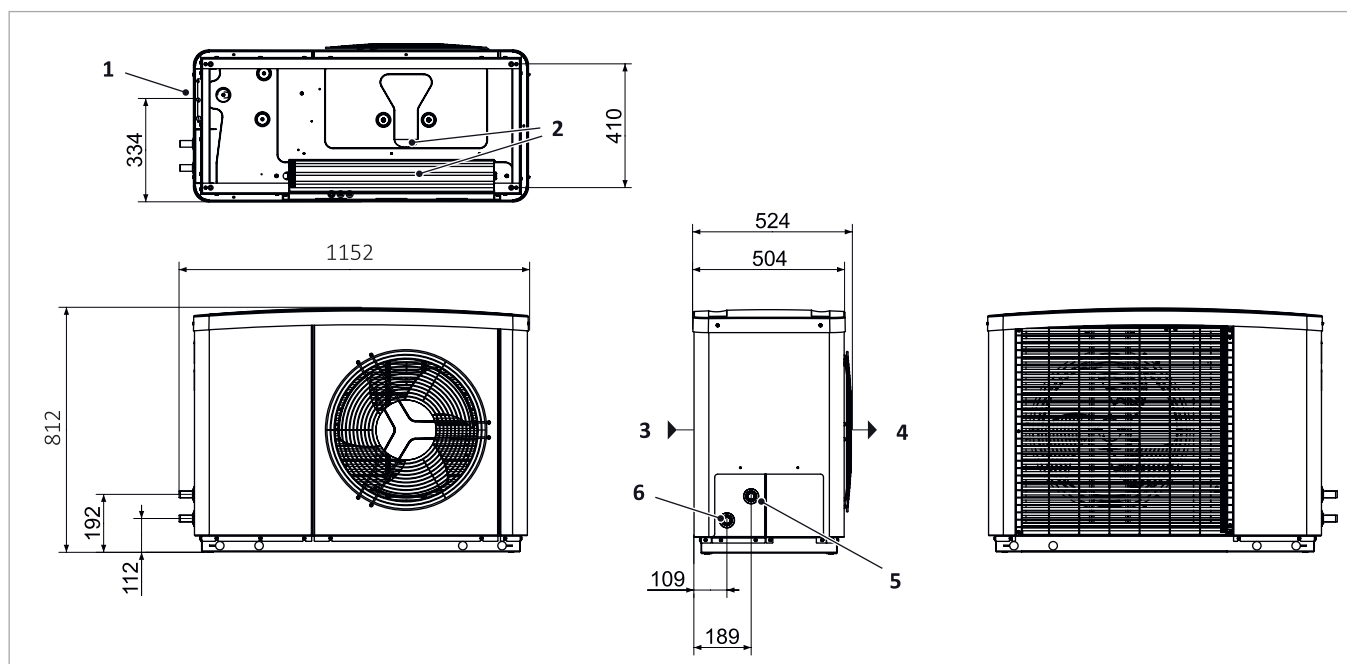


Fig. 20: SolvisLea Eco dimensions

1	Electrical line lead-through	4	Air discharge
2	Condensate discharge	5	Heating flow
3	Air intake	6	Heating return

SolvisLea Eco general technical data

Name	Unit	SolvisLea 8 kW Eco
Dimensions		
Height	[mm]	812
Width	[mm]	1152
Depth	[mm]	524
Design		
Condenser material	[-]	1.4401/Cu
Antifreeze protection	[yes/no]	Yes
Emergency heating power consumption	[kW]	6.2*
Flow/return connection	[mm]	22 (Cu pipe)
Condensate drain diameter	[mm]	–
Operating limits		
Heat source, min.	[°C]	-20
Heat source, max.	[°C]	40
Heating return, min.	[°C]	15
Heating return, max.	[°C]	60
Electrical data		
Max. power consumption (without emergency heating)	[kW]	4.6
Protection class	[-]	IP14B
Frequency	[Hz]	50
Start-up/operating power	[A]	7.0 / 20.0
Compressor protection	[-]	1 x B 25 A
Emergency heating protection	[-]	2 x B16 A*
Controller protection	[-]	1 x B 16 A
Compressor phases	[-]	1/N/PE
Emergency heating phases	[-]	2L/N/PE*
Controller phases	[-]	1/N/PE
Emergency heating rated voltage	[V]	230*

* only SolvisLea 8 kW Eco with SolvisBen HP or SolvisMax HP, ** Start-up/operating power for SolvisLea 11 kW: 4.0 / 7.9 A

10 Technical Data

	Unit	SolvisLea 8 kW Eco
Aggregate weight	[kg]	91
Refrigerant /GWP	[-]	R410A / 2088
Refrigerant fill quantity/CO ₂ equivalent	[kg]/[t]	2.0 / 4.18
Volume flow, heat source side	[m ³ /h]	2200
Permitted operating overpressure, heating circuit	[bar]	3
Internal pressure difference	[hPa]	149
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 kW Eco
Sound power level (EN 12102)	57
Sound pressure level, 5 m clearance, open area	35
Sound power level, outdoor installation (max.)	66
Sound power level, outdoor installation, silent mode (70 %)	61
Sound power level, outdoor installation, silent mode (max.)	57

All specifications in dB(A)

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

	SolvisLea 8 kW Eco
	[%]
For average climatic conditions	
Low-temperature applications	176
Medium-temperature applications	123

SolvisLea Eco performance data

Outdoor temperature/flow temperature	SolvisLea 8 kW Eco		
	Heat output	Power consumption	Coefficient of performance (COP)
	[kW]	[kW]	[-]
Minimum/maximum performance at operating point			
A7/W35	2.60/8.50	-	-
A2/W35	2.00/8.50	-	-
A-7/W35	3.00/7.80	-	-
Performance at the operating point according to EN 14511			
A7/W35	4.86	1.02	4.76
A7/W55	4.31	1.58	2.73
A7/W65	-	-	-
A2/W35	5.73	1.44	3.97
A-7/W35	7.80	2.68	2.92
A-7/W45	7.70	2.93	2.63
A-7/W55	-	-	-
A-7/W65	-	-	-
A-15/W35	7.07	2.84	2.49
Rated heat output (Prated) for average climatic conditions as per regulation (EU) no. 813/2013 & 811/2013			
A-15/W35	8	-	-

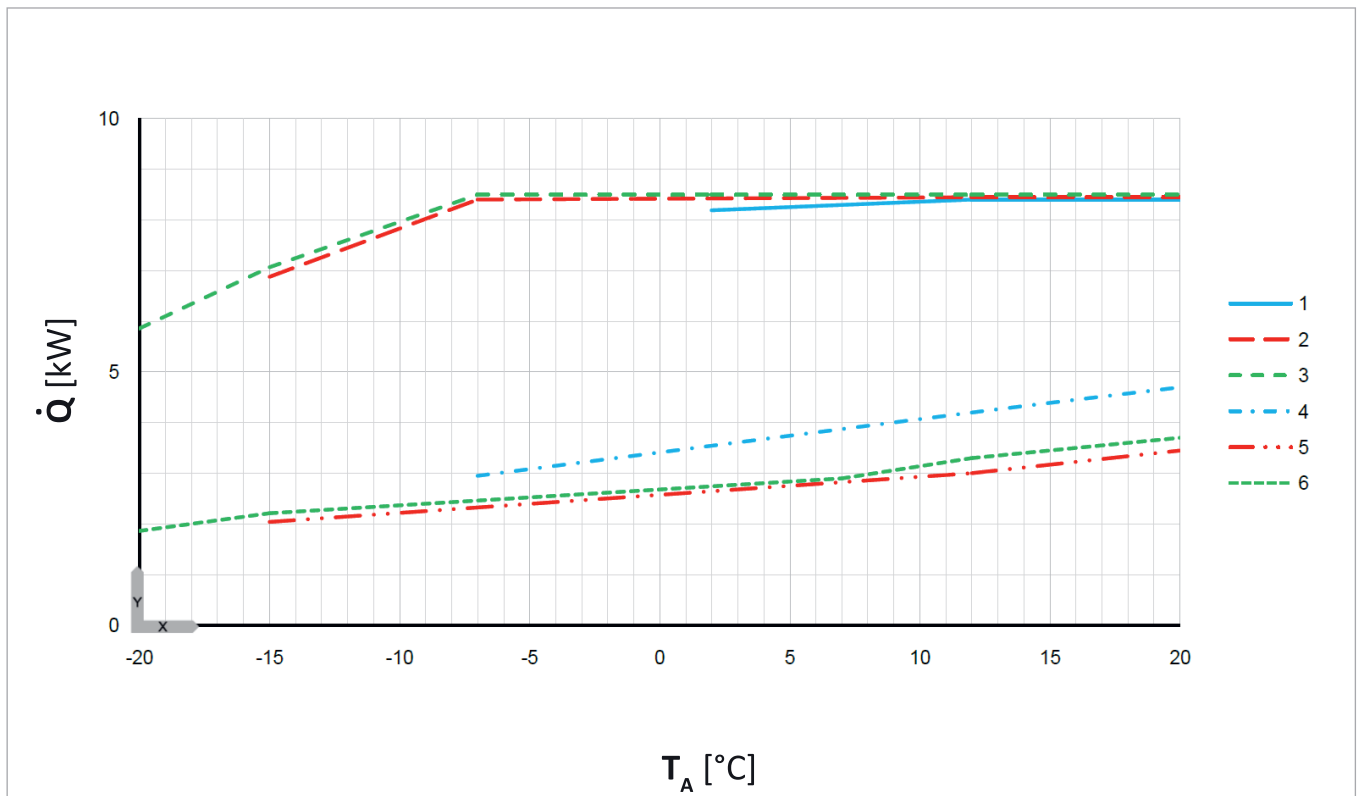


Fig. 21: SolvisLea Eco performance data diagram

- a SolvisLea 14 kW, heating flow 65 °C
 b SolvisLea 14 kW, heating flow 35 °C
 c SolvisLea 11 kW, heating flow 65 °C
 d SolvisLea 11 kW, heating flow 35 °C

- e SolvisLea 8 kW Eco, heating flow 45 °C
 f SolvisLea 8 kW Eco, heating flow 35 °C
 X Air intake temperature [°C]
 Y Heating output [kW]

11 Appendix

11.1 Wiring diagram

11.1.1 SolvisLea Eco as HP system

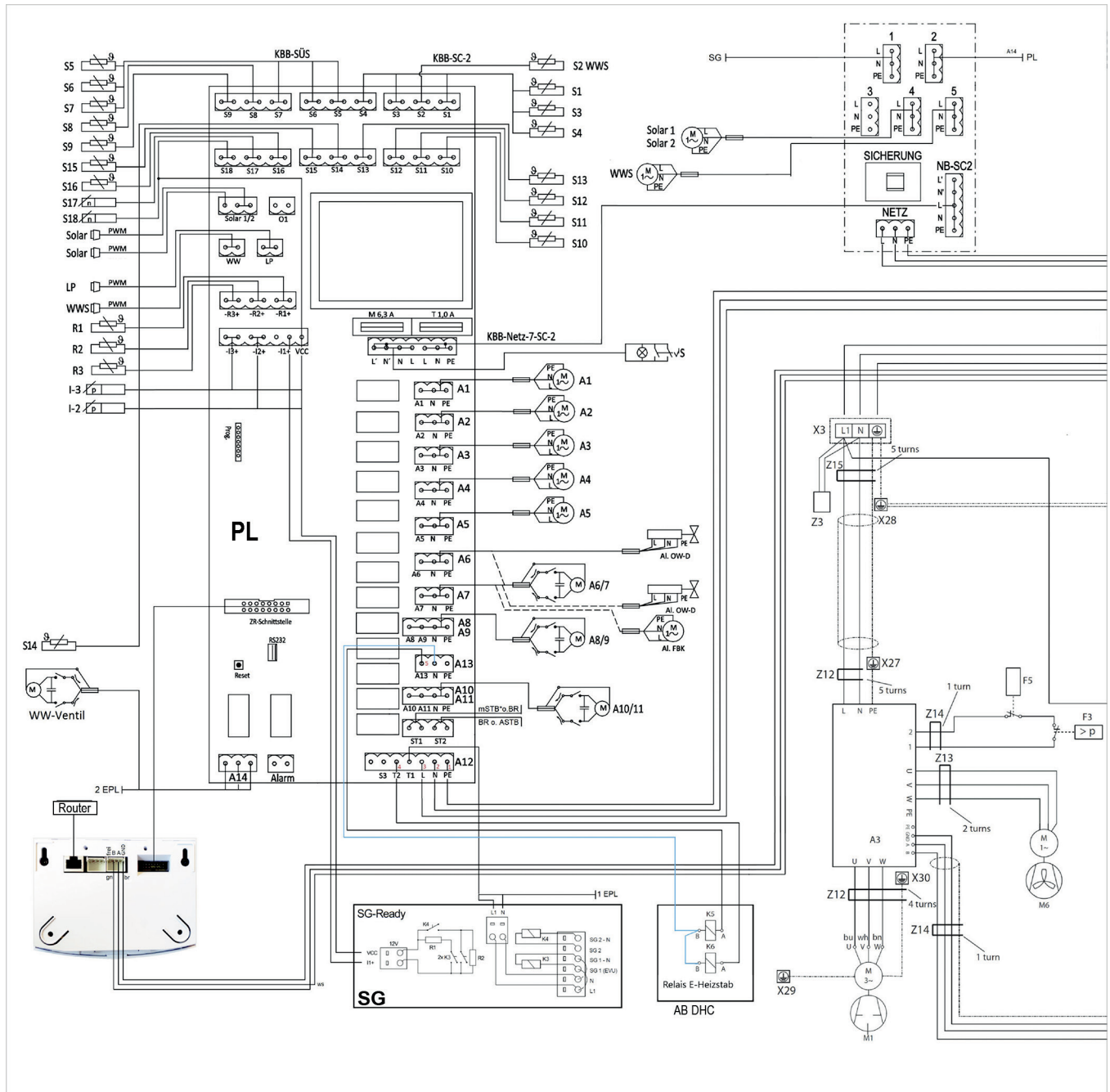


Fig. 22: SolvisLea Eco wiring diagram – part 1

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

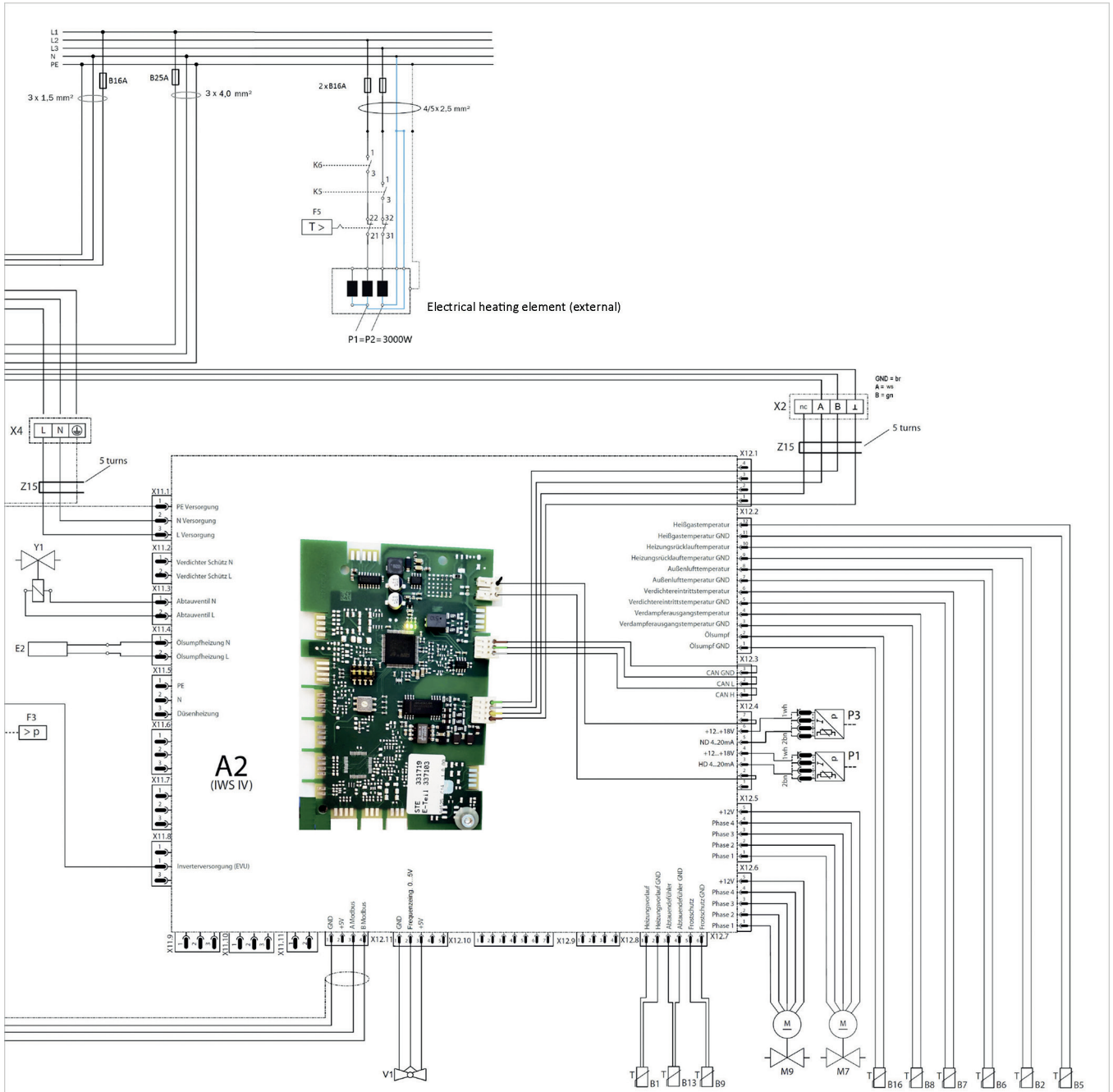


Fig. 23: SolvisLea Eco wiring diagram – part 2

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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11.1.2 SolvisLea Eco as hybrid system

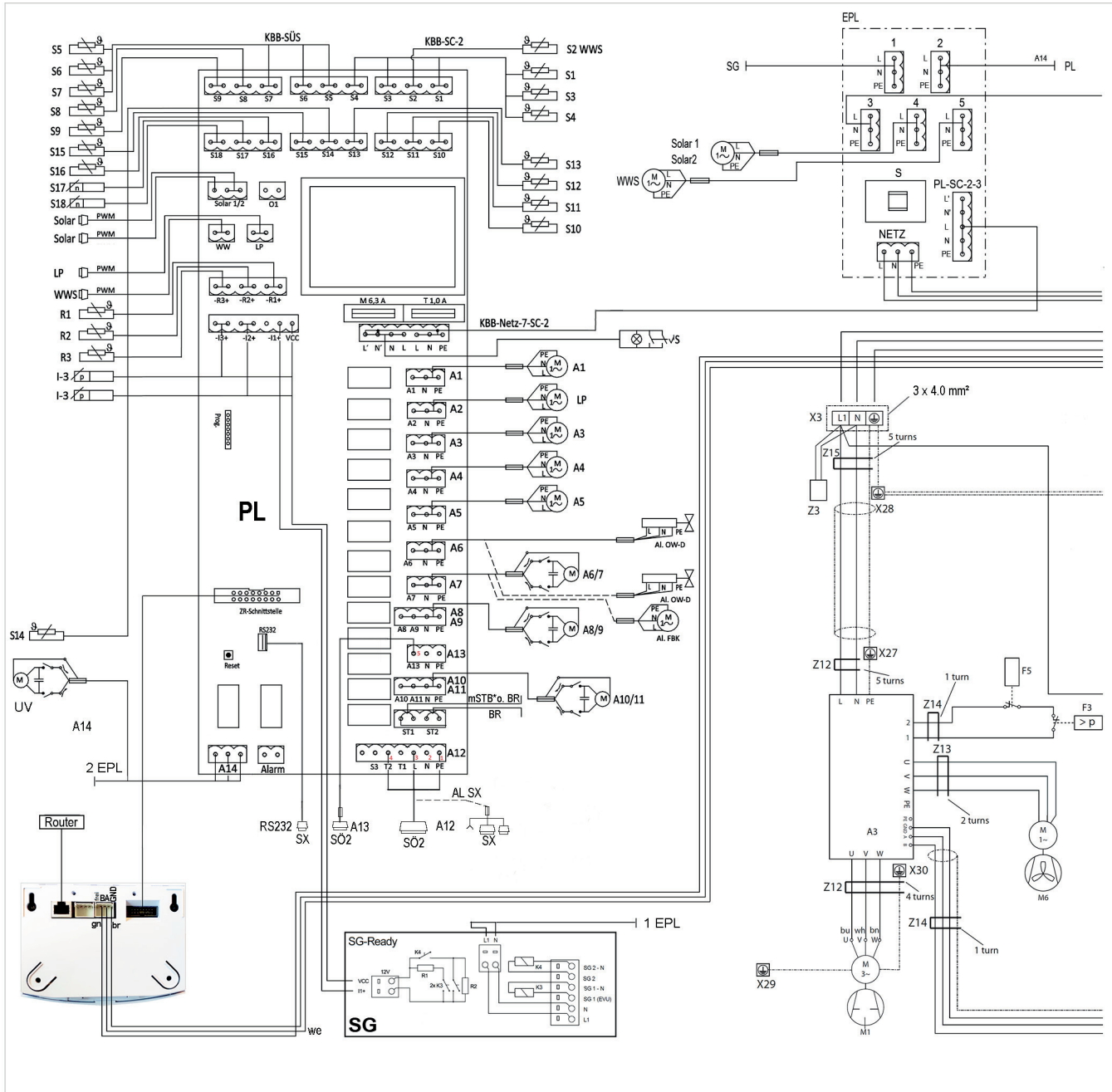


Fig. 24: SolvisLea Eco wiring diagram – part 1

* only applies to SolvisBen Hybrid Öl

X2	WP modbus connection	PE	Protective earth
X3	WP mains	WWS	Hot water station
X4	Controller mains	Solar	Solar pump
X5	DHC mains	KBB	Cable harness
X7	Trace heating	BR	Jumper
L	Phase	DHC	Electrical auxiliary heater
L'	Release phase from power supply company	RSE	Ripple control receiver
A2	Integrated heating pump controller (IWS)	PWM	Pulse width modulation (speed control)
N	Neutral conductor	HW-V	Hot water valve
LP	Load pump	WP	Heating pump
M1	Heating pump compressor	SC-3	SolvisControl 3
M6	Axial fan	SX	Gas burner SX-LN-3
UV	Switching valve	BW2	SÖ-BW-2 oil burner
AL	Alternative	EPL	Expansion Board
PL	SolvisControl 3 mains circuit board	SG	SmartGrid board

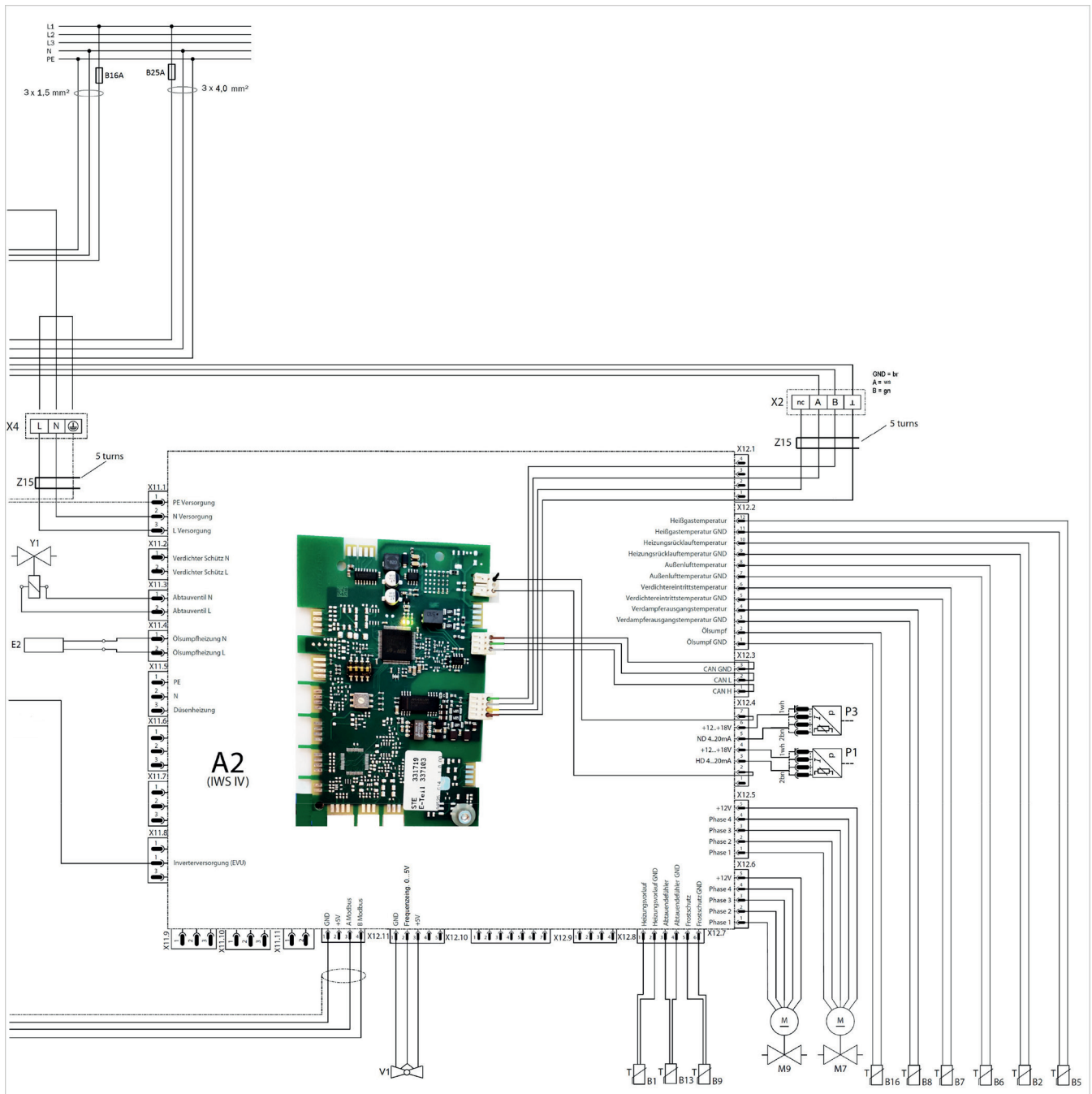


Fig. 25: SolvisLea Eco wiring diagram – part 2

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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11.2 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.

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

Wall console for Lea 8 kW Eco (KS-W-LEA-8)

For on-site attachment of the heating pump. Made of galvanized steel. Adjustable wall rail and equipment rail. Not suitable for mounting on the walls of inhabited buildings.

Lea Eco cover (AD-LEA-8)

Powder-coated to protect the pipes from damage.

Lea Eco connection set (ASS-ETL-LEA-E)

For connecting the flexible pipes (RO-68-FLX-WP) with a rigid pipe (diameter of 22 mm for the heating pump connection and 28 mm for the storage tank connection; not included in the scope of delivery). Viega press system.

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

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

11.3 System diagram



See ➔ *connection diagrams and system diagrams (ALS-BEN) document.*

11.4 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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