INSTALLATION MANUAL

MITSUBISHI HEAVY INDUSTRIES

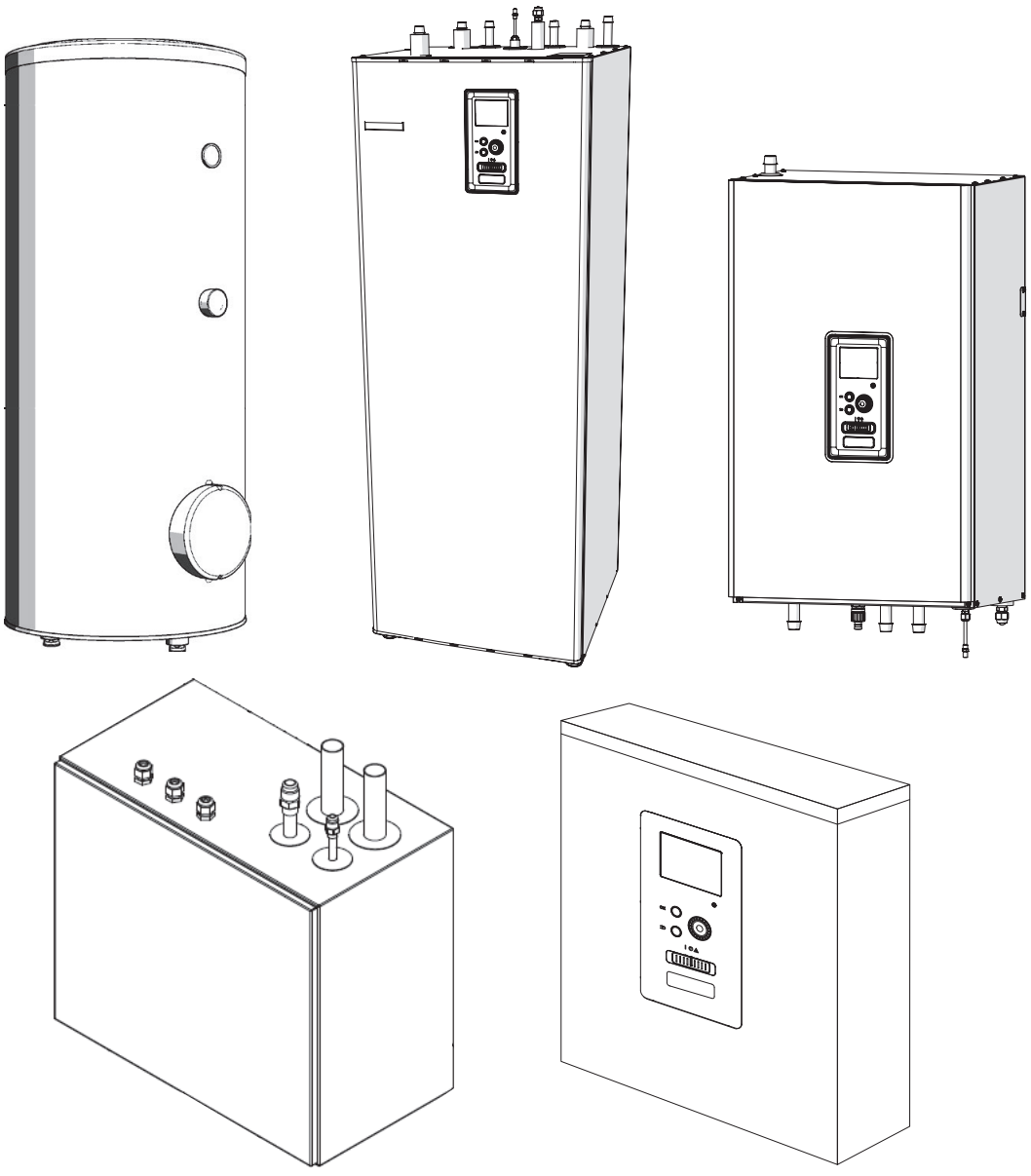
Air to Water Heat Pump using R32/R410A refrigerant

Hydrolution (HM)

HSB60-W/HMA60-W/HMS60-W/FDCW60VNX-A/FDCW60VNX-W

HSB100-W/HMA100-W/HMS100-W/FDCW71VNX-A/FDCW71VNX-W/FDCW100VNX-A

PT300/PT500/RC-HY20-W/RC-HY40-W



CE UKCA

English：Original instruction

This heat pump complies with EMC Directive 2004/108/EC (replaced by 2014/30/EU on 20/4/2016), LV Directive 2006/95/EC (replaced by 2014/35/EU on 20/4/2016).
CE marking is applicable to the area of 50 Hz power supply.
This heat pump complies with EMC S.I. 2016/1091, EER S.I. 2016/1101.
UKCA marking is applicable to the area of 50Hz power supply.

PSC012D169A

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Safety precautions

When installing the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply voltage and etc.) and installation spaces.

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before installation in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. These are very important precautions for safety. Be sure to observe all of them without fail.

■ The symbols used throughout the main text of this manual have the following meaning.

⚠marks mean danger, alarm, and caution. The specified prohibited item is described in the triangle. The left mark means "Shock hazard alarm".

⃠marks mean prohibited items. The specified prohibited item is described in the circle or in the vicinage.

!marks mean compulsory action or instruction. The specified prohibited item is described in the circle. The left mark means "Earth is needed".

The user's manual should be read carefully.

There is information included in the user's manual and/or installation manual.

A service personnel should be handing this equipment with reference to the installation manual .

NOTE
This indicates danger to machine or person.

Caution
This indicates important information about what you should observe when maintaining your installation.

TIP
This indicates tips on how to facilitate using the product.

- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.

This appliance is designed for use in a home environment and can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
This appliance is also intended for use by experts or trained users in shops, hotels, light industry, on farms and in similar environments.

Following precaution is only for R32.

This equipment uses flammable refrigerants. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.

⚠ DANGER

Strict compliance of the domestic laws must be observed when disposing the appliance.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.

The staff in servicing operations must hold the national qualification or other relevant qualifications.

This unit should be installed in rooms which exceed the floor space specified in installation sheets of indoor/ outdoor unit.

Refer to the installation sheet.

⚠ WARNING

Installation must be carried out by the qualified installer.
If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.

Install the system in full accordance with the instruction manual.
Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.

Check the density refered by the foumula (accordance with ISO5149).
If the density exceeds the limit density, please consult the dealer and install the ventilation system.

Use the original accessories and the specified components for installation.
If parts other than those prescribed by us are used, It may cause water leaks, electric shocks, fire and personal injury.

When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage.
Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.

Ventilate the working area well in the event of refrigerant leakage during installation.
If the refrigerant comes into contact with naked flames, poisonous gas is produced.
In case of R32, the refrigerant could be ignited because of its flammability.

After completed installation, check that no refrigerant leaks from the system.
If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.

Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.
An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit.

Install the unit in a location with good support.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.
If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.

The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring

regulation", and the system must be connected to the dedicated circuit.
Power supply with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.

Be sure to shut off the power before starting electrical work.
Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.

Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.
Unconformable cables can cause electric leak, anomalous heat production or fire.

Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.
Loose connections or cable mountings can cause anomalous heat production or fire.

Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.
Incorrect installation may result in overheating and fire.

Do not perform brazing work in the airtight room.
It can cause lack of oxygen.

Use the prescribed pipes, flare nuts and tools for R32 or R410A.
Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.

Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.
Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.

Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.
If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, air can be sucked into refrigerant circuit, which can cause bust or personal injury due to anomalously high pressure in the refrigerant.

Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulphide gas can occur.
Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety.

Only use prescribed optional parts. The installation must be carried out by the qualified installer.
If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.

Do not run the unit with removed panels or protections.
Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.

Be sure to fix up the service panels.
Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.

Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.
If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

Do not perform any change of protective device itself or its setup condition
The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.

Be sure to switch off the power supply in the event of installation, inspection or servicing.
If the power supply is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.

Consult the dealer or an expert regarding removal of the unit.
Incorrect installation can cause water leaks, electric shocks or fire.

Stop the compressor before disconnecting refrigerant pipes in case of pump down operation.
If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.

Perform the drainage/piping work securely according to the installation manual.

If there is a defect in the drainage/piping work, water could drop from the unit and household goods could be wet and damaged.

As the outlet water temperature can reach 60 ºC at maximum, do not touch the water piping directly with a bare hand.

For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation codes.

The unit is only for use in a closed water system.

Utilization in an open water system may lead to excessive corrosion of the water piping and risk of incubating bacteria colonies, particularly Legionella, in water.

Select a location where in case of water leakage, the leakage will not cause damage to other properties.

This installation may be subjected to building regulation approval applicable to respective country that may require to notify the local authority before installation.

⚠ CAUTION

Carry out the electrical work for ground lead with care.

Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

Use an all-pole circuit breaker with a contact gap of 3 mm or more.

This provides complete disconnection under Overvoltage Category Ⅲ. If the breaker does not have sufficient breaking capacity, it can cause the unit malfunction and fire.

Earth leakage breaker must be installed.

If the earth leakage breaker is not installed, it can cause electric shocks.

Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.

Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.

Do not install the unit near the location where leakage of combustible gases can occur.

If leaked gases accumulate around the unit, it can cause fire.

Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.

Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.

Secure a space for installation, inspection and maintenance specified in the manual.

Insufficient space can result in accident such as personal injury due to falling from the installation place.

When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.

If safety facilities are not provided, it can cause personal injury due to falling from the installation place.

Do not use the indoor unit at the place where water splashes may occur.

Since the indoor unit is not waterproof, it can cause electric shocks and fire.

Check that there is no water leakage from the water circuit before starting commissioning.

If there is water leakage you may get scalded by hot water. There is also a risk that the indoor unit or electric equipment will be damaged by the water.

Do not install or use the system close to the equipment that generates electromagnetic fields or high frequency harmonics.

Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.

Do not install the outdoor unit in a location where insects and small animals can inhabit.

Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.

Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.

Using an old and damage base flame can cause the unit falling down and cause personal injury.

Do not install the unit in the locations listed below.

- Locations where carbon fiber, metal powder or any powder is floating.
- Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
- Vehicles and ships.
- Locations where cosmetic or special sprays are often used.
- Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
- Locations where any machines which generate high frequency harmonics are used.
- Locations with salty atmospheres such as coastlines.
- Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual).
- Locations where the unit is exposed to chimney smoke.
- Locations at high altitude (more than 1000m high).
- Locations with ammonic atmospheres.
- Locations where heat radiation from other heat source can affect the unit.
- Locations without good air circulation.
- Locations with any obstacles which can prevent inlet and outlet air of the unit.
- Locations where short circuit of air can occur (in case of multiple units installation).
- Locations where strong air blows against the air outlet of outdoor unit.
- Locations with calcium chloride (e.g. snow melting agent).
- Location where something located above the unit could fall.
- Locations with steam.

It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.

Do not install the outdoor unit in the locations listed below.

- Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
- Locations where outlet air of the outdoor unit blows directly to plants.
- Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
- Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
- Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
- Locations where drainage cannot run off safely.

It can affect surrounding environment and cause a claim.

Do not install the remote controller at the direct sunlight.

It can cause malfunction or deformation of the remote controller.

Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.

It can cause the damage of the items.

Take care when carrying the unit by hand.

Avoid dropping the unit during transportation. If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.

Dispose of any packing materials correctly.

Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.

Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.

If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.

Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.

Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.

Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.

If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.

Do not touch any buttons with wet hands.

It can cause electric shocks.

Avoid damage by metal edge or trapped by panels.
Broken wire can cause unit faults such as electric shock due to short circuiting.

Do not shut off the power supply immediately after stopping the operation.
Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.

Do not control the system with main power switch.
It can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.

Do not touch any refrigerant pipes when the system is in operation.
During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.

Do not clean up the machines with water.
It could cause electric shock.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Disposal and cleaning of refrigerant should be handled by a qualified specialist.
Contact the sales company for details.

Make sure the power supply cord does not contact with hot part (i.e. water piping).
High temperature may cause insulator of power supply cord damage hence electrical shock or fire.

Do not apply excessive force to water pipes that may damage the pipes.
If water leakage occurs, it will cause flooding and damage to other properties.

Do not switch ON the unit while shut off valves are closed.
Unit may be damaged.

Notes for units designed for R32 or R410A

- Do not use any refrigerant other than R32 or R410A. R32 or R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C). A cylinder containing R32 or R410A has a light blue indication mark on the top.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R32 or R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

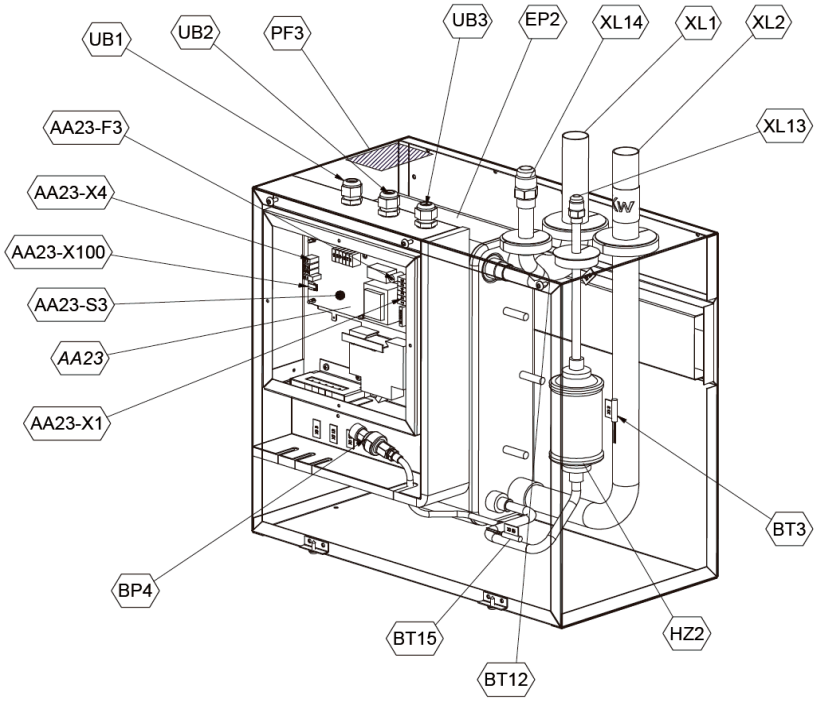
Dedicated tools for R32 or R410A	
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charge
d)	Vacuum pump
e)	Flaring tool set
f)	Protrusion control gauge for copper pipe
g)	Vacuum pump adapter
h)	Gas leak detector

General information for installer

For outdoor unit installation information, see Installation manual for Outdoor unit.

Over view and design

HSB60/100-W



Pipe connections

XL1(Red mark)	Climate system supply
XL2 (Blue mark)	Climate system return
XL14	Connection, gas line
XL13	Connection, liquid line

HVAC elements

EP2	Heat exchanger
HQ1	Particle filter (supplied)
HZ2	Drying filter

Electrical components

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, incoming supply, connection of KVR
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module

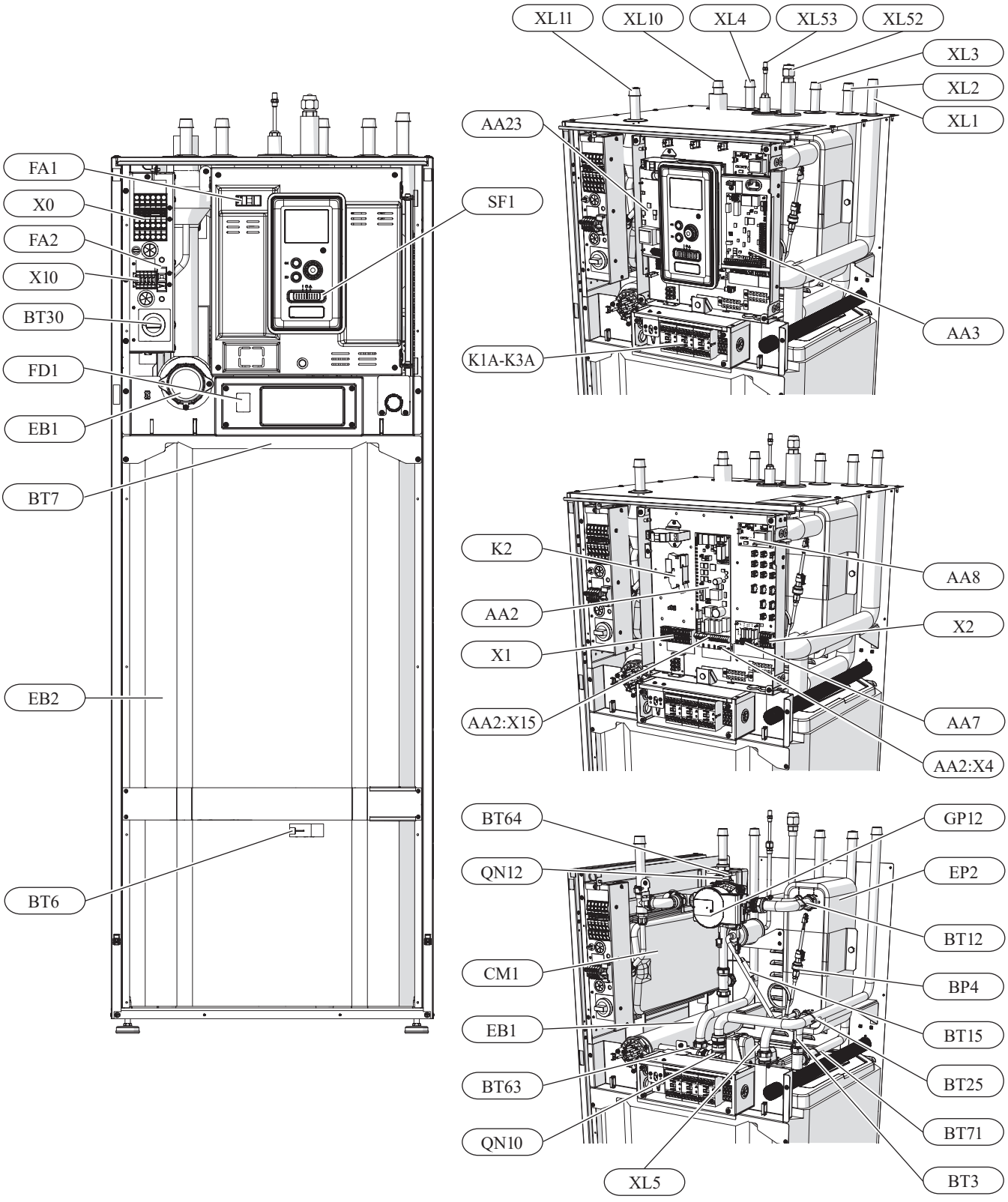
Sensor, thermostats

BP4	Pressure sensor, high pressure
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser, supply
BT15	Temperature sensor, fluid pipe

Miscellaneous

UB1	Cable gland
UB2	Cable gland
UB3	Cable gland

HMA60-W/HMA100-W



Pipe connections

XL1	Connection, heating medium, supply
XL2	Connection, heating medium, return
XL3	Connection, cold water
XL4	Connection, hot water
XL5	Connection, hot water circulation
XL10	Connection, cooling
XL11	Connection, safety group
XL52	Connection, gas cooling medium
XL53	Connection, liquid cooling medium

HVAC elements

CM1	Expansion vessel, closed
QN10	Reversing valve, hot water/climate system
QN12	Reversing valve, cooling/heating
GP12	Circulation pump
EP2	Heat exchanger

Sensor, thermostats

BP4	Pressure sensor, high pressure
BT3	Temp. sensor, heating medium return
BT6	Temp. sensor, hot water charging
BT7	Temp. sensor, hot water heater top
BT12	Temp. sensor, condenser out
BT15	Temp. sensor, liquid refrigerant
BT25	Temp. sensor, heating medium supply
BT63	Temp. sensor, supply heating medium behind immersion heater
BT64	Temp. sensor, cooling operation system supply
BT71	Temp. sensor, heating medium return

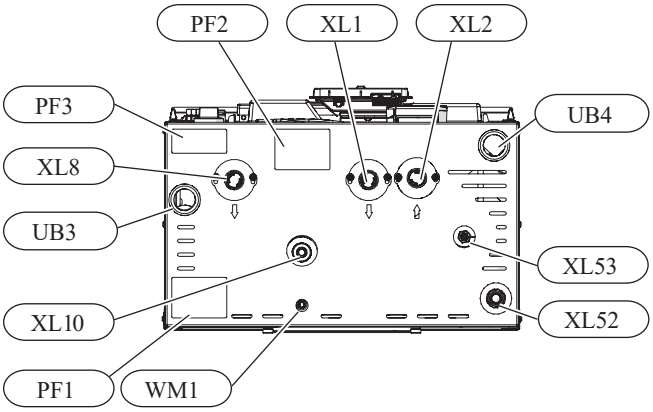
Electrical components

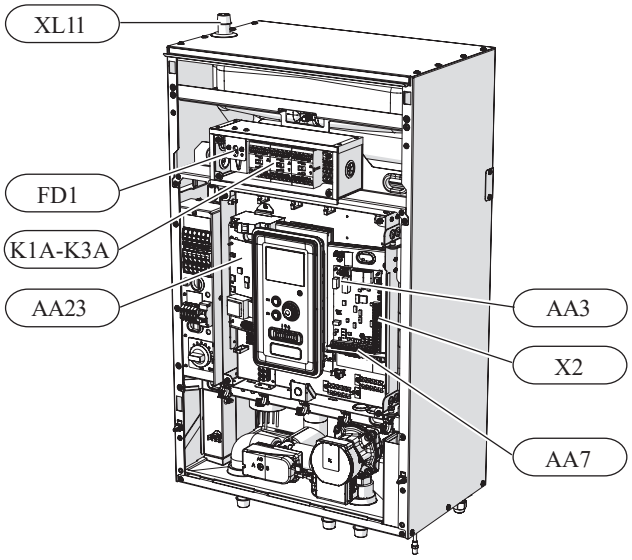
X0	Power terminal - 230V~ / 400V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
AA2:X4	Terminal block - low voltage
AA2:X15	Terminal block - low voltage
K1A-K3A	Contactors for electric additional heat
K2	Alarm relay
BT30	Emergency mode thermostat
AA2	Main board
AA3	Input board
AA23	Communication board
AA7	Extension card
AA8	Titanium anode card
FD1	Thermal circuit breaker
FA1	Miniature circuit breaker (protecting the indoor unit)
FA2	Miniature circuit breaker (protecting the outdoor unit)
EB1	Electric additional heat

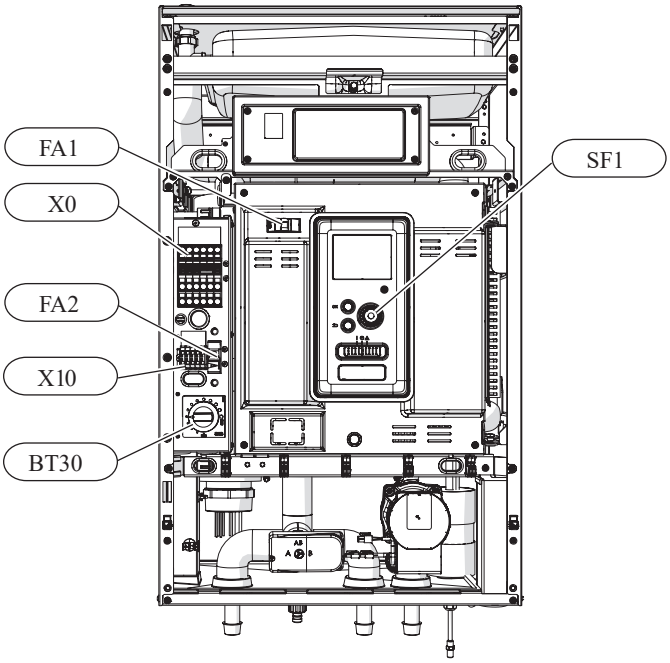
Miscellaneous

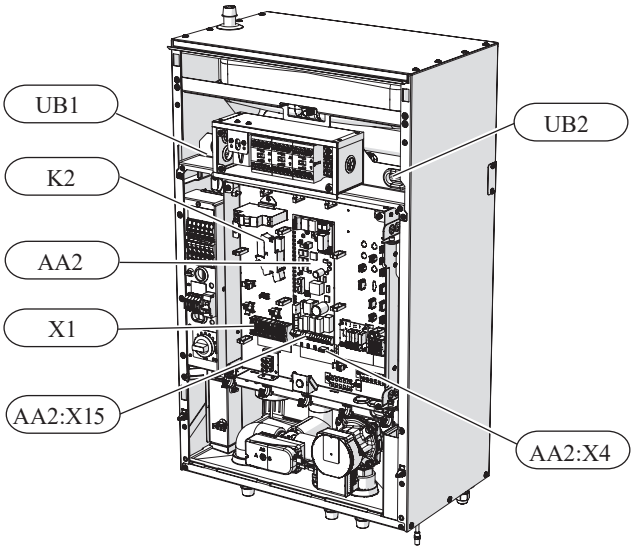
SF1	Controller switch
EB2	Hot water tank

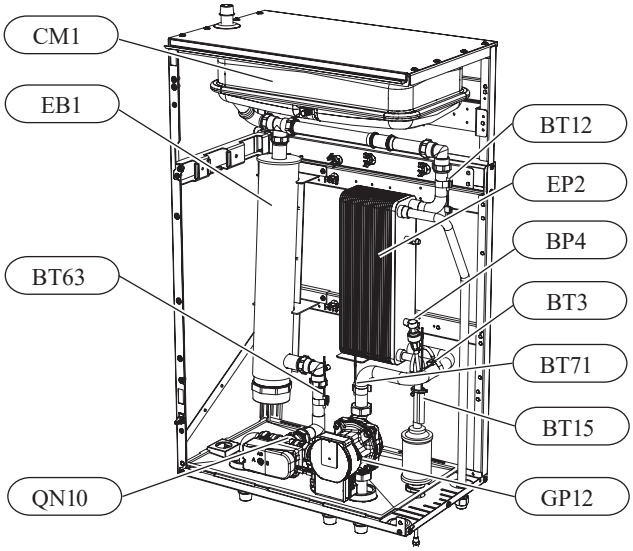
HMS60-W/HMS100-W











Pipe connections

XL1	Connection, heating medium, supply
XL2	Connection, heating medium, return
XL8	Connection, heating medium hot water, supply
XL10	Connection, drain valve
XL11	Connection, safety assembly, pressure gauge
XL52	Connection, gas refrigerant
XL53	Connection, liquid refrigerant
WM1	Condensate drip tray drain

HVAC components

CM1	Expansion vessel, closed
QN10	Reversing valve, hot water/climate system
GP12	Circulation pump
EP2	Heat exchanger

Sensor, thermostats

BP4	Pressure sensor, high pressure
BT3	Temp. sensor, heating medium return
BT12	Temp. sensor, condenser out
BT15	Temp. sensor, liquid refrigerant
BT63	Temp. sensor, supply heating medium behind immersion heater
BT71	Temp. sensor, heating medium return

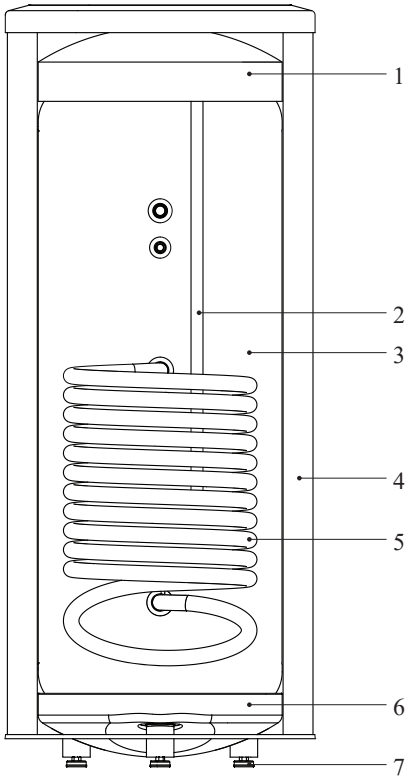
Electrical components

X0	Power terminal - 230V~ / 400V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
AA2:X4	Terminal block - low voltage
AA2:X15	Terminal block - low voltage
K1A-K3A	Contactors for electric additional heat
K2	Alarm relay
BT30	Emergency mode thermostat
AA2	Main board
AA3	Input board
AA23	Communication board
AA7	Extension card
FD1	Thermal circuit breaker
FA1	Miniature circuit breaker (protecting the indoor unit)
FA2	Miniature circuit breaker (protecting the outdoor unit)
EB1	Electric additional heat

Miscellaneous

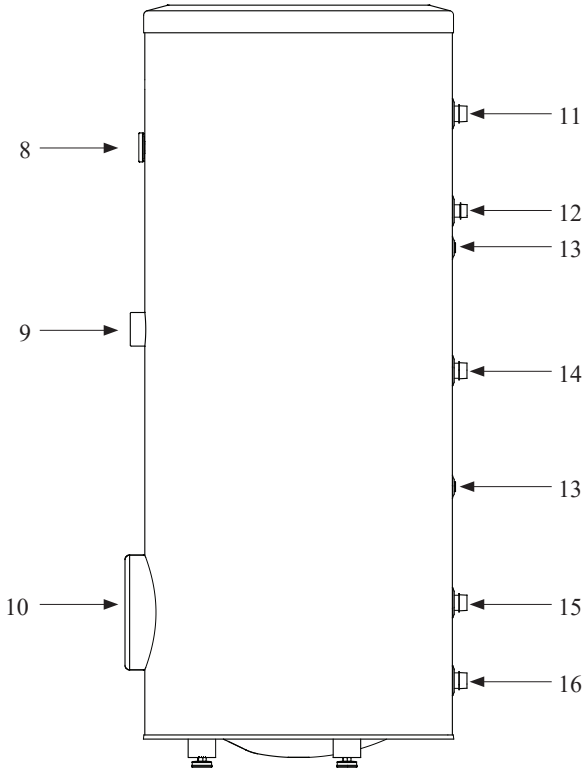
SF1	Controller switch
UB1	Rear left cable groomet
UB2	Rear right cable groomet
UB3	Lower left cable groomet
UB4	Lower right cable groomet
PF1	Serial number HMS
PF2	Plate with the designation of the hydraulic connections
PF3	Warning plate

PT300/500



Section of the PT300/500 storage tanks.

1. Upper insulation of the storage tank
2. Protective magnesium anode
3. Enamelled tank
4. Side insulation of the storage tank
5. Coil
6. Lower insulation of the storage tank
7. Adjustable foot



Side view of the PT300/500 storage tanks.

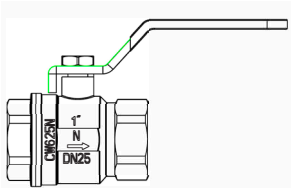
8. Thermometer
9. Connector pipe for mounting electric heating unit
10. Inspection opening
11. Hot water intake connector pipe
12. Hot water circulation connector pipe
13. Temperature sensor cover
14. Coil supply connector pipe
15. Connection of return line from the coil
16. Cold water supply connector pipe

Transport and storage

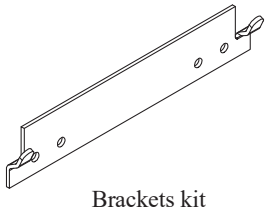
Indoor unit and tank unit must be transported and stored vertically in dry conditions.

Supplied components

HSB60/100-W Indoor unit



Particle filter R25 (HQ1).

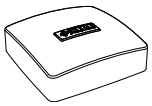


Brackets kit

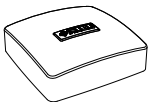
Replace by ⅜″ flare on HSB when outdoor unit is FDCW71VNX-W

Flare reduction (HSB100-W only)

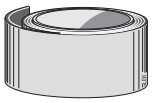
RC-HY20/40-W Control unit



Outside sensor

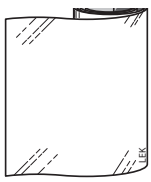


Room sensor (RC-HY40-W only)

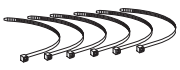


Insulation tape

Temperature sensor



Aluminium tape

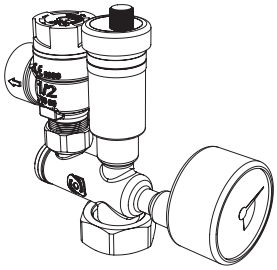


Cable ties

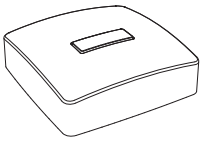
Heating pipe paste

Current sensor (RC-HY40-W only)

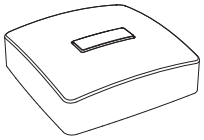
HMA60/100-W Indoor unit



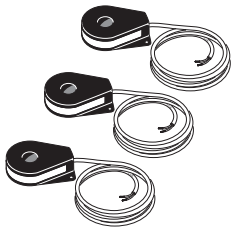
Safety group with safety valve (3 bar), pressure gauge and automatic air vent



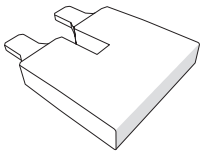
Outside sensor



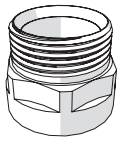
Room sensor



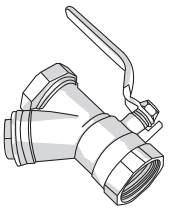
Current sensor



230V connection jumper

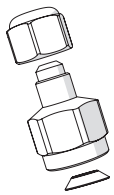


Connector 1”



Particle filter

Temperature sensor BT



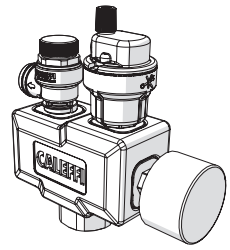
Reduction 3/8” to 1/4” (HMA 100-W only)

Install this adapter on the indoor unit when FDCW71VNX-W is installed

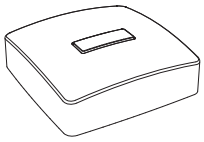
NOTE

The rated opening pressure of the safety valve is 3 bar.

HMS60/100-W Indoor unit

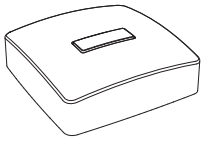


Safety group with safety valve (3 bar), pressure gauge and automatic air vent

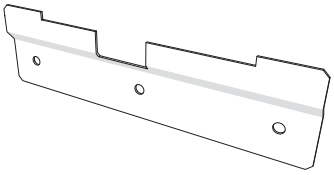


Outside sensor

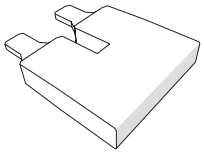
Temperature sensor BT



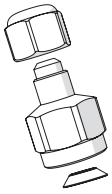
Room sensor



Hanger

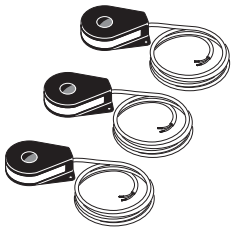


230V connection jumper

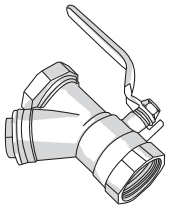


Reduction 3/8" to 1/4" (HMS 100-W only)

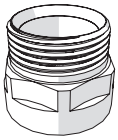
Install this adapter on the indoor unit when FDCW71VNX-W is installed



Current sensor



Particle filter



Connector 1"

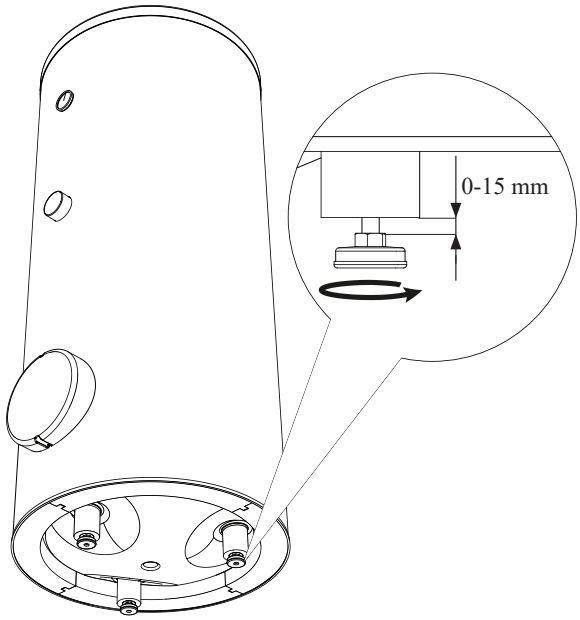
NOTE

The rated opening pressure of the safety valve is 3 bar.

Assembly

- It is recommended that indoor unit is installed in a room with existing floor drainage, most suitably in a utility room or boiler room.
- For indoor unit and control unit, the mounting surface must be firm, flat and vertical, preferably a concrete wall.
- Tank unit must be set on a solid waterproof base that would keep the weight of the unit. The height-adjusting legs allow for levelling and stable setting.

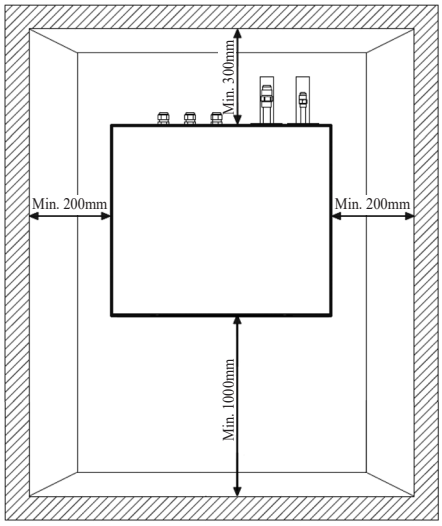
PT300/500



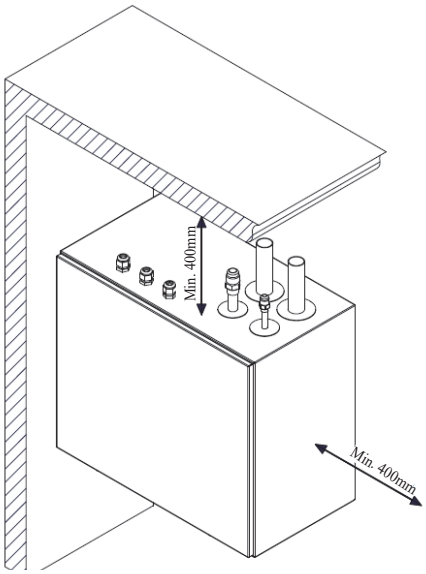
- Install indoor unit with its back to an outside wall, ideally in a room where noise does not matter. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.
- Install tank unit and its pipings to indoor unit indoors in order to avoid icing.
- Ensure free space described in the following figures for future maintenance.

HSB60/100-W

Recommendation for positioning on wall



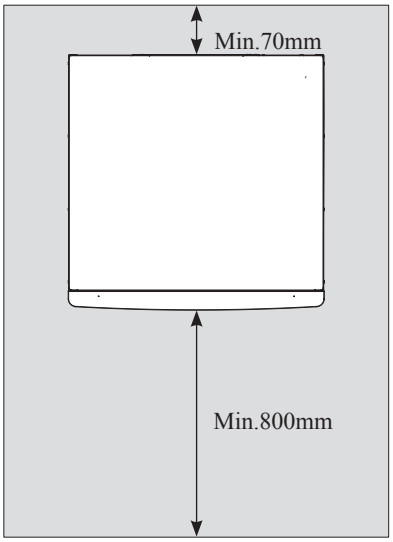
Recommendation for positioning in corner



*Min 800mm is required in front

HMA60/100-W

Leave a free space of 800 mm in front of the indoor unit. There must be a minimum free space of 70 mm behind the indoor unit, however the recommended distance is 150 mm. All servicing of HMA can be carried out from the front.



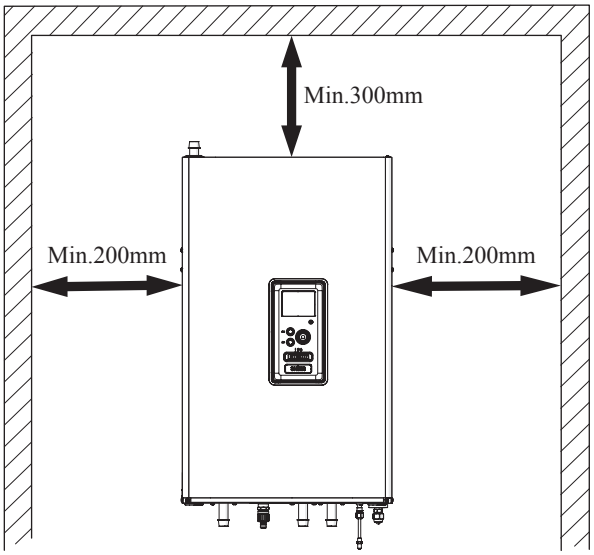
NOTE

If connecting an additional heat source, leave sufficient space behind the appliance for problem free completion of the connections and future maintenance.

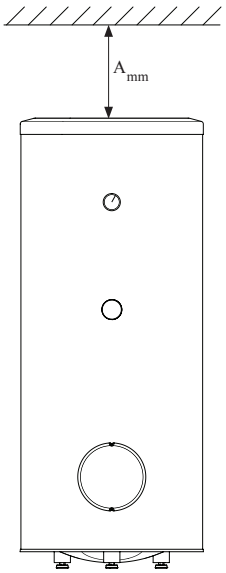
HMS60/100-W

HMS can be installed in any room that meets the requirements of local regulations and is protected against temperature drop below 0°C to avoid freezing of the heating medium. 800 mm of free space should be ensured in the front of the indoor unit. All servicing of HMS can be performed from the front.

Wall placement recommendations



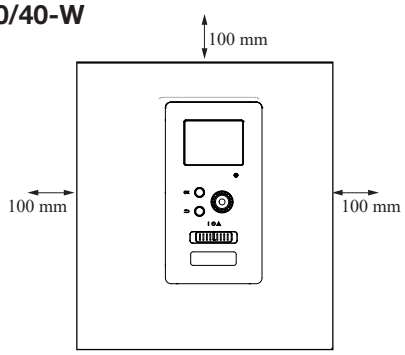
PT300/500



A_{min} is required on top to replace anode bar, and 500 mm is required in front to replace immersion heater if equipped.

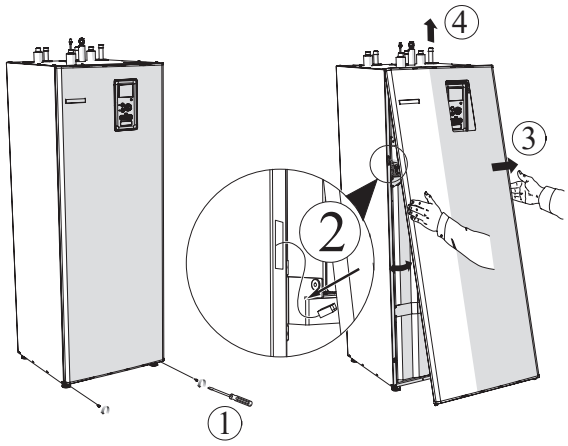
Application	Connector pipe dia.	Type of anode	A_{min}
PT300	1"	Chain ø26 × 8	150 mm
	¾"	Titanium anode	200 mm
PT500	1¼"	Chain ø33 × 5	150 mm
	¾"	Titanium anode	400 mm

RC-HY20/40-W

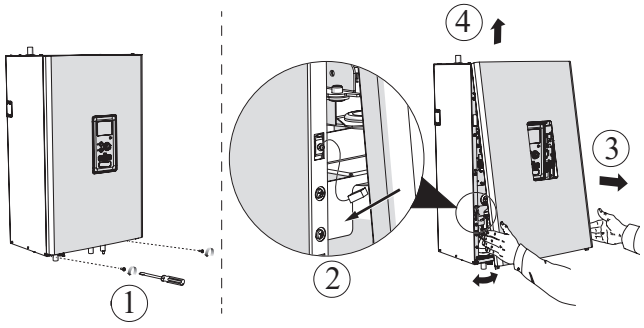


Removing the cover

HMA60/100-W



HMS60/100-W



1. Unscrew the bolts from the lower edge of the front cover ① .
2. Tilt the cover at the edge, making sure that the connection cables are not damaged and disconnect the cable grounding the front cover ② .
3. Disassemble the front cover by tilting its lower edge toward you ③ and lifting it up ④ .

CAUTION

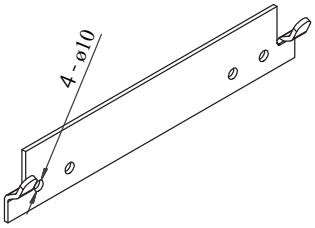
After reassembling the cover, the earthing wire must be connected.

Hanging indoor unit

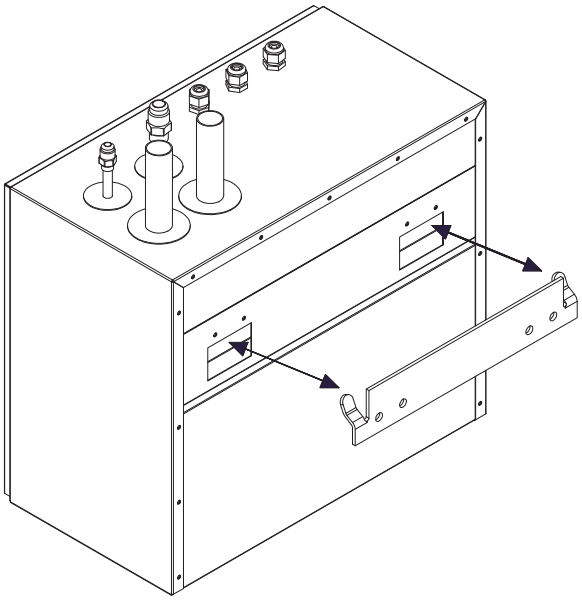
HSB60/100-W

It is recommended that the split box is installed in a room with existing floor drainage, most suitably in a utility room or boiler room.

1. The bracket for the split box is mounted to the wall by use of appropriate screws.



2. Insert the split box in the bracket mounted to the wall.



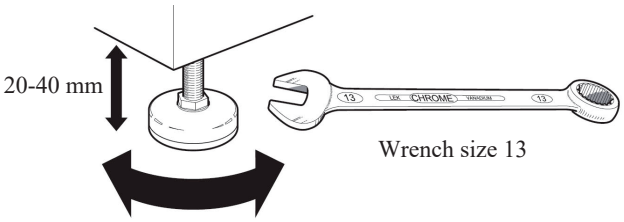
NOTE

Indoor unit weigh A kg excluding water inside.

	A
HSB60-W	16
HSB100-W	18

HMA60/100-W

- HMA must be set on a solid waterproof base that would keep the weight of the indoor unit. The regulated legs of the heat pump allow for levelling and stable setting of the device.



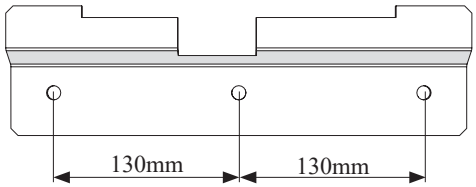
- Since HMA has condensation water drainage, the set-up location of the indoor unit should be equipped with a floor drain leading to the sewage system.

HMS60/100-W

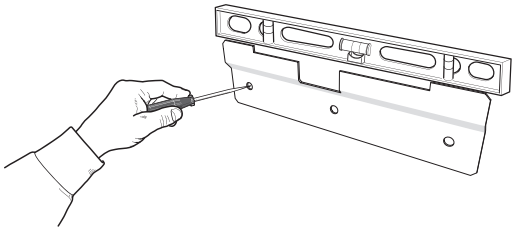
CAUTION

When installing HMS below 1.0 m, the minimum floor area should be calculated based on the EN 378-1 standard.

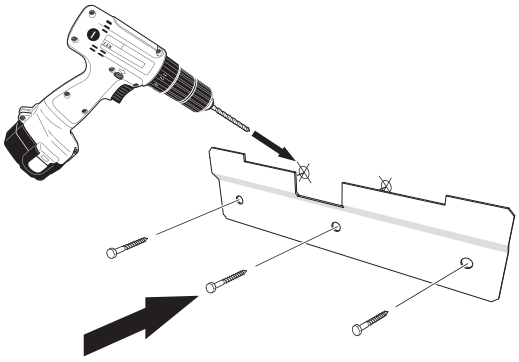
- HMS is equipped with wall-mounted hanger. For mounting hole spacing, see drawing below.
- HMS must be hanged on walls of sufficient load-bearing capacity able to take the weight of a filled indoor unit.



- Since HMS is equipped with condensate drain-off system, the indoor unit must be installed at the site with sewage system drain.



1. Place the included mounting hanger horizontally against the wall. Level the hanger using the spirit level. Mark the points for the mounting holes to be drilled.



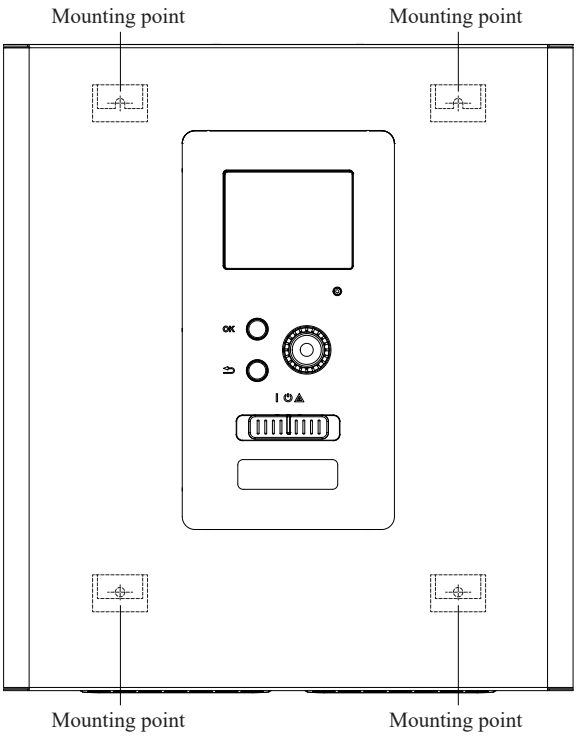
2. Drill the holes in marked points.
3. Screw the attachments to the wall using the provided rawplugs and bolts.
4. Install HMS on the mounted hanger.
5. Level the device using the bottom adjustment screws

CAUTION

Included rawplugs should be assessed in terms of load-bearing capacity and material of the wall on which the device is to be hanged. Replace with the other rawplugs meeting the requirements, if necessary.

Hanging control unit

Use all mounting points and install control unit upright against a flat wall. Make sure whole back surface faces the wall.



Dimensioning expansion vessel

The expansion vessel volume must be at least 5% of total water volume in the circulation system.

Initial pressure and max height difference

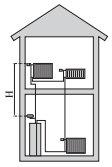
Recommended maximum height difference between expansion vessel and the highest point in the system is 5m.

The initial pressure of the pressure expansion vessel must be dimensioned according to the maximum height (H) between the vessel and the highest positioned radiator, see figure. An initial pressure of 0.5 bar (5 mvp) means a maximum permitted height difference of 5 m.

If the standard initial pressure in the pressure vessel is not high enough it can be increased by filling via the valve in the expansion vessel. The expansion vessel's standard initial pressure must be entered in the check list on User's manua1.

Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the water.

Consult local distributor in case height difference exceeds 5m.



Recommended installation order

1. Hang indoor unit and control unit to appropriate position and connect indoor unit and tank unit.
2. Connect indoor unit to climate system, cold and hot water lines as well as any external heat sources. See page 23. Also see docking descriptions on page 39, 40 and further on.
3. Install refrigerant pipes according to the description on the Installation manual for outdoor unit.
4. Connect current limiter, any centralised load control and external contacts as well as the cable between indoor unit and outdoor unit.
5. Connect incoming electricity to indoor unit and/or outdoor unit. See page 53, 54 and further on.
6. Follow the commissioning instructions on page 58-80.

Selection of installation location for the indoor unit (Only FDCW60/71VNX-W)

• If the total refrigerant charge in the system (m_c) is ≤ 1.84kg, no restriction applies for the installation room area (A_{room}).
• If the total refrigerant charge in the system (m_c) is > 1.84kg, minimum installation room area ($A_{min, total}$) and maximum refrigerant charge (m_{max}) restrictions apply. The following steps must be followed.

1) Check m_{max} in the installation room area (A_{room})

(a) Measure installation room area (A_{room})
(b) Check m_{max} which correspond to the A_{room} based on the table1.
(c-1) When $m_{max} \geq m_c$, the unit can be installed in the installation room area(A_{room}) without any further room size or ventitation requirements.
(c-2) When $m_{max} < m_c$, further requirements are necessary. Please proceed to the next step.

2) Check the total minimum floor area ($A_{min\ total}$)

(a) Measure area of adjacent room B (B_{room})
(b) Check $A_{min\ total}$ for total refrigerant charge in the system
(c-1) When $A_{min\ total} > A_{room} + B_{room}$, other requirements are necessary. Please contact your dealer.
(c-2) When $A_{min\ total} \leq A_{room} + B_{room}$, unit can be installed in the room A if complies with the next step.

3) Make two permanent openings (one lower, a second higher), between A_{room} and B_{room}

(a) Check the minimum opening area (Anv_{min}) for natural ventilation based on table 3.
(b) The two permanent openings must meet the below conditions.

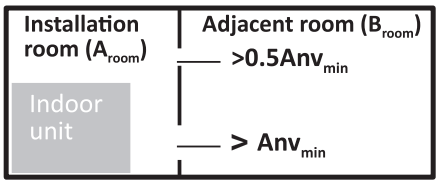
Lower opening

– The area of any openings above 300 mm from the floor shall not be considered in determining compliance with Anv_{min}.
– The bottom of the opening must not be > unit point of release and not > 100mm from the floor.
– At least 50% of the required opening area Anv_{min} shall be below 200mm from the floor.
– Opening are permanent openings which cannot be closed.
– The height of the opening between wall and floor which connect the rooms are not less than 20mm.

Second higher opening

– The total size of the opening must be ≥ 50% of Anv_{min}
– The bottom of the opening must be situated ≥ 1500mm from the floor.
– The requirement for the second opening can be met by drop ceilings, ventilation ducts, or similar arrangements that provide an airflow path between the connected rooms.

Symbol	Description	
m_c	Total refrigerant charge in the system	kg
A_{room}	Installation room area	m^2
M_{max}	Allowable maximum refrigerant charge	kg
B_{room}	Adjacment room area	m^2
$A_{min\ total}$	Required minimum room area	m^2
Δm	m_c-m_{max}	kg
Anv_{min}	Minimum ventilation opening area	cm^2



Total refrigerant charge in the system (m_c)
= factory refrigerant charge + additional refrigerant charge

Table1. Maximum refrigerant charge

A_{room} (m^2)	Maximum refrigerant charge (M_{max}) (kg)	
	H=1.0 m	H=1.8 m
1	0.230	0.414
2	0.461	0.829
3	0.691	1.243
4	0.921	1.658
5	1.151	2.072
6	1.382	2.487
7	1.512	2.721
8	1.616	2.909
9	1.714	3.085
10	1.807	3.252
11	1.895	3.411
12	1.979	3.562
13	2.060	3.708
14	2.138	3.848
15	2.213	3.983
16	2.285	4.113
17	2.356	4.240
18	2.424	4.363
19	2.490	4.482
20	2.555	4.599
21	2.618	4.712
22	2.680	4.823
23	2.740	4.932
24	2.799	5.038
25	2.856	5.142
26	2.913	5.244
27	2.969	5.343
28	3.023	5.441
29	3.077	5.538
30	3.129	5.632

- H: Indoor unit installation height in case of wall hanging type (HSB, HMS).
  If installation height is other than 1.0 m or 1.8 m, please calculate according to IEC60335-2-40:2018 Clauses GG2.
  In case of HMA, Use H=1.0 m to calculate.
- "Intermediate" values are rounded as per following examples:
- if A_{room} = 20.8 m^2, then 20 m^2 is considered in Table 1
- if m_c = 2.27 kg, then 2.28 kg is considered in Table 2
- if (m_c-m_{max}) = 1.5 kg, then 1.64 kg is considered in Table 3

Table2. Minimum room area

m_c (kg)	Minimum room area ($A_{min\ total}$) (m^2)	
	H=1.0 m	H=1.8 m
1.86	10.60	3.27
1.88	10.83	3.34
1.90	11.06	3.41
1.92	11.29	3.49
1.94	11.53	3.56
1.96	11.77	3.63
1.98	12.01	3.71
2.00	12.26	3.78
2.02	12.50	3.86
2.04	12.75	3.94
2.06	13.00	4.01
2.08	13.26	4.09
2.10	13.51	4.17
2.12	13.77	4.25
2.14	14.03	4.33
2.16	14.29	4.41
2.18	14.56	4.49
2.20	14.83	4.58
2.22	15.10	4.66
2.24	15.37	4.74
2.26	15.65	4.83
2.28	15.93	4.92
2.30	16.21	5.00
2.32	16.49	5.09
2.34	16.78	5.18
2.36	17.06	5.27
2.38	17.36	5.36
2.40	17.65	5.45
2.42	17.94	5.54
2.44	18.24	5.63
2.46	18.54	5.72
2.48	18.84	5.82
2.50	19.15	5.91
2.52	19.46	6.01
2.54	19.77	6.10

- Systems with total refrigerant charge 1.84kg or less are not subjected to any requirements for minimum installation room area.
- Refrigerant charge above 2.54kg is not allowed in the unit.

Table3. Minimum opening area for natural ventilation

m_c (kg)	M_{max} (kg)	Δm=m_c-m_{max} (kg)	Minimum opening area (Anv_{min}) (cm^2)
2.54	0.10	2.44	987
2.54	0.30	2.24	906
2.54	0.50	2.04	825
2.54	0.70	1.84	744
2.54	0.90	1.64	682
2.54	1.10	1.44	662
2.54	1.30	1.24	620
2.54	1.50	1.04	559
2.54	1.70	0.84	480
2.54	1.90	0.64	387
2.54	2.10	0.44	280
2.54	2.30	0.24	160
2.54	2.50	0.04	28

Pipe installation

General

Pipe installation must be carried out in accordance with current norms and directives.

A following table shows plumbing necessary for each product.

	Refrigerant	Plumbing
HSB/HMA/HMS	Necessary	Necessary
PT	—	Necessary
RC-HY	—	—

This heat pump system is designed for low or medium temperature heating system. It is recommended water temperature must not exceed 55°C on supply and 45°C on return at lowest design outdoor temperature (DOT) though indoor unit can operate with a return temperature of up to 63°C and an outgoing temperature from the unit of 65°C.

Indoor unit is not equipped with shut off valves; these must be installed outside the heat pump to facilitate any future servicing.

Indoor unit can be connected to the radiator system, floor heating system and/or fan convectors.

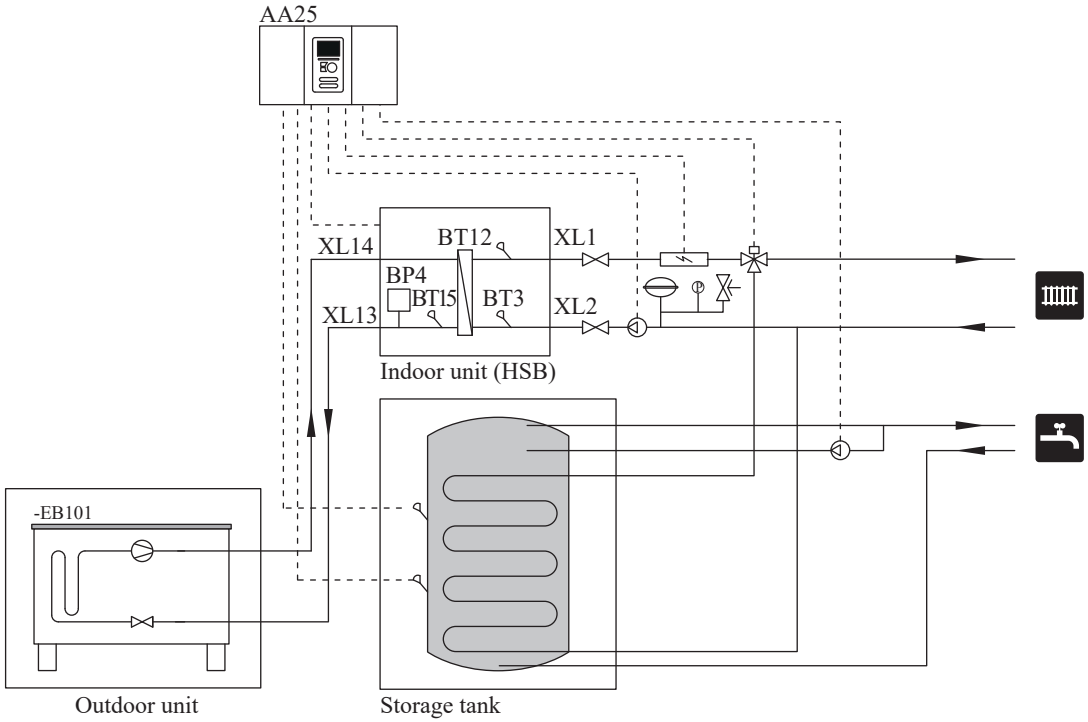
Safety valve is not equipped with in indoor unit. Make sure to install safety valve in the circuit.

Installation diagram

Outdoor unit provides heat for space heating and domestic hot water using free energy in the outdoor air within the range of low temperature up to -20°C. The system is controlled by RC-HY20-W or RC-HY40-W control unit.

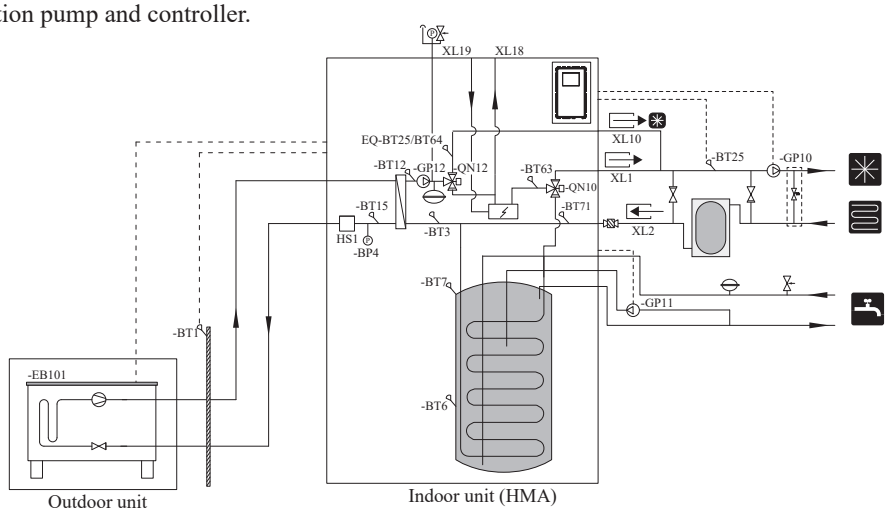
HSB60/100-W

Indoor unit is equipped with plate heat exchanger. It is necessary to install expansion vessel, shut-off valves, safety valve, electric heater and circulation pump to make a complete heating system. In case domestic hot water is required, 3 way valve and tank is also needed.



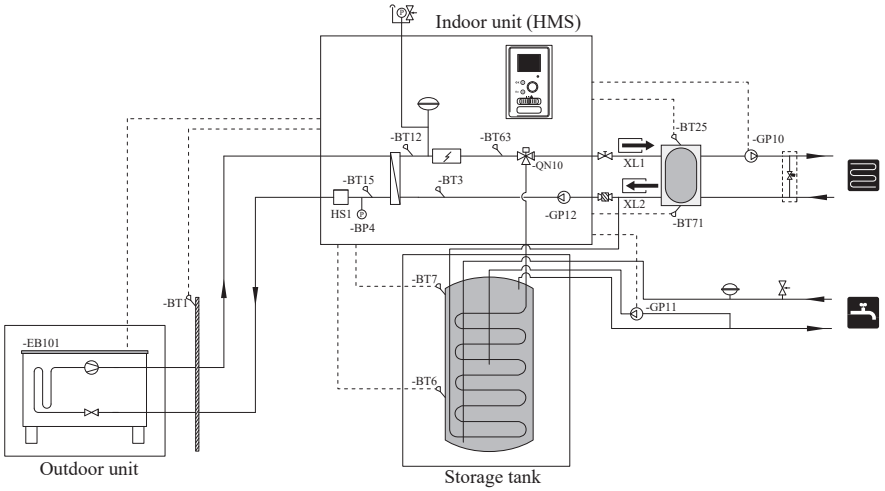
HMA60/100-W

HMA60/100-W indoor unit is equipped with a water heater, expansion vessel, safety valve, electrical heater, plate heat exchanger, sensors, gauge, circulation pump and controller.



HMS60/100-W

HMS60/100-W indoor unit is equipped with expansion vessel, safety valve, electrical heater, plate heat exchanger, sensors, gauge, circulation pump and controller. In case hot heater production is required, a tank is also needed.



LEGEND

- Shut-off valve
- Non-return valve
- Shunt valve
- Safety valve
- Temperature sensor
- Expansion vessel
- Pressure gauge
- Automatic air vent
- Filterball
- Circulation pump
- Electric heating
- Cooling system filter
- Compressor
- Plate heat exchanger
- Cooling operation
- Central heating system (under floor heating systems)
- Domestic hot water
- Relief valve
- Additional heat source
- Buffer vessel
- Fan coil
- Optional components

CAUTION

The installation diagrams presented in the manual are examples and do not include all system components. They do not replace the design of the building's central heating system.

System requirements

The minimum water volume in the climate system is subject to the values in the table below. If it is not fulfilled, volume vessel must be installed.

For more options, see the docking description on Page 37.

(liter)

	With underfloor cooling application	Without underfloor cooling application
HSB60-W HMA60-W HMS60-W FDCW60VNX-A/-W	80	50
HSB100-W HMA100-W HMS100-W FDCW71VNX-A/-W FDCW100VNX-A	80	50

Overflow valve

NOTE

A free flow is required for all docking options, which means that an overflow valve must be installed.

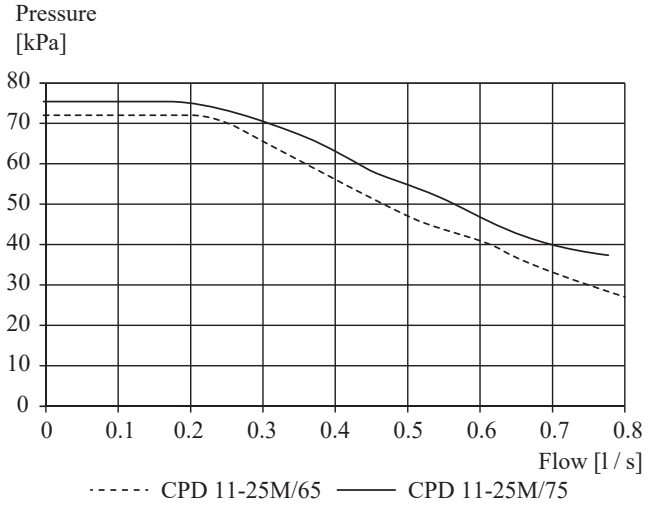
The circulation pump may become damaged.

Pump capacity diagram

HSB60/100-W

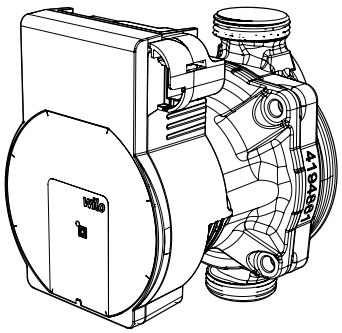
HSB60/100-W is not equipped with circulation pump.

This graph shows the characteristic of CPD11-25M/65 and 75.

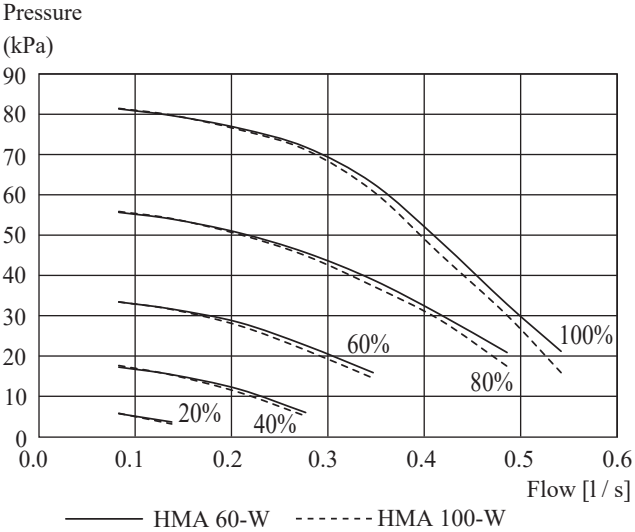


HMA60/100-W

The circulation pump in HMA is controlled by frequency, and is automatically regulated via control and based on the heating / hot water demand.

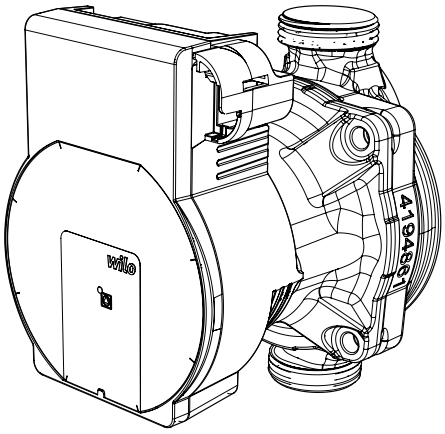


Available pressure, circulation pump GP12.

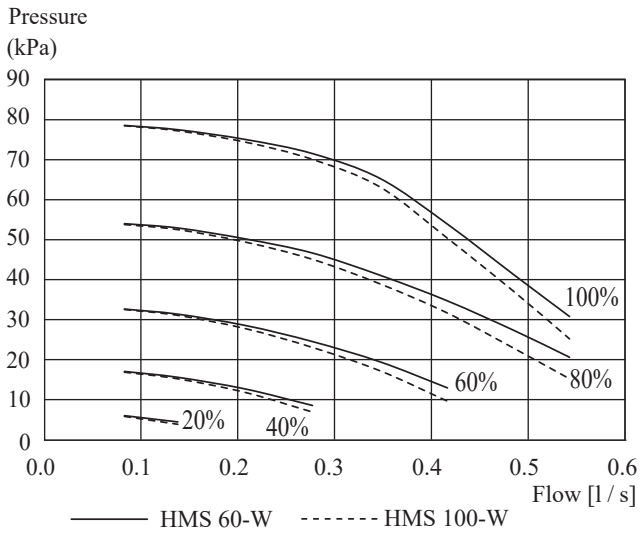


HMS60/100-W

The circulation pump in HMS is PWM controlled and regulates itself by control and based on heating/hot water demand.

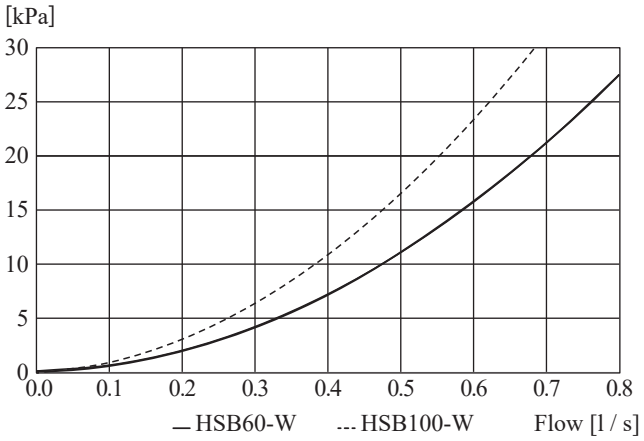


Available pressure, circulation pump GP12

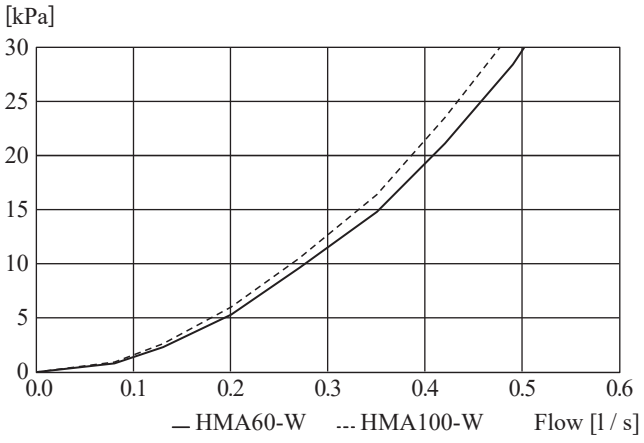


Pressure drop in indoor unit

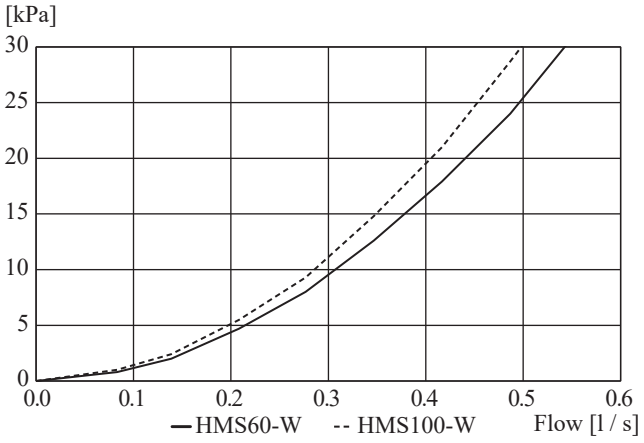
HSB60/100-W



HMA60/100-W



HMS60/100-W



Connection of extra circulation pump

When connecting extra circulation pumps, requirements for pressure, maximum flow etc must be met. See page 39, 40 for location.

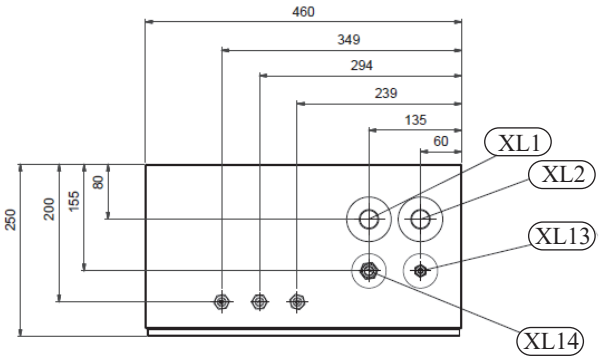
NOTE

Non-return valve must be installed in case extra circulation pump is used. See page 39, 40 for the position.

The circlulation pump may become damaged.

Dimensions and pipe connections

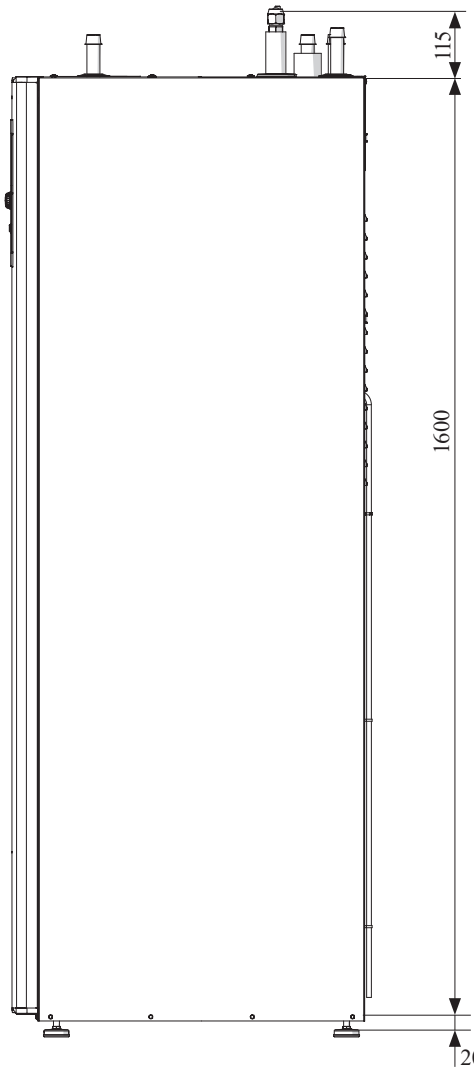
HSB60/100-W

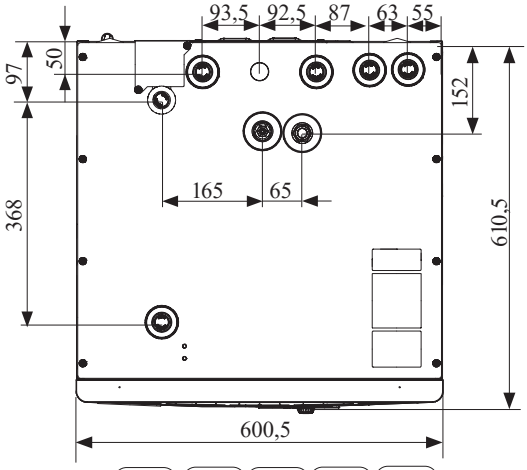


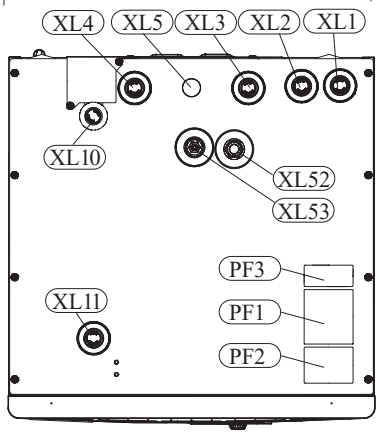
Pipe connections

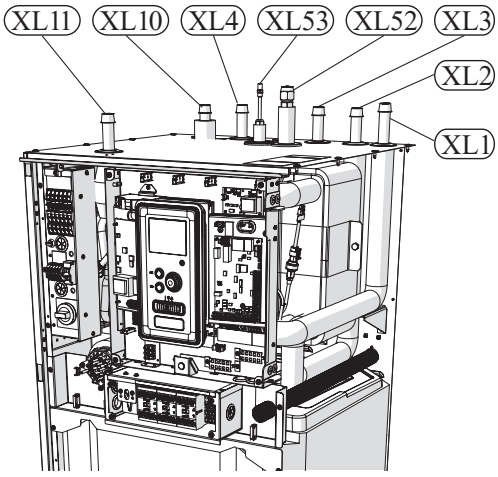
Symbol	Content		
		HSB60-W	HSB100-W
XL1	Climate system supply	ϕ22 mm	ϕ28 mm
XL2	Climate system return	ϕ22 mm	ϕ28 mm
XL13	Connection, liquid line	1/4”	3/8”
XL14	Connection, gas line	1/2”	5/8”

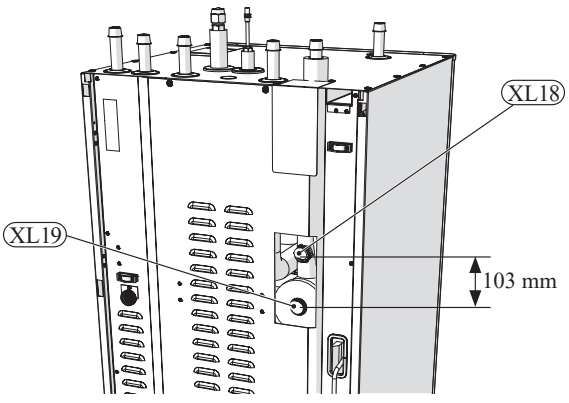
HMA60/100-W











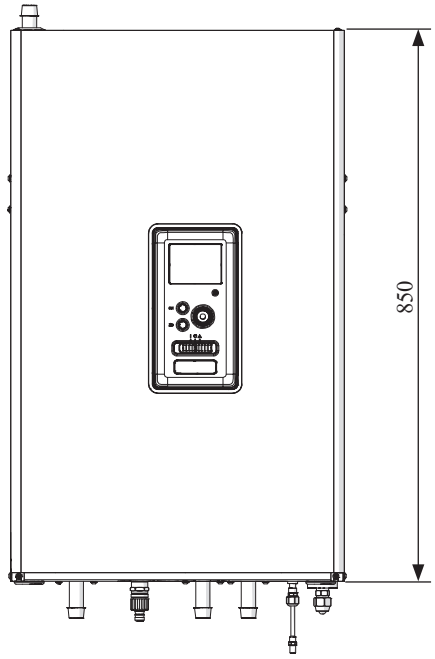
Pipe connections

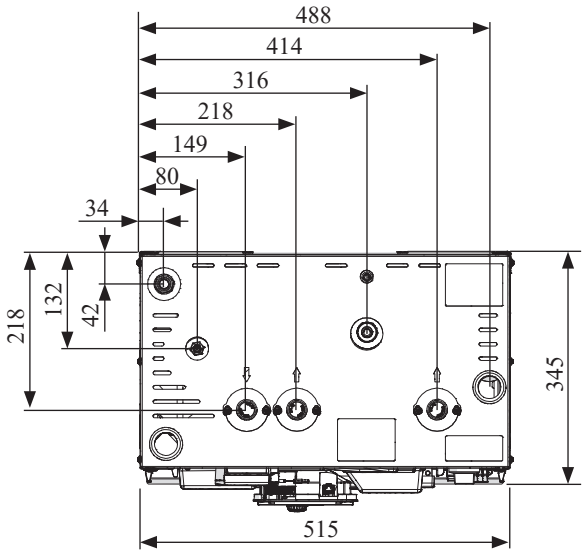
Symbol	Connection		
		HMA60-W	HMA100-W
XL1	Heating medium supply	ϕ22 mm	ϕ22 mm
XL2	Heating medium return	ϕ22 mm	ϕ22 mm
XL3	Cold water	ϕ22 mm	ϕ22 mm
XL4	Hot water	ϕ22 mm	ϕ22 mm
XL5	Circulation	ϕ15 mm	ϕ15 mm
XL10	Cooling	ϕ22 mm	ϕ22 mm
XL11	Safety group, manometer	ϕ22 mm	ϕ22 mm
XL52	Connection, gas line	1/2”	5/8”
XL53	Connection, liquid line	1/4”	3/8”-1/4”
XL18	Return to an additional heat source	ϕ22 mm	ϕ22 mm
XL19	Supply from additional heat source	ϕ22 mm	ϕ22 mm

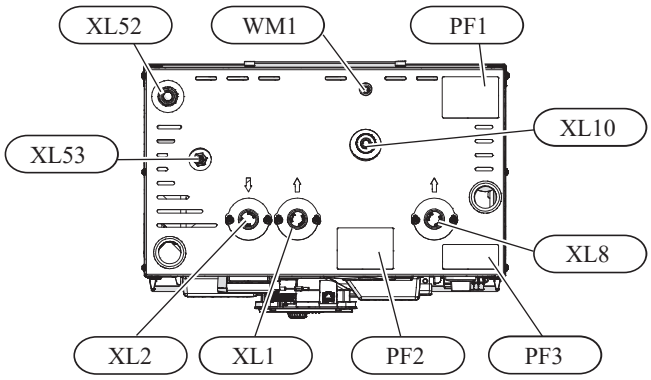
Other information

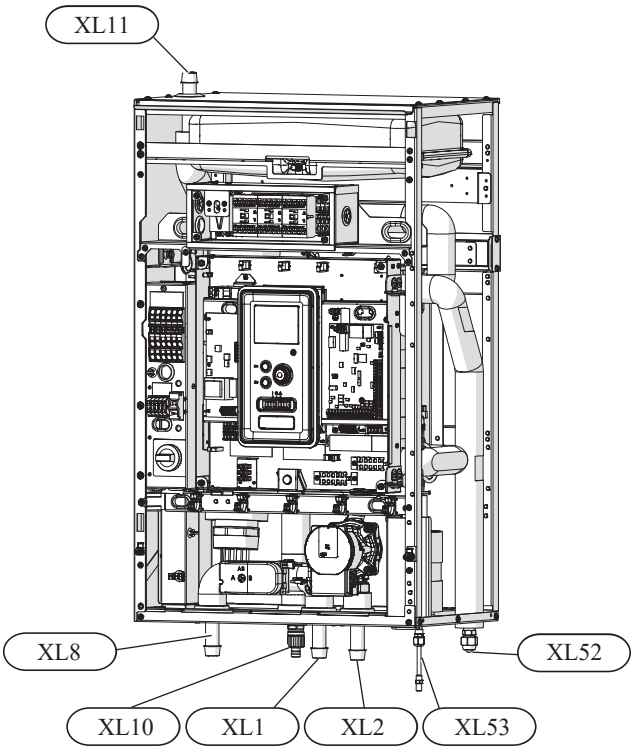
PF1	Serial number
PF2	Plate with the designation of the hydraulic connections
PF3	Warning plate

HMS60/100-W









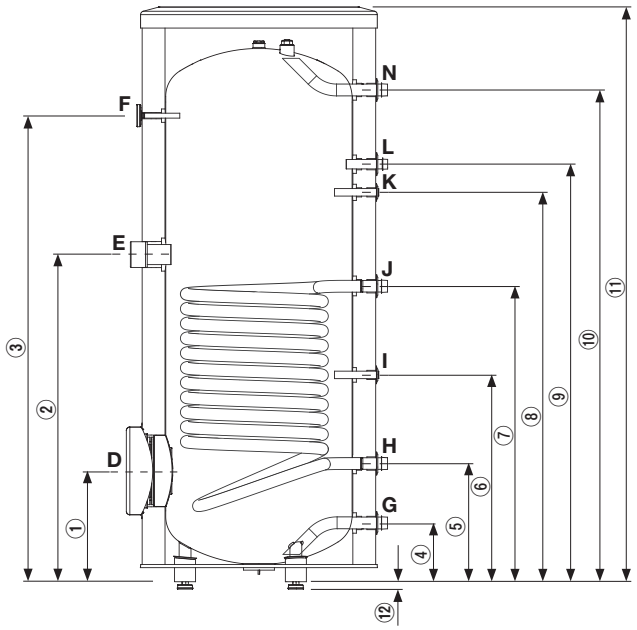
Pipe connections

Symbol	Connection		
		HMS60-W	HMS100-W
XL1	Heating medium supply	ϕ22 mm	ϕ22 mm
XL2	Heating medium return	ϕ22 mm	ϕ22 mm
XL8	HW heating medium. Supply	ϕ22 mm	ϕ22 mm
XL10	Drain valve	GW1/2"	GW1/2"
XL11	Safety group	ϕ22 mm	ϕ22 mm
XL52	Connection, gas line	1/2”	5/8”
XL53	Connection, liquid line	1/4”	3/8”-1/4”
WM1	Drain from the drip tray	ϕ8 mm × 1.5 mm	ϕ8 mm × 1.5 mm

Other information

PF1	Serial number
PF2	Plate with the designation of the hydraulic connections
PF3	Warning plate

PT300/500



Connection		U/m	PT300/500
D	Inspection opening	mm	ϕ120
E	Heating unit connection	inch	1½″Female
F	Thermometer enclosure	mm	ϕ10 Female
N	Hot water outlet	inch	1″Male
L	Hot water circulation	inch	¾″Male
K	Temperature sensor enclosure (BT7)	mm	ϕ16 Female
J	Coil supply	inch	1″Male
I	Temperature sensor enclosure (BT6)	mm	ϕ16 Female
H	Return from coil	inch	1″Male
G	Cold water input	inch	1″Male

Dimensions			
		PT300	PT500
①	mm	315	337
②	mm	930	967
③	mm	1325	1477
④	mm	167	188
⑤	mm	336	288
⑥	mm	588	387
⑦	mm	840	805
⑧	mm	1107	1234
⑨	mm	1187	1302
⑩	mm	1398	1545
⑪	mm	1634	1835
⑫	mm	21-0/+15	

Water circuit

Connection to heating system

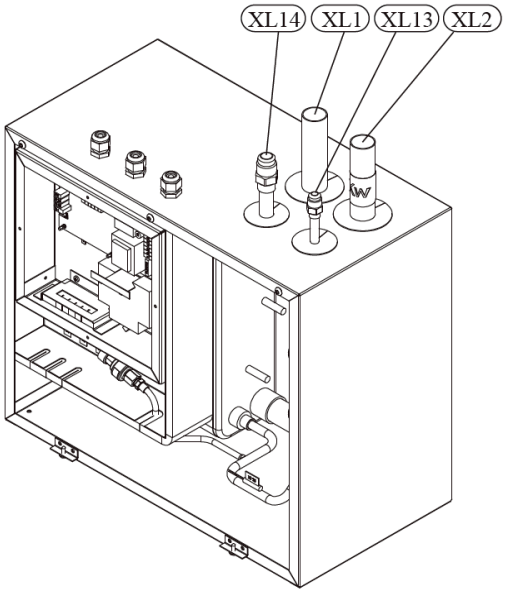
Connect XL1 to supply line and X2 to return line from heating system.

- All required safety devices and shut-off valves must be installed as close to the indoor unit as possible.
- Install bleed valves where necessary, highest point of the water system in usual case.
- When connecting to a system with thermostats on all radiators, install an overflow valve or remove some of the thermostats to ensure sufficient flow.
- See section Dockings for outline diagram.
- Install a safety valve with manometer on heating circuit and hot water circuit. (FL2)

  For HSB60/100-W install a safety valve for heating circuit on the water pipe returning to indoor unit since it doesn't have port for FL2.

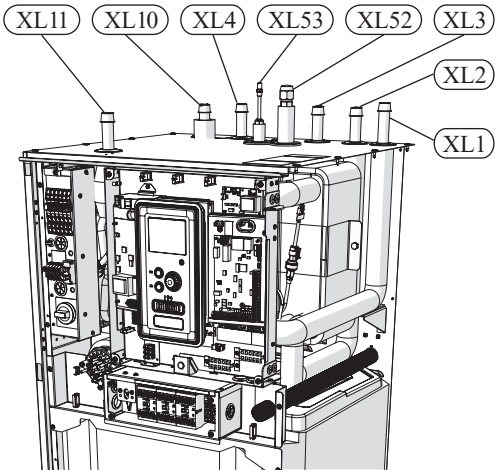
  The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost proof.
- The end of overflow water pipe from the safety valves must be left open to the atmosphere. The water may drip from the pipe.

HSB60/100-W



Install safety valve as close to XL2 as possible.

HMA60/100-W



The pipe connections of the climate system are made from the top of the appliance.

- All required safety devices and shut-off valves must be fitted as close to the HMA unit as possible.
- Vent valves must be installed when necessary.
- The safety group with the pressure gauge and air vent on the central heating circuit, as well as the safety valve on the hot water system must be fitted to the appropriate connections XL 11 and XL 3. To prevent air pockets from forming, the overflow pipe must be inclined in its entire length from the safety valve and must also be frost proof.
- When connecting to the installation (where all radiators / underfloor heating circuits are equipped with thermostatic valves or solenoid valves), appropriate hydraulic solutions should be used to obtain a minimum undisturbed flow in the heating system (e.g. excess-relief valve, low loss header, buffer in parallel or open heating loops). Remember to always keep the minimum required flow and volume of the system - see the sections "Minimum system flow" and "Buffer vessel".

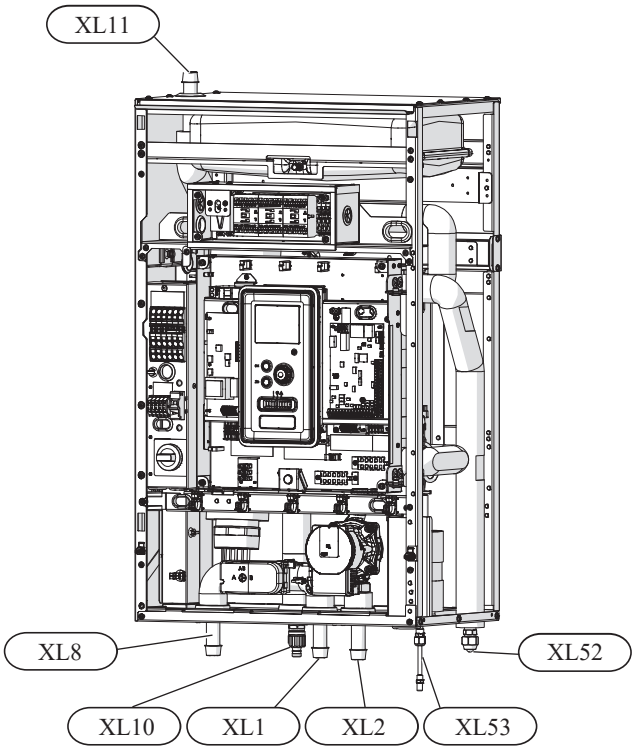
NOTE

The term "heating system", as used in this installation and operation manual, shall mean the heating or cooling system supplied with a hot or cold medium from the HMA module for heating or cooling purposes.

CAUTION

Suitable safety valve must be installed directly on the cold water supply line to the hot water tank. Safety valve will protect against excessive increase of pressure. The drain from the safety valve should be discharged into the sewage system or drain.

HMS60/100-W



The pipe connections of the climate system are made from the bottom of the appliance except safety assembly which is made from the top.

- All required safety devices and shut-off valves must be fitted as close to the HMS unit as possible.
- Air vent valves must be installed where necessary.
- The safety valve with the pressure gauge and air vent on the central heating circuit, must be fitted to the appropriate connection XL 11. To prevent air pockets from forming, the overflow pipe must be inclined in its entire length from the safety valve and must also be frost proof.
- When connecting to a system (where all radiators / underfloor heating circuits are equipped with thermostatic valves or solenoid valves), appropriate hydraulic solutions (e.g. excess-relief valve, low loss header, buffer in parallel or open heating loops). Remember to always keep the minimum required flow and volume of the system - see the sections “Minimum system flow” and “Buffer vessel”.

CAUTION

It is absolutely necessary for the appropriate safety valve to be fitted directly on the cold water supply pipe to the HW tank, to protect the tank against an excessive pressure increase. The outflow from the safety valve should be discharged to a sewage system or a drain.

Connection to hot water heater

For HSB-W and HMS-W series, it is necessary to connect PT300/500 tank unit applying 3 way valve in order to use domestic hot water function. HMS-W includes 3 way valve from factory.

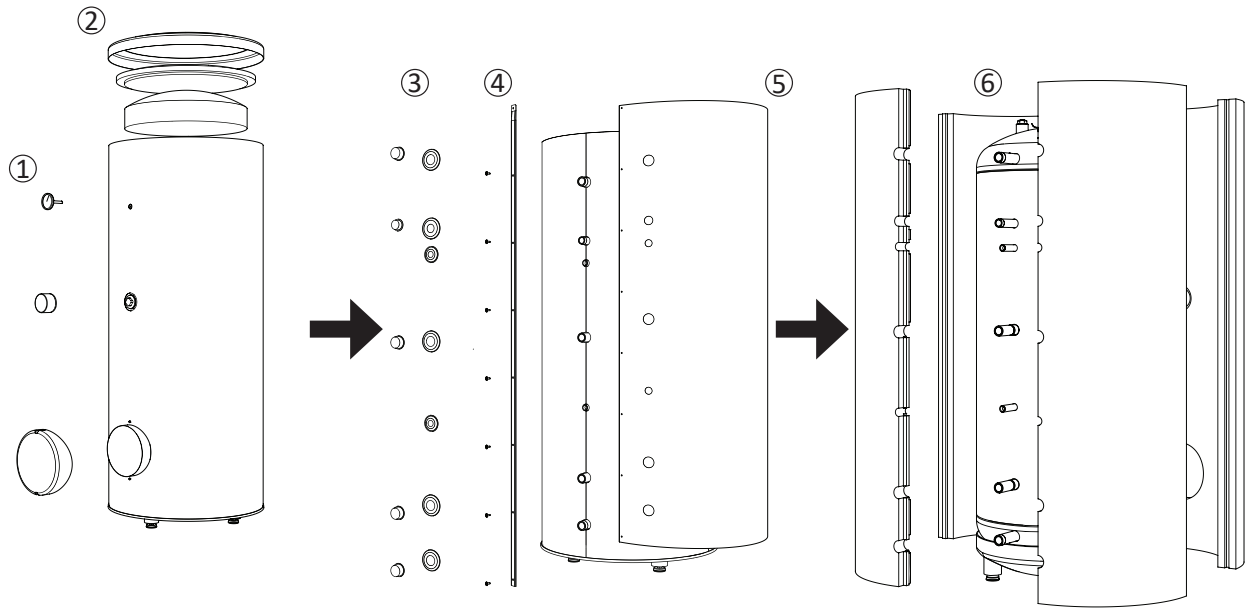
Housing disassembly of tank unit

Removable housing with thermal insulation facilitates transport and installation of the storage tank. Disassembly the housing in the following order (see next page figure):

1. Remove the Temperature gauge, plug of the heating element connector pipe and blanking plate of the inspection opening.
2 Remove the upper cover of the housing together with thermal insulation.
3. Remove the plugs from the connector pipes and black bushings.
4. Remove the fixing screws and the strip connecting the housing jacket.
5. Remove the jacket surrounding the tank (housing jacket.)
6. Remove the four-piece thermal insulation.

After the installation of the storage tank in its final location, reinstall the removed components in the reverse order.

Housing and thermal insulation disassembly



Connecting hot water tank to indoor unit

CAUTION

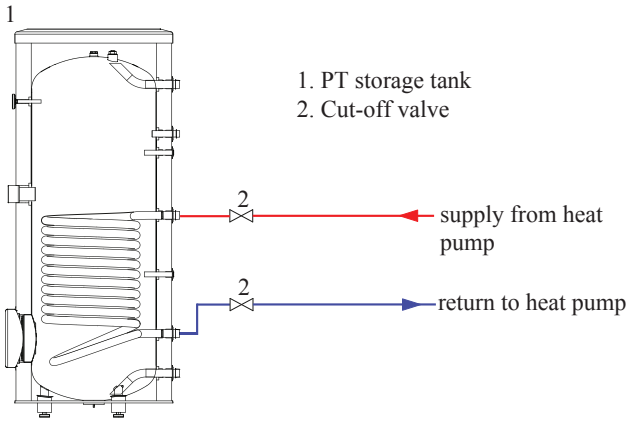
Installation and commissioning of the storage tank shall only be done by appropriately qualified installer. The installer should inform the user of the functions of the product and provide the necessary in formation on its safe use.

Information

We recommend installing a strainer in order to protect the pumps, check valve and the components of the heating system.

- Tank and its pipings to indoor unit must be installed indoors where the temperature wouldn't drop below 15°C in order to prevent pipings from icing.
- Maximum piping length between indoor unit and tank is 10 m.
- Tank unit should be placed on firm, preferably a concrete floor or foundation.
- Tank unit can be aligned using the adjustable feet.
- Protection against overpressure shall be made in accordance with the relevant regulations.
- Connect the heating system according to the installation diagram (see figure).

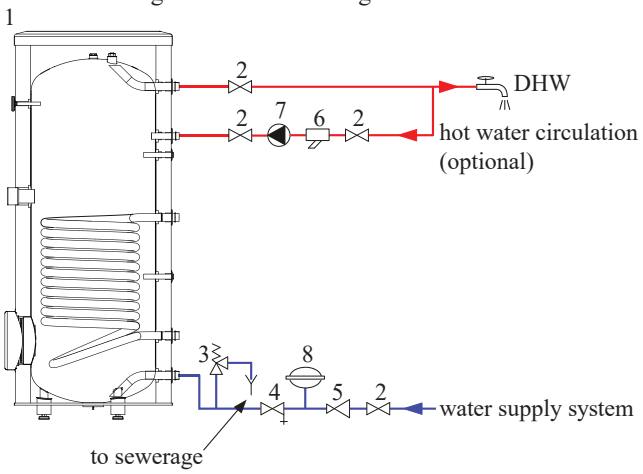
Installation diagram of the PT storage tank with one coil.



Connecting hot water tank to water main

- Install a mixing valve if the temperature exceeds 60 °C.
- It is recommended to install a thermostatic mixing valve for stable temperature hot water supply.
- Connect the storage tank to the water supply system of water pressure at least 1 bar and max 10 bar. Install a pressure reducer if the pressure at the cold water inlet to the tank is higher than allowed.
- Install a safety valve which have a maximum 8.0 bar opening pressure on the incoming domestic water line according to outline diagram in order to protect the storage tank against overpressure. Pressure increases during heating the water.
- During heating the water, small and temporary water flow from the safety valve can occur, which indicates that the pressure has increased above the rated value, which triggered the valve. This may in no way be prevented.
- Safety valve drain line should be installed with a decline, in an environment free of freezing and remain open to the atmosphere. The manufacturer is not responsible for flooding the room through the safety valve.
- Blocked safety valve can cause equipment failure. Drain the outflow from the safety valve to the sewerage or drain grate.
- See section Dockings for outline diagram.
- Connect the water supply system according to the installation diagram.

Installation diagram of the PT storage tank with one coil.



1. PT storage tank
2. Cut-off valve
3. Safety valve
4. Drain valve
5. Pressure reducer (option, if the pressure in the system exceeds the allowable value)
6. Strainer
7. Hot water circulating pump
8. Hot water expansion vessel

Information

In order to minimize the flow of water from the safety valve associated with the thermal expansion of the liquid, it is advisable to install a suitable expansion vessel at the cold water connection (see item 8.)

CAUTION

Installation of the appropriate safety valve in the cold water supply line protecting the unit against overpressure is mandatory!

CAUTION

Installation of necking of any kind (such as reducers, dirt pockets, etc.) and cut-off valves between the storage tank and the safety valve is not allowed. Only a T-pipe with a drain valve and a T-pipe with an expansion vessel may be installed in these line sections.

CAUTION

Never block the safety valve or drain line. This can cause a dangerous overpressure in the storage tank.

CAUTION

When heating water, slight, temporary discharge from the safety valve can occur. This is a correct safety valve function. Any attempt to interfere in its operati on can lead to the danger and destruction of the storage tank.

CAUTION

Never use the equipment with clogged safety valves.

Connection

After the installation and levelling the tank, follow the procedure below (for the connector pipe symbols, refer to page 30):

1. Remove protecting plugs from the connector pipes
2. Connect the hot water intake line (N).
3. Connect the cold water supply line together with the required safety valves (G).
4. If the system has the hot water circulation system, connect it to the connector pipe (L). Otherwise, plug the pipe.
5. Connect the supply (J) and return (H) of the heating medium to the coil.

CAUTION

If there is an electric heating module installed in the storage tank, fill the tank with water before connecting it to the electrical installation.

Hot water circulation circuit

Hot water circulation function is available for PT300/500.

PT300/500

If the system has the hot water circulation system, connect it to the port L (see page 30).

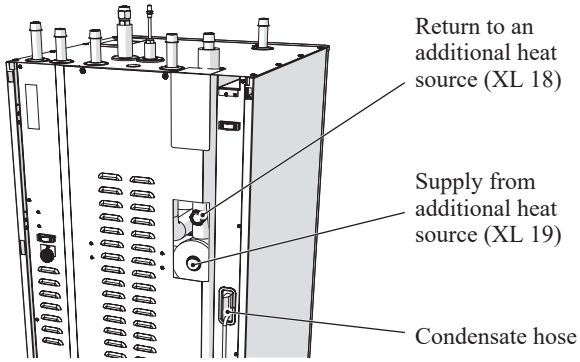
Then install the Cut-off valves, circulation pump and strainer.

Connection of external heat source

HSB60/100-W

External heat source, e.g. a gas or oil boiler or electric heater, can be connected on supply line of heating system (XL1).

HMA60/100-W



An external heat source with a maximum power of 15 kW, e.g. a gas or solid fuel boiler, can be connected to the back of the HMA unit after removing the plate blocking access to the connection sockets (picture above). See subsection System diagram.

Refrigerant circuit

Connecting refrigerant pipes

See Installation manual for outdoor unit.

Piping insulation

Install insulation on all piping in order to avoid condensation during cooling operation.

It is also strongly recommended to insulate piping for heating only application in order to avoid getting burned or reducing the heating capacity.

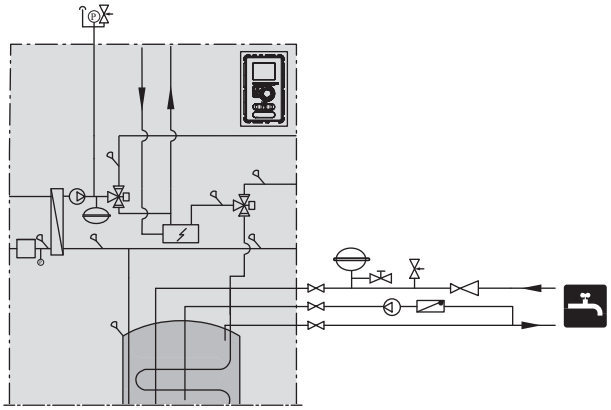
The thickness of the insulation should be 20mm where the relative humidity exceeds 70%.

DHW circulation

NOTE

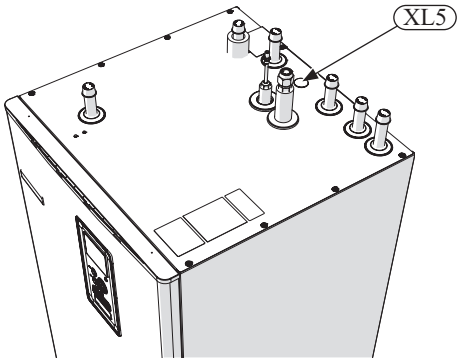
If connection AA3: X7 is used for another purpose, an additional AXC 30M is required to connect the hot water circulation pump control.

The HMA have possibility to connect DHW circulation. The circulation connection (XL5) is located at the top of the tank.

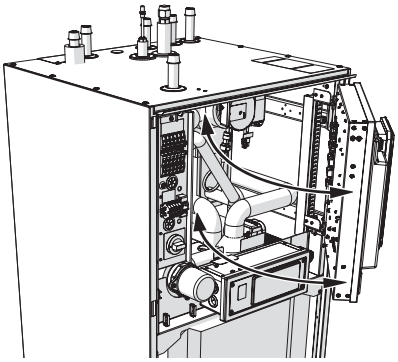


To connect the circulation:

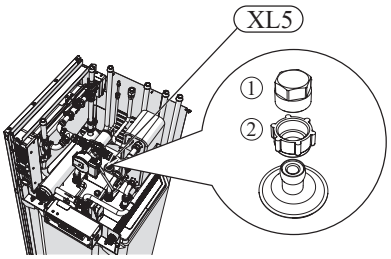
1. Remove the XL5 plug from the top of the housing.



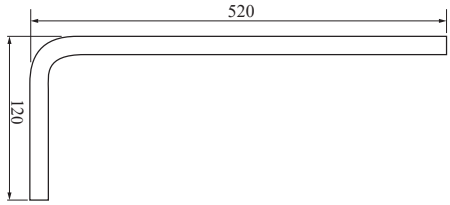
2. Remove the front panel, then move the control box to the right to gain access, to the hydraulic connections.



3. Remove the plug from the circulation pipe (XL5).
4. Install the elbow (not included in the HMA device) facing the rear housing, on the circulation pipe.



5. Connect the pipe to the elbow, with the dimensions shown in the figure below, leading pipe in the top of the housing, in place of the XL5 plug.
6. Install the circulation pump on the pipe outlet of the HMA device, and then connect its control to the controller or AA5 card.
7. Install the control box and the front panel.

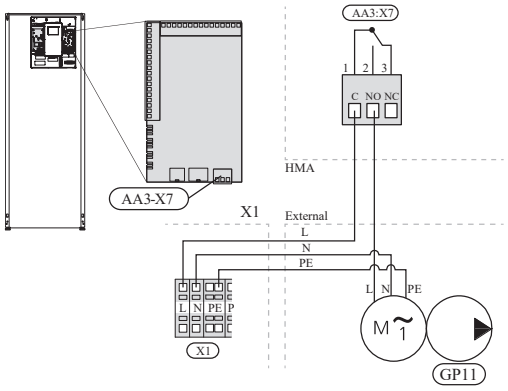


Dimensions of the pipe for circulation

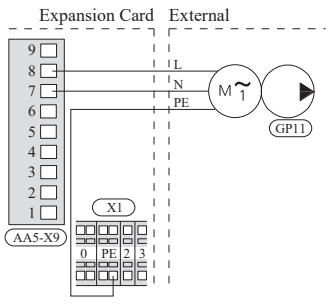
Elbow 15x15

Connecting the control of the hot water circulation pump
The hot water circulation pump can be connected in two configurations:

- to board AA3: X7 (potential free relay; max. 2 A), on terminal block AA3-X7: NO (230 V), and N and PE on terminal block X1.



- in case AA3:X7 output is already in use, to accessory board AA5 (not included in HMA) on block AA5-X9:8 (230 V), AA5-X9:7 (N) and X1:PE



See the AXC30M installation manual for more information.

Dockings

General

Installation requirements

Hydrolution can be connected in several different ways, some of which are shown on the following pages.

	HSB60-W HMA60-W HMS60-W	
	FDCW60VNX-A	FDCW60VNX-W
Max pressure, climate system	0.25 MPa (2.5 Bar)	
Highest recommended supply/return temperature	55/45°C	
Max temperature, climate system	65 °C	
Max temperature in indoor unit	65 °C	
Max temperature from external heat source	65 °C	
Max supply temperature with compressor at outdoor temp -20°C	58 °C	
Min supply temp. cooling	7 °C	
Max supply temp. cooling	25 °C	
Min volume, climate system during heating, cooling	50 L	
Min volume, climate system during underfloor cooling	80 L	
Max flow, climate system	0.29 L/s	0.29 L/s
Min flow, climate system, at 100% circulation pump speed	0.12 L/s	0.09 L/s
Nominal system flow heating (ΔT=5K)	0.29 L/s (6.0kW, 7/45°C)	0.29 L/s (6.0kW, 7/45°C)
Nominal system flow cooling (ΔT=5K)	0.28 L/s (5.8kW, 35/7°C)	0.29 L/s (6.0kW, 35/7°C)

	HSB100-W HMA100-W HMS100-W		
	FDCW71VNX-A	FDCW71VNX-W	FDCW100VNX-A
Max pressure, climate system	0.25 MPa (2.5 Bar)	0.25 MPa (2.5 Bar)	0.25 MPa (2.5 Bar)
Highest recommended supply/return temperature	55/45°C	55/45°C	55/45°C
Max temperature, climate system	65 °C	65 °C	65 °C
Max temperature in indoor unit	65 °C	65 °C	65 °C
Max temperature from external heat source	65 °C	65 °C	65 °C
Max supply temperature with compressor at outdoor temp -20°C	58 °C	60 °C	58 °C
Min supply temp. cooling	7 °C	7 °C	7 °C
Max supply temp. cooling	25 °C	25 °C	25 °C
Min volume, climate system during heating, cooling	50 L	50 L	80 L
Min volume, climate system during underfloor cooling	80 L	80 L	100 L
Max flow, climate system	0.38 L/s	0.38 L/s	0.57 L/s
Min flow, climate system, at 100% circulation pump speed	0.19 L/s	0.19 L/s	0.29 L/s
Nominal system flow heating (ΔT=5K)	0.38 L/s (8kW, 7/45°C)	0.38 L/s (8kW, 7/45°C)	0.43 L/s (6kW, 7/45°C)
Nominal system flow cooling (ΔT=5K)	0.34 L/s (7.1kW, 35/7°C)	0.34 L/s (7.1kW, 35/7°C)	0.38 L/s (5.8kW, 35/7°C)

External circulation pump must be used when the pressure drop in the system is greater than the available external pressure. In such cases, a bypass line with non-return valve must be installed.
Use an overflow valve if system flow cannot be guaranteed.

Symbol key

Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Control valve
	Safety valve
	Temperature sensor
	Expansion vessel
	Pressure gauge
	Circulation pump
	Shunt / shuttle valve
	Fan

Docking alternatives

Heating system can be constructed in several different ways combining indoor unit, tank, control unit and other accessories.

In the system example shown on the following page, heating, hot water as well as cooling operation are available.

Additional heating is helpful on the cold day of the year as the energy from the air is reduced. It is also recommended as back-up in case the heat pump operation is blocked for any reason (e.g. ambient temperature exceeds the operation limit of heat pump).

NOTE

The heating medium side and the hot water side must be fitted with the necessary safety equipment in accordance with the applicable regulations.

This is the outline diagram. Actual installations must be planned according to applicable standards.

For HSB60/100-W, proceed to page 39.

For HMA60/100-W, proceed to page 41.

For HMS60/100-W, proceed to page 43.

Explanation

AA25 Controller

BT1	Outdoor sensor[1)]
BT6	Temperature sensor, hotwater charging[1)]
BT7	Temperature sensor, hot water top[1)]
BT25	Temperature sensor, external supply line[1)]
BT50	Room sensor[1)] (Not included in RC-HY20-W)
BT63	Temperature sensor, external supply line after electric heater[1)] (Not included in RC-HY20-W)
BT71	Temperature sensor, external return line[1)]
GP10	Circulation pump, Heating medium
QN10	Reversing valve, Hot water/Heating medium[2)]

EB1 Additional heat

EB1	Immersion heater[3)]
KA1	Auxiliary relay/Contactor[2)]
K1A-K3A	Contactors for immersion heater[3)]

EB101 Heat pump system

BP4	Pressure sensor, condenser[1)]
BT3	Temperature sensor, return line[1)]
BT12	Temperature sensor, condenser supply line[1)]
BT15	Temperature sensor, fluid pipe[1)]
EB101	Heat pump
FL10	Safety valve[3)]
GP12	Charge pump[2)]
HQ1	Particle filter[1)]
HS1	Particle filter, refrigerant system[1)]
QM1	Drain valve, Heating medium
QM31	Shut-off valve, Heating medium, Flow
QM32	Shut off valve, Heating medium, Return
QM43	Shut-off valve

EQ1 Cooling system

BT64	Temperature sensor, cooling supply line[2)]
CP6	Single jacket accumulator tank, cooling
GP13	Circulation pump, cooling
QN12	Reversing valve, Cooling/Heating[2)]

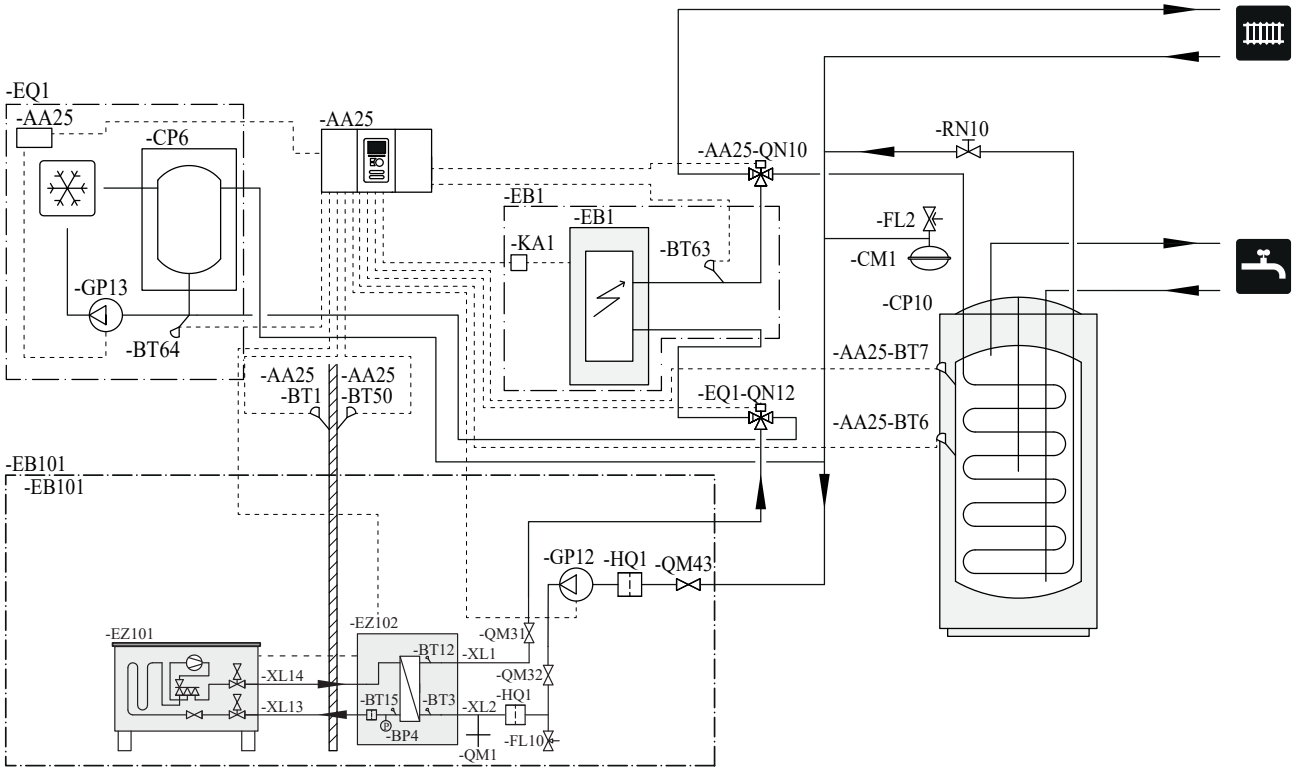
Miscellaneous

CM1	Expansion vessel closed, Heating medium[3)]
CP5	Buffer vessel
CP10	Accumulator tank with hotwater heating
EB20	Immersion heater
FL2	Safety valve, Heating medium
KA1	Auxiliary relay/Contactor
RN10	Trim valve

1) Included in HSB, HMA, HMS or RC-HY
2) Included in HMA, HMS or supplied with accessory
3) Included in HMA or HMS

HSB60/100-W

Installation with indoor unit HSB60/100-W, tank PT300/500, controller RC-HY20/40-W with step controlled additional heat before reversing valve for hot water and cooling function (4 pipe system)



NOTE

Not all components are shown in this outline diagram.

Controller (AA25) starts and stops the heat pump (EB101) to meet the heating and hot water demand.

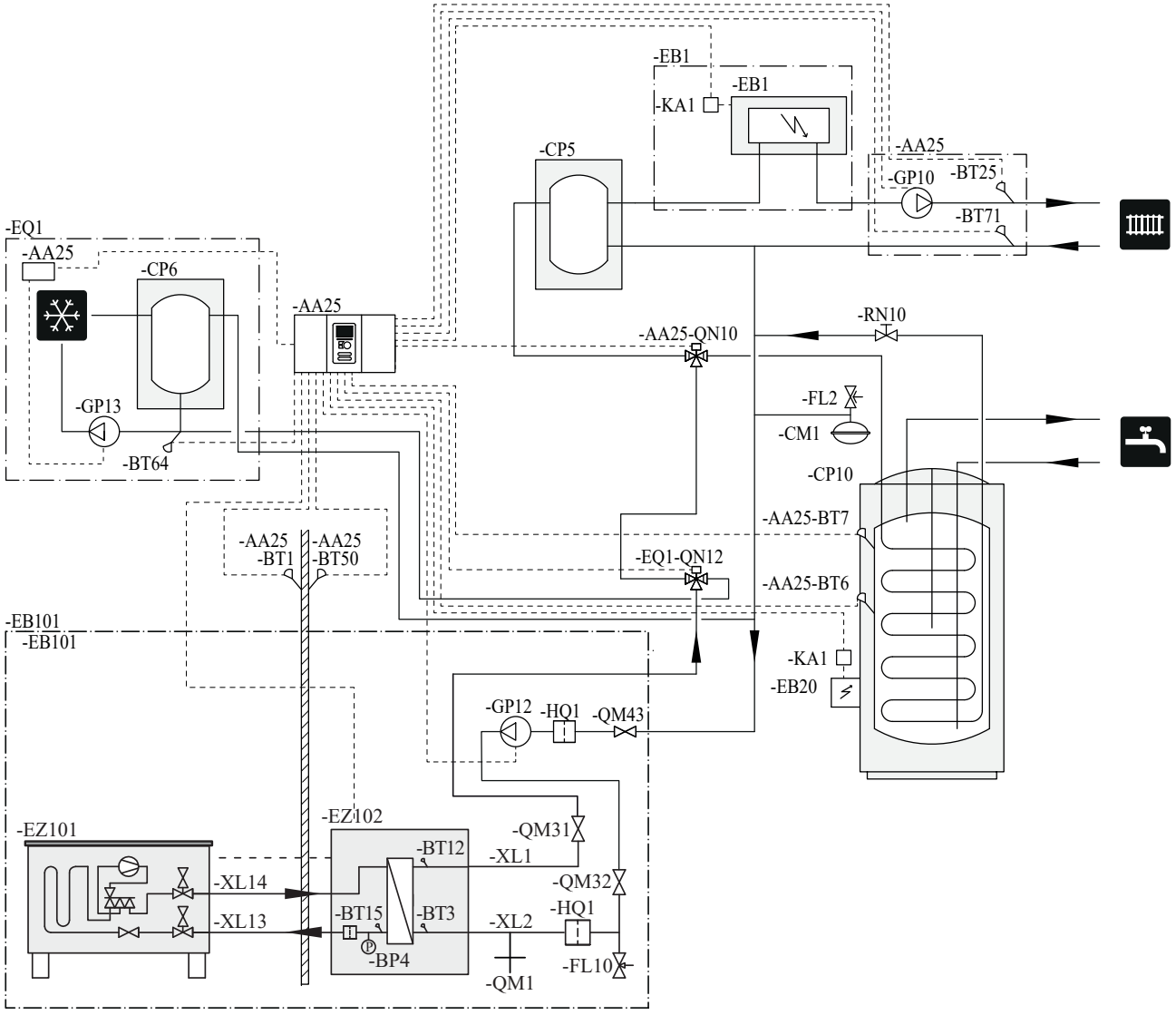
At simultaneous heating and hot water demand, the reversing valve (AA25-QN10) switches periodically between the climate system and the water heater/accumulator tank (CP10). When the hot water heater/accumulator tank is fully charged, the reversing valve switches to the climate system.

Additional heat (EB1) is turned on automatically when the heating demand exceeds the heat pump capacity. This is used for both heating and charging hot water.

The additional heat can also be used for water heater when a higher temperature is required than the heat pump can produce.

During cooling operation, the reversing valve (EQ1-QN12) switches to the cooling system (EQ1). If several simultaneous demands occur while there is a cooling demand, the system reacts differently. In the event of a hot water demand, the reversing valve switches back and hot water is produced until the demand is fulfilled. In the event of a heating demand, the reversing valve switches periodically between cooling and heating. If the cooling demand is met, the reversing valve switches back to basic mode (heating/hot water).

Indoor unit HSB60/100-W, tank PT300/500, controller RC-HY20/40-W with step controlled additional heat after reversing valve for hot water and cooling function (4 pipe system)



NOTE

Not all components are shown in this outline diagram.

This installations alternative is suitable for more complex installations with a focus on comfort.

Controller (AA25) starts and stops the heat pump (EB101) to meet the heating and hot water demand of the installation.

At simultaneous heating and hot water demand the reversing valve (AA25-QN10) switches periodically between the climate system and the water heater/accumulator tank (CP10). When the hot water heater/accumulator tank is fully charged, the reversing valve switches to the climate system.

Additional heat (EB1) is turned on, automatically when the heating demand exceeds the heat pump capacity.

Immersion heater (EB20) in the water heater/accumulator tank is used during the time to produce hot water if the heat pump is used for heating at the same time.

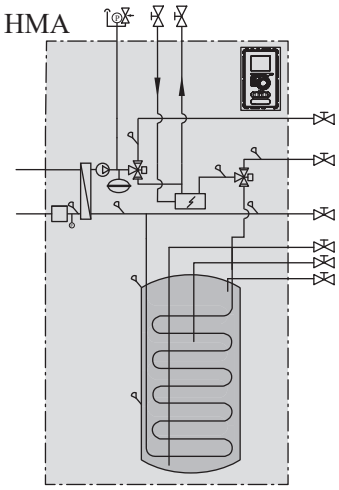
The immersion heater (EB20) can also be used if a higher temperature of hot water is required than the heat pump can produce.

During cooling operation, the reversing valve (EQ1-QN12) switches to the cooling system (EQ1). If several simultaneous demands occur while there is a cooling demand, the system reacts differently. In the event of a hot water demand, the reversing valve switches back and hot water is produced until the demand is fulfilled. In the event of a heating demand, the reversing valve switches periodically between cooling and heating. If the cooling demand is met, the reversing valve switches back to basic mode (heating/hot water).

HMA60/100-W

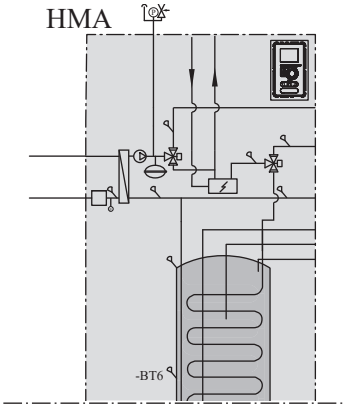
Docking the indoor unit

The HMA unit is not equipped with a shut-off valve for the central heating system, it must be installed on the outside of the indoor unit to allow any future servicing.



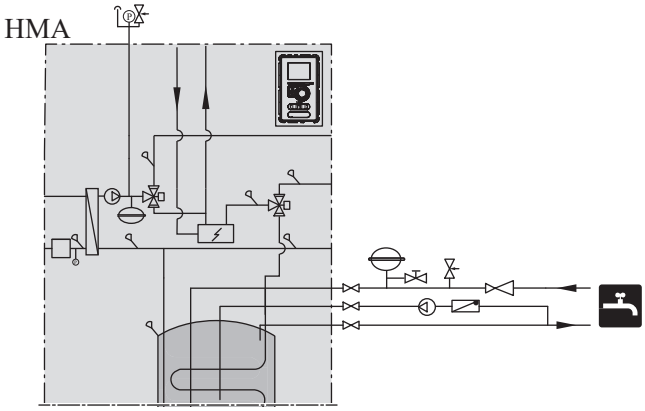
Docking without heat pump

It is not necessary to change the configuration of the hydraulic connections for the indoor unit to work independently without the outdoor unit. The unit is equipped with an additional heater that can be used as the main heat source when there is no outdoor unit.



Connecting cold and hot water

The hot water tank should be connected to a water supply system with water pressure of min. 1 bar, max. 10 bar. If the pressure at the cold water inlet to the tank is higher than the permissible level, use a pressure reducer. During heating of the water in the tank, the pressure increases, which is why each tank must be equipped with the appropriate safety valve, installed on the cold water supply, which will protect the tank against an excessive increase in pressure. If using hot water circulation, see subsection “Hot water circulation”.



NOTE

It is absolutely necessary to install a properly selected safety valve on the cold water supply pipe.

NOTE

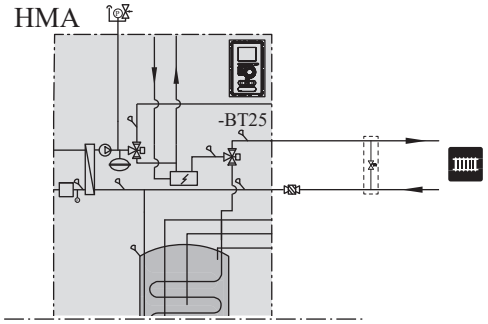
Do not use the appliance if the safety valve is blocked / damaged.

NOTE

It is forbidden to install any constrictors (e.g. reducers, particle filter, etc.) and shut-off valves between the storage tank and the safety valve. Only fitting a tee with a draining valve and a tee with an expansion vessel is permitted.

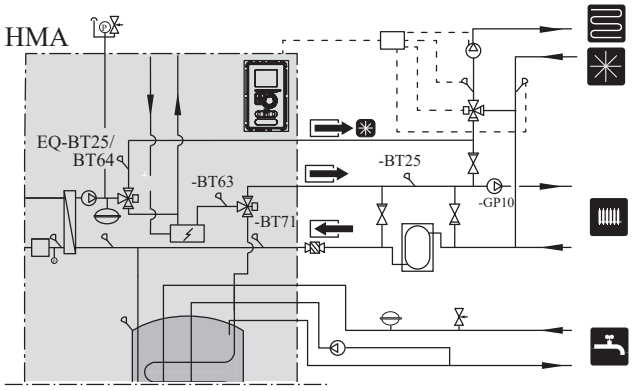
Docking the climate system

When connecting to a system with thermostatic valves on all radiators/underfloor heating circuits, use the appropriate hydraulic solutions which ensure the proper heating medium volume and minimum, undisturbed flow. See the subsection “Buffer vessel”.



Connecting the 2-pipe cooling operation system

In the 2-pipe cooling operation system, the sensor BT64 / EQ-BT25 assumes the function of sensor BT25. Degree minutes are counted according to EQ-BT25. The BT25 sensor should be moved to the installation according to the diagram.

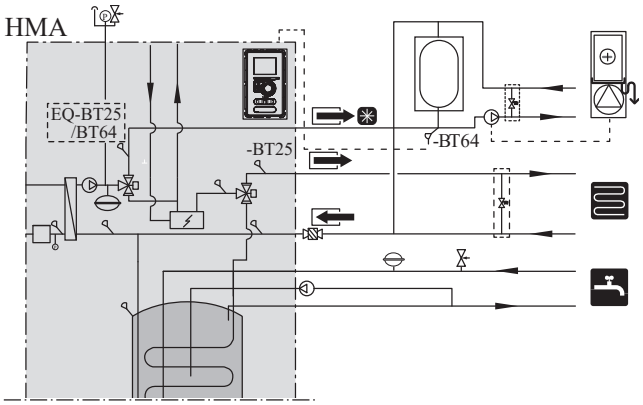


NOTE

The hydraulic system should be suitable for heating and cooling and have appropriate thermal insulation (allowed for cooling).

Connecting the 4-pipe cooling operation system

The 4-pipe system requires an additional cooling buffer vessel. Sensor BT64 must be transferred to the buffer vessel. Degree minutes for heating are counted according to BT25. Degree minutes for cooling operation are counted according to BT 64.

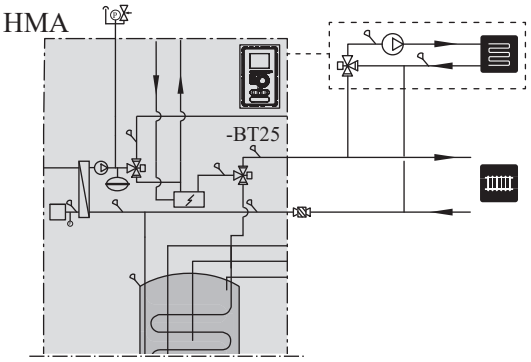


NOTE

The heat pump should have cooling insulation and working in an intermittent mode.

Docking an additional climate system

The system can be expanded to include additional heating/cooling circuits, provided an additional accessory board is used. Once the AXC 30M card or ready-to-use ECS 41M kit has been put into use, an additional heating/cooling circuit can be activated using the controller.



Additional accessories and the connection options and methods for these are described in the instructions for AXC 30M and ECS 41M.

System diagram

The HMA indoor unit is equipped with a storage tank with a hot water coil, expansion vessel, safety group, electric additional heat, reversing valves, plate heat exchanger, energy meter, electronic circulation pump and controller.

Combined together with the hydrolution outdoor air heat pump unit, it forms a complete climate system.

The FDCW outdoor unit supplies thermal energy for heating domestic water, powering the climate system, heating swimming pools and cooling operation, using free energy contained in the air outside, working efficiently in the low temperature range, as low as -20°C.

The connection of the outdoor unit and the indoor unit HMA, with a system of pipes filled with refrigerant, protects the connection against freezing in the event of interruptions in the electric power supply to appliances. The system's operations are controlled using an advanced controller.

The control mechanism of HMA allows for two cooling operation systems to be used:

• 2-pipe cooling system,

• 4-pipe cooling system.

CAUTION

HMA is equipped with all temperature sensors as standard. In some system layouts, the sensors must be transferred to other parts of the system. For location of the sensors, see the relevant point on docking the system.

CAUTION

In the event that the water volume of the central heating system is increased using a buffer vessel, you will need to check the system volume and possibly increase the volume of the existing expansion vessel.

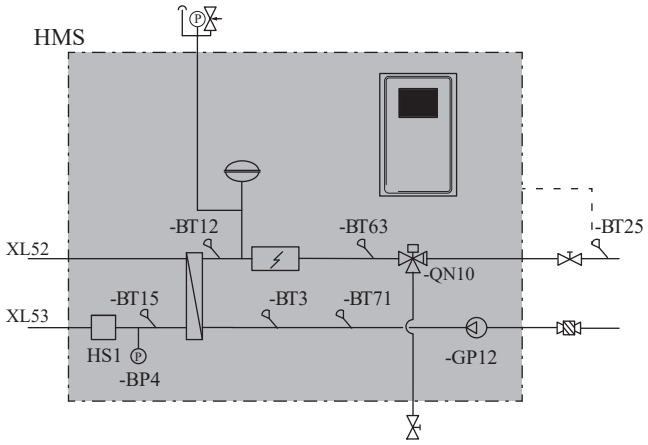
HMS60/100-W

NOTE

Temperature sensor BT25 is included with the device. It should be installed on the installation in accordance with the guidelines in the following section.

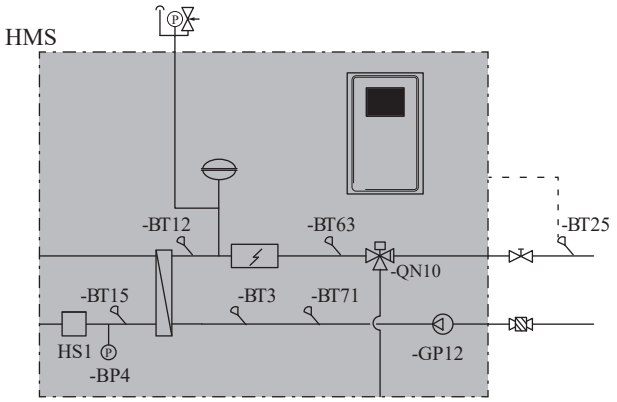
Docking the indoor unit

The HMS unit is not equipped with a shut-off valve for the central heating system, it must be installed on the outside of the indoor unit to allow any future servicing.



Docking without heat pump

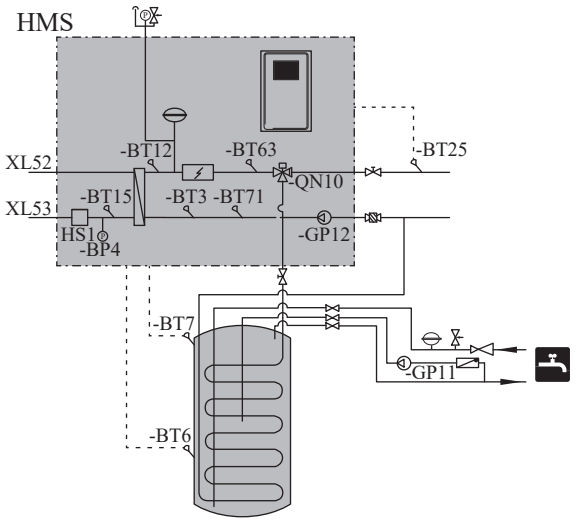
No change of hydraulic connection configuration is necessary to ensure operation of the indoor unit independently from the outdoor unit. The device is equipped with additional heater that may be used as the main heat source in the case of absence of outdoor unit.



Connecting cold and hot water

The HMS unit should be connected to the exchanger in the external hot water tank for domestic hot water. The exchange area of the exchanger is very important when selecting it. The sensors BT6 and BT7 should be placed in the appropriate places. BT7 sensor in the place that will show the highest temperature in the tank. Whereas the BT6 sensor in 1/3−1/2 of the coil height measured from the lower extreme point. The location of the sensors is shown in the domestic hot water connection diagram. DHW tank should be connected to a water

system with a water pressure recommended by the tank manufacturer. If the pressure at the inlet of cold water to the tank is higher than allowed, use a pressure reducer. When heating the water in the tank, the pressure increases, therefore each tank must be equipped with a suitable safety valve, installed on the cold water inlet, which will protect the DHW tank against excessive pressure build-up. In the case of using DHW circulation see section “Hot water circulation”.



NOTE

The location of the BT6 sensor should be selected based on the design of the domestic hot water tank used.

NOTE

It is absolutely necessary to install a properly selected safety valve on the cold water supply pipe.

NOTE

Safety valve for the HW storage tank must be fitted as recommended by the storage tank manufacturer and applicable regulations.

NOTE

Do not use the appliance if the safety valve is blocked / damaged.

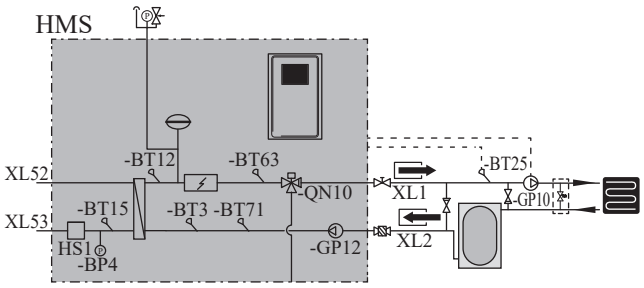
NOTE

It is forbidden to install any constrictors (e.g. reducers, particle filter, etc.) and shut-off valves between the storage tank and the safety valve. Only fitting a tee with a draining valve and a tee with an expansion vessel is permitted.

Docking the climate system

When connecting to a system with thermostatic valves on all radiators/underfloor heating circuits, use the appropriate hydraulic solutions which ensure the proper heating medium volume and minimum, undisturbed flow.

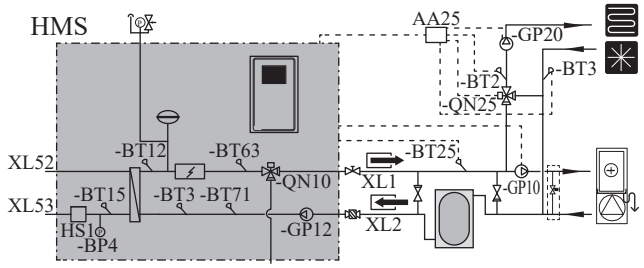
The unit comes with a BT25 sensor that must be installed on an external supply pipeline at a distance of min. 1 m from HMS along the pipeline. However, in the case of a system equipped with a buffer, the BT25 sensor should be installed in the buffer or in a place ensuring the correct reading of the supply temperature to the heating system. In the case of installation with a buffer in a parallel system, it is recommended to move the BT71 sensor to the bottom of the buffer.



Connecting the 2-pipe cooling operation system

In the 2-pipe cooling degree minutes are counted according to BT25.

The principle of a 2-pipe system is to use the same circuit for cooling and/or heating (2-pipe cooling diagram). When cooling is activated, cooling works by default in the system 2-pipe.

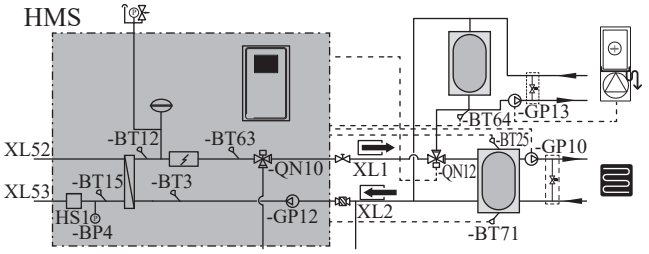


NOTE

The hydraulic system should be suitable for heating and cooling and have appropriate thermal insulation (allowed for cooling).

Connecting the 4-pipe cooling operation system

The operating principle of the 4-pipe system is to use separate heating and cooling circuits. In the 4-pipe system, a cooling tank is required. The BT64 sensor should be placed in the buffer vessel or on the cooling flow pipeline. Degree minutes for heating are counted according to BT25. Degree minutes for cooling operation are counted according to BT 64. BT64 is connected at the AUX inputs. Selection of the 4-pipe system can be found in the SERVICE section, menu 5.2.4.

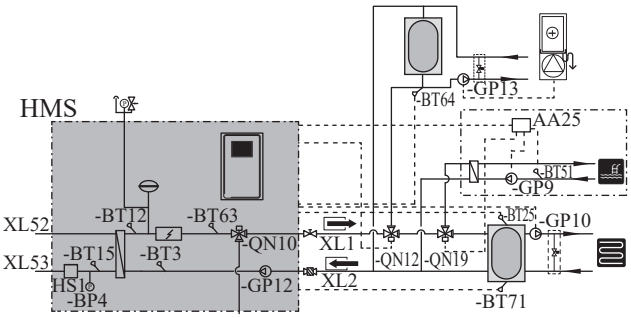


NOTE

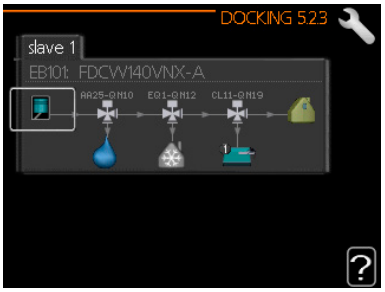
The heat pump should have cooling insulation and working in an intermittent mode.

Connecting the 4-pipe cooling operation system and pool heating

In case the installation in the building requires 4-pipe cooling and pool heating, the controller allows it to be implemented according to the following hydraulic diagram (QN12 valve must be installed before QN19 valve)



and the scheme according to menu 5.2.3:

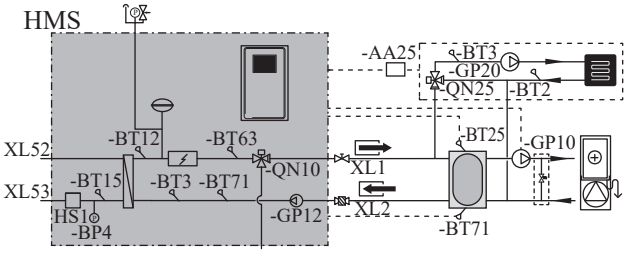


The connection of the QN19 valve is described in the manual of the POOL 40M accessory.

For connection of the QN12 valve see section “Connection of the QN12 valve”.

Docking an additional climate system

The system can be expanded to include additional heating/cooling circuits, provided an additional accessory card is used. Once the AXC 30M card or ready-to-use ECS 40M / ECS 41M kit has been put into use, an additional heating/cooling circuit can be activated using the controller.



System diagram

The HMS indoor unit together with the hydrolution air source heat pump outdoor unit provides a complete climate system. The FDCW outdoor unit provides thermal energy for heating domestic water, powering the heating system, heating swimming pools and cooling using free energy contained in the outside air, working efficiently in the range of low temperatures down to -20°C.

The connection of the outdoor unit, hot water tank and the indoor unit HMS, with a system of pipes filled with refrigerant, protects the connection against freezing in the event of interruptions in the electric power supply to appliances. The system’s operations are controlled using an advanced controller.

CAUTION

HMS is equipped with all temperature sensors as standard. The BT25 sensor must be installed on its own in the external pipeline, and in some systems the sensors must be moved to other parts of the system. For location of the sensors, see the relevant point on docking the system.

CAUTION

In the event that the water volume of the central heating system is increased using a buffer vessel, you will need to check the system volume and possibly increase the volume of the existing expansion vessel.

NOTE

In the installation before the HMS, a particle filter dedicated for heating installations should be used. The filter will protect the unit against pollution.

Electrical installation

General

HSB60/100-W

Indoor unit must be installed via an isolator switch in accordance with the local codes and regulations.

- Disconnect the indoor unit, outdoor unit and control unit before insulation testing of the house wiring.
- If the building is equipped with an earth-fault breaker, Hydrolution should be equipped with a separate one.
- For the electrical wiring diagram, see page 123-133.
- Do not lay communication, sensor or signal cables for external connection close to high voltage lines.
- Minimum cross section of communication, sensor or signal cables for external connection must be 0.5mm^2 up to 50 m, for example EKKX, LiYY or equivalent.
- Use screened three core cable for communication between controller (RC-HY20/40-W) and indoor unit (HSB60/100-W).
- When laying cables into indoor units and controllers, be sure to route the cable grommet (UB1 AND UB2).
- Be careful to route cables not to be damaged by metal edge or trapped by panels.

NOTE

Electrical installation and service must be carried out under the supervision of a qualified electrician.

Turn off the circuit breaker before carrying out any servicing.

Electrical installation and wiring must be carried out in accordance with the stipulations in force.

Make sure to turn off the power supply during installation.

NOTE

Do not turn on the power on control until the boiler is filled with water.

The circulation pump and immersion heater may become damaged.

NOTE

If the power supply cable is damaged, only authorised person may replace it to avoid danger or damage.

HMA60/100-W

All electrical equipment, except the outdoor temperature sensor, room sensor and current sensors are already connected at the factory.

- Disconnect the indoor module before performing tests of electrical system insulation in the building.
- If the building is equipped with a differential switch, HMA must be equipped with a separate switch.
- The diagram of indoor module connections can be found in section “Diagram of electrical connections”.
- Do not lay communication and signal cables to external contacts near voltage cables.
- Minimum cross-section of communication and signal cables to external contacts must total 0.5mm^2 with the length of up to 50 m, for example EKKX or LiYY, or similar.
- The power supply cable should be dimensioned according to the current standards.
- Use the UB1 cable grommet (as marked in the illustration) to lead the cables to the HMA. In the UB1 grommet, the cables are routed through the entire indoor unit from the rear wall towards the front.

NOTE

The switch (SF1) for the controller must not be set to “I” or “⚠” until the climate system has been filled with heating medium and vented. Otherwise, the thermal circuit breaker, thermostat and the electric additional heat may be damaged.

NOTE

Cut off the power using the circuit breaker before carrying out any servicing. Electrical installation must be carried out in accordance with the current regulations by a person with the proper authorisations and qualifications.

NOTE

When SF1 is set to “⚠” - the HMA unit switches the QN10 valve to the central heating and heating takes place according to thermostat BT30. Hot water is not heated while the switch is set to “⚠”.

NOTE

If the system is operating at “⚠” the temperature on BT30 should be aligned with the operating temperature of the central heating system. If the temperature set on the thermostat is too high, it can damage the system.

HMS60/100-W

All electrical equipment, except the outdoor temperature sensor, room sensor are already connected at the factory.

To ensure proper electrical connection:

- Disconnect the power supply of the indoor unit before insulation testing the building wiring.
- If the house is equipped with a residual-current device, HMS must be equipped with a separate residual current breaker.
- For the indoor unit wiring diagram, see section “Electrical wiring diagram”.
- Communication and sensor cables must not be laid close to voltage cables.
- The minimum cross section of the communication and sensor cables to external connections must be 0.5 mm² with a length of up to 50 m, for example EKKX, LiYY or equivalent.
- The power supply cable should be dimensioned according to the current standards.
- Cable lying in HMS should be performed with UB cable grommets (marked on the drawing). In UB1 and UB 2, the cables are laid through the entire indoor unit from the rear wall toward the front wall. UB 3 and UB 4 are the lower cable grommets.

NOTE

The switch (SF1) for the controller must not be set to “I” or “⚠” until the climate system has been filled with heating medium and the central heating system vented. Otherwise, the thermal circuit breaker, thermostat and the electric additional heat may be damaged.

NOTE

Cut off the power using the circuit breaker before carrying out any servicing. Electrical installation must be carried out in accordance with the current regulations by a person with the proper authorisations and qualifications.

NOTE

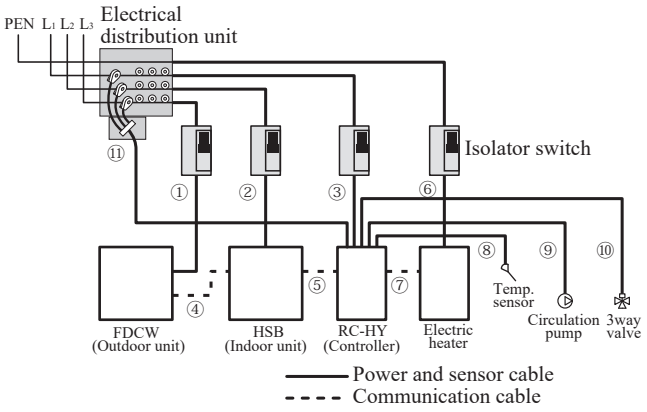
When SF1 is set to “⚠” - the HMS unit switches the QN10 valve to the central heating and heating takes place according to thermostat BT30. Hot water is not heated while the switch is set to “⚠”.

NOTE

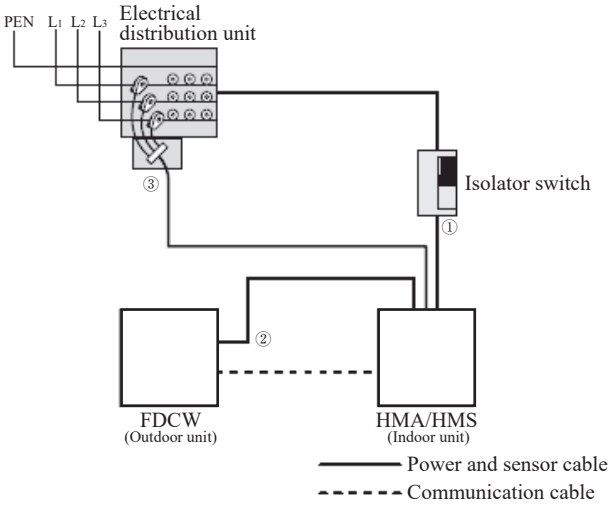
If the system is operating at “⚠” the temperature on BT30 should be aligned with the operating temperature of the central heating system. If the temperature set on the thermostat is too high, it can damage the system.

Principle diagram, electrical installation

HSB60/100-W



HMA60/100-W and HMS60/100-W



Item		Cable size
①	Power - FDCW60VNX-A/-W	3core, 2.0mm^2 (power cable)
	Power - FDCW71VNX-A	3core, 2.5mm^2 (power cable)
	Power - FDCW71VNX-W	3core, 3.5mm^2 (power cable)
	Power - FDCW100VNX-A	3core, 3.5mm^2 (power cable)
②	Power - HSB60-W	3core, 1.5mm^2 (power cable)
	Power - HSB100-W	
③	Power - Controller	3core, 1.5mm^2 (power cable)
④	Outdoor unit - Indoor unit	2core, 1.5mm^2 (communication cable)
⑤	Indoor unit - Controller	3core, 0.5mm^2, LiYY,EKKX or equivalent (communication cable)
⑥	Power - Electrical heater	Selected according to power source voltage (230V/400V). Please refer to installation manual for ELK
⑦	Controller - Electrical heater	4core, 0.5mm^2 (communication cable)
⑧	Controller - Temp sensors	2core, 0.5mm^2 (each sensor)
⑨	Controller - Circulation pump	3core, 0.75mm^2 (power cable) 2core, 0.5mm^2 (communication cable)
⑩	Controller - 3way valve for switching heating/hot water	3core, 0.75mm^2
⑪	Current sensor (RC-HY40-W only)	6core, 0.5mm^2

The cable size shown on the above table is minimum size. Choose appropriate size according to local laws and regulations.

Item	Cable size	
①	Power-Indoor unit	5core, 3.5mm^2 (400V)*1 3core, 10mm^2 (230V)
②	Indoor unit-Outdoor unit	5core, 2.0mm^2 *1 (power/communication cable)
③	Current sensor	6core, 0.5mm^2

*1 FDCW60VNX-A/-W: 2.0mm^2
FDCW71VNX-A: 2.5mm^2
FDCW71VNX-W/FDCW100VNX-A: 3.5mm^2

The cable size shown on the above table is reference value.

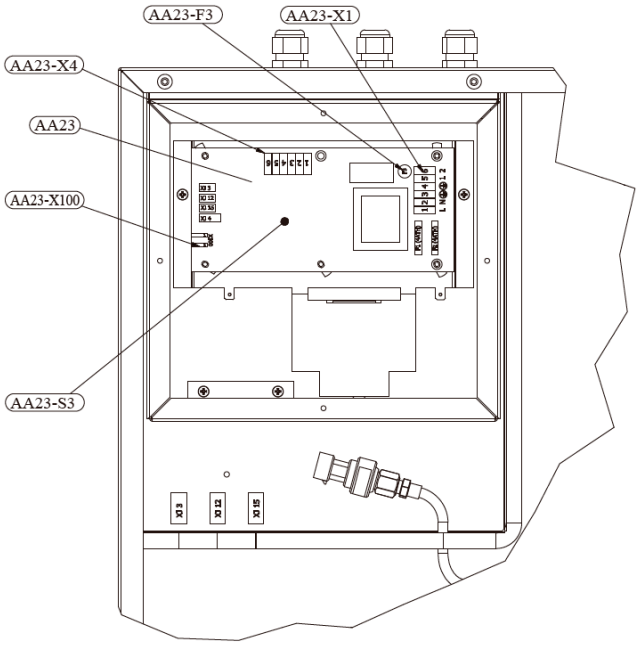
Chose appropriate size according to local laws and regulations.

NOTE

When laying cables into the indoor unit and controllers,
be sure that the cables are groomed to avoid excessive resistance to the terminal blocks.
If there is an excessive resistance applied to the wiring, they may disconnect and damage the unit (short circuit).

Electrical components

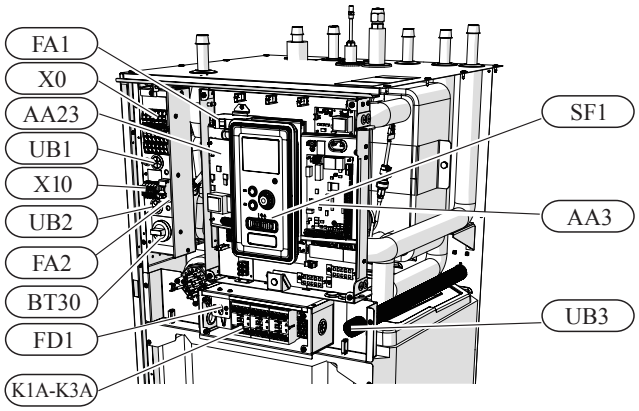
HSB60/100-W

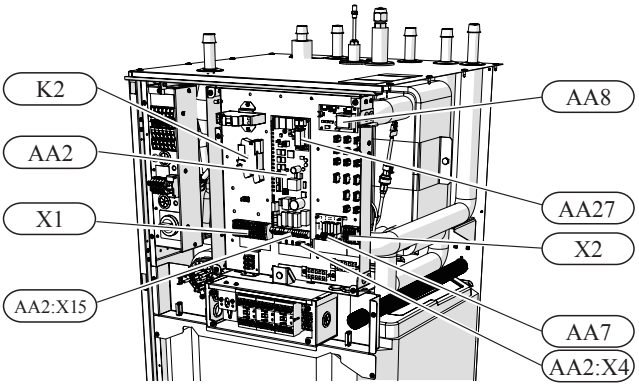


Explanation

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, incoming supply, connection of KVR
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module FDCW

HMA60/100-W

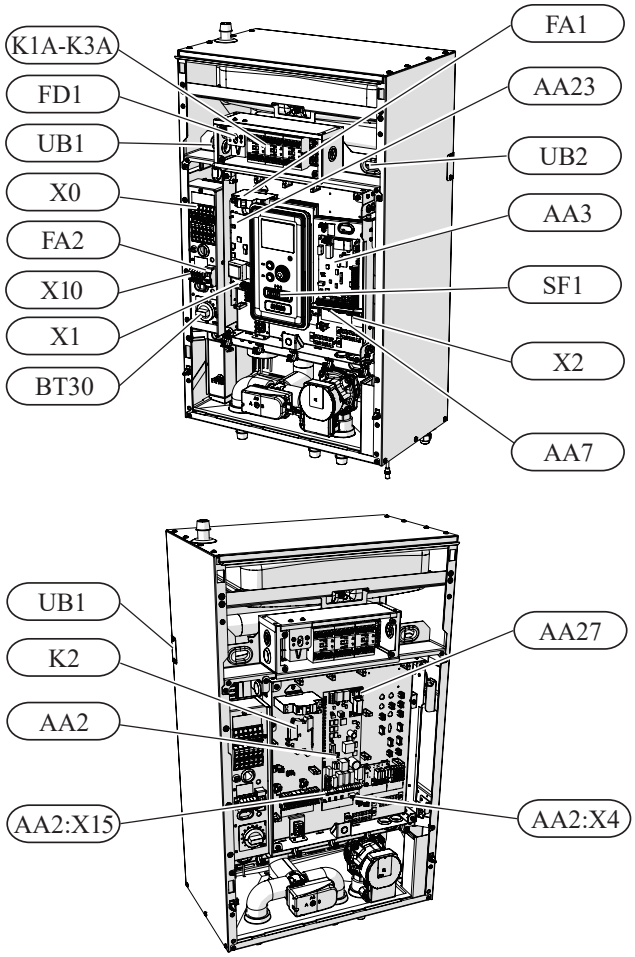




Explanation

X0	Power terminal - 400 V~/230 V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
FA1	Miniature circuit breaker (for the indoor unit)
K1A-K3A	Electric additional heat contactor
BT30	Emergency mode thermostat
AA3	Sensor card
AA23	Communication card
AA7	Relay board
FA2	Miniature circuit breaker (protecting the outdoor unit)
FD1	Thermal circuit breaker STB
UB1-UB3	Cable grommet
K2	Alarm relay
AA2	Main board
AA2:X15	Terminal block - low voltage
AA2:X4	Terminal block - low voltage
AA8	Titanium anode card
AA27	Relay board
SF1	Switch

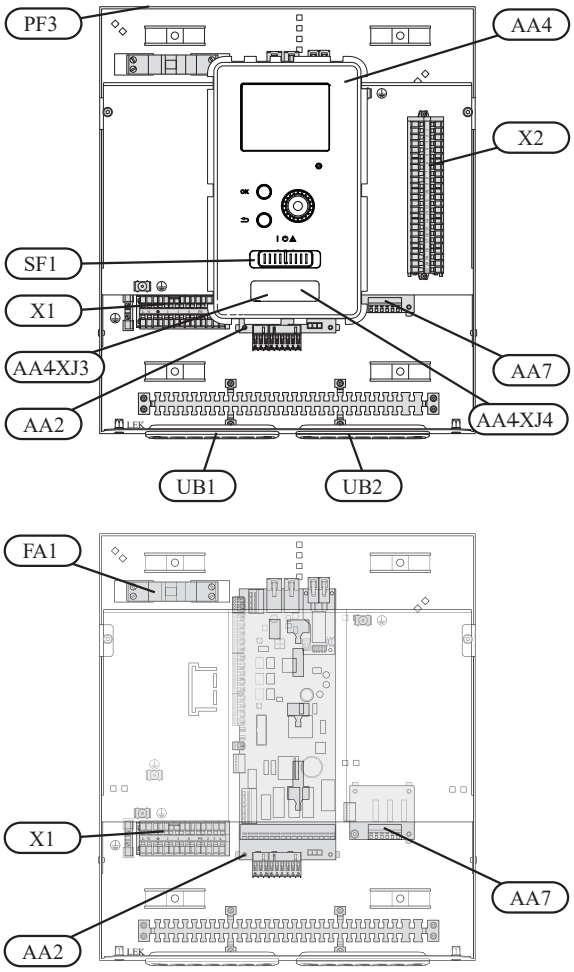
HMS60/100-W



Explanation

X0	Power terminal - 230V~ / 400V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
FA1	Miniature circuit breaker (for the indoor unit)
K1A-K3A	Electric additional heat contactor
BT30	Emergency mode thermostat
AA3	Input board
AA23	Communication card
AA7	Relay board
FA2	Miniature circuit breaker (protecting the outdoor unit)
FD1	Thermal circuit breaker
UB1	Rear left cable grommet
UB2	Rear right cable grommet
K2	Alarm relay
AA2	Main board
AA2:X15	Terminal block - low voltage
AA2:X4	Terminal block - low voltage
AA27	Relay board
SF1	Switch

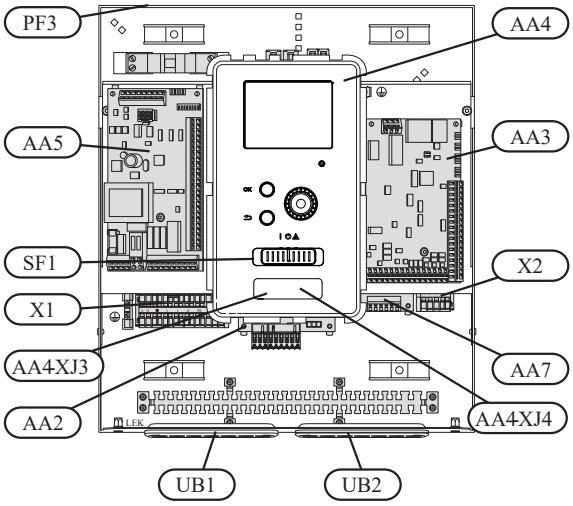
RC-HY20-W

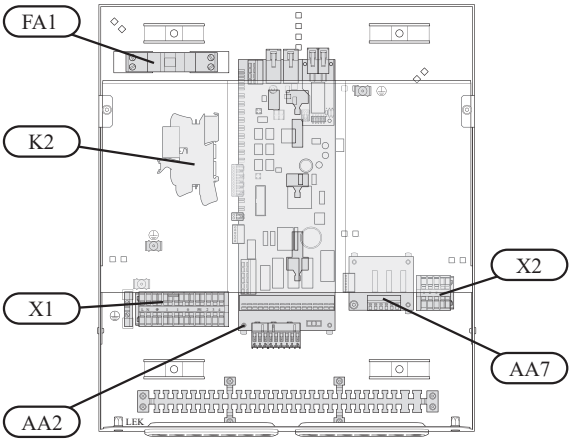


Explanation

AA2	Base card
AA4	Display unit
	AA4-XJ3 USB socket
AA4-XJ4	Service outlet (No function)
AA7	Extra relay circuit board
FA1	Miniature circuit-breaker
X1	Terminal block, incoming electrical supply
X2	Terminal block, control signal circulation pump, sensors AUX inputs and heat pump
SF1	Switch
PF3	Serial number plate
UB1	Cable grommet, incoming supply electricity, power for accessories
UB2	Cable grommet, signal

RC-HY40-W



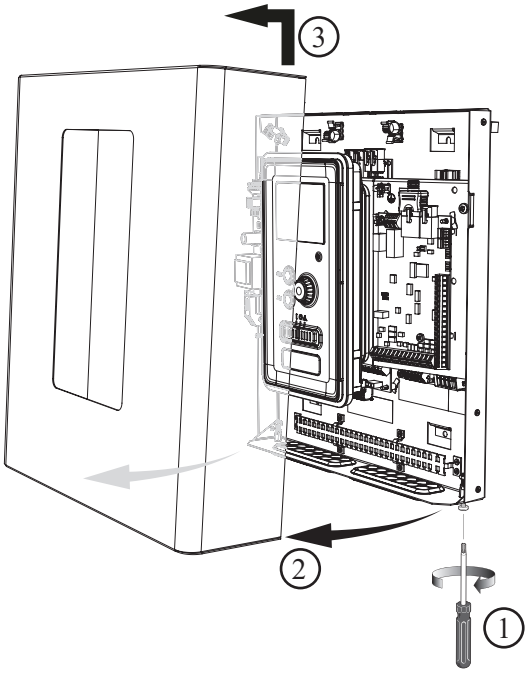


Explanation

AA2	Base card
AA3	Input circuit board
AA4	Display unit
AA4-XJ3	USB socket
AA4-XJ4	Service outlet (No function)
AA5	Accessory card
AA7	Extra relay circuit board
FA1	Miniature circuit-breaker
K2	Emergency mode relay
X1	Terminal block, incoming electrical supply
X2	Terminal block, AUX4 - AUX6
SF1	Switch
PF3	Serial number plate
UB1	Cable grommet, incoming supply electricity, power for accessories
UB2	Cable grommet, signal

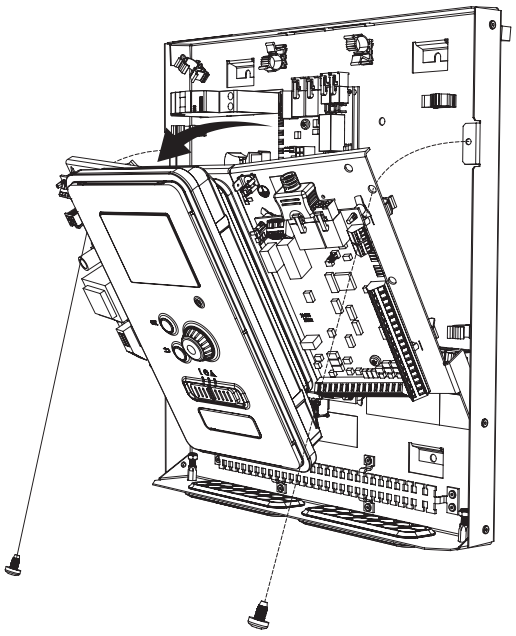
Accessibility, electrical connection for controller

The cover of the control module is opened using a Torx 25 screwdriver. Assembly takes place in the reverse order.

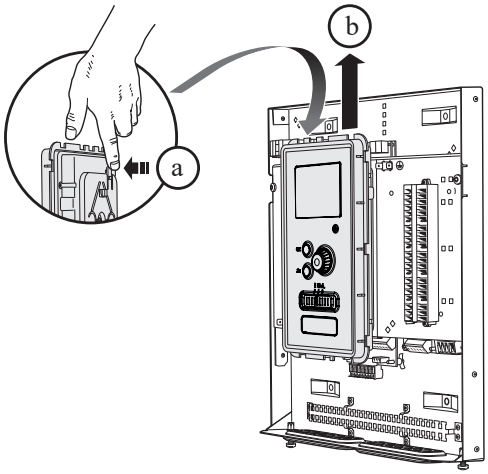


NOTE

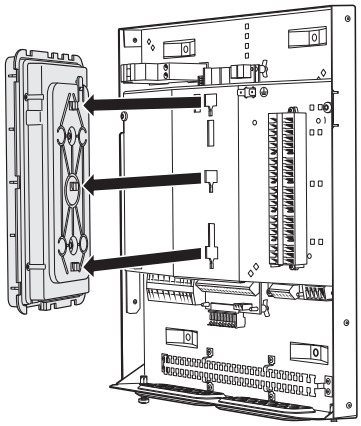
The cover to access the base board is opened using a Torx 25 screwdriver



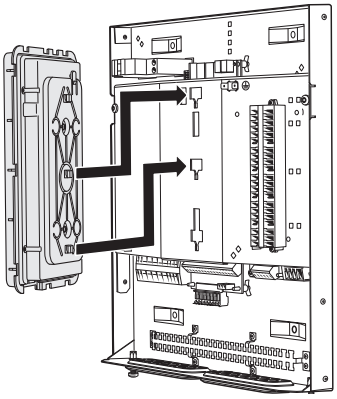
The display may need to be moved for easier access when connecting electrics. This is easily done by following these steps.



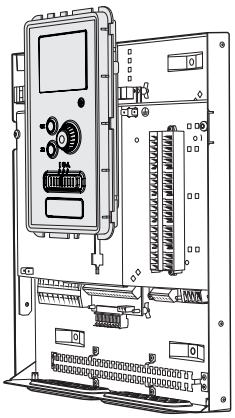
1. Press in the catch on the upper rear side of the display unit towards you (a) and move the display unit upwards (b) so that the mountings unhook from the panel.



2. Lift the display unit from its mountings.



3. Align the two lower mountings on the reverse of the display unit with the two upper holes in the panel as illustrated.



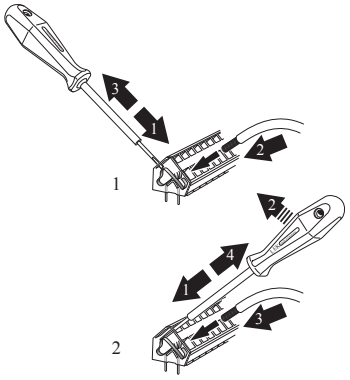
4. Secure the display on the panel.

5. When the electrical connection is ready the display must be reinstalled with three mounting points again, otherwise the front cover cannot be installed.

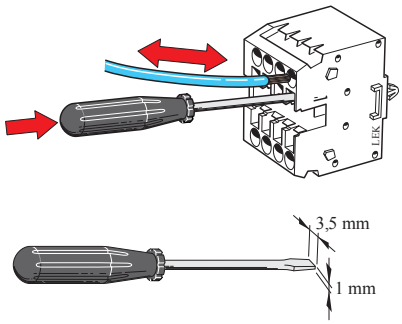
Cable lock

Use a suitable tool to release/lock cables in the terminal block.

Terminal block on the electrical card



Terminal block



Connection

NOTE

To prevent interference, unscreened communication and/ or sensor cables to external connections must not be laid closer than 20 cm from high voltage cables.

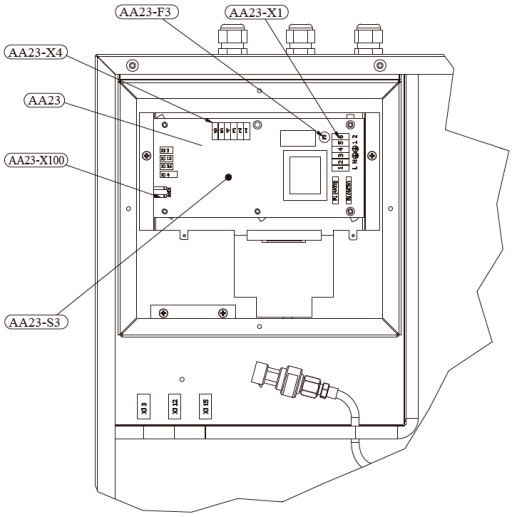
Power supply

Indoor unit

HSB60/100-W

In case of HSB60/100-W, power supply is made to indoor unit, outdoor unit and controller separately. 230V 1AC 50Hz is applied.

For indoor unit, incoming supply is connected on AA23-X1 terminal.



For outdoor unit, incoming supply is connected on TB terminal. See figure on Connection between indoor and outdoor unit.

HMA60/100-W

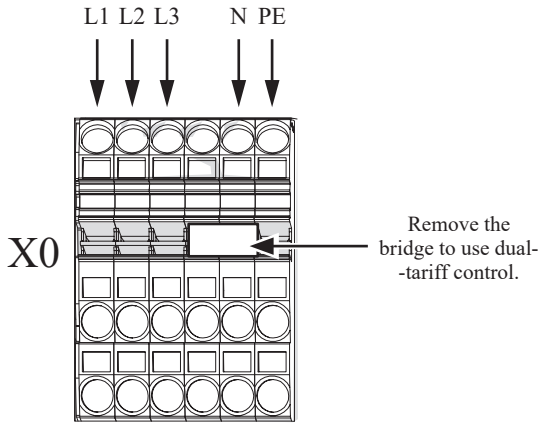
Power supply connection 400 V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1). The cable must be dimensioned according to the applicable standards.

The 400V connection allows for a maximum power of 9kW to the electric additional heat. The connection should be made according to the diagram in the user manual.

Detailed electrical diagram - see subsection “Electrical wiring diagrams”.

Diagram - connecting power supply 400 V



NOTE

If a 400V connection is used, the maximum power of the electric additional heater placed in the HMA unit is 9 kW.

NOTE

In the case of dual-tariff control by the power company, it is recommended to connect the neutral wire from the power circuit (meter).

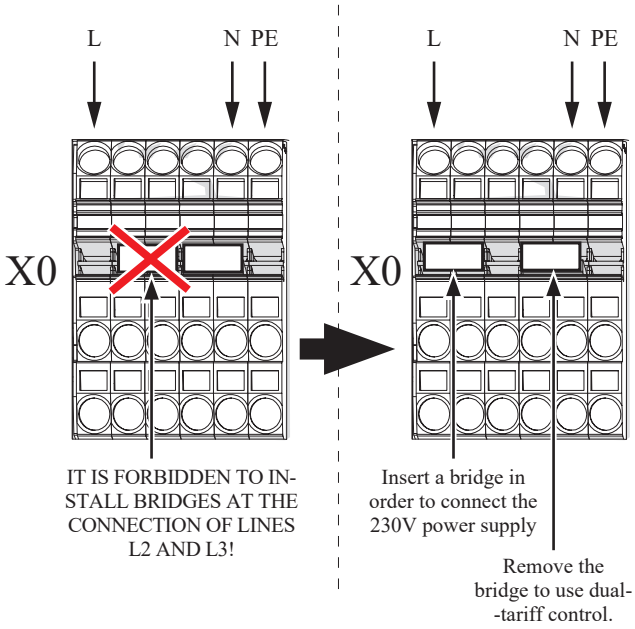
Power supply connection 230 V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1).

The 230V connection allows for a maximum power of 6.0 kW to the additional heating. The connection should be made according to the diagram in the user manual.

Detailed electrical diagram - see subsection “Electrical wiring diagrams”.

Diagram - connecting power supply 230 V



NOTE

When a 230V connection is used, the maximum power of the additional heat used in the HMA unit is 6.0 kW.

NOTE

In the case of a dual tariff power supply by the power company, it is advisable to connect the neutral wire from the power supply circuit (meter) - particularly when using a 230 V connection.

NOTE

It is forbidden to install bridges at the connection of lines L2 and L3. Otherwise, the appliance and the electrical system may be damaged.

The manufacturer is not liable for any damage caused by failure to comply with the above instructions.

HMS60/100-W

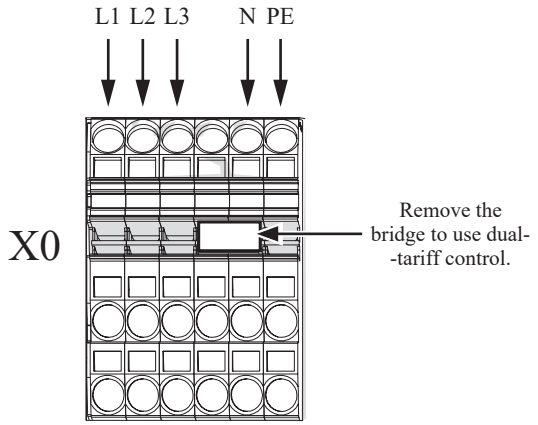
Power supply connection 400V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1, UB2) or through the input on the bottom (UB3, UB4). The cable must be dimensioned according to the applicable standards.

The 400V connection allows for a maximum power of 9kW to the electric additional heat. The connection should be made according to the diagram in the user manual.

Detailed electrical diagram - see subsection “Electrical wiring diagrams”.

Diagram - connecting power supply 400V



NOTE

In the case of dual-tariff control by the power company, it is recommended to connect the neutral wire from the power circuit (meter).

NOTE

When a 400V connection is used, the maximum power of the electric module used in the HMS 60-W / HMS 100-W unit is 9kW.

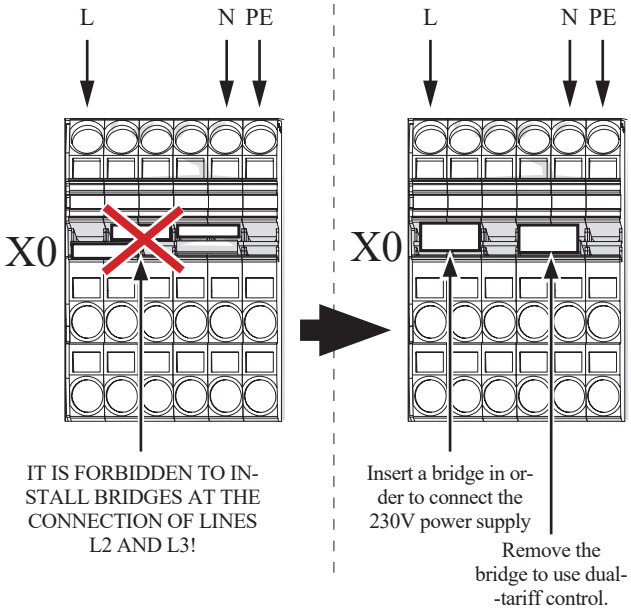
Power supply connection 230V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1, UB2) or through the input on the bottom (UB3, UB4). The cable must be dimensioned according to the applicable standards.

The 230V connection allows for a maximum power of 6.0 kW to the additional heating. The connection should be made according to the diagram in the user manual.

Detailed electrical diagram - see subsection “Electrical wiring diagrams”.

Diagram - connecting power supply 230V



NOTE

When a 230V connection is used, the maximum power of the additional heat used in the HMS 60-W / HMS 100-W unit is 6.0 kW.

NOTE

In the case of a dual tariff power supply, it is advisable to connect the neutral wire from the power supply circuit (meter) - particularly when using a 230 V connection.

NOTE

It is forbidden to install bridges at the connection of lines L2 and L3. Otherwise, the appliance and the electrical system may be damaged.

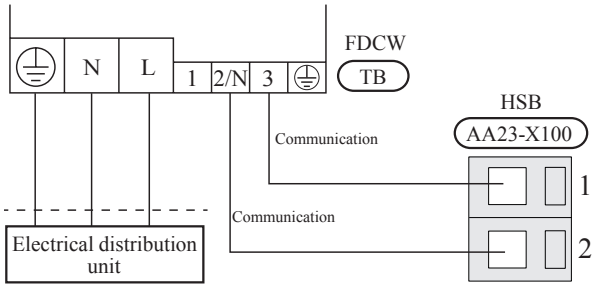
The manufacturer is not liable for any damage caused by failure to comply with the above instructions

Connection between indoor and outdoor unit

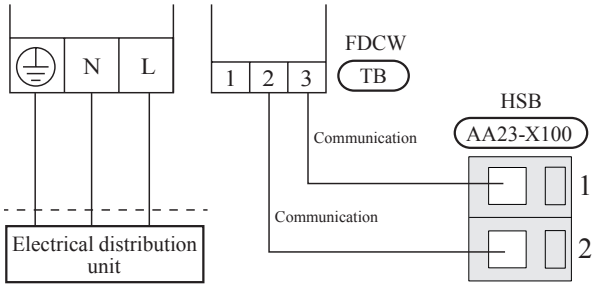
Connecting HSB and FDCW

The communication cable between indoor and outdoor unit is connected between terminal AA23-X100 in indoor unit and TB in outdoor unit. Screened 2 core cable is recommended.

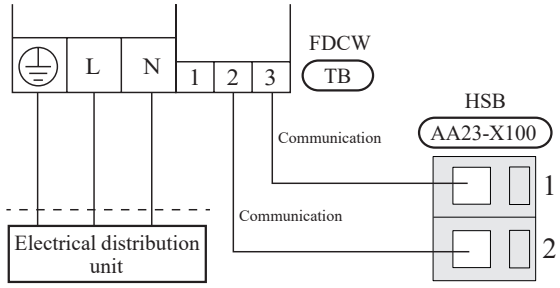
<HSB60-W with FDCW60VNX-A/-W>



<HSB100-W with FDCW71VNX-A/-W>



<HSB100-W with FDCW100VNX-A>



Connecting HMA/HMS and FDCW

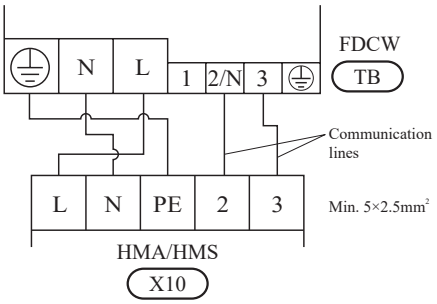
The device connecting cable should be connected to the power supply terminal block (TB) in FDCW and to the terminal block (X10) in HMA.

NOTE

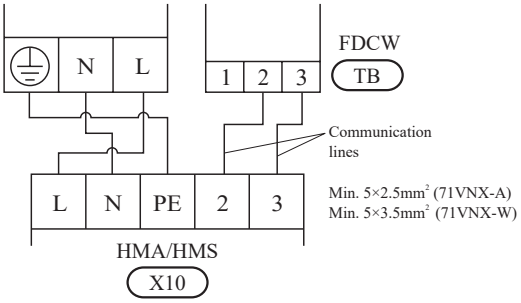
Wiring must be secured so that the terminal block is not under tension. The end of the wire should be 8 mm long without insulation.

Connect the phase (brown), neutral (blue), communication (black and grey) and protective (yellow-green) conductors as shown in the drawing:

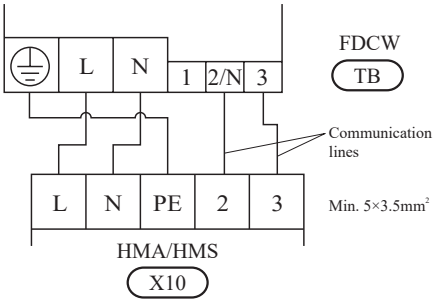
<HMA/HMS60-W with FDCW60VNX-A/-W>



<HMA/HMS100-W with FDCW71VNX-A/-W>



<HMA/HMS100-W with FDCW100VNX-A>



Connection between indoor unit and controller

See Connection for RC-HY20/40-W

Cascade connection setting

In case of cascade connection system, it is necessary to allot unique address to each indoor unit. Set the dip switch S3-1, -2 and -3 according to the following table.

Address	S3:1	S3:2	S3:3
1	OFF	OFF	OFF
2	On	OFF	OFF
3	OFF	On	OFF
4	On	On	OFF
5	OFF	OFF	On
6	On	OFF	On
7	OFF	On	On
8	On	On	On

Recommended fuse size

The recommended fuse size shown in the following table is reference value. Choose appropriate size according to local laws and regulations.

	Recommended fuse size
HSB60-W	6A/230V 1AC 50Hz
HSB100-W	6A/230V 1AC 50Hz
HMA/HMS60-W	32A/230V 1AC 50Hz 25A/400V 3NAC 50Hz
HMA/HMS100-W	40A/230V 1AC 50Hz 25A/400V 3NAC 50Hz
FDCW60VNX-A/-W	20A/230V 1AC 50Hz
FDCW71VNX-A/-W	20A/230V 1AC 50Hz
FDCW100VNX-A	30A/230V 1AC 50Hz
RC-HY20/40-W	10A/230V 1AC 50Hz
Electric heater (ELK9M/9M1)	16A/400V 3NAC 50Hz 9kW 40A/230V 1AC 50Hz 9kW 20A/230V 1AC 50Hz 4.5kW

Recommended cable size

The recommended cable size shown in the page 48 is reference value. Choose appropriate size according to local laws and regulations.

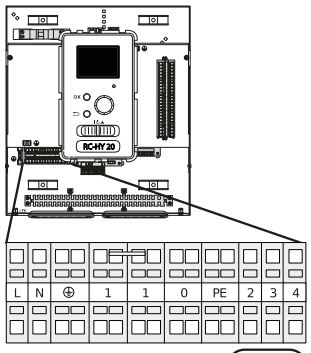
RC-HY20/40-W

Cable connection is different according to the system structure. Refer to the connection method according to the indoor unit

Power source

Connect the power cable on X1 terminal as shown below.

RC-HY20/40-W must be installed via an isolator switch with a minimum breaking capacity of 3mm. Minimum cable area must be sized according to the fuse rating used.



RC-HY20-W

Connections

This chapter shows all the necessary and available connections with RC-HY20-W.

For RC-HY40-W, proceed to page 64.

For HMA60/100-W, proceed to page 72.

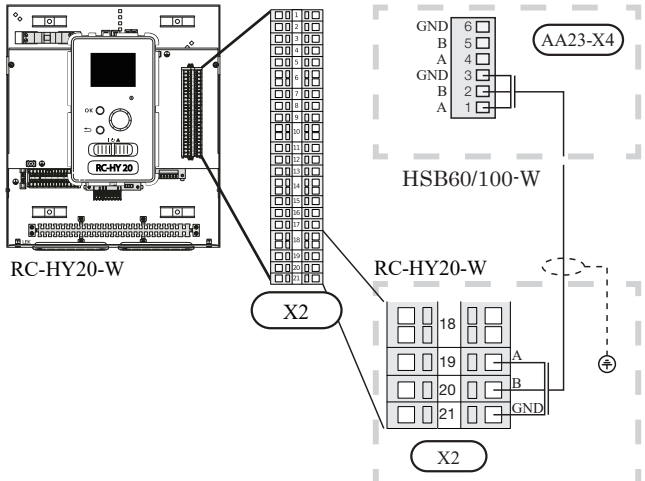
For HMS60/100-W, proceed to page 76.

Connection between controller and indoor unit

HSB60/100-W

Signal cable is connected between the controller and the indoor unit with screened 3 cores cable for HSB series.

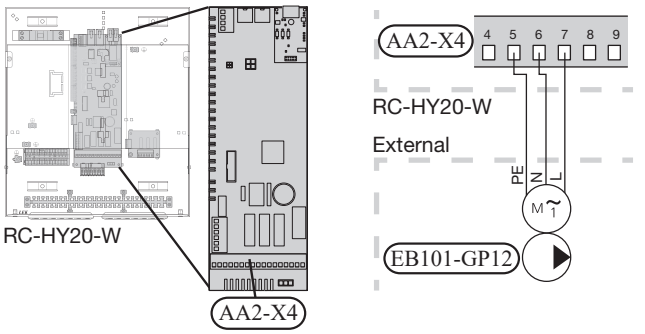
Connect the port 19 (A), 20 (B) and 21 (GND) on X2 terminal on RC-HY20-W on the port 1,2 and 3 on X4 terminal on AA23 board respectively



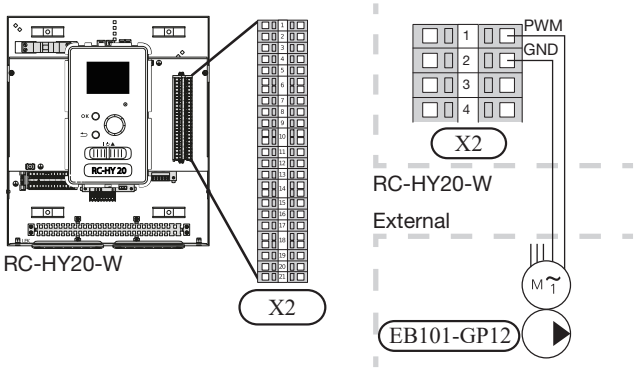
Circulation pump (GP12)

For HSB series it is necessary to install the circulation pump externally and it is also necessary to make its electrical connections.

Connect the circulation pump (EB101-GP12) power supply to the terminal block X4:5 (PE), X4:6 (N) and X4:7 (L) on AA2 board as illustrated.



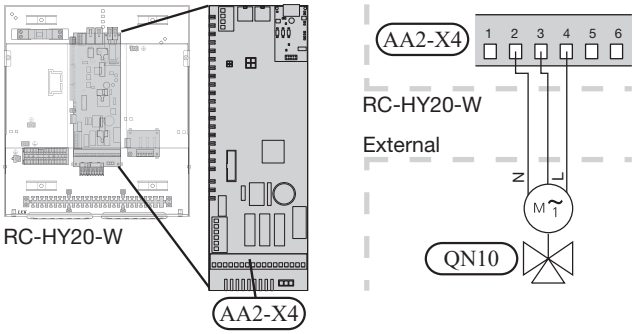
Connect the control signal cable to the terminal block X2:1 (PWM), X2:2 (GND) as illustrated.



3 way valve (QN10)

3 way reversing valve for hot water and space heating control. Reverses according to system demand.

Connect the QN10 to terminal block X4:2 (N), X4:3 (Control) and X4:4 (L) on AA2 board as illustrated.



Temperature sensors

Use 2 core cable with a minimum 0.5 mm² cross section.

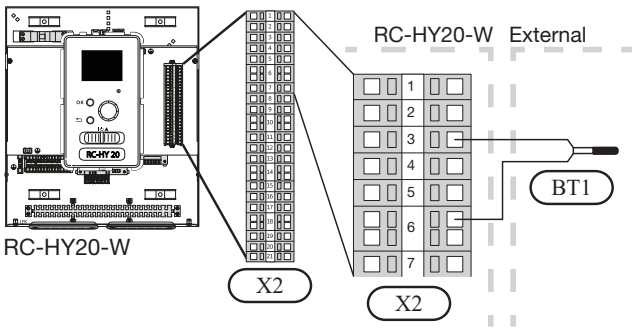
If any temperature sensor is not mentioned below please refer to option connection.

- **Ambient air temperature sensor (BT1)**

Install ambient air temperature sensor (BT1) in the shade on a wall facing north or north west, so it is unaffected by the morning sun (for example).

Connect the sensor to the terminal block X2:3 and X2:6 as illustrated.

If a conduit is used it must be sealed to prevent condensation in the sensor capsule.

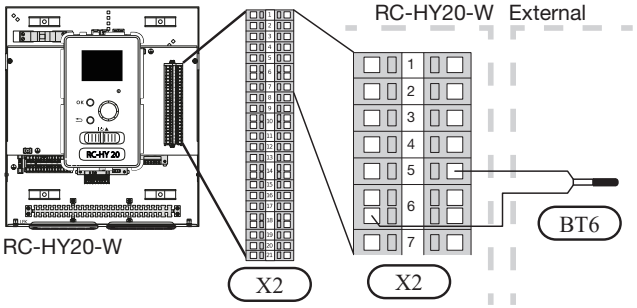


- **Temperature sensor, hot water charging (BT6)**

The temperature sensor, hot water charging (BT6) is placed in a submerged tube located on the bottom part of the hot water tank.

Connect the sensor to the terminal block X2:5 and X2:6 as illustrated.

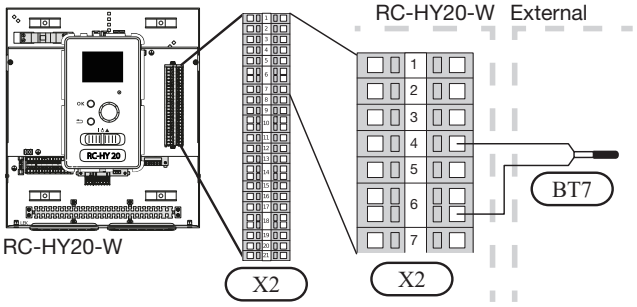
Hot water production is activated in menu 5.2 in the start guide or service menu.



- **Temperature sensor, hot water top (BT7)**

The temperature sensor, hot water top (BT7) is placed in a submerged tube located on the top part of the hot water tank. It can be connected to show the hot water temperature at the top of the tank.

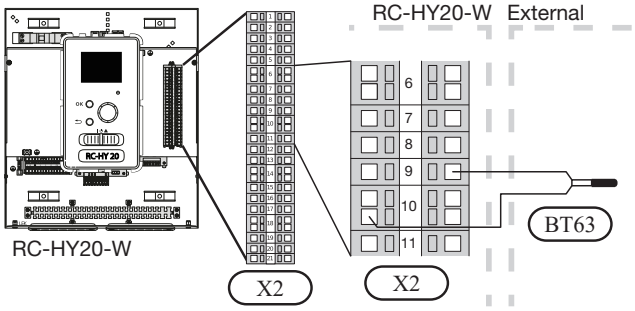
Connect the sensor to the terminal block X2:4 and X2:6 as illustrated.



- **Temperature sensor, additional heating (BT63)**

This temperature sensor is used in case the additional heating (boiler, electrical heater or other) is placed before the 3 way valve (QN10).

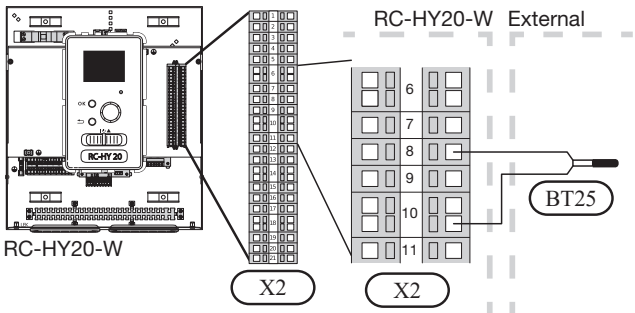
Connect the sensor to the terminal block X2:9 and X2:10 as illustrated.



- **Temperature sensor, external flow line (BT25)**

This temperature sensor is used in case the additional heating (boiler, electrical heater or other) is placed after the 3 way valve (QN10).

Connect the sensor to the terminal block X2:8 and X2:10 as illustrated.



Optional connections

- **Room sensor (BT50)**

It is possible to connect a room sensor (accessory part) to the RC-HY20-W controller.

The room temperature sensor has three functions:

1. Show current room temperature in the controller display.

2. Option of changing the room temperature in °C.

3. Makes it possible to change/stabilise the room temperature.

Install the sensor in a neutral position where the set temperature is required. A suitable location is on a free inner wall in a hall approx. 1.5 m above the floor.

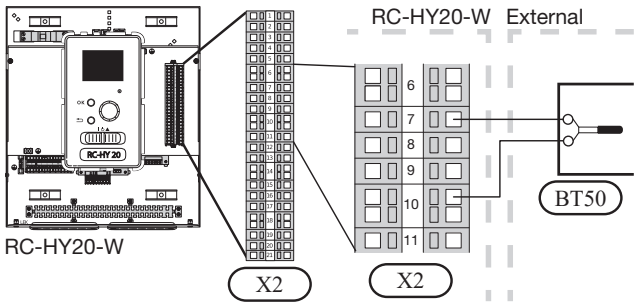
Do not install the room sensor where correct room temperature cannot be detected such as in a recess, between shelves, behind a curtain, above or close to a heat source, in a draft from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

The controller can operate without the sensor, but if the end user wants to read off the accomodation's indoor temperature in controller display, the sensor must be installed.

If the sensor is used to change the room temperature in °C and/or to change/stabilise the room temperature, the sensor must be activated in menu 1.9.4.

if the sensor is used in a room with underfloor heating, it should only have an indicatory function, not control the room temperature.

Connect the room sensor to the terminal block X2:7 and X2:10 as illustrated.



CAUTION

Changes of temperature in accommodation take time. For example, short time periods in combination with underfloor heating will not give a noticeable difference in room temperature.

- **Step controlled additional heat**

External step controlled additional heat can be controlled by up to three potential-free relays in the controller (3-step linear or 7-step binary). Alternatively two relays (2-step linear or 3-step binary) can be used for step controlled additional heat, which means that the third relay can be used to control the immersion heater in the water heater/accumulator tank.

Step in occurs with at least 1 minute intervals and step outs with at least 3 seconds intervals.

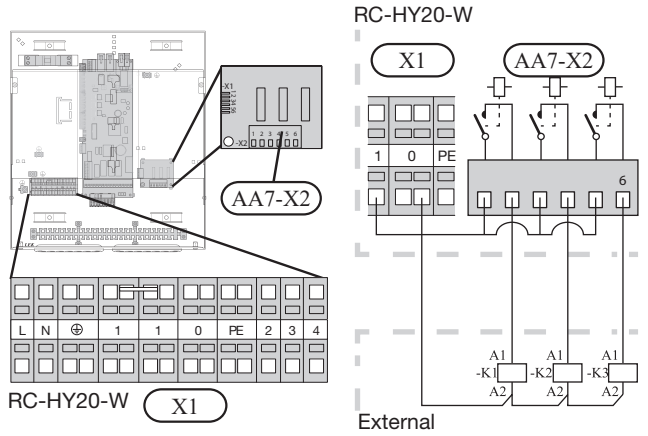
Step 1 is connected to terminal block X2:2 on the additional relay board (AA7).

Step 2 is connected to terminal block X2:4 on the additional relay board (AA7).

Step 3 or immersion heater in the water heater/accumulator tank is connected to terminal block X2:6 on the additional relay board (AA7).

The settings for step controlled additional heat are made in menu 4.9.3 and menu 5.1.12.

All additional heat can be blocked by connecting a potential-free switch function to the software controlled input on terminal block X2 which is selected in menu 5.4.



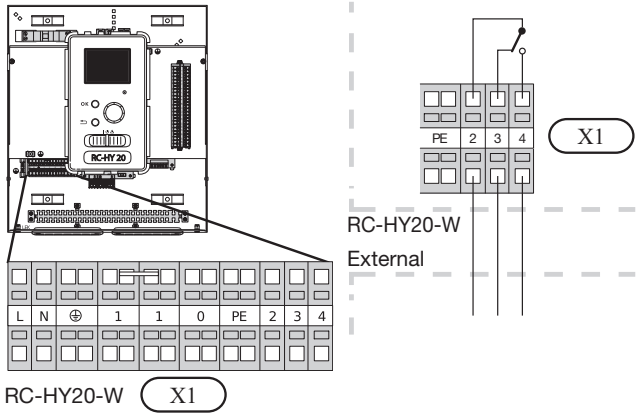
NOTE

Mark up any junction boxes with warnings for external voltage.

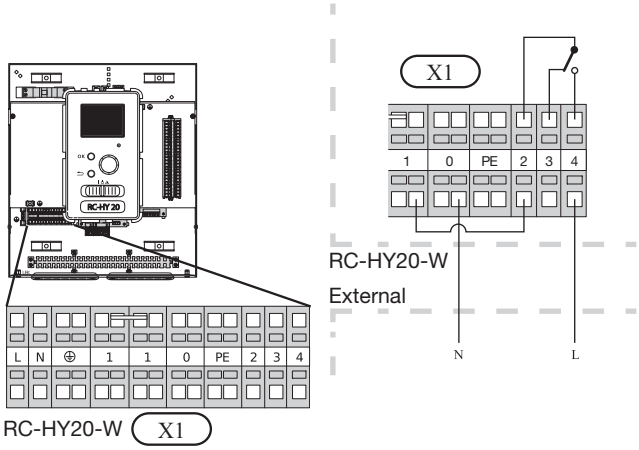
- **Emergency mode**

When the switch (SF1) is in "⚠" mode (emergency mode) the circulation pump is activated (EB101-GP12).

The emergency mode relay can be used to activate external additional heat. Between the port 2 and 4 is closed during emergency mode. An external thermostat must be connected to the control circuit (port 4) to control the temperature. Ensure that the heating medium circulates through the external additional heating.



If the relay is to be used for control voltage, bridge the supply from terminal block X1:1 to X1:2 and connect neutral and control voltage from the external additional heat to X1:0 (N) and X1:4 (L).



CAUTION

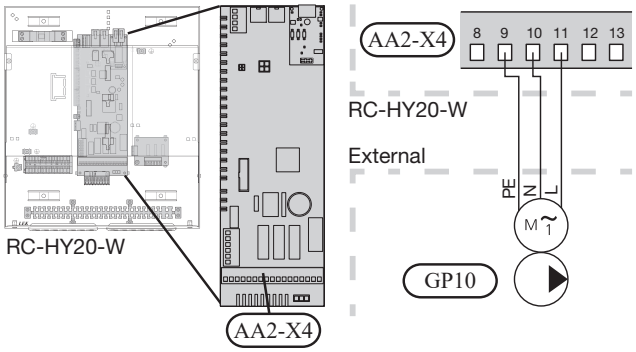
No hot water is produced when emergency mode is activated.

NOTE

Mark up any junction boxes with warnings for external voltage.

- **External circulation pump (GP10)**

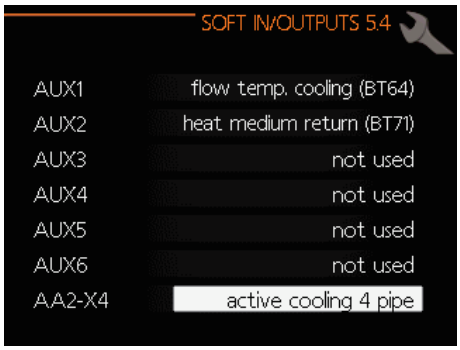
Connect the external circulation pump (GP10) to terminal block X4:9 (PE), X4:10 (N) and X4:11 (230V) on the AA2 board as illustrated.



- **AUX inputs**

On terminal block X2, RC-HY20-W has software controlled auxiliary (AUX) inputs and outputs for connecting the external switch function or sensor.

This means that when an external switch function or sensor is connected to one of the six available inputs, this function must be selected in menu 5.4:



The available external inputs are:

- Temperature sensor, cooling/heating (BT74)
  Additional room sensor (BT74) is applied in case user wants to determine the operation mode (cooling/heating) with a temperature in a particular room.
  This option can be chosen only in case cooling function is available.
- Temperature sensor, external return line (BT71)
  Temperature sensor BT71 is applied in case additional heater is placed after 3-way valve.
- Temperature sensor, flow line cooling (BT64)
  Temperature sensor BT64 is required in case 4-pipe system is used for cooling operation. This option can be chosen only in case cooling function is activated.
- Contact for external tariff blocking
  In cases where external tariff blocking is required it must be connected to terminal block X2.
  Tariff blocking means that the additional heat, the compressor, heating and cooling are disconnected by connecting a potential free switch function to the input selected in menu 5.4.

A closed contact results in the electrical output being disconnected.

■ Switch for “SG ready”

NOTE

This function can only be used in mains networks that support the "SG Ready"-standard . "SG Ready" requires two AUX inputs.

This function can only be used in power supply networks that support the “SG Ready” standard. “SG Ready” requires two AUX inputs.

“SG Ready” is a smart tariff management scheme in which electricity supplier can affect indoor and hot water temperature or simply prohibits additional heat and/or the compressor operation in heat pump at certain period of the day. You can choose which operation mode is affected by this function in menu 4.1.5 after the function is activated.

Choose two external input circuits and connect potential-free switches, and set “SG Ready A” and “SG Ready B” in menu 5.4. The system works differently according to the combination of the circuit open/closed.

- Blocking (A: Closed, B: Open)
  “SG Ready” is active. Compressor operation and additional heat is prohibited.
- Normal mode (A: Open, B: Open)
  “SG Ready” is not active. No effect on the system.
- Low price mode (A: Open, B: Closed)
  “SG Ready” is active. The system operates to provide higher capacity than normal mode by using lower tariff electricity. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.
- Overcapacity mode (A: Closed, B: Closed)
  “SG Ready” is active. The system supplies higher capacity than Low price mode since the electricity price is supposed to be very low in this mode. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.

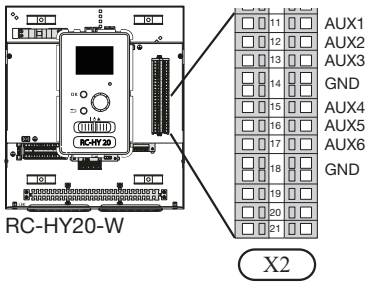
■ Contact for activation of “temporary lux”
Temporary hot water production function “temporary lux” is activated with this signal. Connect the terminals with a potential-free switch and choose the function in menu 5.4. “Temporary lux” is activated only when the switch is closed.

■ Contact for activation of “external adjustment”
Target temperature offset for supply temperature or room temperature can be done with this signal.
When a room sensor is connected and activated, the target room temperature is offset in °C if the switch is closed. When a room sensor is not connected, target supply water temperature (heat curve) is offset instead.
The degree of offset can be set in menu 5.4.

■ Switch for external alarm
Alarms from external devices can be connected to the control and appear as an info alarm. Potential-free signal of NO or NC type can be connected.

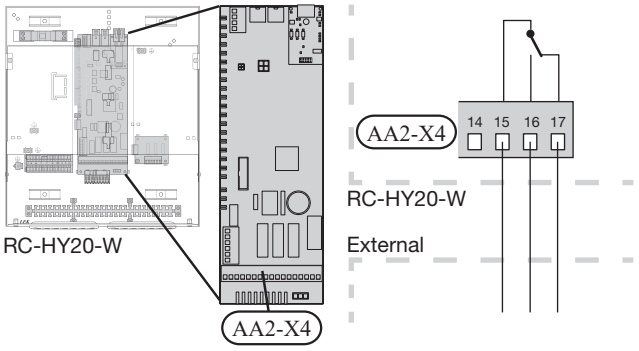
■ Switch for external blocking
This function is used in case certain operation mode needs to be prohibited. The operation at selected operation mode is prohibited when the switch is closed. Following functions can be managed.
- Additional heat
- Compressor operation
- Heating mode
- Cooling mode
- Hot water mode

Connect the auxiliary inputs to the terminal block X2:11-17 and X2:14 or X2:18 (GND) as illustrated. X2:14 and X2:18 are common to all auxiliary circuits.



• AUX outputs

External output is available on the port 15 to 17 on X4 terminal on AA2 board on RC-HY20-W. The relay output can have a max load of 2A at resistive load.

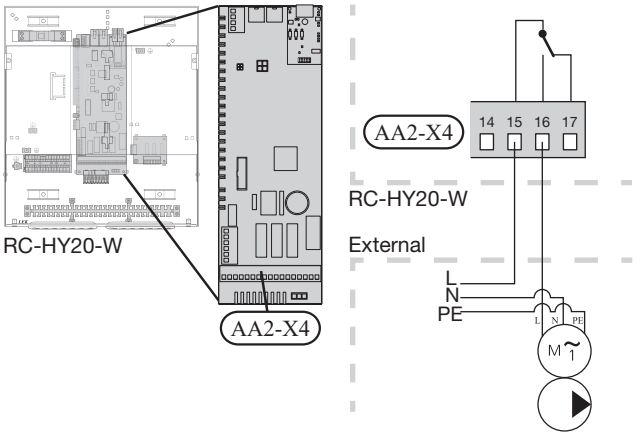


The following functions are available. Select the function in menu 5.4.

■ Indication of buzzer alarm
When an alarm occurs, the circuit becomes closed between the port 15 and 16. During normal operation, the port 15 and 17 is closed.

■ Cooling mode indication / Active cooling mode (4-pipe cooling)
When the system turns into cooling mode, the circuit becomes closed between the port 15 and 16. By using this signal, it is possible to switch 3-way valve for 4-pipe cooling (QN12) or to assemble a display circuit indicating cooling mode.

■ External pump control (GP10)
External pump (GP10) is used in case additional heater is placed after 3-way valve that switches heating/hot water.
Connect the circulation pump as shown below using the port 15 and 16 on X4 terminal.



■ Hot water circulation pump control (GP11)

In case the distance between hot water tap and hot water storage tank is far, the hot water supply line temperature is likely to drop and it may take time to supply hot water from the tap. In that case, hot water circulation pump (GP11) is applied to maintain hot water supply line temperature warm (refer to page 39 for diagram).

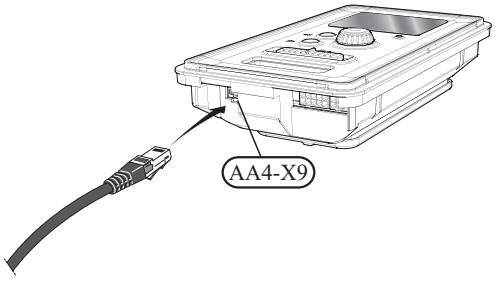
For details of connecting the pump, refer to External pump control (GP10).

NOTE

Mark up any junction boxes with warnings for external voltage.

• **myUplink**

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable grommet (UB2) in the controller for cable routing.



RC-HY40-W

Connections

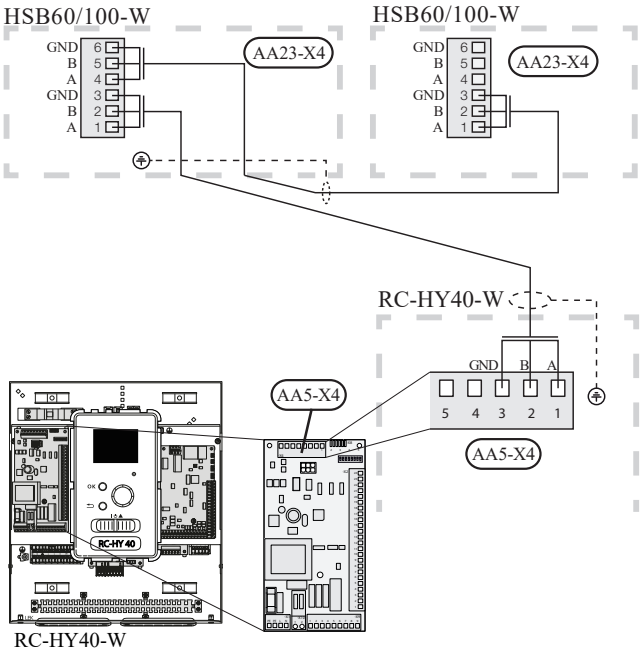
This chapter shows all the necessary and available connections with RC-HY40-W.

Connection between controller and indoor unit

HSB60/100-W

Connect the port 1(A), 2(B) and 3(GND) on X4 terminal on AA5 board on RC-HY40-W to the port 1, 2 and 3 on X4 terminal on AA23 board on HSB60-W respectively.

In case several systems are connected to one controller, connect the port 4, 5 and 6 on X4 terminal on AA23 board on HSB60/100-W close to the controller to the port 1, 2 and 3 on X4 terminal on AA23 board on another HSB.



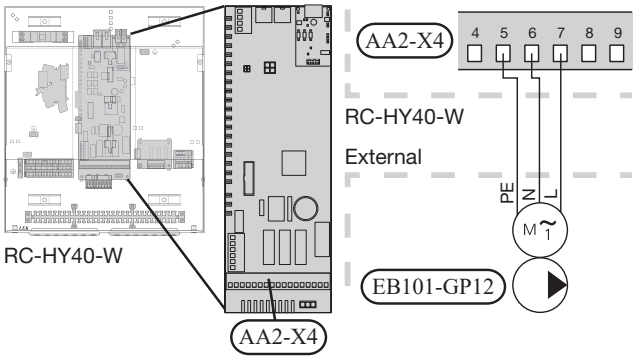
Circulation pump (GP12)

For HSB series it is necessary to install the circulation pump externally and it is also necessary to make its electrical connections.

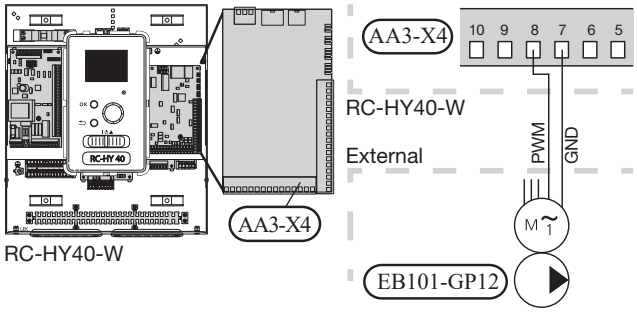
With RC-HY40-W it is possible to connect up to 2 circulation pumps, one for outdoor unit 1 (EB101) and outdoor unit 2 (EB102).

- **GP12 for unit 1 (EB101)**

Connect the circulation pump (EB101-GP12) power supply to the terminal block X4:5 (PE), X4:6 (N) and X4:7 (L) on AA2 board as illustrated.

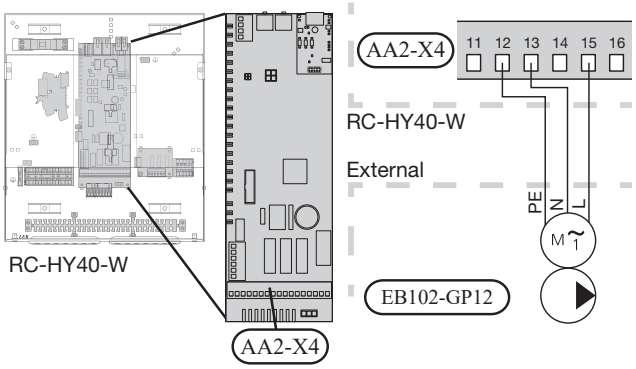


Connect the control signal cable to the terminal block X4:7 (PWM), X4:8 (GND) on AA3 board as illustrated.

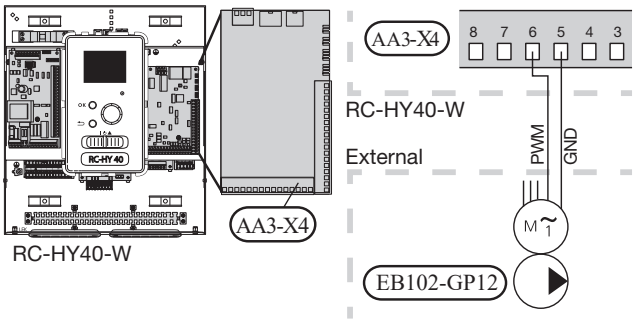


- **GP12 for unit 2 (EB102)**

Connect the circulation pump (EB102-GP12) power supply to the terminal block X4:12 (PE), X4:13 (N) and X4:15 (L) on AA2 board as illustrated.



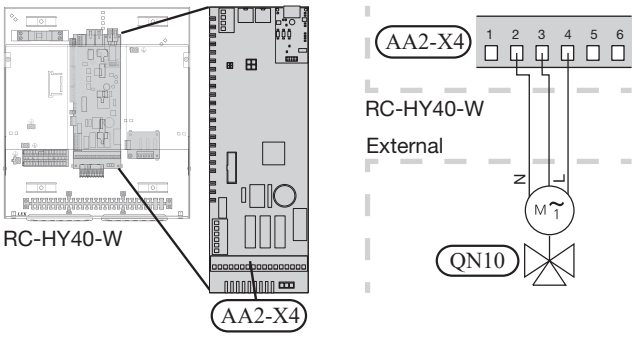
Connect the control signal cable to the terminal block X4:5 (PWM), X4:6 (GND) on AA3 board as illustrated.



3 way valve (QN10)

3 way reversing valve for hot water and space heating control. Reverses according to system demand.

Connect the QN10 to terminal block X4:2 (N), X4:3 (Control) and X4:4 (L) on AA2 board as illustrated.



Temperature sensors

Use 2 core cable with a minimum 0.5 mm² cross section.

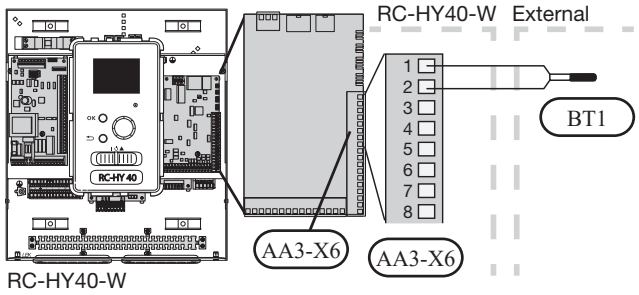
If any temperature sensor is not mentioned below please refer to option connection.

- **Ambient air temperature sensor (BT1)**

Install ambient air temperature sensor (BT1) in the shade on a wall facing north or north west, so it is unaffected by the morning sun (for example).

Connect the sensor to the terminal block X6:1 and X6:2 on AA3 board as illustrated.

If a conduit is used it must be sealed to prevent condensation in the sensor capsule.

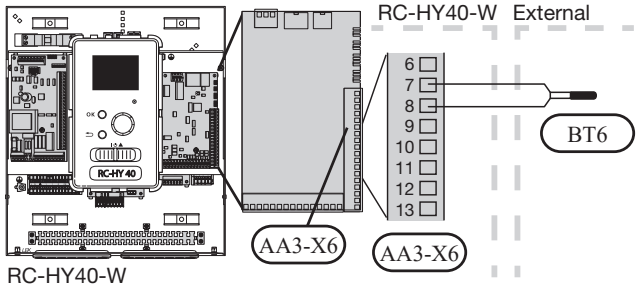


- **Temperature sensor, hot water charging (BT6)**

The temperature sensor, hot water charging (BT6) is placed in a submerged tube located on the bottom part of the hot water tank.

Connect the sensor to the terminal block X6:7 and X6:8 on AA3 board as illustrated.

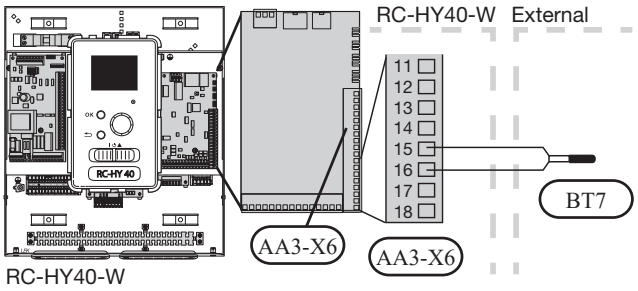
Hot water production is activated in menu 5.2 in the start guide or service menu.



- **Temperature sensor, hot water top (BT7)**

The temperature sensor, hot water top (BT7) is placed in a submerged tube located on the top part of the hot water tank. It can be connected to show the hot water temperature at the top of the tank.

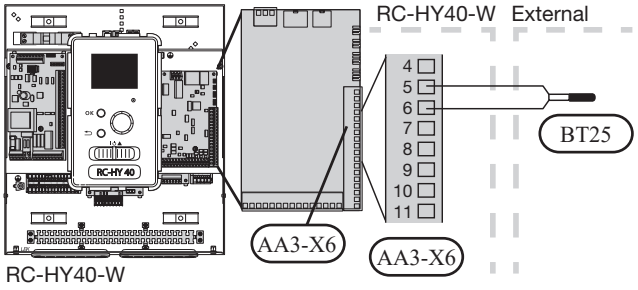
Connect the sensor to the terminal block X6:15 and X6:16 on AA3 board as illustrated.



- **Temperature sensor, external flow line (BT25)**

This temperature sensor is used in case the additional heating (boiler, electrical heater or other) is placed after the 3 way valve (QN10).

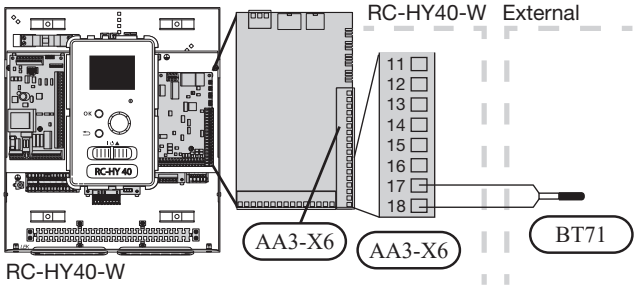
Connect the sensor to the terminal block X6:5 and X6:6 on AA3 board as illustrated.



- **Temperature sensor, external return line (BT71)**

This temperature sensor is used in case the additional heating (boiler, electrical heater or other) is placed after the 3 way valve (QN10).

Connect the sensor to the terminal block X6:17 and X6:18 on AA3 board as illustrated.



Optional connections

- **Load monitor**

In case many power electrical appliances are connected in the property and the electric heater is energised at the same time, there is a risk of tripping the main fuse of the property.

The controller has an integrated load monitor that controls the power steps of the electric heater by disconnecting step by step in the event of overload in a phase. It will be reconnected if other current consumption is reduced.

Connecting current sensors

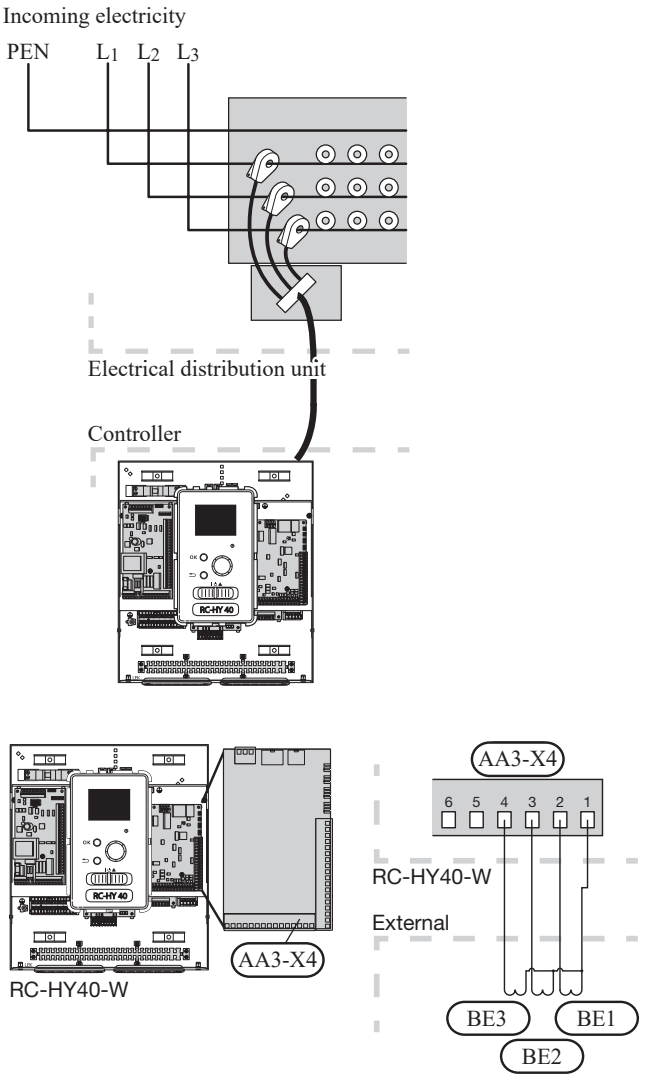
A current sensor (BE1 - BE3) should be installed on each incoming phase conductor in to the electrical distribution unit to measure the current. This is best done in the electrical distribution unit.

Connect the current sensors to a multi-core cable in an enclosure next to the electrical distribution unit. Use a multi-core cable of at least 0.5 mm² from the enclosure to the heat pump.

Connect the cable to terminal block X4:1 to 4.

X4:1 is the common terminal block for the three current sensors.

Set the size of the property's main fuse in menu 5.1.12.



- **Room sensor (BT50)**

It is possible to connect a room sensor to the RC-HY40-W controller.

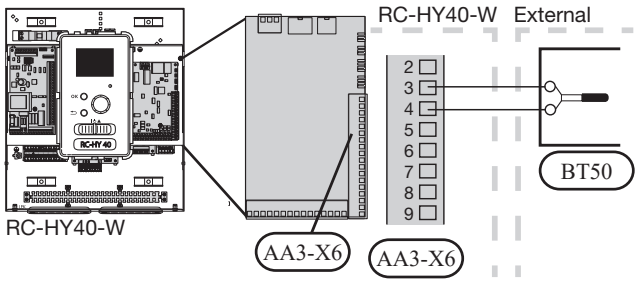
The room temperature sensor has three functions:

1. Show current room temperature in the controller display.

2. Option of changing the room temperature in °C.

3. Makes it possible to change/stabilise the room temperature.

Install the sensor in a neutral position where the set temperature is required. A suitable location is on a free inner wall in a hall approx. 1.5 m above the floor.
Do not install the room sensor where correct room temperature cannot be detected such as in a recess, between shelves, behind a curtain, above or close to a heat source, in a draft from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.
The controller can operate without the sensor, but if the end user wants to read off the accomodation's indoor temperature in controller display, the sensor must be installed.
If the sensor is used to change the room temperature in °C and/ or to change/stabilise the room temperature, the sensor must be activated in menu 1.9.4.
if the sensor is used in a room with underfloor heating, it should only have an indicatory function, not control the room temperature.
Connect the sensor to the terminal block X6:3 and X6:4 on AA3 board as illustrated.



CAUTION

Changes of temperature in accommodation take time. For example, short time periods in combination with underfloor heating will not give a noticeable difference in room temperature.

- **Step controlled additional heat**

Before the reversing valve QN10

External step controlled additional heat can be controlled by up to three potential-free relays in the controller (3-step linear or 7-step binary).

The electric additional heat will charge with the maximum permitted immersion heater output together with the compressor to conclude hot water charging and return to charging the heating as soon as possible. This only occurs when the number of degree minutes is below the start value for the additional heat.

After the reversing valve QN10

External step controlled additional heat can be controlled by 2 relays (2 step liner or 3 step binary), which means that the third relay is used to control the immersion heater in the hot water tank.

With the AXC30M accessory or the AA5 card included on the RC-HY40-W (if this card is not being used for other function), a further three potential free relays can be used for additional heat control, which then gives an additional 3 liner or 7 binary steps.

Step in occurs with at least 1 minute intervals and step outs with at least 3 seconds intervals.

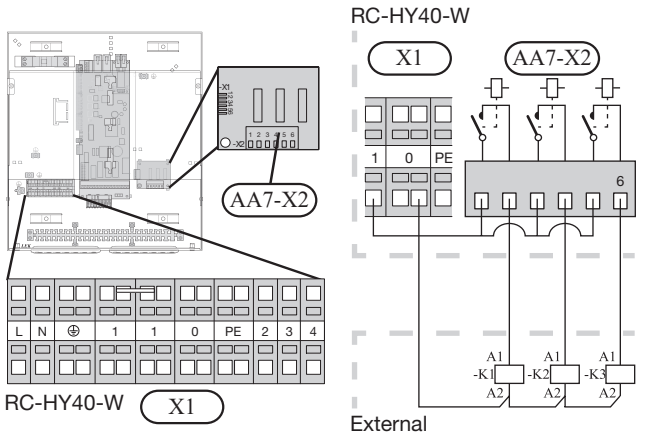
Step 1 is connected to terminal block X2:2 on the additional relay board (AA7).

Step 2 is connected to terminal block X2:4 on the additional relay board (AA7).

Step 3 or immersion heater in the water heater/accumulator tank is connected to terminal block X2:6 on the additional relay board (AA7).

The settings for step controlled additional heat are made in menu 4.9.3 and menu 5.1.12.

All additional heat can be blocked by connecting a potential-free switch function to the software controlled input on terminal block X2 which is selected in menu 5.4.



NOTE

Mark up any junction boxes with warnings for external voltage.

- **Shunt controlled additional heat**

This connection enables an external additional heater, eg. an oil boiler, gas boler or district heating exchanger to aid with heating.

RC-HY40-W controls a shunt valve and start the signal for the additonal heat using three relays. If the installation cannot manage to maintain the correct supply temperature, the additional heat starts. When the boiler sensor (BT52) shows approx. 55°C, RC-HY40-W send s signal to the shunt valve (QN11) to open from the additional heat. The shunt (QN11) is controlled to ensure the true supply temperature corresponds with the control system's theroretically calculated set point value. When the heating demand drops sufficiently so that additional heat is no longer required, the shunt valve (QN11) closes completely.

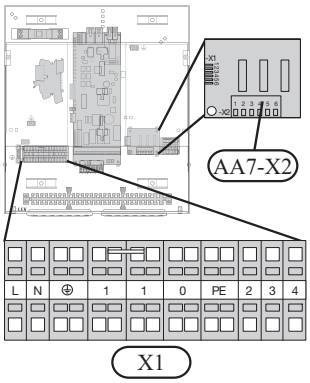
Factory setting minimum operating time for the boiler is 12 hours (can be adjusted in menu 5.1.12).

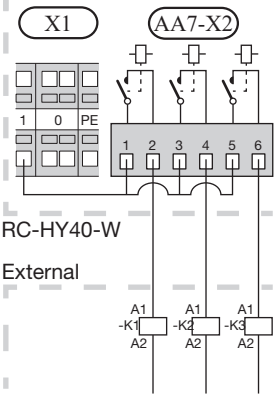
The settings for shunt controlled additional heat are made in menu 4.9.3 and menu 5.1.12.

The boiler sensor (BT52) is connceted to the soft inputs and selected in menu 5.4.

Connect the shunt motor (QN11) to terminal block X2:4 (230V, close) and 6 (230V, open) on the additional realy board (AA7) and therminal block X1:0 (N).

To control switching the additional heat ON and OFF, connect it to terminal block X2:2 on the extra relay board (AA7).





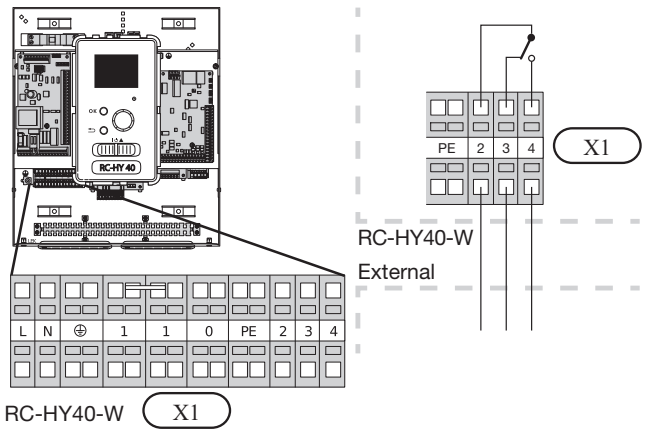
NOTE

Mark up any junction boxes with warnings for external voltage.

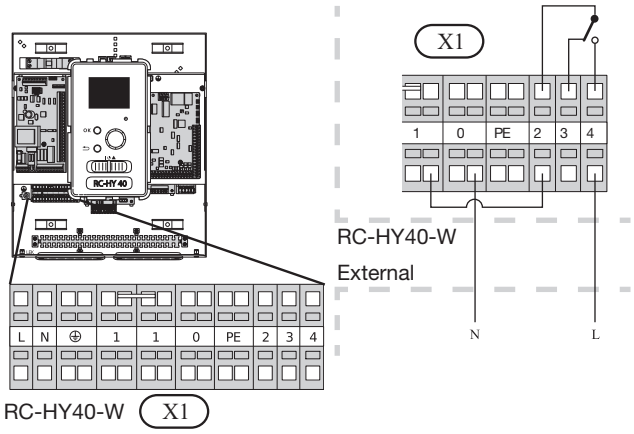
- **Emergency mode**

When the switch (SF1) is in "⚠" mode (emergency mode) the circulation pump is activated (EB101-GP12).

The emergency mode relay can be used to activate external additional heat. Between the port 2 and 4 is closed during emergency mode. An external thermostat must be connected to the control circuit (port 4) to control the temperature. Ensure that the heating medium circulates through the external additional heating.



If the relay is to be used for control voltage, bridge the supply from terminal block X1:1 to X1:2 and connect neutral and control voltage from the external additional heat to X1:0 (N) and X1:4 (L).



NOTE

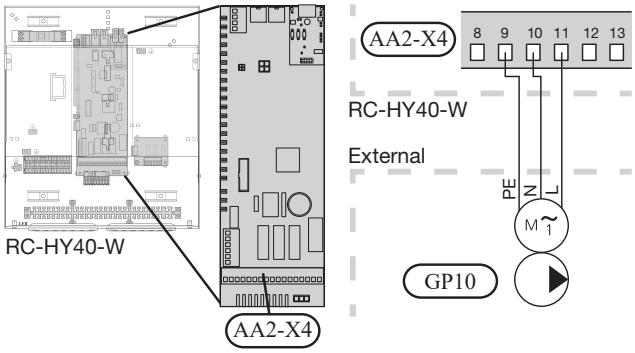
Mark up any junction boxes with warnings for external voltage.

CAUTION

No hot water is produced when emergency mode is activated.

- **External circulation pump (GP10)**

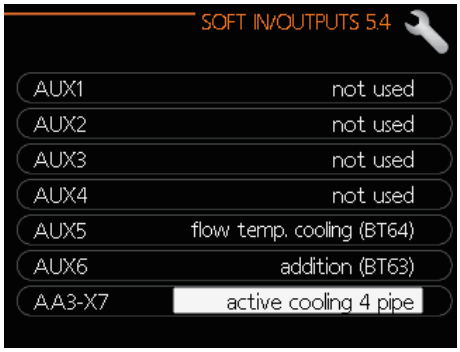
Connect the external circulation pump (GP10) to terminal block X4:9 (PE), X4:10 (N) and X4:11 (230V) on the AA2 board as illustrated.



- **AUX inputs**

On terminal block X6 on AA3 board and on X2, RCHY40-W has software controlled auxiliary (AUX) inputs and outputs for connecting the external switch function or sensor.

This means that when an external switch function or sensor is connected to one of the six available inputs, this function must be selected in menu 5.4:



The available external inputs are:

- Temperature sensor, cooling/heating (BT74)
  Additional room sensor (BT74) is applied in case user wants to determine the operation mode (cooling/heating) with a temperature in a particular room.
  This option can be chosen only in case cooling function is available.
- Temperature sensor, additional heating (BT63)
  Temperature sensor BT63 is applied in case additional heater is placed before 3-way valve.
- Temperature sensor, boiler (BT52)
  Temperature sensor BT52 is applied in case shunt control additional heat function is enabled on addition menu.
- Temperature sensor, flow line cooling (BT64)
  Temperature sensor BT64 is required in case 4-pipe system is used for cooling operation. This option can be chosen only in case cooling function is activated.
- Contact for external tariff blocking
  In cases where external tariff blocking is required it must be connected to auxiliary inputs.
  Tariff blocking means that the additional heat, the compressor, heating and cooling are disconnected by connecting a potential free switch function to the input selected in menu 5.4.
  A closed contact results in the electrical output being disconnected.
- Switch for “SG ready”

NOTE

This function can only be used in mains networks that support the "SG Ready"-standard .
"SG Ready" requires two AUX inputs.

This function can only be used in power supply networks that support the “SG Ready” standard. “SG Ready” requires two AUX inputs.

“SG Ready” is a smart tariff management scheme in which electricity supplier can affect indoor and hot water temperature or simply prohibits additional heat and/or the compressor operation in heat pump at certain period of the day. You can choose which operation mode is affected by this function in menu 4.1.5 after the function is activated.

Choose two external input circuits and connect potential-free switches, and set “SG Ready A” and “SG Ready B” in menu 5.4. The system works differently according to the combination of the circuit open/closed.

- Blocking (A: Closed, B: Open)
  “SG Ready” is active. Compressor operation and additional heat is prohibited.
- Normal mode (A: Open, B: Open)
  “SG Ready” is not active. No effect on the system.
- Low price mode (A: Open, B: Closed)
  “SG Ready” is active. The system operates to provide higher capacity than normal mode by using lower tariff electricity. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.
- Overcapacity mode (A: Closed, B: Closed)
  “SG Ready” is active. The system supplies higher capacity than Low price mode since the electricity price is supposed to be very low in this mode. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.

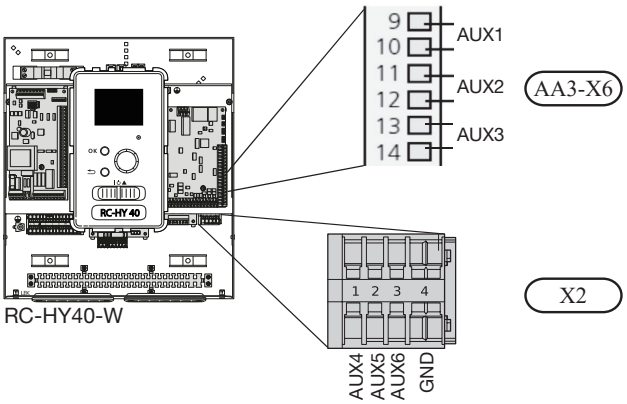
- Contact for activation of “temporary lux”
  Temporary hot water production function “temporary lux” is activated with this signal. Connect the terminals with a potential-free switch and choose the function in menu 5.4.
  “Temporary lux” is activated only when the switch is closed.
- Contact for activation of “external adjustment”
  Target temperature offset for supply temperature or room temperature can be done with this signal.
  When a room sensor is connected and activated, the Electric connections 34 target room temperature is offset in °C if the switch is closed. When a room sensor is not connected, target supply water temperature (heat curve) is offset instead. The degree of offset can be set in menu 5.4.

■ Switch for external alarm
Alarms from external devices can be connected to the control and appear as an info alarm. Potential-free signal of NO or NC type can be connected.

■ Switch for external blocking
This function is used in case certain operation mode needs to be prohibited. The operation at selected operation mode is prohibited when the switch is closed. Following functions can be managed.
- Additional heat
- Compressor operation
- Heating mode
- Cooling mode
- Hot water mode

Connect the auxiliary inputs 1 to 3 to the terminal block X6:9-10, 11-12, 13-14 of AA3 board as illustrated.

Auxiliary inputs 4 to 6 are connected to terminal block X2:1-4, 2-4 and 3-4. X2:4 is common to all auxiliary circuits (GND).



• **AUX outputs**

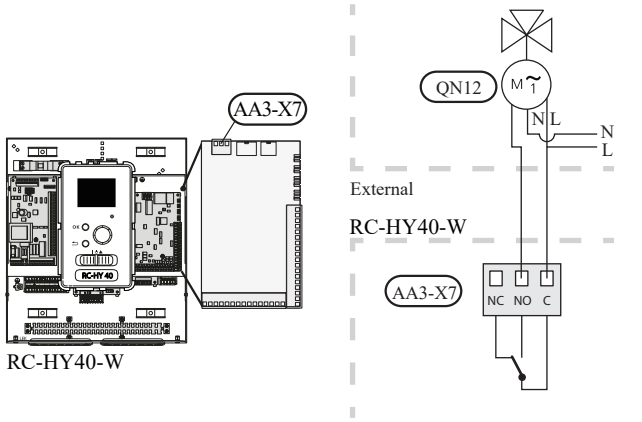
External output is available on the port NC, NO and C on X7 terminal on AA3 board on RC-HY40-W. The relay output can have a max load of 2A at resistive load.

Following functions are available. Select the function in menu 5.4.

■ Indication of buzzer alarm

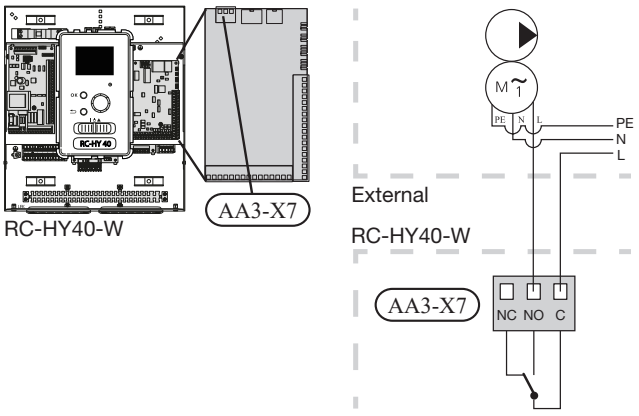
When an alarm occurs, the circuit becomes closed between the port NO and C. During normal operation, the port NC and C is closed.

■ Cooling mode indication / Active cooling mode (4-pipe cooling)
When the system turns into cooling mode, the circuit becomes closed between the port NO and C. By using this signal, it is possible to switch 3-way valve for 4-pipe cooling or to assemble a display circuit indicating cooling mode.



■ External pump control (GP10)
External pump (GP10) is used in case additional heater is placed after 3-way valve that switches heating/hot water.

Connect the circulation pump as shown below using the NO, C on X7 terminal on AA3 board on RC-HY40-W.



■ Hot water circulation pump control (GP11)
In case the distance between hot water tap and hot water storage tank is far, the hot water supply line temperature is likely to drop and it may take time to supply hot water from the tap. In that case, hot water circulation pump (GP11) is applied to maintain hot water supply line temperature warm (refer to page 39 for diagram).

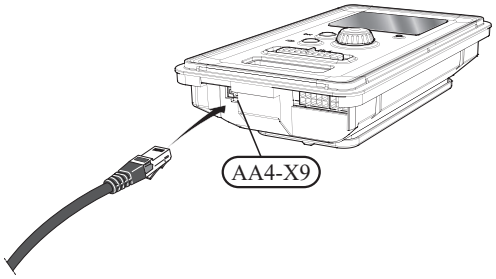
For details of connecting the pump, refer to External pump control (GP10).

NOTE

Mark up any junction boxes with warnings for external voltage.

• **myUplink**

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable grommet (UB2) in the controller for cable routing.



Accessories

Instruction for connection and configuration of other accessories provided with each accessory part.

• **Accessories with accessory board (AA5)**

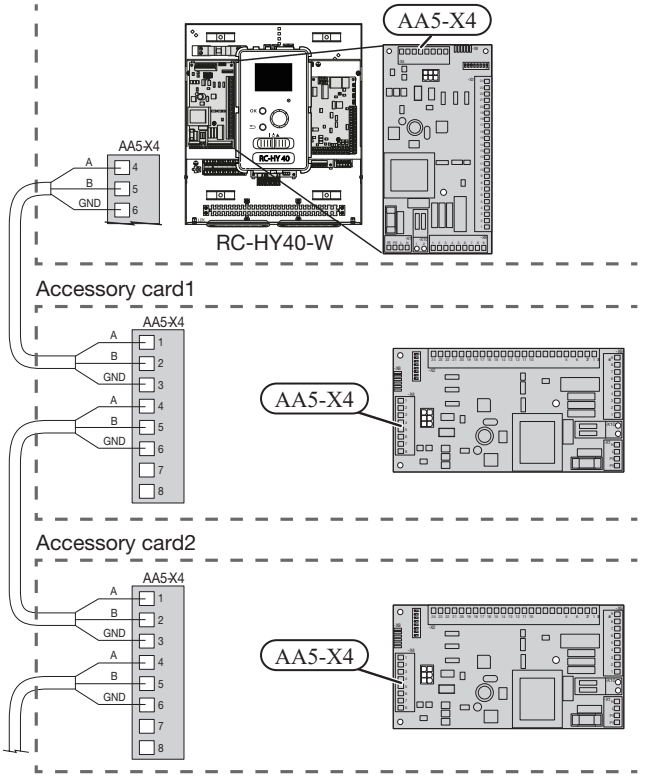
Accessories with accessory board (AA5) are connected to the control module's terminal block X3:4-6 on the input board AA5 (included on RC-HY40-W).

If several accessories are to connected or are already installed, the following instructions must be followed.

The first accessory board must be connected directly to the control module's terminal block AA5-X4. The following boards must be connected in series with the previous board.

Use cable type LiYY, EKKX or similar.

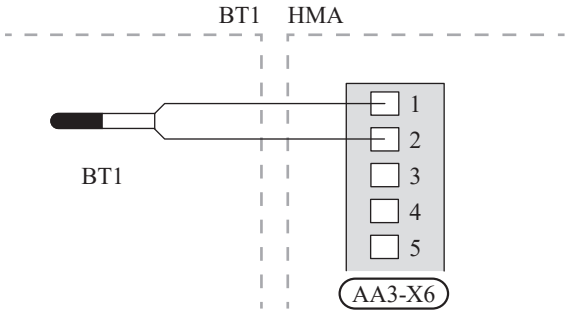
Refer to the acccessory manual for further instructions.



HMA60/100-W

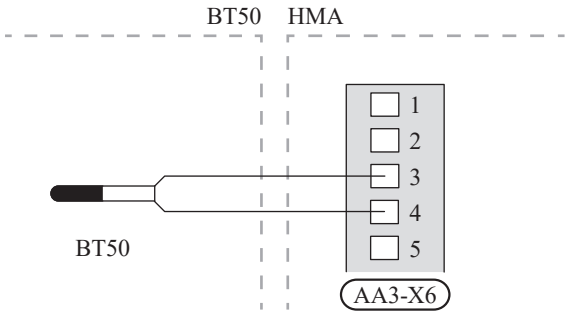
Connecting the outdoor temperature sensor

The outdoor temperature sensor BT1 (included) should be connected to the HMA unit via terminal block AA3-X6:1 and AA3-X6:2.



Connecting the indoor temperature sensor

The indoor temperature sensor BT50 (included) should be connected to the HMA unit via terminal block AA3-X6:3 and AA3-X6:4.



CURRENT SENSORS

When many power consumers are connected in the property at the same time as the electric additional heat is in operation, there is a risk of the property's main fuses tripping. HMA comes with current meters that controls the power steps for the electric additional heat by disconnecting step by step in event of overload in a phase. Reconnection occurs when other current consumption is reduced.

CAUTION

If current meters are installed, full functionality is obtained by enabling "detect phase sequence" and changing the fuse size to 20A in menu 5.1.12.

Connecting current sensors

NOTE

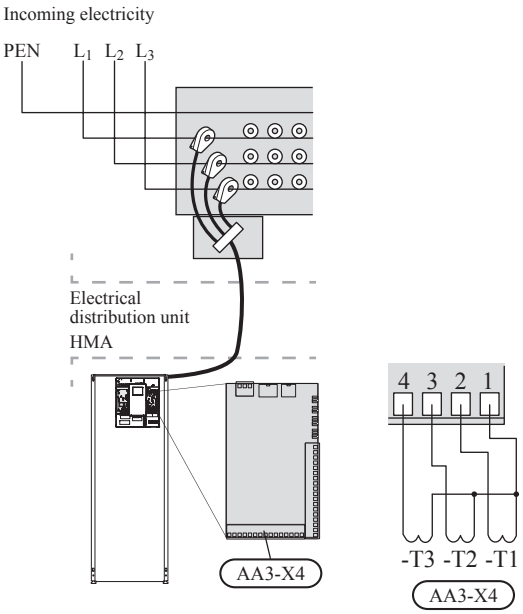
If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.

A current sensor must be installed on each incoming phase conductor into the electrical distribution unit, to measure the current. The electrical distribution unit is an appropriate installation point.

Current meters should be connected to the four-wire cable in the distribution box. Between the housing and HMA, use a four-wire cable with a cross-section of min. 0.5mm².

Connect the cable to the input board (AA3) on terminal block X4:1-4 where X4:1 is the common terminal block for the three current sensors.

If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.



NOTE

If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.

Settings

Electric additional heat- maximum power

The electric additional heat has a maximum power of 9 kW (400 V) / 6,0 kW (230 V). The power is split into 3 steps. The possible operational power steps are: 3, 6 and 9 kW (400 V) or 1,5, 3,0 and 6,0 kW (230 V). The maximum power step of the immersion heater can be set using menu 5.1.12.

Emergency mode

When the controller is set to emergency mode (SF1 is set to ⚠) only the most necessary functions are activated.

- Hot water is not heated.
- Constant temperature in the supply line, more information in the section Emergency mode thermostat.

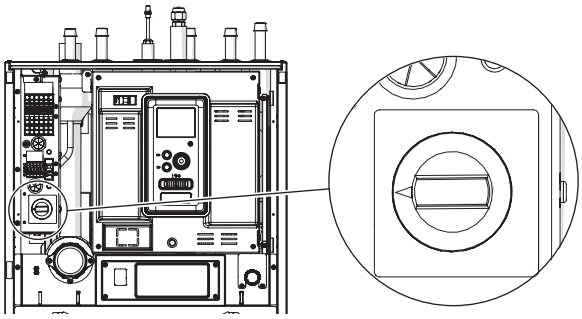
NOTE

While on emergency mode, it is not possible to heat hot water.

Emergency mode thermostat

The supply temperature in emergency mode is set using a thermostat (BT30). It should be set according to the demands of the heating/cooling circuits in operation.

The adjustment range is 5 - 65°C. Please note, however, that for underfloor heating the setting should be min. 20°C, max. 35-45°C to maintain comfort in the room and efficient operation of the system.



NOTE

The maximum available heater power in emergency mode is 3kW.

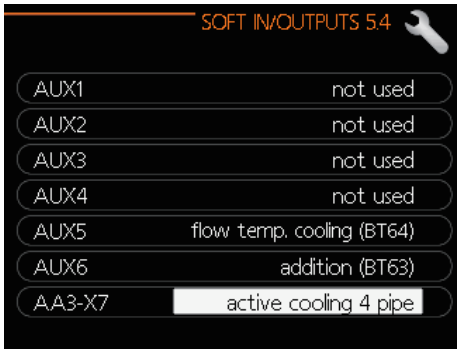
NOTE

The temperature on the thermostat must be set according to the system requirements. If the temperature is too high, it can damage the system.

- **AUX inputs**

On terminal block X6 on AA3 board and on X2, HMA60/100-W has software controlled auxiliary (AUX) inputs and outputs for connecting the external switch function or sensor.

This means that when an external switch function or sensor is connected to one of the six available inputs, this function must be selected in menu 5.4:



The available external inputs are:

- Temperature sensor, cooling/heating (BT74)
  Additional room sensor (BT74) is applied in case user wants to determine the operation mode (cooling/heating) with a temperature in a particular room.
  This option can be chosen only in case cooling function is available.
- Temperature sensor, additional heating (BT63)
  Temperature sensor BT63 is applied in case additional heater is placed before 3-way valve.
- Temperature sensor, boiler (BT52)
  Temperature sensor BT52 is applied in case shunt control additional heat function is enabled on addition menu.
- Temperature sensor, flow line cooling (BT64)
  Temperature sensor BT64 is required in case 4-pipe system is used for cooling operation. This option can be chosen only in case cooling function is activated.
- Contact for external tariff blocking
  In cases where external tariff blocking is required it must be connected to auxiliary inputs.
  Tariff blocking means that the additional heat, the compressor, heating and cooling are disconnected by connecting a potential free switch function to the input selected in menu 5.4.
  A closed contact results in the electrical output being disconnected.
- Switch for “SG ready”

NOTE

This function can only be used in mains networks that support the "SG Ready"-standard .
"SG Ready" requires two AUX inputs.

This function can only be used in power supply networks that support the “SG Ready” standard. “SG Ready” requires two AUX inputs.

"SG Ready" is a smart tariff management scheme in which electricity supplier can affect indoor and hot water temperature or simply prohibits additional heat and/or the compressor operation in heat pump at certain period of the day. You can choose which operation mode is affected by this function in menu 4.1.5 after the function is activated.

Choose two external input circuits and connect potential-free switches, and set "SG Ready A" and "SG Ready B" in menu 5.4. The system works differently according to the combination of the circuit open/closed.

- Blocking (A: Closed, B: Open)
  "SG Ready" is active. Compressor operation and additional heat is prohibited.
- Normal mode (A: Open, B: Open)
  "SG Ready" is not active. No effect on the system.
- Low price mode (A: Open, B: Closed)
  "SG Ready" is active. The system operates to provide higher capacity than normal mode by using lower tariff electricity. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.
- Overcapacity mode (A: Closed, B: Closed)
  "SG Ready" is active. The system supplies higher capacity than Low price mode since the electricity price is supposed to be very low in this mode. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.

■ Contact for activation of "temporary lux"
Temporary hot water production function "temporary lux" is activated with this signal. Connect the terminals with a potential-free switch and choose the function in menu 5.4.

"Temporary lux" is activated only when the switch is closed.

■ Contact for activation of "external adjustment"
Target temperature offset for supply temperature or room temperature can be done with this signal.

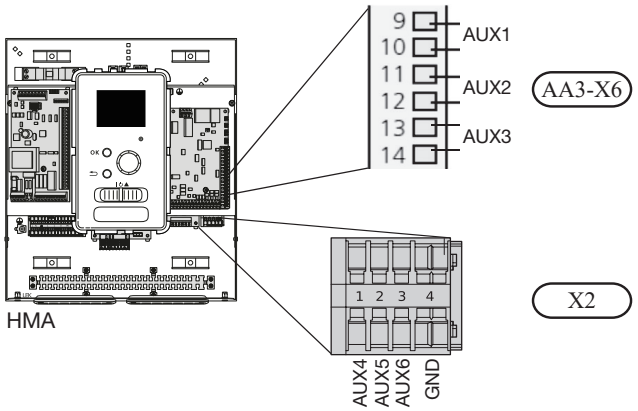
When a room sensor is connected and activated, the Electric connections 34 target room temperature is offset in °C if the switch is closed. When a room sensor is not connected, target supply water temperature (heat curve) is offset instead. The degree of offset can be set in menu 5.4.

■ Switch for external alarm
Alarms from external devices can be connected to the control and appear as an info alarm. Potential-free signal of NO or NC type can be connected.

■ Switch for external blocking
This function is used in case certain operation mode needs to be prohibited. The operation at selected operation mode is prohibited when the switch is closed. Following functions can be managed.
- Additional heat
- Compressor operation
- Heating mode
- Cooling mode
- Hot water mode

Connect the auxiliary inputs 1 to 3 to the terminal block X6:9-10, 11-12, 13-14 of AA3 board as illustrated.

Auxiliary inputs 4 to 6 are connected to terminal block X2:1-4, 2-4 and 3-4. X2:4 is common to all auxiliary circuits (GND).



• **AUX outputs**

External output is available on the port NC, NO and C on X7 terminal on AA3 board on HMA60/100-W. The relay output can have a max load of 2A at resistive load.

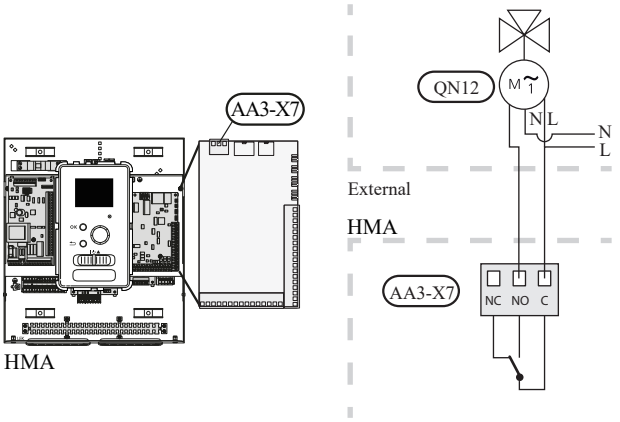
Following functions are available. Select the function in menu 5.4.

■ Indication of buzzer alarm

When an alarm occurs, the circuit becomes closed between the port NO and C. During normal operation, the port NC and C is closed.

■ Cooling mode indication / Active cooling mode (4-pipe cooling)

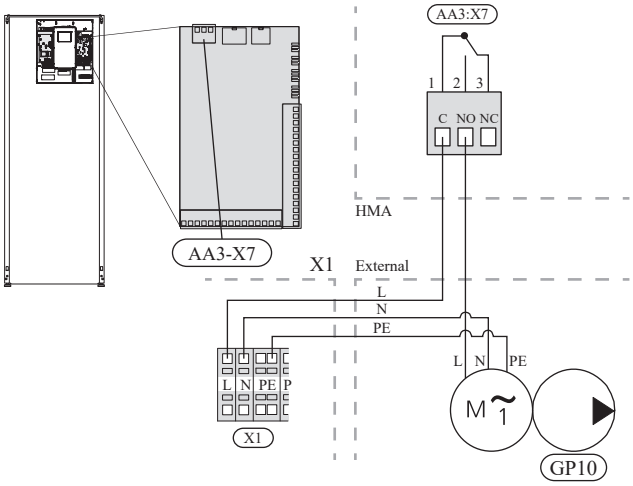
When the system turns into cooling mode, the circuit becomes closed between the port NO and C. By using this signal, it is possible to switch 3-way valve for 4-pipe cooling or to assemble a display circuit indicating cooling mode.



■ External pump control (GP10)

External pump (GP10) is used in case additional heater is placed after 3-way valve that switches heating/hot water.

Connect the circulation pump as shown below using the NO, C on X7 terminal on AA3 board on HMA60/100-W.



■ Hot water circulation pump control (GP11)

In case the distance between hot water tap and hot water storage tank is far, the hot water supply line temperature is likely to drop and it may take time to supply hot water from the tap. In that case, hot water circulation pump (GP11) is applied to maintain hot water supply line temperature warm (refer to page 41 for diagram).

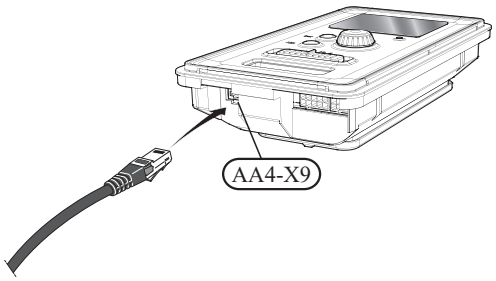
For details of connecting the pump, refer to External pump control (GP10).

NOTE

Mark up any junction boxes with warnings for external voltage.

• **myUplink**

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable grommet (UB2) in the controller for cable routing.



Accessories

Instruction for connection and configuration of other accessories provided with each accessory part.

- **Accessories with accessory board (AA5)**

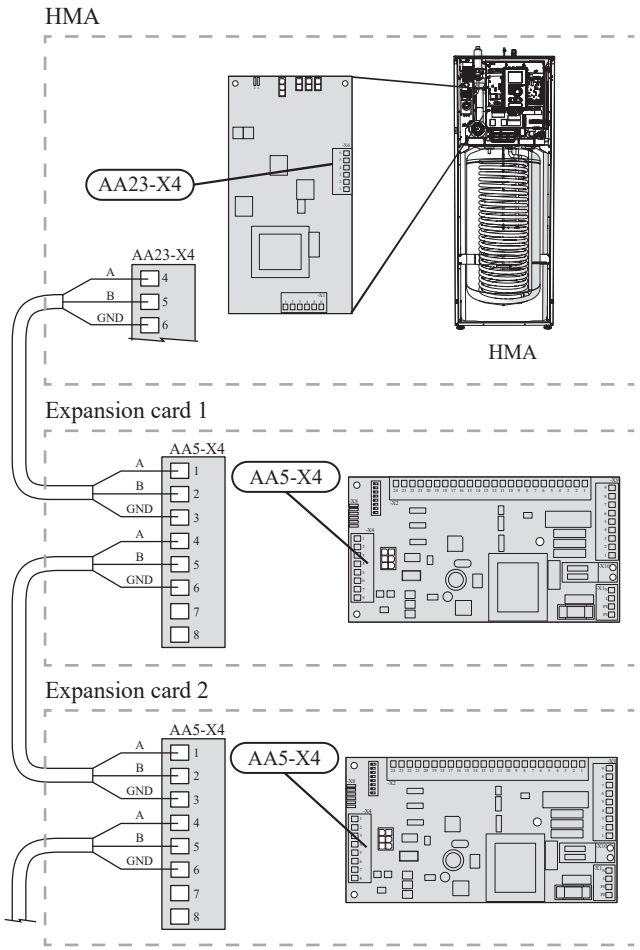
Accessories with accessory board (AA5) are connected to the control module's terminal block X3:4-6 on the input board AA23 (included on HMA60/100-W).

If several accessories are to connected or are already installed, the following instructions must be followed.

The first accessory board must be connected directly to the control module's terminal block AA23-X4. The following boards must be connected in series with the previous board.

Use cable type LiYY, EKKX or similar.

Refer to the acccessory manual for further instructions.

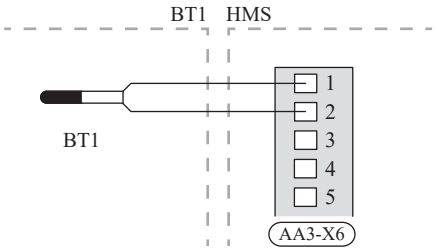


For detailed information on using the expansion card, see the installer manual for the AXC 30M accessory.

HMS60/100-W

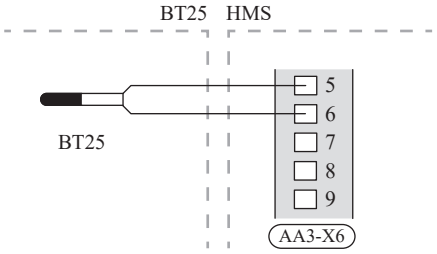
Connecting the outdoor temperature sensor

The outdoor temperature sensor BT1 (included) should be connected to the HMS60-W/HMS100-W unit via terminal block AA3-X6:1 and AA3-X6:2.



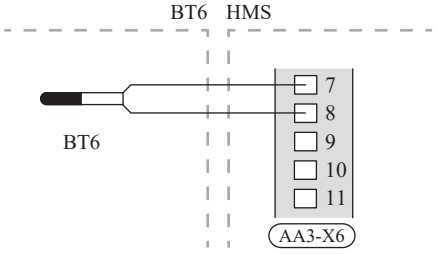
Connecting the temperature sensor BT25

The temperature sensor BT25 (included) should be connected to the HMS60-W/HMS100-W unit via terminal block AA3-X6: 5 and AA3-X6: 6. For the location of the sensor, see the section “Connection options”.



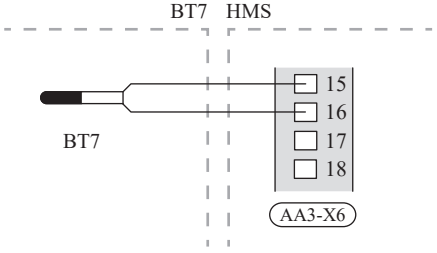
Connecting the temperature sensor BT6

The temperature sensor BT6 (included) should be connected to the HMS60-W/HMS100-W unit via terminal block AA3-X6: 7 and AA3-X6: 8.



Connecting the temperature sensor BT7

The temperature sensor BT7 (included) should be connected to the HMS60-W/HMS100-W unit via terminal block AA3-X6: 15 and AA3-X6: 16.



CAUTION

The location of the remaining sensors is available in the subsection “Electrical wiring diagrams”.

CURRENT SENSORS

When many power consumers are connected in the property at the same time as the electric additional heat is in operation, there is a risk of the property's main fuses tripping. Current meters controls the power steps for the electric additional heat by disconnecting step by step in event of overload in a phase. Reconnection occurs when other current consumption is reduced.

CAUTION

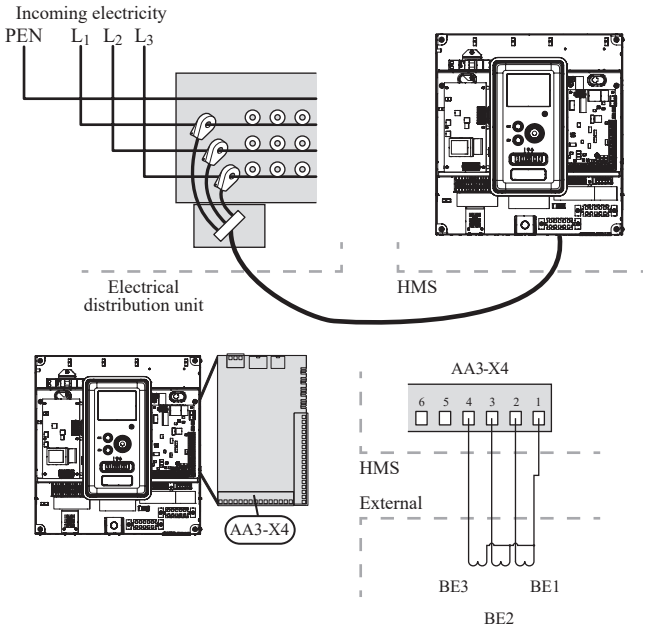
If current meters are installed, full functionality is obtained by enabling "detect phase sequence" and changing the fuse size to 20A in menu 5.1.12.

Connecting current sensors

A current sensor (BE1 - BE3) must be installed on each incoming phase conductor into the electrical distribution unit, to measure the current. The electrical distribution unit is an appropriate installation point. Connect the current sensors to a multi-core cable in an enclosure next to the electrical distribution unit. Use unscreened multi-core cable of at least 0.5 mm², from the enclosure to control module. Connect the cable to the input board (AA3) on terminal block X4:1-4 where X4:1 is the common terminal block for the three current sensors. The value for the size of the fuse is set in menu 5.1.12 to correspond with the size of the property's main fuse. Here it is also possible to adjust the current sensor's transformer ratio.

NOTE

If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.



If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.

Settings

Electric additional heat- maximum power

The electric additional heat has a maximum power of 9 kW (400 V) / 6.0 kW (230 V). The power is split into 3 steps. The possible operational power steps are: 3, 6 and 9 kW (400 V) or 1.5, 3.0 and 6.0 kW (230 V). The maximum power step of the immersion heater can be set using menu 5.1.12.

Emergency mode

When the controller is set to emergency mode (SF1 is set to ⚠) only the most necessary functions are activated.

- Hot water is not heated.
- Constant temperature in the supply line, more information in the section Emergency mode thermostat.

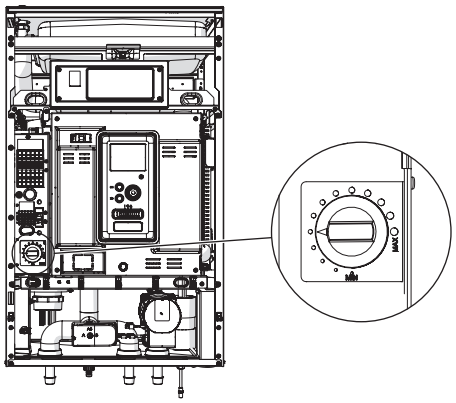
NOTE

While on emergency mode, it is not possible to heat hot water.

Emergency mode thermostat

The supply temperature in emergency mode is set using a thermostat (BT30). It should be set according to the demands of the heating/cooling circuits in operation.

The adjustment range is 5 - 65°C. Please note, however, that for underfloor heating the setting should be min. 20°C, max. 35-45°C to maintain comfort in the room and efficient operation of the system.



NOTE

The maximum available heater power in emergency mode is 3kW.

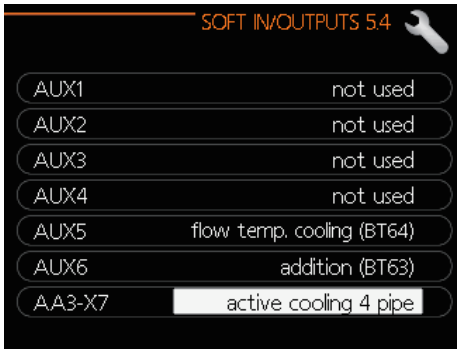
NOTE

The temperature on the thermostat must be set according to the system requirements. If the temperature is too high, it can damage the system.

- **AUX inputs**

On terminal block X6 on AA3 board and on X2, HMS60/100-W has software controlled auxiliary (AUX) inputs and outputs for connecting the external switch function or sensor.

This means that when an external switch function or sensor is connected to one of the six available inputs, this function must be selected in menu 5.4:



The available external inputs are:

- Temperature sensor, cooling/heating (BT74)
  Additional room sensor (BT74) is applied in case user wants to determine the operation mode (cooling/heating) with a temperature in a particular room.
  This option can be chosen only in case cooling function is available.
- Temperature sensor, additional heating (BT63)
  Temperature sensor BT63 is applied in case additional heater is placed before 3-way valve.
- Temperature sensor, boiler (BT52)
  Temperature sensor BT52 is applied in case shunt control additional heat function is enabled on addition menu.
- Temperature sensor, flow line cooling (BT64)
  Temperature sensor BT64 is required in case 4-pipe system is used for cooling operation. This option can be chosen only in case cooling function is activated.
- Contact for external tariff blocking
  In cases where external tariff blocking is required it must be connected to auxiliary inputs.
  Tariff blocking means that the additional heat, the compressor, heating and cooling are disconnected by connecting a potential free switch function to the input selected in menu 5.4.
  A closed contact results in the electrical output being disconnected.
- Switch for “SG ready”

NOTE

This function can only be used in mains networks that support the "SG Ready"-standard . "SG Ready" requires two AUX inputs.

This function can only be used in power supply networks that support the “SG Ready” standard. “SG Ready” requires two AUX inputs.

“SG Ready” is a smart tariff management scheme in which electricity supplier can affect indoor and hot water temperature or simply prohibits additional heat and/or the compressor operation in heat pump at certain period of the day. You can choose which operation mode is affected by this function in menu 4.1.5 after the function is activated.

Choose two external input circuits and connect potential-free switches, and set “SG Ready A” and “SG Ready B” in menu 5.4. The system works differently according to the combination of the circuit open/closed.

- Blocking (A: Closed, B: Open)
  “SG Ready” is active. Compressor operation and additional heat is prohibited.
- Normal mode (A: Open, B: Open)
  “SG Ready” is not active. No effect on the system.
- Low price mode (A: Open, B: Closed)
  “SG Ready” is active. The system operates to provide higher capacity than normal mode by using lower tariff electricity. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.
- Overcapacity mode (A: Closed, B: Closed)
  “SG Ready” is active. The system supplies higher capacity than Low price mode since the electricity price is supposed to be very low in this mode. You can select the operation mode (heating/hot water/cooling) affected by this function in menu 4.1.5.

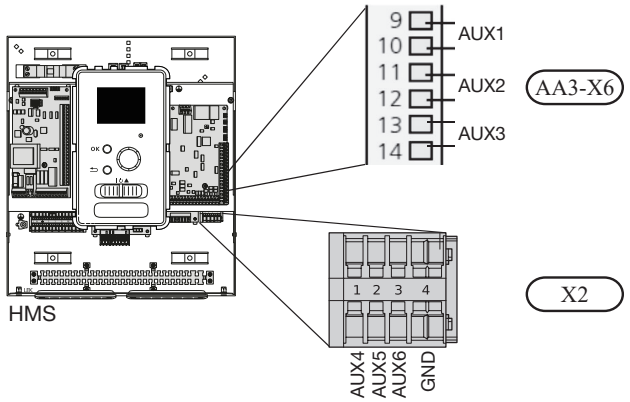
- Contact for activation of “temporary lux”
  Temporary hot water production function “temporary lux” is activated with this signal. Connect the terminals with a potential-free switch and choose the function in menu 5.4.
  “Temporary lux” is activated only when the switch is closed.
- Contact for activation of “external adjustment”
  Target temperature offset for supply temperature or room temperature can be done with this signal.
  When a room sensor is connected and activated, the Electric connections 34 target room temperature is offset in °C if the switch is closed. When a room sensor is not connected, target supply water temperature (heat curve) is offset instead. The degree of offset can be set in menu 5.4.

■ Switch for external alarm
Alarms from external devices can be connected to the control and appear as an info alarm. Potential-free signal of NO or NC type can be connected.

■ Switch for external blocking
This function is used in case certain operation mode needs to be prohibited. The operation at selected operation mode is prohibited when the switch is closed. Following functions can be managed.
- Additional heat
- Compressor operation
- Heating mode
- Cooling mode
- Hot water mode

Connect the auxiliary inputs 1 to 3 to the terminal block X6:9-10, 11-12, 13-14 of AA3 board as illustrated.

Auxiliary inputs 4 to 6 are connected to terminal block X2:1-4, 2-4 and 3-4. X2:4 is common to all auxiliary circuits (GND).



• **AUX outputs**

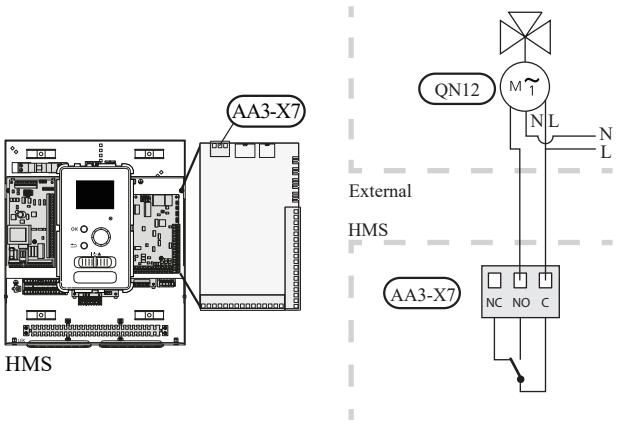
External output is available on the port NC, NO and C on X7 terminal on AA3 board on HMS60/100-W. The relay output can have a max load of 2A at resistive load.

Following functions are available. Select the function in menu 5.4.

■ Indication of buzzer alarm

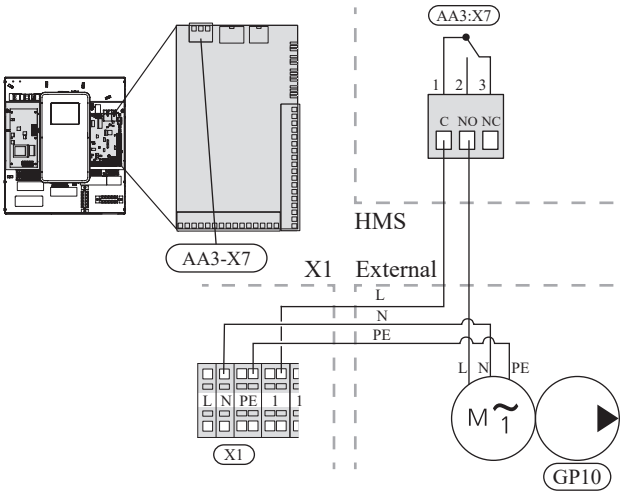
When an alarm occurs, the circuit becomes closed between the port NO and C. During normal operation, the port NC and C is closed.

■ Cooling mode indication / Active cooling mode (4-pipe cooling)
When the system turns into cooling mode, the circuit becomes closed between the port NO and C. By using this signal, it is possible to switch 3-way valve for 4-pipe cooling or to assemble a display circuit indicating cooling mode.



■ External pump control (GP10)
External pump (GP10) is used in case additional heater is placed after 3-way valve that switches heating/hot water.

Connect the circulation pump as shown below using the NO, Con X7 terminal on AA3 board on HMS60/100-W.



■ Hot water circulation pump control (GP11)
In case the distance between hot water tap and hot water storage tank is far, the hot water supply line temperature is likely to drop and it may take time to supply hot water from the tap. In that case, hot water circulation pump (GP11) is applied to maintain hot water supply line temperature warm (refer to page 43 for diagram).

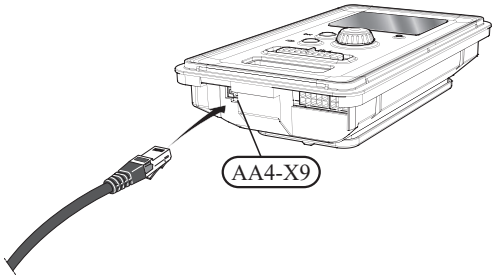
For details of connecting the pump, refer to External pump control (GP10).

NOTE

Mark up any junction boxes with warnings for external voltage.

- **myUplink**

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable grommet (UB2) in the controller for cable routing.



Accessories

Instruction for connection and configuration of other accessories provided with each accessory part.

- **Accessories with accessory board (AA5)**

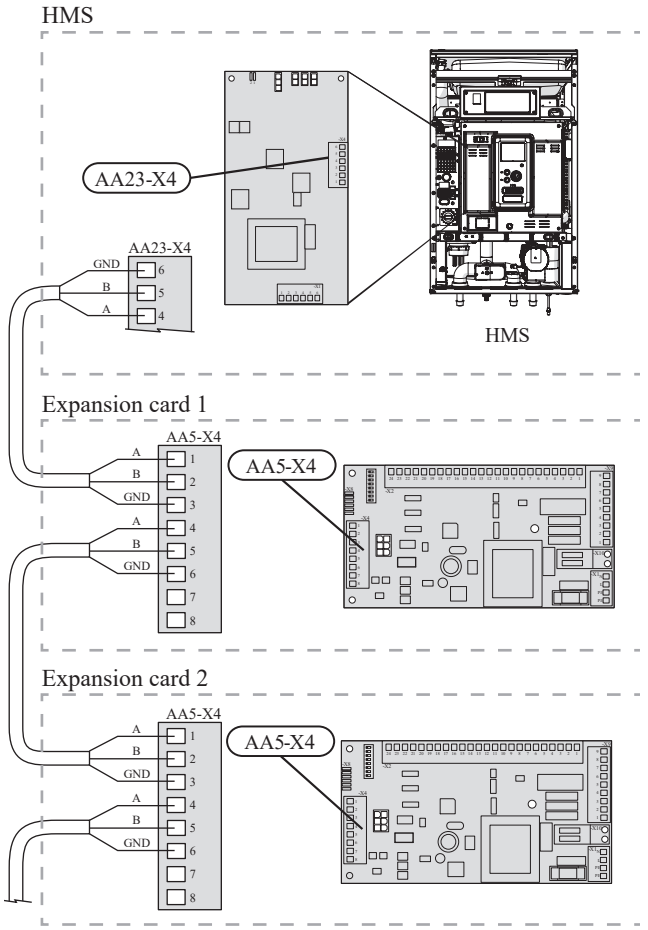
Accessories with accessory board (AA5) are connected to the control module's terminal block X3:4-6 on the input board AA23 (included on HMS60/100-W).

If several accessories are to connected or are already installed, the following instructions must be followed.

The first accessory board must be connected directly to the control module's terminal block AA23-X4. The following boards must be connected in series with the previous board.

Use cable type LiYY, EKKX or similar.

Refer to the acccessory manual for further instructions.



For detailed information on using the expansion card, see the installer manual for the AXC 30 accessory.

Commissioning and adjusting

Preparations

Before starting commissioning, check the followings;

- The signal cable is connected between indoor unit and outdoor unit as well as indoor unit and controller according to the instruction.
- The power cable is connected to indoor unit, outdoor unit and controller according to the instruction.
- Operation switch in controller is in the position ⏻.
- The service valves on outdoor unit (QM35 and QM36) are open.
- Drain valve is closed before filling water in the system.
- Temperature limiter and electrical switch are not tripped.
- The system is filled with water and well vented.
- There are no leaks on the water pipe.

Filling and venting

Hot water tank

1. Open the hot water tap as well as venting valve if applicable, and then open the cold water cut-off valve at the inlet.
2. Fill the storage tank until obtaining uniform water outflow at the hot water tap, and then close the hot water tap and venting valve.
3. Fill the water heater coil in the tank. See Climate system for details.

After the installation and levelling the tank, follow the procedure below (for the connector pipe symbols, refer to page 23):

1. Remove protecting plugs from the connector pipes
2. Connect the hot water intake line (N).
3. Connect the cold water supply line together with the required safety valves (G).
4. If the system has the hot water circulati on system, connect it to the connector pipe (L). Otherwise, plug the pipe.
5. Connect the supply (J) and return (H) of the heating medium to the coil.

CAUTION

If there is an electric heating module installed in the storage tank, fill the tank with water before connecting it to the electrical installation.

CAUTION

Open the hot water intake valves before heating the system up for the first time or after a longer break in its operation in order to check whether the storage tank is filled with water and the cut-off valve at the cold water inlet is not closed.

Climate system

1. Open the vent at the top of the heating system.
2. Open all shut-off valves, where installed, so that water flows into all circuits.
3. Open the valve for filling the heating circuit and fill it with water.
4. Close the vent when water comes out continuously without bubbles.
5. Check the manometer and close the filling valve when the pressure reaches the required value (2 bar is recommended).
6. Start the circulation pump of the heating system, and open the vent from time to time and release the all remaining air in the heating system.
7. Open safety valve until the pressure of the heating system drops down to about 1 bar. If the pressure drops below 1 bar during venting, add additional water in the circuit.

Inspection of installation

Current regulations require that the climate system is inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and must be documented. Do not replace any part of the system without carrying out new checks.

Start-up and inspection

Before start-up

1 In case of cascade connection, check if each indoor unit has a unique address. See Cascade connection setting on page 57 for details.

2. Start commissioning by the following steps.

Commissioning with heat pump

Start guide is shown on the display on the controller when it is turned ON for the first time. Follow the start guide in the display, or choose menu 5.7 to show the start guide. For details, see Start guide on page 84-97.

Commissioning with additional heater only

Follow the start guide in the display as same as commissioning with heat pump, and then follow the list below.

1. Go to menu 4.2 op. mode.
2. Mark “add. heat only” using the control knob and then press the OK button.
3. Return to the main menus by pressing the Back button.

CAUTION

When commissioning without MHI air/water heat pump an alarm communication error may appear in the display.

The alarm is reset if the relevant heat pump is deactivated in menu 5.2.2 ("installed heat pump").

3-way valve operation check

1. Activate "AA2-K1 (QN10)" in menu 5.6.
2. Check that the reversing valve opens or is open for hot water charging.
3. Deactivate "AA2-K1 (QN10)" in menu 5.6.

AUX function check

To check any function connected to the AUX socket,

1. Activate “AA2-X4 (RC-HY20-W)” or “AA3-X7 (RC-HY40-W, HMA60/100-W, HMS60/100-W)” in menu 5.6.
2. Check the desired function.
3. Deactivate “AA2-X4 (RC-HY20-W)” or “AA3-X7 (RC-HY40-W, HMA60/100-W, HMS60/100-W)” in menu 5.6.

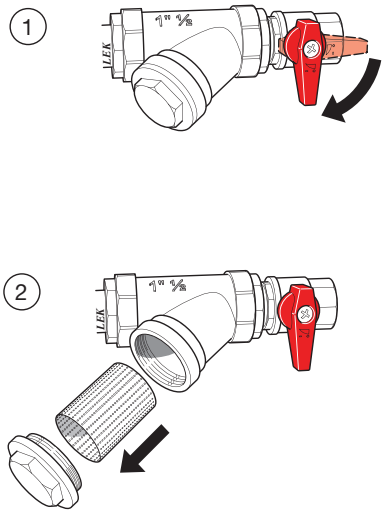
Cooling mode

In case the climate system contains a cooling circuit, activate cooling function in menu 5.11.1.1. After that, you can choose cooling mode indication in menu 5.4 for the AUX output.

Cleaning particle filter

Clean the particle filter (HQ1) after installation.

1. Close valve QM31 and the valve by the particle filter (HQ1).
2. Open the safety valve (QM20) to ensure that the pressure in HSB60-W drops.
3. Clean the particle filter (HQ1) as illustrated.



Secondary adjustment

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the circulation pump and radiators the entire system will require further venting. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required.

Start guide

NOTE

Fill in the climate system with water before the switch is set to "|"

1. Set the control module's switch to "|".
2. Follow the instructions in the start guide in the control module display. If the start guide does not start when you start the control module, start it manually in menu 5.7.

TIP

See page 98 for a more in-depth introduction to the installation's control system (operation, menus etc.).

Commissioning

The start guide is displayed when installation is started, It describes what needs to carry out at the first start together with basic settings during installation.

The start guide is displayed so that it cannot be bypassed in order to carry out the start-up correctly. You can start the start guide later in menu 5.7.

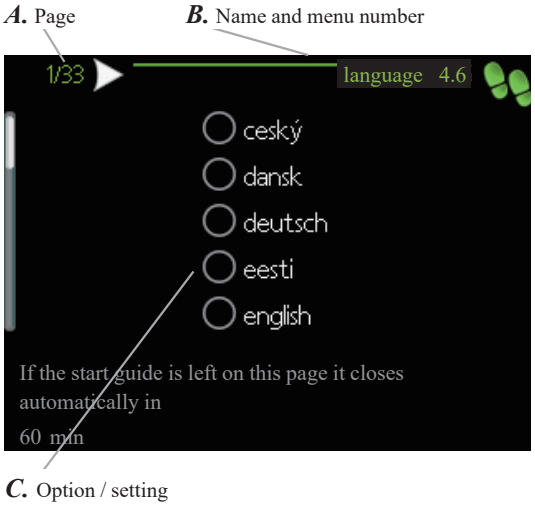
During the start-up guide, reversing valves and the shunt are run back and forth to help vent the heat pump.

CAUTION

As long as the start guide is active, no function in the heat pump will start automatically.

Each time the controller is ON, the guide will appear until it is completed on the last page.

Operation in the start guide



A. Page

You can see the current page of the start guide.

Scroll between the pages of the start guide as follows:

1. Turn the control knob until the arrow is marked in the top left corner (at the page number).
2. Press OK button to proceed to the next page in the start guide.

B. Name and menu number

You can see the menu name of this page. The number refers to the menu number in the control system.

To read more about affected menus, see the help menu or read the user manual.

C. Option / setting

Make settings for the system here.

D. Help menu

In many menus there is a symbol indicating that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press OK button.

The help text often consists of several windows that you can scroll between using the control knob.

Start guide – RC-HY20-W

This menu is shown when the heat pump is started for the first time. It ensures that commissioning is carried out correctly and all necessary steps are followed.

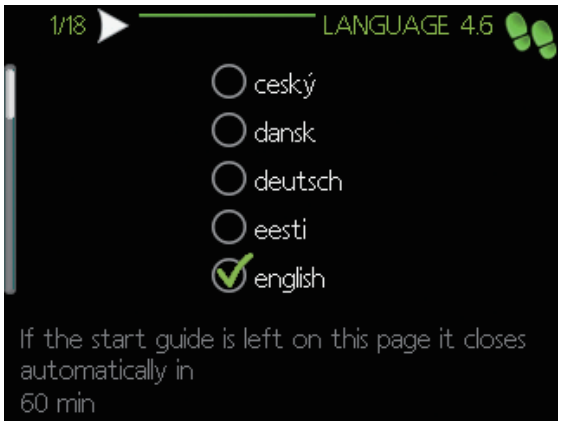
The following menus are basic settings. If accessories are connected other menus might appear.

Start guide can be started anytime on service menu 5.7.

If RC-HY40-W or HMS60/100-W, proceed to page 88.

For HMA60/100-W, proceed to page 93.

1/18 – Language

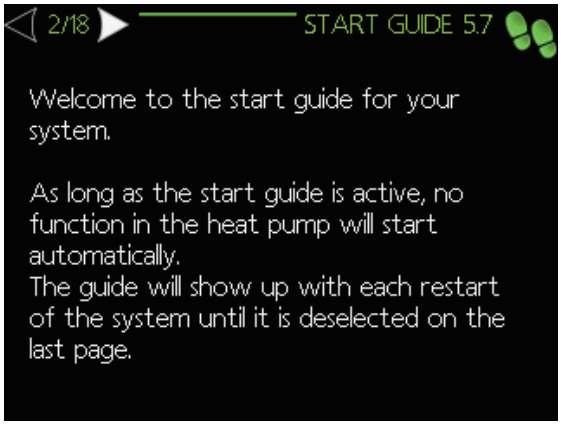


Select the language of the controller.

Factory setting: English

Available languages: Czech, Danish, German, Estonian, English, Spanish, French, Croatian, Icelandic, Italian, Latvian, Lithuanian, Hungarian, Dutch, Norwegian Polish, Portuguese, Romanian, Russian, Slovenian, Finnish, Swedish, Turkish.

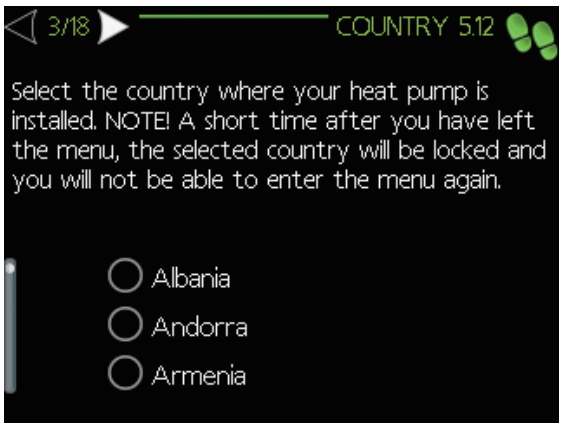
2/18 – Start guide



This menu displays information about the start guide.

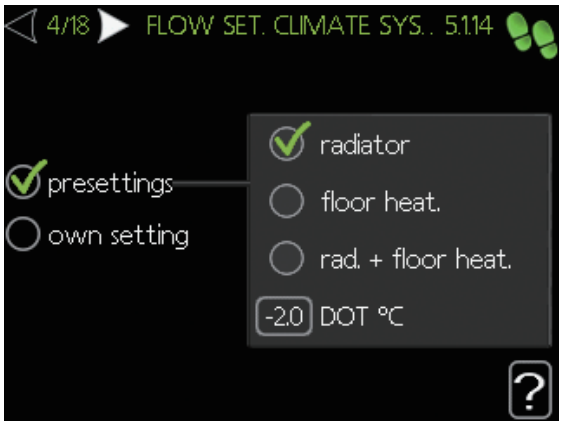
No action needed.

3/18 – Country



Select the country where the heat pump is installed.

4/18 – Flow set/ climate syst.



The type of heating distribution system the heating medium pump works towards is set here.

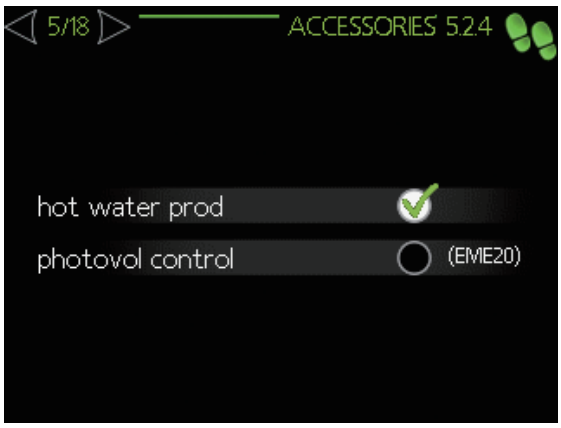
Factory settings: Presettings – Radiator

Setting range:

- Presettings
  - Radiator
  - Floor heating
  - Rad. + Floor heat.
- Own setting
  - Setting range dt at DOT: 0.0 – 25.0 °C
  - Setting range DOT: -40.0 – 20.0 °C

Where dt at DOT is the difference in degrees between the flow at return temperature at dimensioned outdoor temperature.

5/18 – Accessories

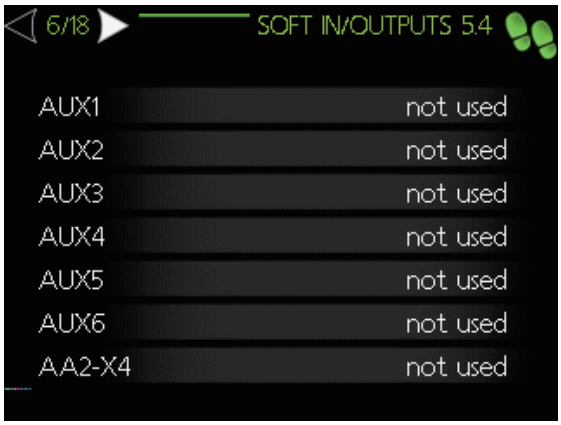


Activate additional connected accessories here.

Setting range:

- Hot water production
- Photovoltaic control (EME20M)

6/18 – Soft in/outputs



Set the function of each input and output for each terminal (if connected).

Setting range:

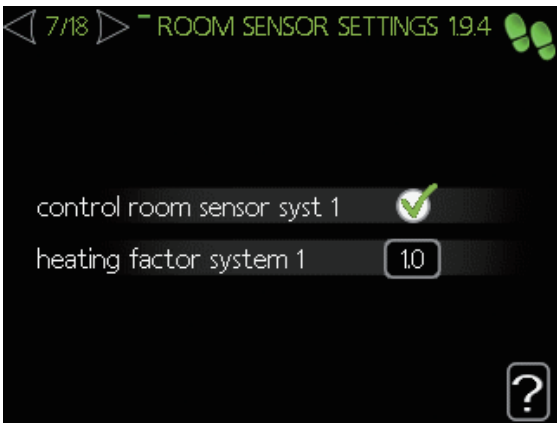
- AUX 1-6

- Temperature sensor, cooling/heating (BT74)
- Temperature sensor, heating external return line (BT71)
- Temperature sensor, flow line cooling (BT64)
- Contact for external tariff blocking
- Switch for “SG ready”
- Contact for activation of “external adjustment”
- Switch for external alarm
- Switch for external blocking

- AA3-X7

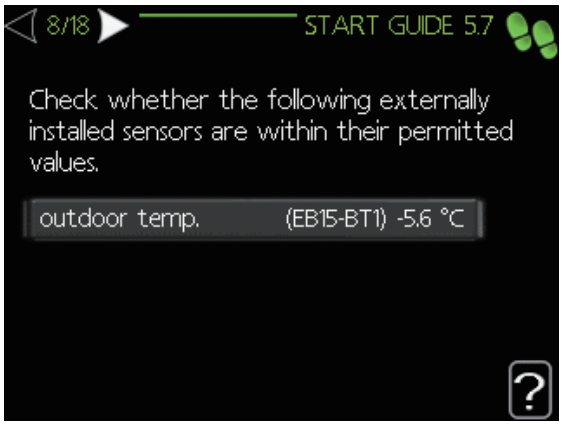
- Alarm output
- Cooling mode indication
- Active cooling 4 pipe
- External heating medium pump (GP10)
- Hot water circulation (GP11)
- Holiday output

7/18 – Room sensor settings



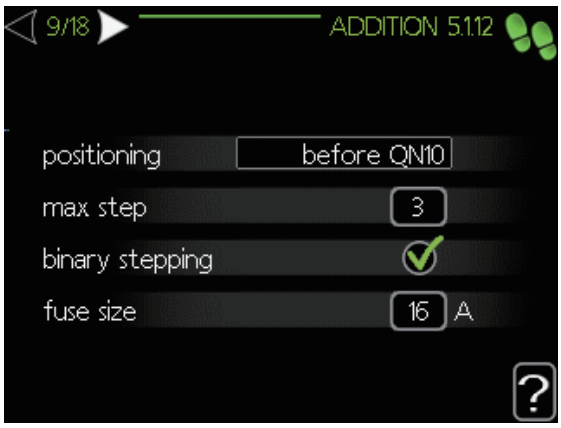
Activate and set the room temperature sensor RTS40M settings for the climate system 1 (if connected).

8/18 – Start guide



Check if the values shown on the screen are correct. If they are not correct, please check your connections.

9/18 – Addition



Set addition settings here.

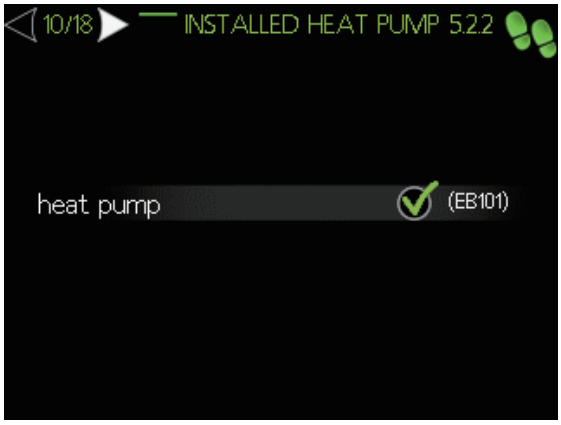
Factory setting:

- **Positioning:** Before QN10
- **Max step:** 3
- **Binary stepping:** OFF
- **Fuse size:** 16 A

Setting range:

- **Positioning:**
  - Before QN10
  - After QN10
- **Max step:**
  - Binary stepping deactivated: 0-3
  - Binary stepping activated: 0-7
- **Binary stepping:**
  - OFF
  - ON
- **Fuse size:** 1 - 200 A

10/18 – Installed heat pump



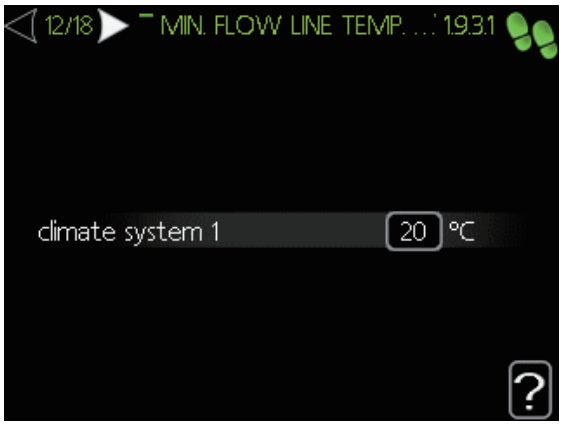
Enable outdoor unit here (if connected).

11/18 – Time and date

Set time and date here.

If the system is connected to myUplink then time and date are set automatically.

12/18 – Min. flow line temperature

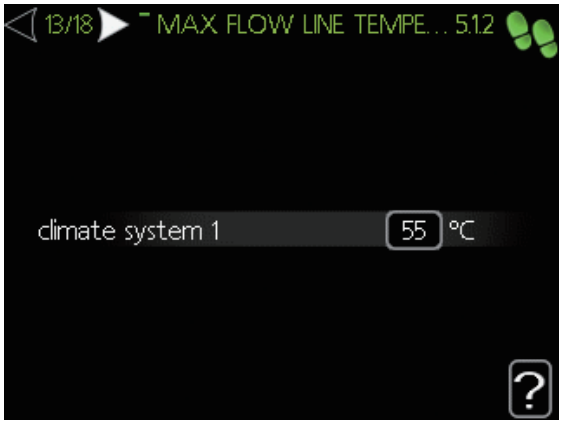


Set the minimum flow line temperature of the climate system.

Factory setting: 20°C

Setting range: 5.0 – 70.0°C

13/18 – Max. flow line temperature

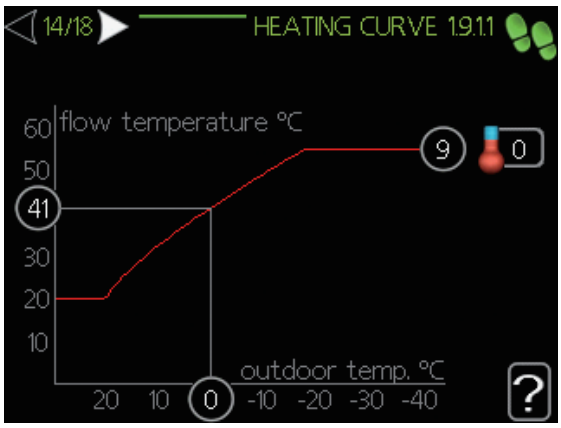


Set the maximum flow line temperature of the climate system.

Factory setting: 60°C

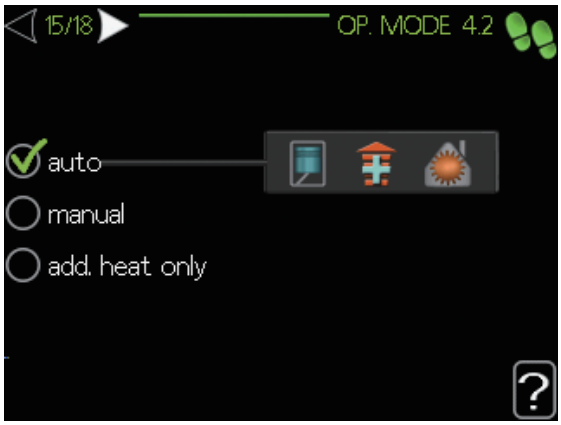
Setting range: 5.0 – 70.0°C

14/18 – Heating curve



View and set (if desired) the space heating curve here.

15/18 – Op. mode



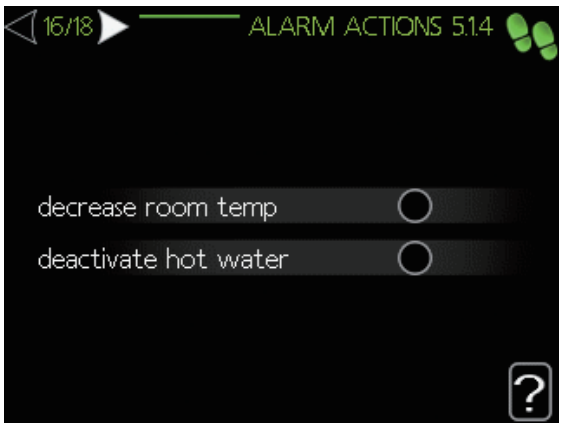
Set the operation mode of the heat pump system.

Factory setting: Auto

Setting range:

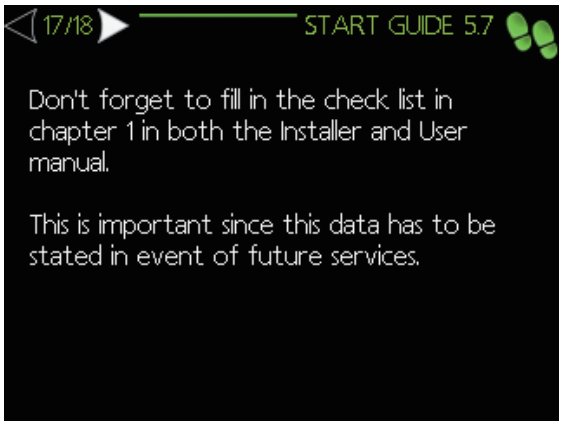
- Auto
- Manual
  - Heating
  - Cooling (only if permitted)
  - Add. Heat only
- Add. Heat only
  - Heating

16/18 – Alarm actions



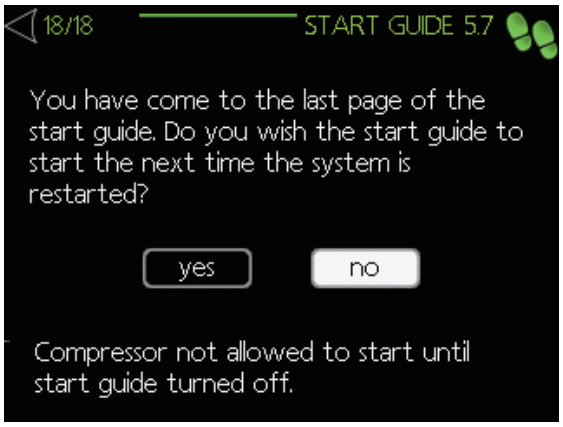
Set how to control the heat pump system in case of alarm.

17/18 – Start guide



No action needed.

18/18 – Start guide



Commissioning guide finishes here. It is possible to set it to open again upon restart of the controller or do not open it anymore.

Proceed to page 98 in order to skip commissioning for other units and check other system adjustments.

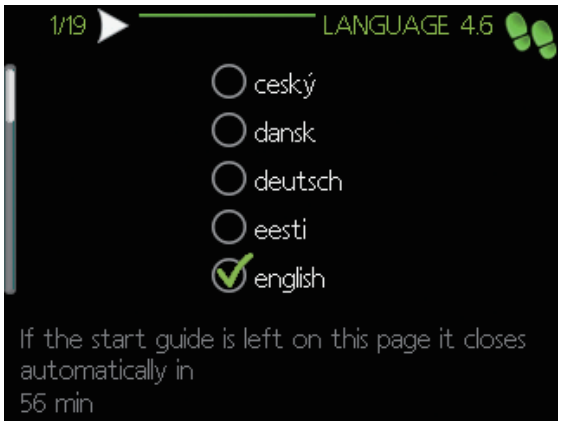
Start guide – RC-HY40-W or HMS60/100-W

This menu is shown when the heat pump is started for the first time. It ensures that commissioning is carried out correctly and all necessary steps are followed.

The following menus are basic settings. If accessories are connected other menus might appear.

Start guide can be started anytime on service menu 5.7.

1/19 – Language

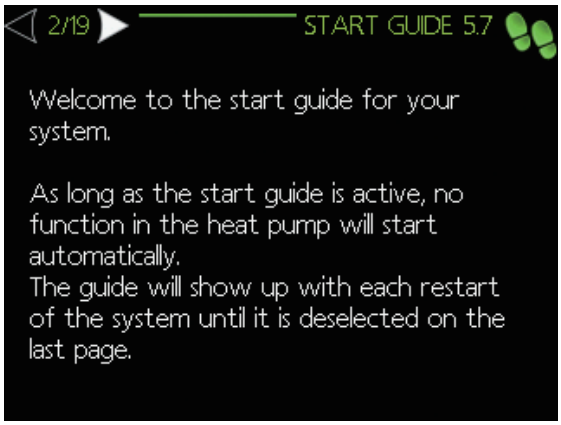


Select the language of the controller.

Factory setting: English

Available languages: Czech, Danish, German, Estonian, English, Spanish, French, Croatian, Icelandic, Italian, Latvian, Lithuanian, Hungarian, Dutch, Norwegian Polish, Portuguese, Romanian, Russian, Slovenian, Finnish, Swedish, Turkish.

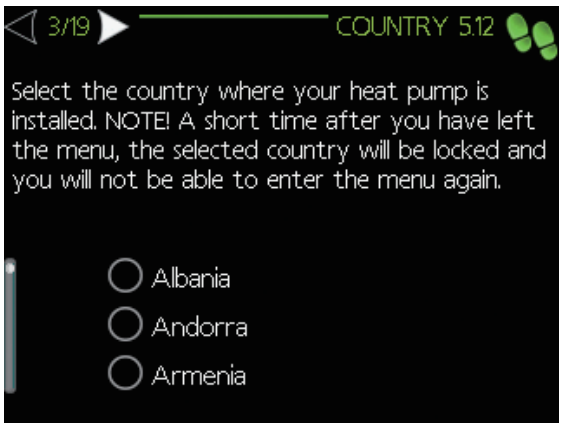
2/19 – Start guide



This menu displays information about the start guide.

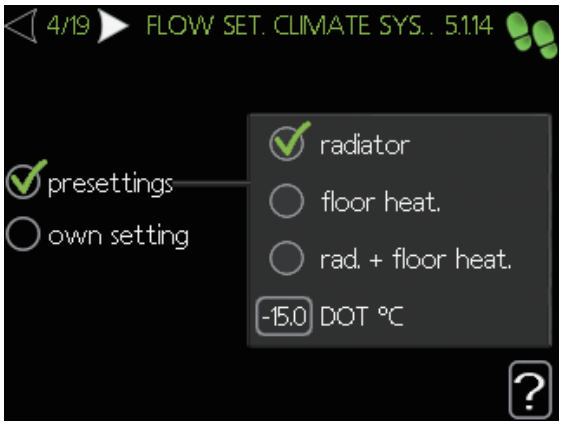
No action needed.

3/19 – Country



Select the country where the heat pump is installed.

4/19 – Flow set/ climate syst.



The type of heating distribution system the heating medium pump works towards is set here.

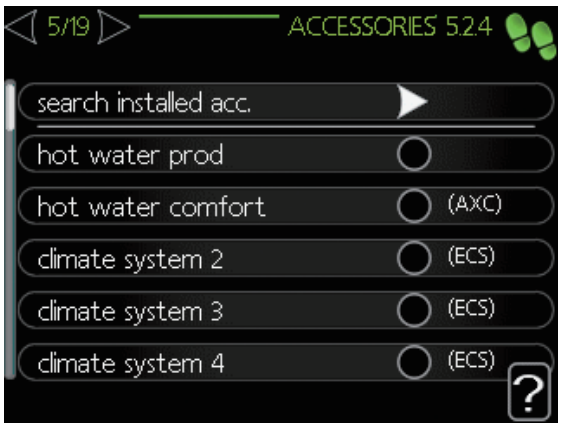
Factory settings: Presettings – Radiator

Setting range:

- Presettings
  - Radiator
  - Floor heating
  - Rad. + Floor heat.
- Own setting
  - Setting range dt at DOT: 0.0 – 25.0 °C
  - Setting range DOT: -40.0 – 20.0 °C

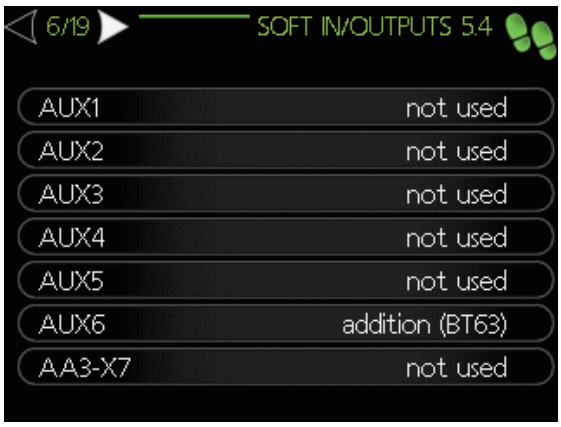
Where dt at DOT is the difference in degrees between the flow at return temperature at dimensioned outdoor temperature.

5/19 – Accessories



Activate or search for connected accessories here. Some accessories require DIP Switch configuration on their AA5 board.

6/19 – Soft in/outputs



Set the function of each input and output for each terminal (if connected).

Setting range:

- AUX 1-6

- Temperature sensor, cooling/heating (BT74)
- Temperature sensor, additional heating (BT63)
- Temperature sensor, flow line cooling (BT64)
- Temperature sensor, boiler (BT52)
- Contact for external tariff blocking
- Switch for “SG ready”
- Contact for activation of “external adjustment”
- Switch for external alarm
- Switch for external blocking

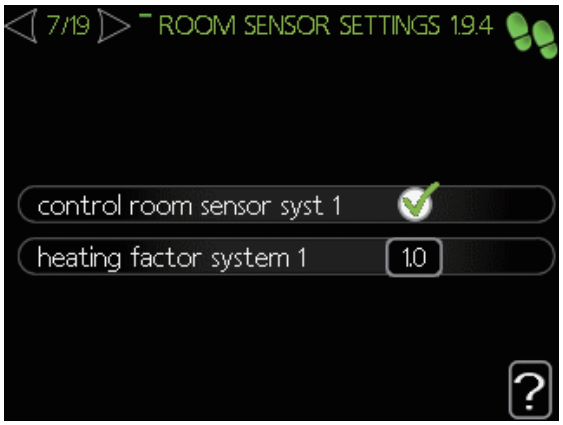
- AA3-X7

- Alarm output
- Cooling mode indication
- Active cooling 4 pipe
- External heating medium pump (GP10)
- Hot water circulation (GP11)
- Holiday output

Note: in case of HMS60/100-W units, BT63 sensor is connected on AUX6.

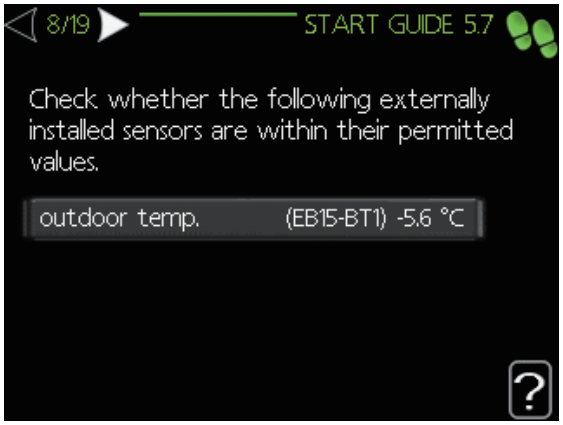
During commissioning BT63 is automatically shown on this menu.

7/19 – Room sensor settings



Activate and set the room temperature sensor RTS40M settings for the climate system 1 (if connected).

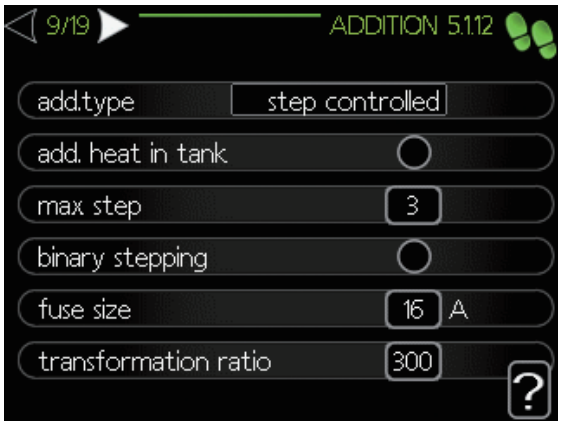
8/19 – Start guide



Check if the values shown on the screen are correct. If they are not correct, please check your connections.

9/19 – Addition

<RC-HY40-W only>



Set addition settings here.

Factory setting:

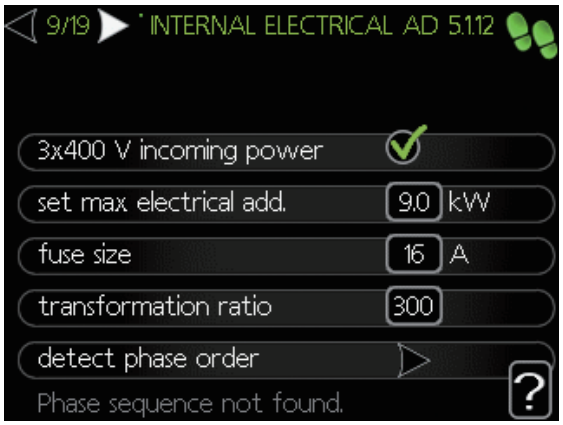
- **Add. type:** Step controlled
- **Add heat in tank:** OFF
- **Max step:** 3
- **Binary stepping:** OFF
- **Fuse size:** 16 A
- **Transformation ratio:** 300

Setting range:

- **Add. type:**
  - Step controlled
  - Shunt controlled
- **Positioning:**
  - Before QN10
  - After QN10
- **Add. heat in tank:**
  - OFF
  - ON
- **Add. heat heating (in case add heat in tank is ON):**
  - OFF
  - ON
- **Max step:**
  - Binary stepping deactivated: 0-3
  - Binary stepping activated: 0-7
- **Binary stepping:**
  - OFF
  - ON
- **Fuse size:** 1 - 200 A
- **Transformation ratio:** 300-3000

9/19 – Internal electrical addition

<HMS60/100-W only>



Here you set the max. electrical output out of the internal addition in HMS60/100-W and the fuse size for the installation.

Here you can also check which current sensor is installed on which incoming phase to the property (this requires current sensors to be installed).

Do this by marking “detect phase order” and pressing the OK button.

Factory setting:

- **3 x 400 V incoming power: ON**
- **Set max electrical add: 9 kW**
- **Fuse size: 16 A**
- **Transformation ratio: 300**

Setting range:

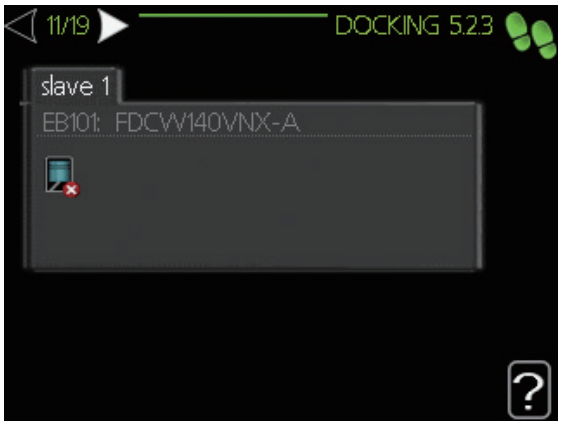
- **3 x 400 V incoming power:**
  - OFF
  - ON
- **Set max electrical add:**
  - If 3 x 400 V incoming power is ON: 3, 6, 9 kW
  - If 3 x 400 V incoming power is OFF: 1.5, 3, 6 kW
- **Fuse size:** 1 - 200 A
- **Transformation ratio:** 300-3000

10/19 – Installed slaves

Search for installed slaves and enable them (if connected) here. If everything is correct, the units are automatically selected after searching for installed slaves.

Note: in case of HMS units only one slave can be selected.

11/19 – Docking



Set outdoor unit docking.

In case of RC-HY40-W units, compressor is blocked as standard and docking needs to be adjusted manually according to installation type.

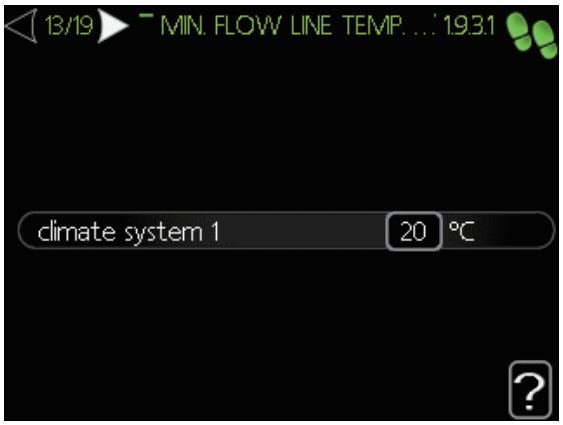
In case of HMS units, docking comes pre-set as heating and hot water only. If necessary, docking needs to adjust manually according to installation type.

12/19 – Time and date

Set time and date here.

If the system is connected to myUplink then time and date are set automatically.

13/19 – Min. flow line temperature

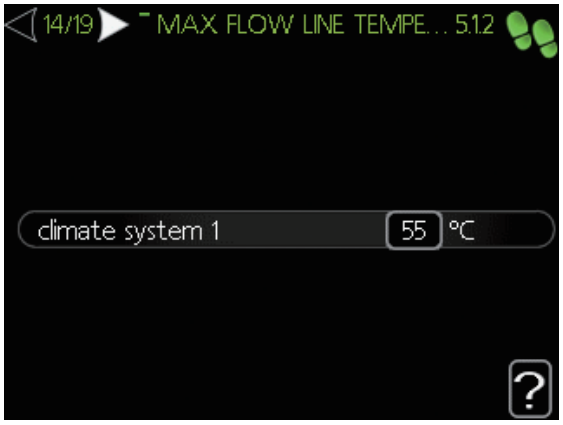


Set the minimum flow line temperature of the climate system.

Factory setting: 20°C

Setting range: 5.0 – 70.0°C

14/19 – Max. flow line temperature

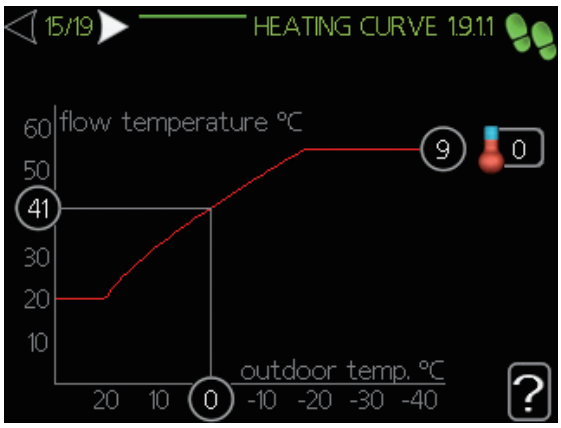


Set the maximum flow line temperature of the climate system.

Factory setting: 55°C

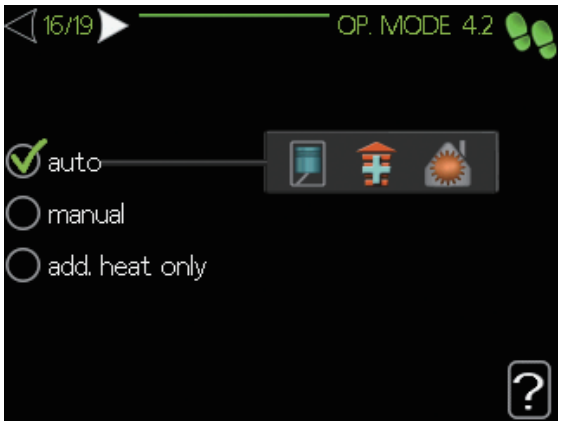
Setting range: 5.0 – 70.0°C

15/19 – Heating curve



View and set (if desired) the space heating curve here.

16/19 – Op. mode



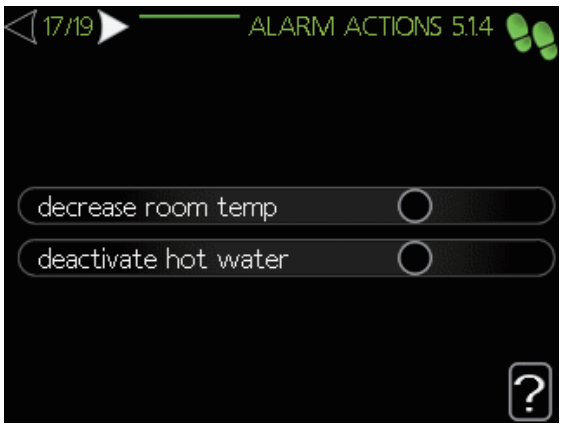
Set the operation mode of the heat pump system.

Factory setting: Auto

Setting range:

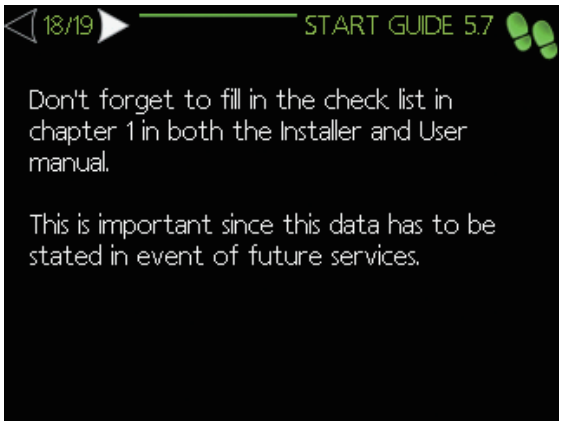
- Auto
- Manual
  - Heating
  - Cooling (only if permitted)
  - Add. Heat only
- Add. Heat only
  - Heating

17/19 – Alarm actions



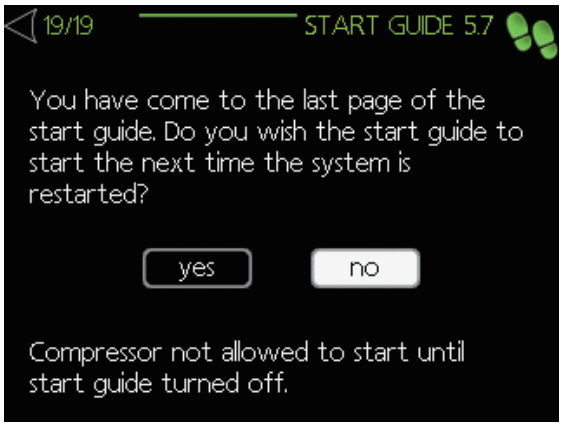
Set how to control the heat pump system in case of alarm.

18/19 – Start guide



No action needed.

19/19 – Start guide



Commissioning guide finishes here. It is possible to set it to open again upon restart of the controller or do not open it anymore.

Proceed to page 98 in order to skip commissioning for other units and check other system adjustments.

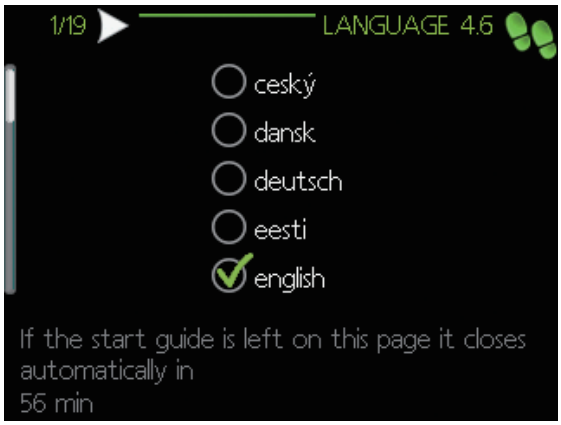
Start guide – HMA60/100-W

This menu is shown when the heat pump is started for the first time. It ensures that commissioning is carried out correctly and all necessary steps are followed.

The following menus are basic settings. If accessories are connected other menus might appear.

Start guide can be started anytime on service menu 5.7.

1/19 – Language

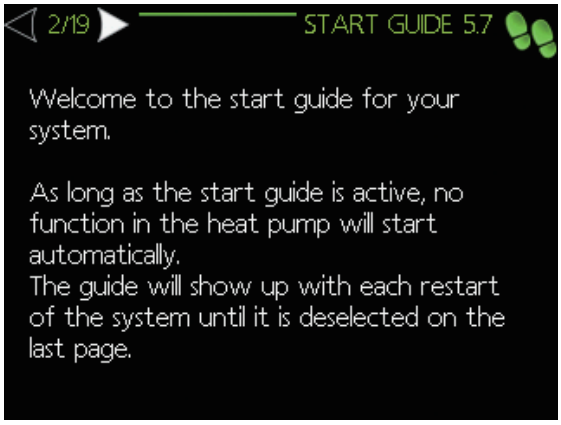


Select the language of the controller.

Factory setting: English

Available languages: Czech, Danish, German, Estonian, English, Spanish, French, Croatian, Icelandic, Italian, Latvian, Lithuanian, Hungarian, Dutch, Norwegian Polish, Portuguese, Romanian, Russian, Slovenian, Finnish, Swedish, Turkish.

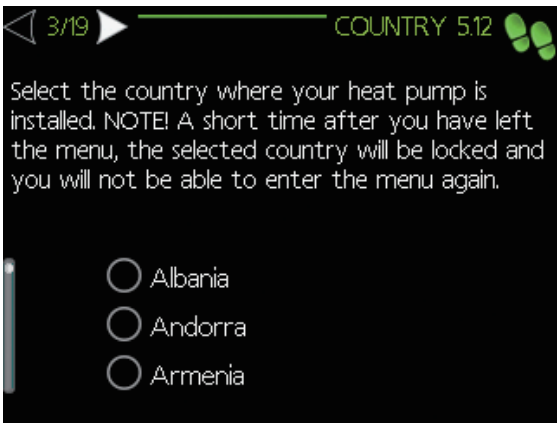
2/19 – Start guide



This menu displays information about the start guide.

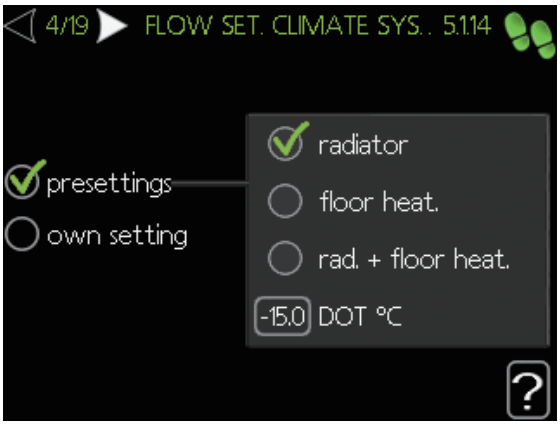
No action needed.

3/19 – Country



Select the country where the heat pump is installed.

4/19 – Flow set/ climate syst.



The type of heating distribution system the heating medium pump works towards is set here.

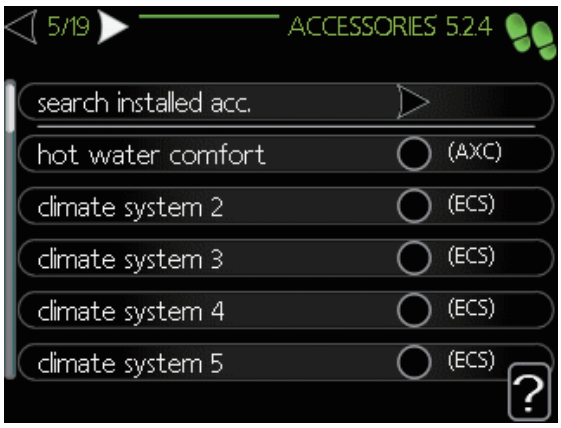
Factory settings: Presettings – Radiator

Setting range:

- Presettings
  - Radiator
  - Floor heating
  - Rad. + Floor heat.
- Own setting
  - Setting range dt at DOT: 0.0 – 25.0 °C
  - Setting range DOT: -40.0 – 20.0 °C

Where dt at DOT is the difference in degrees between the flow at return temperature at dimensioned outdoor temperature.

5/19 – Accessories

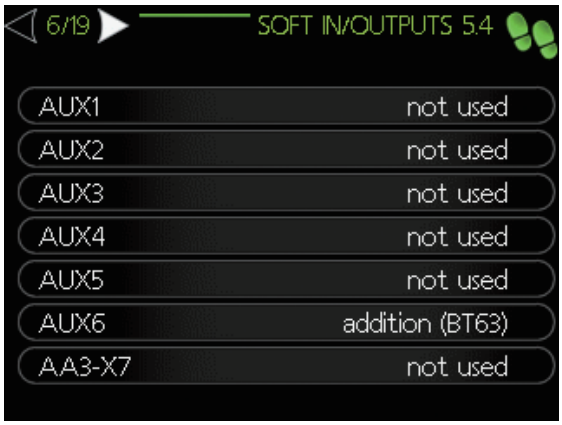


Activate or search for connected accessories here.

Hot water production is enabled from factory and cannot be disabled.

Some accessories require DIP Switch configuration on their AA5 board.

6/19 – Soft in/outputs



Set the function of each input and output for each terminal (if connected).

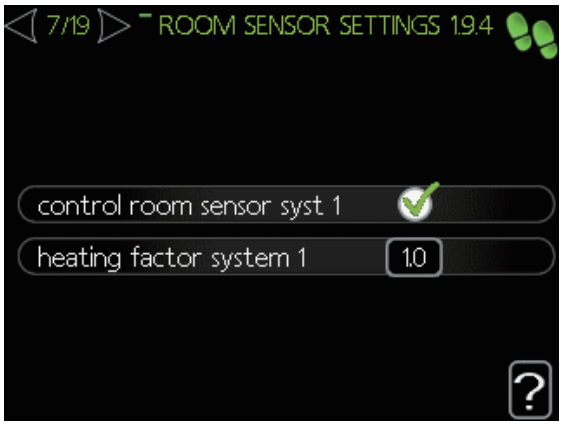
Setting range:

- AUX 1-6
  - Temperature sensor, cooling/heating (BT74)
  - Temperature sensor, additional heating (BT63)
  - Temperature sensor, flow line cooling (BT64)
  - Temperature sensor, boiler (BT52)
  - Contact for external tariff blocking
  - Switch for “SG ready”
  - Contact for activation of “external adjustment”
  - Switch for external alarm
  - Switch for external blocking
- AA3-X7
  - Alarm output
  - Cooling mode indication
  - Active cooling 4 pipe
  - External heating medium pump (GP10)
  - Hot water circulation (GP11)
  - Holiday output

Note: BT63 sensor is connected on AUX6 and BT64 is connected on AUX5.

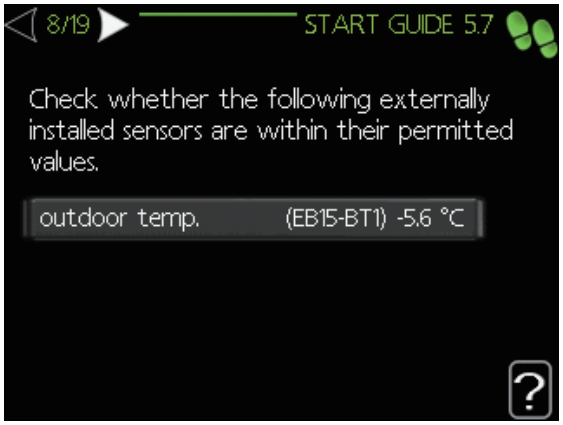
During commissioning BT63 is automatically shown on this menu. BT64 will appear once cooling mode is enabled (if this operation mode is required).

7/19 – Room sensor settings



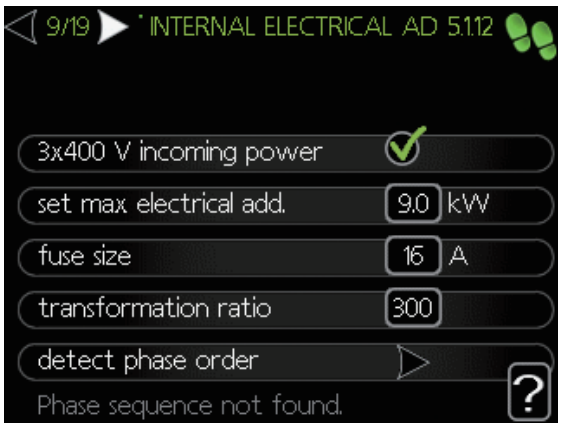
Activate and set the room temperature sensor RTS40M settings for the climate system 1 (if connected).

8/19 – Start guide



Check if the values shown on the screen are correct. If they are not correct, please check your connections.

9/19 – Internal electrical addition



Here you set the max. electrical output out of the internal addition in HMS60/100-W and the fuse size for the installation.

Here you can also check which current sensor is installed on which incoming phase to the property (this requires current sensors to be installed).

Do this by marking “detect phase order” and pressing the OK button.

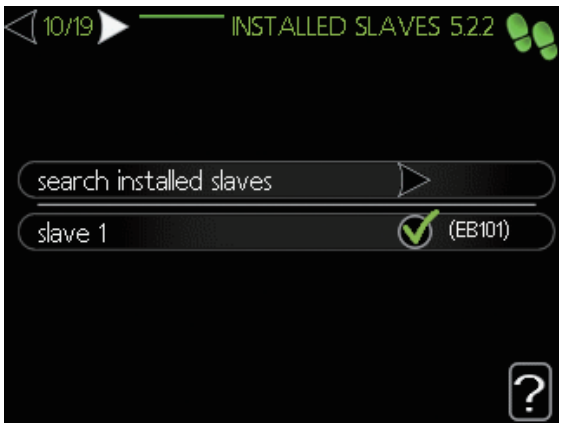
Factory setting:

- **3 x 400 V incoming power:** ON
- **Set max electrical add:** 9 kW
- **Fuse size:** 16 A
- **Transformation ratio:** 300

Setting range:

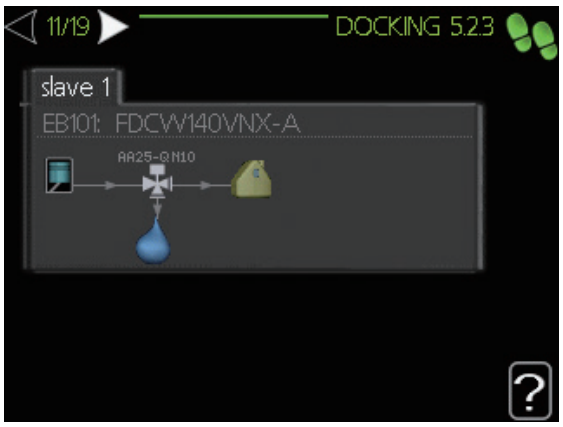
- **3 x 400 V incoming power:**
  - OFF
  - ON
- **Set max electrical add:**
  - If 3 x 400 V incoming power is ON: 3, 6, 9 kW
  - If 3 x 400 V incoming power is OFF: 1.5, 3, 6 kW
- **Fuse size:** 1 - 200 A
- **Transformation ratio:** 300-3000

10/19 – Installed slaves



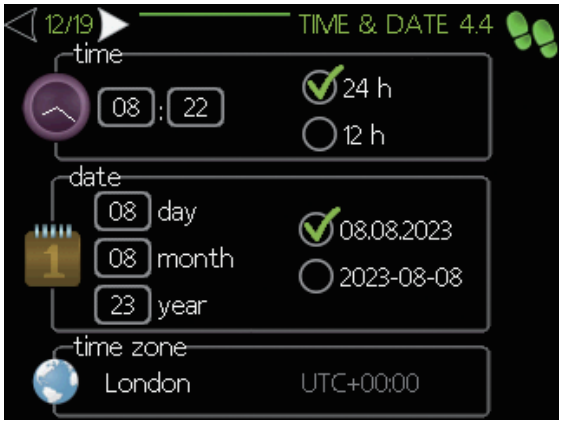
Search for installed slave and enable it (if connected) here. If everything is correct, the unit is automatically selected after searching for installed slaves.

11/19 – Docking



From factory docking comes pre-set as shown above – heating and hot water only. If necessary, docking needs to adjust manually according to installation type.

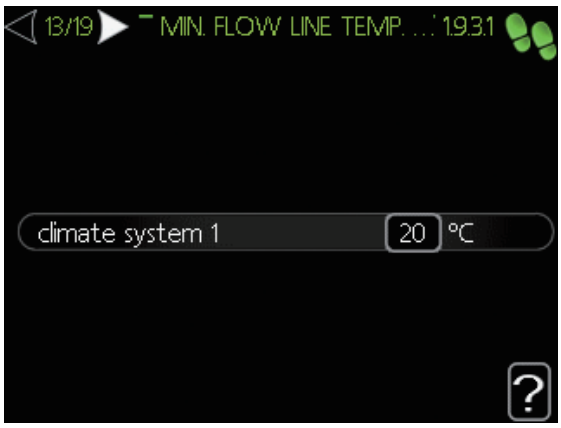
12/19 – Time and date



Set time and date here.

If the system is connected to myUplink then time and date are set automatically.

13/19 – Min. flow line temperature

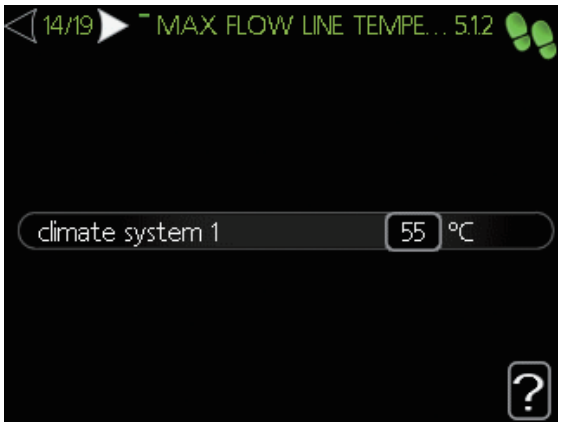


Set the minimum flow line temperature of the climate system.

Factory setting: 20°C

Setting range: 5.0 – 70.0°C

14/19 – Max. flow line temperature

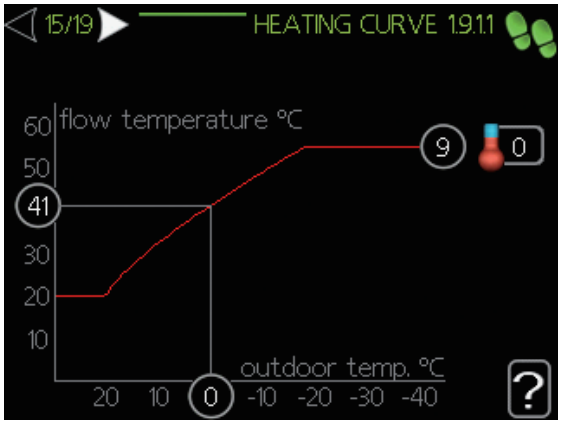


Set the maximum flow line temperature of the climate system.

Factory setting: 55°C

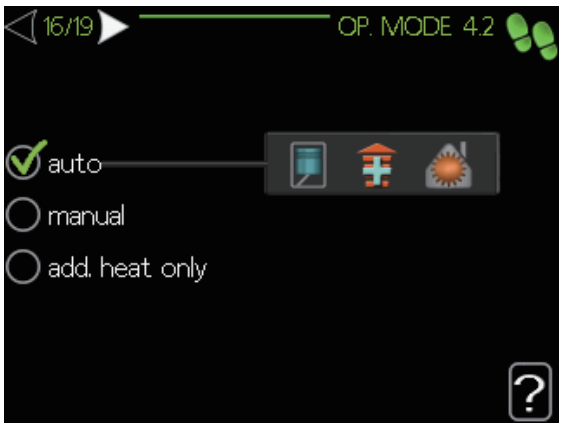
Setting range: 5.0 – 70.0°C

15/19 – Heating curve



View and set (if desired) the space heating curve here.

16/19 – Op. mode



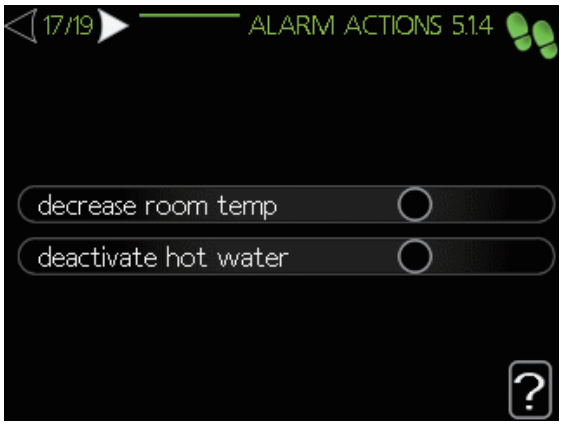
Set the operation mode of the heat pump system.

Factory setting: Auto

Setting range:

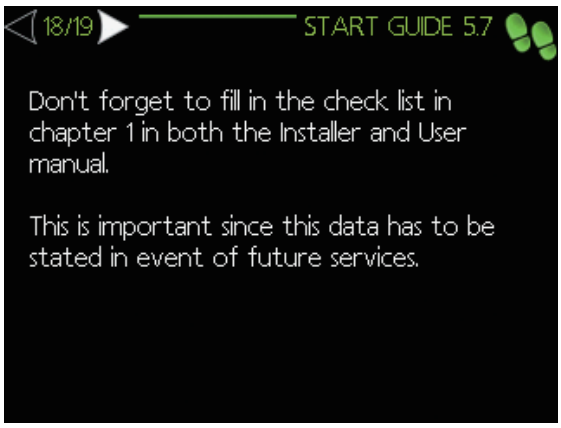
- Auto
- Manual
  - Heating
  - Cooling (only if permitted)
  - Add. Heat only
- Add. Heat only
  - Heating

17/19 – Alarm actions



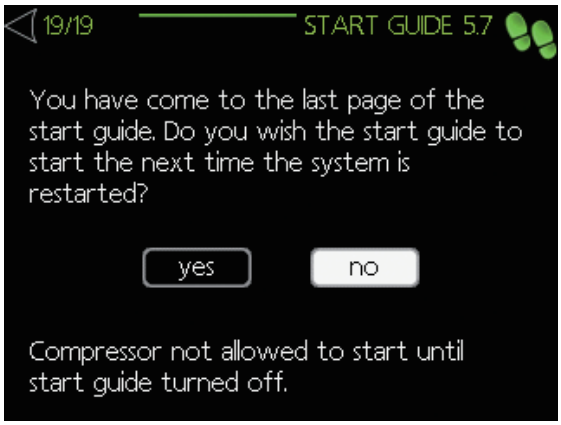
Set how to control the heat pump system in case of alarm.

18/19 – Start guide



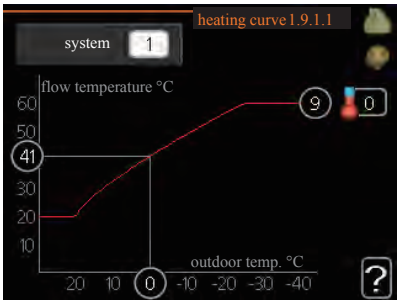
No action needed.

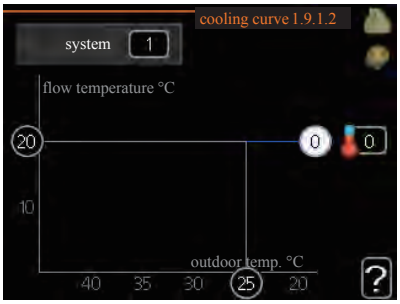
19/19 – Start guide



Commissioning guide finishes here. It is possible to set it to open again upon restart of the controller or do not open it anymore.

Heating/cooling curve setting





heating curve

Setting range: 0 – 15

Default value: 9

cooling curve (accessory required)

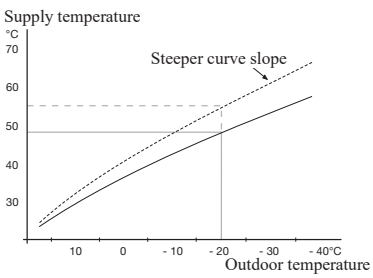
Setting range: 0 – 9

Default value: 0

The prescribed heating curve for your house can be viewed in the menu heating curve . The task of the heating curve is to give an even indoor temperature, regardless of the outdoor temperature, and thereby energy efficient operation. From this heating curve, the control module determines the temperature of the water to the heating system, supply temperature, and there by the indoor temperature. Select the heating curve and read off how the supply temperature changes at different outdoor temperatures here. If there is cooling function, the same settings can be made for the cooling curve.

Curve coefficient

The heating/cooling curve shows the relation between the target supply temperature and the corresponding outdoor temperature. A steep curve indicates that supply temperature becomes higher at low outdoor air temperature in heating and it becomes lower at high outdoor air temperature in cooling.



The optimum slope depends on the climate conditions in your location, the type of heating device (radiators or under floor heating) and how well insulated the house is.

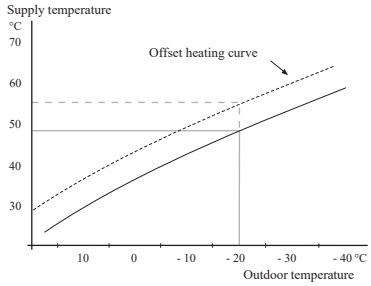
The curve is set when the heating installation is installed, but may need adjusting later. Normally, the curve will not need further adjustment.

CAUTION

In the event of making fine adjustments of the indoor temperature, the curve must be offset up or down instead, this is done in menu 1.1 temperature .

Curve offset

The target temperature can be offset in parallel over the entire outdoor temperature range by this function. This is offset by 5 °C by adjusting 2 steps.



Flow line temperature – maximum and minimum values

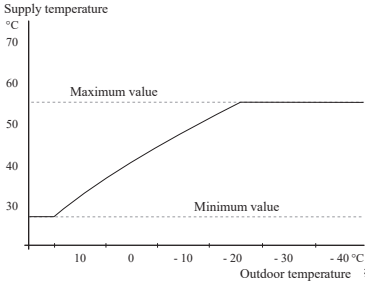
This function is used in order to limit max-min supply temperature. The heating / cooling curve becomes flat beyond max / min target temperature.

CAUTION

Underfloor heating systems are normally max flow line temperature set between 35 and 45°C. Take care not to cause low temperature burns in case it is set higher than 35°C.

Must be restricted with underfloor cooling min. flow line temp. to prevent condensation.

Check the max temperature for your floor with your installer/floor supplier.



The figure at the end of the curve indicates the curve number. The figure beside the thermometer icon gives the curve offset. Use the control knob to set a new value.

Confirm the new setting by pressing the OK button.

Curve 0 is an own curve created in menu 1.9.7.

To select another curve (slope):

1. Press OK button to access the setting mode
2. Select a new curve. The curves are numbered from 0 to 15, and the bigger number curve has steeper slope.

   Curve 0 means that own curve (menu 1.9.7) is used.
3. Press OK button to exit the setting.

To read off a curve:

1. Turn the control knob so that the ring on the shaft with the outdoor temperature is marked.
2. Press OK button.
3. Follow the grey line up to the curve and out to the left to read off the value for the supply temperature at the selected outdoor temperature.
4. You can now select to take read outs for different outdoor temperatures by turning the control knob to the right or left and read off the corresponding flow temperature.
5. Press OK or Back button to exit read off mode.

TIP

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

If it is cold outdoors and the room temperature is too low, increase the curve slope by one increment.

If it is cold outdoors and the room temperature is too high, lower the curve slope by one increment.

If it is warm outdoors and the room temperature is too low, increase the curve offset by one increment.

If it is warm outdoors and the room temperature is too high, lower the curve offset by one increment.

Hot water circulation setting

hot water recirc.

operating time

Setting range: 1 – 60 min

Default value: 60 min

downtime

Setting range: 0 – 60 min

Default value: 0 min

Set the hot water circulation for up to three periods per day here. During the set periods the hot water circulation pump will run according to the settings above.

"operating time" decide how long the hot water circulation pump must run per operating instance.

"downtime" decide how long the hot water circulation pump must be stationary between operating instances.

Hot water circulation is activated in menu 5.4 "soft inputs and outputs".

SG Ready

This function can only be used in mains networks that support the "SG Ready"-standard .

Make settings for the function "SG Ready" here.

Low price mode means that the electricity supplier has a low tariff and the system uses this to reduce costs.

Over capacity mode means that the electricity supplier has set the tariff very low and the system uses this to reduce the costs as much as possible.

affect room temperature

Here you set whether room temperature should be affected when activating "SG Ready".

With low price mode of "SG Ready" the parallel offset of the indoor temperature is increased by "+1". If a room sensor is installed and activated, the desired room temperature increases by 1 °C.

With over capacity mode of "SG Ready" the parallel offset for the indoor temperature is increased by"+2".

If a room sensor is installed and activated, the desired room temperature increases by 2 °C.

affect hot water

Here you set whether the temperature of the hot water should be affected when activating "SG Ready".

With low price mode on "SG Ready" the stop temperature of the hot water is set as high as possible at only compressor operation (immersion heater not permitted).

With over capacity mode of "SG Ready" the hot water is set to "luxury" (immersion heater permitted).

affect cooling (accessory required)

Here you set whether room temperature during cooling operation should be affected when activating "SG Ready".

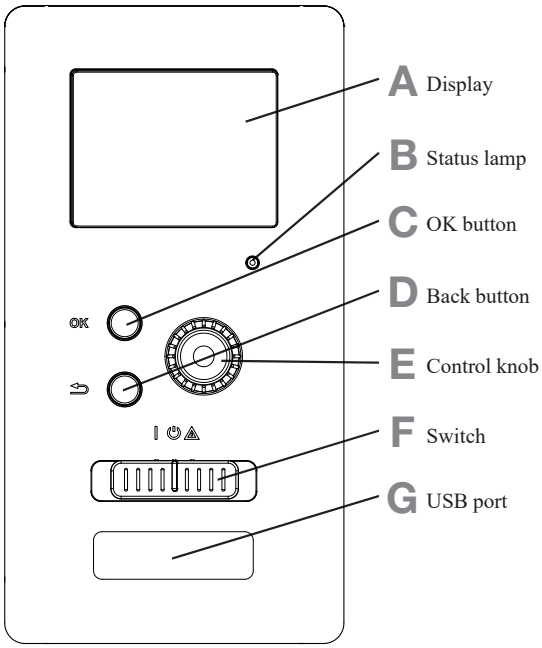
With low price mode of "SG Ready" and cooling operation the indoor temperature is not affected.

With over capacity mode of "SG Ready" and cooling operation the parallel offset for the indoor temperature is reduced by"-1". If a room sensor is installed and activated, the desired room temperature decreases by 1 °C.

NOTE

The function must be connected to two AUX inputs and activated in menu 5.4.

Control
Display unit



A Display

Instructions, settings and operational information are shown on the display. The easy-to-read display and menu system, make it easy to navigate between various menus and options, set comfort and get the necessary information.

B Status lamp

The status lamp indicates the status of the control module. It:

- lights green during normal operation.
- lights yellow in emergency mode.
- lights red in the event of an alarm.

C OK button

The OK button is used to:

- confirm selections of sub menus/options/set values/page in the start guide.

D Back button

The back button is used to:

- go back to the previous menu.
- change a setting that has not been confirmed.

E Control knob

The control knob can be turned to the right or left. You can:

- scroll in menus and between options.
- increase and decrease values.
- change pages in multiple page instructions (for example help text and service info).

F Switch (SF1)

The switch shows three positions:

- On (|)
- Standby (⏻)
- Emergency mode (⚠)

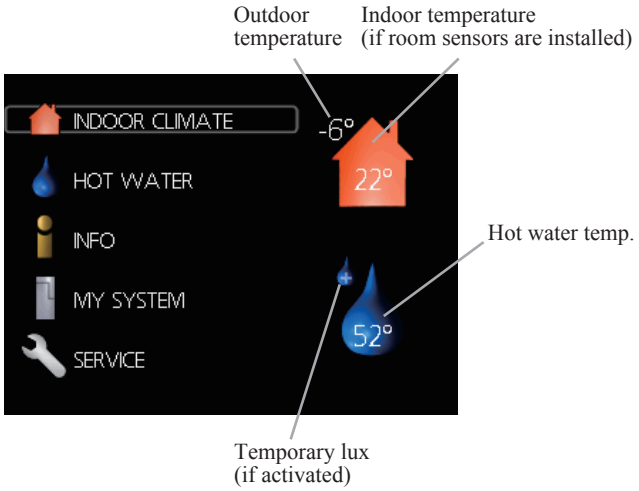
Emergency mode must only be used in the event of a fault on the control module. In this mode, the compressor in the heat pump is turned off and the immersion heater is activated.
The control module display is not illuminated and the status lamp lights yellow.

G USB port

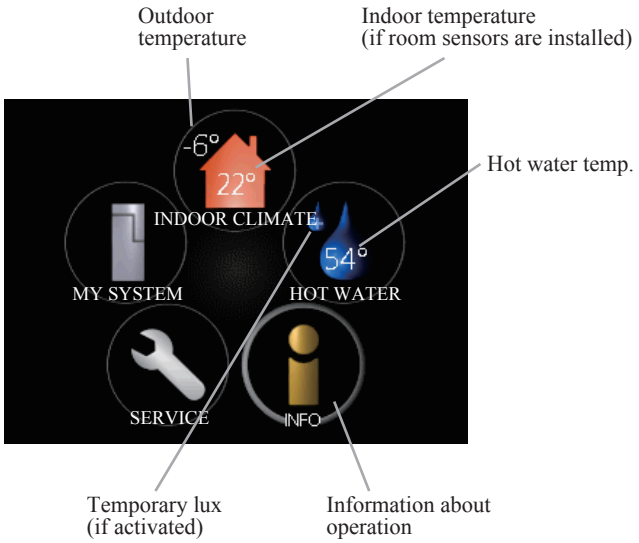
The USB port is hidden behind the plastic badge of the product name.
The USB port is used to update the software.

Menu system

RC-HY20-W



RC-HY40-W, HMA60/100-W, HMS60/100-W



Menu 1 - INDOOR CLIMATE

Setting and scheduling the indoor climate. See information in the help menu or user manual.

Menu 2 - HOT WATER

Setting and scheduling hot water production. See information in the help menu or user manual.

This menu only appears if a water heater is installed in the system.

Menu 3 - INFO

Display of temperature and other operating information and access to the alarm log. See information in the help menu or user manual.

Symbols in the display

The following symbols can appear in the display during operation.

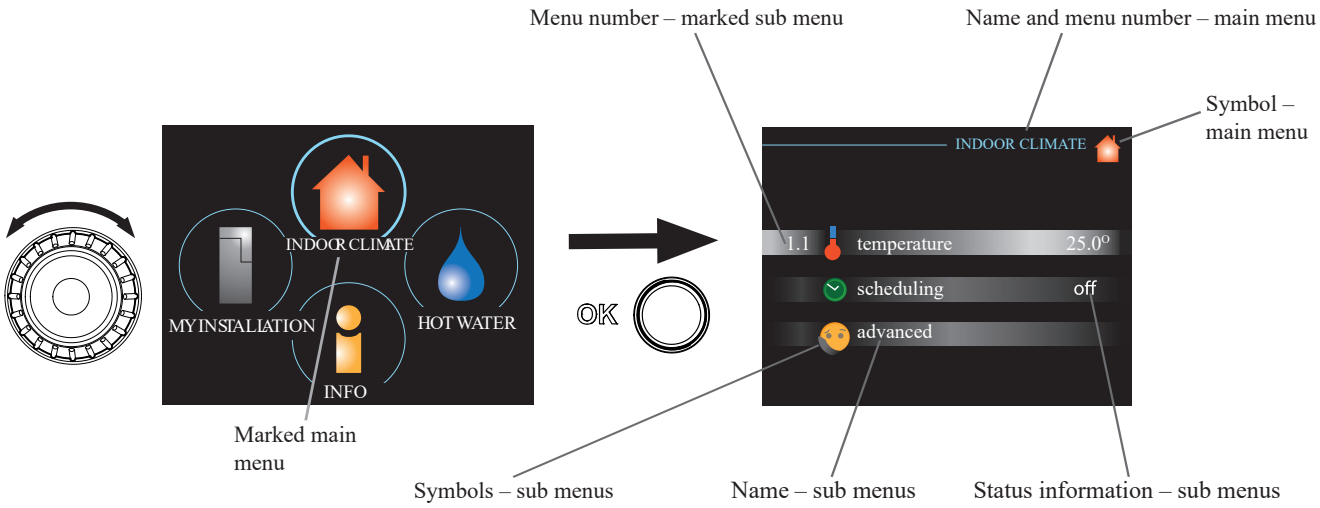
Symbol	Description
	This symbol appears when there is information to be noticed in menu 3.1.
	These two symbols indicate whether the compressor in the outdoor unit or additional heat in the installation is blocked via controller. These functions will be blocked for example, when either of the operation mode is blocked in menu 4.2, when blocking of either function is scheduled in menu 4.9.5, or when an alarm for blocking the operation occurs.  Blocking the compressor.  Blocking additional heat.
	This symbol appears if periodic increase or lux mode for the hot water is activated.
	This symbol indicates if "holiday setting" is active in menu 4.7.
	This symbol indicates if the controller has contact with myUpway.
	This symbol indicates if cooling is active.
	This symbol indicates where pool heating is active. Accessory required - RC-HY40-W, HMA60/100-W, HMS60/100-W.
	This symbol is visible in installations with active solar accessories.

Menu 4 - MY INSTALLATION

Setting time, date, language, display, operating mode etc. See information in the help menu or user manual.

Menu 5 - SERVICE

Advanced settings. These settings are not available to the end user. The menu is made visible by pressing the Back button for 7 seconds in the top screen.



Operation

To move the cursor, turn the control knob to the left or the right. The marked position is brighter and/or has a light frame.

Selecting menu

To advance in the menu system select a main menu by marking it and then pressing the OK button. A new window opens with sub menus.

Select one of the sub menus by marking it and then pressing the OK button.

Selecting options

Alternative

In an options menu the current selected option is indicated by a green tick.

To select another option:

1. Mark the applicable option. One of the options is pre-selected (white).

2. Press the OK button to confirm the selected option. The selected option has a green tick.

Setting a value

Values to be changed

To set a value:

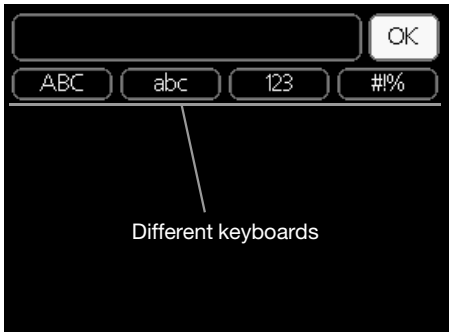
1. Mark the value you want to set using the control knob.

2. Press the OK button. The background of the value becomes green, which means that you have accessed the setting mode.

3. Turn the control knob to the right to increase the value and to the left to reduce the value.

4. Press the OK button to confirm the value you have set. To change and return to the original value, press the Back button.

Use the virtual keyboard



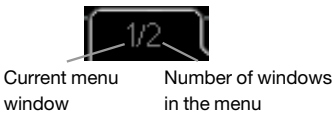
In some menus where text may require entering, a virtual keyboard is available.

Depending on the menu, you can gain access to different character sets which you can select using the control knob. To change character table, press the Back button. If a menu only has one character set, the keyboard is displayed directly.

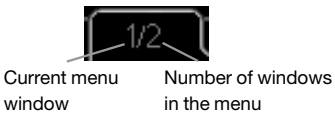
When you have finished writing, mark "OK" and press the OK button.

Scroll through the windows

A menu can consist of several windows. Turn the control knob to scroll between the windows.



Scroll through the windows in the start guide



1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the steps in the start guide.

Help menu

In many menus there is a symbol that indicates that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press the OK button.

The help text often consists of several windows that you can scroll between using the control knob.

Menu list

Menu			RC-HY20-W	RC-HY40-W***
1. Indoor climate				
1.1. Temperature	1.1.1. Heating		○	○
	1.1.2. Cooling **		○	○
1.3. Scheduling	1.3.1. Heating		○	○
	1.3.2. Cooling **		○	○
1.9. Advanced	1.9.1. Curve	1.9.1.1 Heating curve	○	○
		1.9.1.2 Cooling curve **	○	○
	1.9.2. External adjustment		○	○
	1.9.3. Min. flow line temp.	1.9.3.1 Heating	○	○
		1.9.3.2 Cooling **	○	○
	1.9.4. Room sensor settings		○	○
	1.9.5. Cooling settings		○	○
	1.9.7. Own curve	1.9.7.1 Heating	○	○
		1.9.7.2 Cooling **	○	○
	1.9.8. Point offset		○	○
2. Hot water				
2.1. Temporary lux			○	○
2.2. Comfort mode			○	○
2.3. Scheduling			○	○
2.9. Advanced	2.9.1. Periodic increase		○	○
	2.9.2. Hot water recirc		○	○
3. Info				
3.1. Service info			○	○
3.2. Compressor info			○	○
3.3. Add. heat info			○	○
3.4. Alarm log			○	○
3.5. Indoor temp. log			○	○
3.6. Energy log			○	○
4. My system				
4.1. Plus functions	4.1.1. Pool 1		—	○
	4.1.2. Pool 2		—	○
	4.1.3. internet	4.1.3.1. myUplink	○	○
		4.1.3.8. tcp/ip settings	○	○
		4.1.3.9. proxy settings	○	○
	4.1.5. SG Ready		○	○
	4.1.6. Smart price adaption™		○	○
	4.1.8. Smart energy source™	4.1.8.1. settings	—	○
		4.1.8.2. Set. Price	—	○

Menu			RC-HY20-W	RC-HY40-W***
	4.1.8. Smart energy source™	4.1.8.3. CO2 impact	—	○
		4.1.8.4. Ttariff periods, electricity	—	○
		4.1.8.6. Tariff per, ext. shunt add	—	○
		4.1.8.7. Tariff per, ext. step add	—	○
	4.1.10. Solar electricity		○	○
4.2. Op. mode			○	○
4.3. My icons			○	○
4.4. Time & date			○	○
4.6. Language			○	○
4.7. Holiday setting			○	○
4.9. Advanced	4.9.1. Op. prioritisation		○	○
	4.9.2. Auto mode setting		○	○
	4.9.3. Degree minute setting		○	○
	4.9.4. Factory setting user		○	○
	4.9.5. Schedule blocking		○	○
	4.9.6. Schedule silent mode		○	○
5. Service				
5.1. Operating settings	5.1.1. Hot water settings *		○	○
	5.1.2. Max flow line temperature		○	○
	5.1.3. Max diff flow line temp.		○	○
	5.1.4. Alarm actions		○	○
	5.1.12. Addition		○	○
	5.1.14. Flow set. climate system		○	○
	5.1.22. Heat pump testing		○	○
	5.1.23. Compressor curve		○	○
5.2 System settings	5.2.2. Installed slaves		○	○
	5.2.3. Docking		○	○
	5.2.4. Accessories		○	○
5.3 Accessory settings	5.3.2. Shunt controlled add. heat		—	○
	5.3.3. Extra climate system		—	○
	5.3.4. Solar heating		—	○
	5.3.8. Hot water comfort		—	○
	5.3.10. Modbus		—	○
	5.3.20. Flow sensor		—	○
5.4. Soft in/outputs			○	○
5.5. Factory setting service			○	○
5.6. Forced control			○	○
5.7. Start guide			○	○
5.8. Quick start			○	○

Menu			RC-HY20-W	RC-HY40-W***
5.9. Floor drying function			○	○
5.10. Change log			○	○
5.11. Slave settings	5.11.1. EB101	5.11.1.1. Heat pump	○	○
		5.11.1.2. Charge pump (GP12)	○	○
	5.11.2. EB102		—	○
	5.11.3. EB103		—	○
	5.11.4. EB104		—	○
	5.11.5. EB105		—	○
	5.11.6. EB106		—	○
	5.11.7. EB107		—	○
	5.11.8. EB108		—	○
5.12. Country			○	○

*Accessory required

** Cooling function required

*** RC-HY40-W controller functions are the same as HMA/HMS

Sub-menus

Menu SERVICE has orange text and is intended for the advanced user. This menu has several sub-menus.

Status information for the relevant menu can be found on the display to the right of the menus.

operating settings: operation settings for the controller.
system settings: system settings for the controller, activating accessories, etc.

soft in/outputs: setting software controlled in and outputs on the input card AA3 (RC-HY40-W, HMA60/100-W, and HMS60/100-W) and terminal block X2.

factory setting service: total reset of all settings (including setting available to the user) to default values.

forced control: forced control of the different components in the indoor module.

start guide: manual start of the start guide which run the first time when the controller is started quick start: quick starting of the compressor..

NOTE

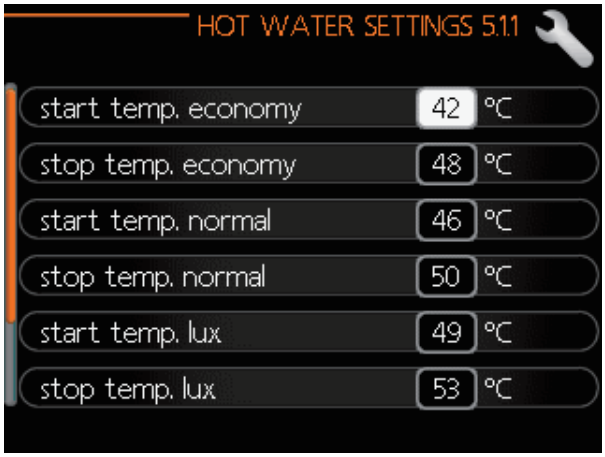
Incorrect settings in the service menus can damage the installation.

Menu 5.1 - Operating settings

Operating settings can be made for the controller in the sub-menus.

Menu 5.1.1 - Hot water settings

The hot water settings require that hot water production is activated in menu 5.2.4 - accessories.



Economy

Setting range start temp. economy: 5-55°C

Factory setting start temp. economy: 42°C

Setting range stop temp. economy: 5-60°C

Factory setting stop temp. economy: 48°C

Normal

Setting range start temp. normal: 5-60°C

Factory setting start temp. normal: 46°C

Setting range stop temp. normal: 5-65°C

Factory setting stop temp. normal: 50°C

Luxury

Setting range start temp. luxury: 5-70°C

Factory setting start temp. luxury: 49°C

Setting range stop temp. luxury: 5-70°C

Factory setting stop temp. luxury: 53°C

Stop temp. periodic increase

Setting range: 55-70°C

Factory setting: 55°C

Charge method

Setting range: target temp, delta temp

Default value: delta temp

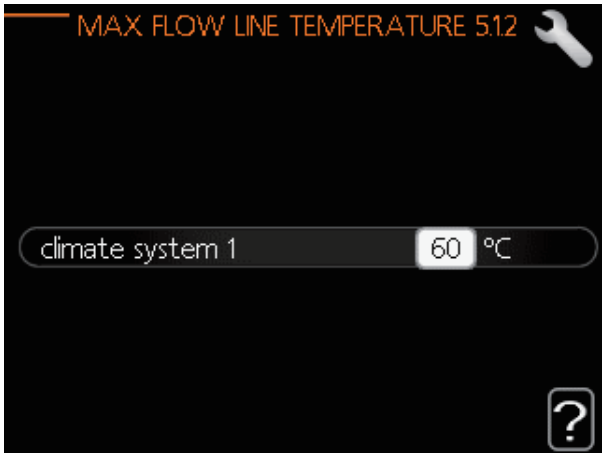
Here you set the start and stop temperatuer of the hot water for the different comfort options in menu 2.2 as well as the stop temperature for period increase in menu 2.9.1.

The charge methodfor hot water is selected here. “delta temp” is recommended for heaters with charge coil (PT300/500), "target temp" for heaters with domestic coil.

Factory setting valve might vary with type of installed indoor unit.

Menu 5.1.2 - max flow line temperature

The hot water settings require that hot water production is activated in menu 5.2.4 - accessories.



Climate system

Setting range: 5-80°C
Default value: 60°C

Set the maximum supply temperature for the climate system here. If the installation has more than one climate system, individual maximum supply temperatures can be set for each system. Climate systems 2 – 8 cannot be set to a higher max supply temperature than climate system 1.

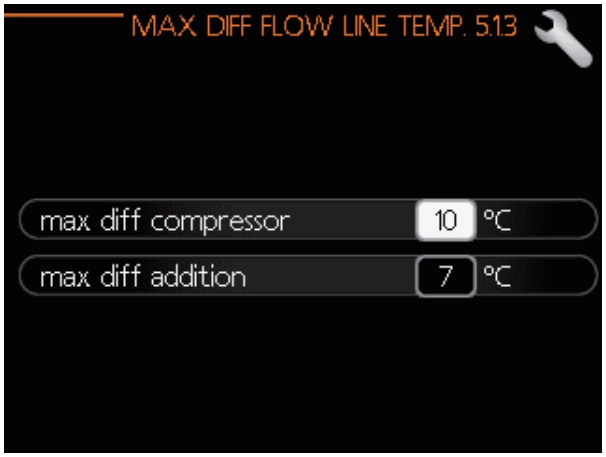
CAUTION

Underfloor heating systems are normally max flow line temperature between 35 and 45°C.

Be careful not to cause low tempeature if it is set at 35°C or higher.

Check the max floor temperature with your floor supplier.

Menu 5.1.3 - max diff flow line temp.



max diff compressor

Setting range: 1-25°C
Default value: 10°C

max diff addition

Setting range: 1-24°C
Default value: 7°C

Here you set the maximum permitted difference between the calculated and actual supply temperature during compressor and additional heat mode. Max diff additional heat can never exceed max diff compressor.

max diff compressor

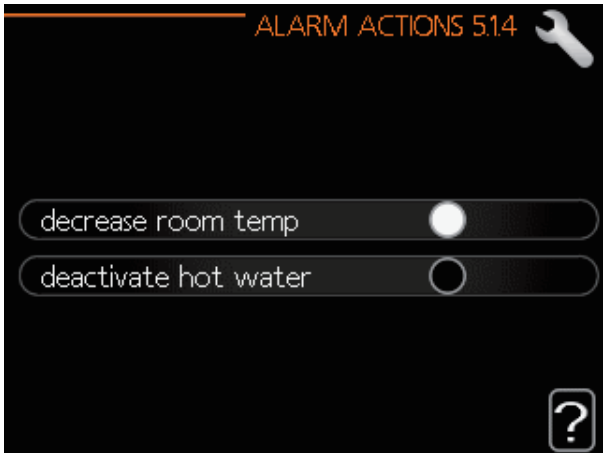
When the current supply temperature deviates from the set value compared to that calculated, the heat pump is forced to stop irrespective the degree minute value.

If the current supply temperature exceeds the calculated flow temperature plus the set value, the degree minute value is set to 0. The compressor in the heat pump stops when there is only a heating demand.

max diff addition

If "addition" is selected and activated in menu 4.2 and the present supply temperature exceeds the calculated temperature plus the set value, the additional heat is forced to stop.

Menu 5.1.4 - Alarm actions



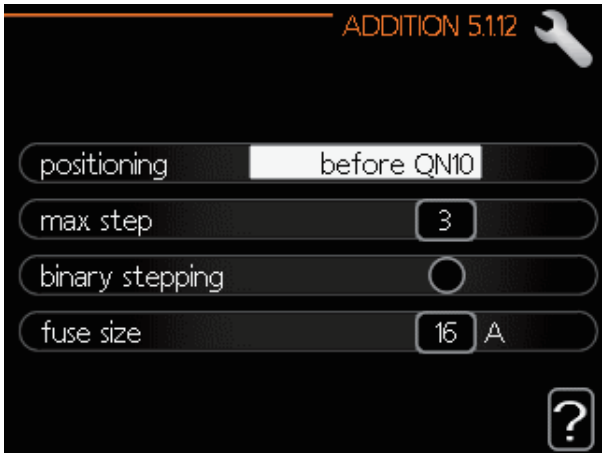
Select how you want the controller to alert you that there is an alarm in the display here. The different alternatives are: the heat pump stops producing hot water and/or reduces the room temperature.

CAUTION

If no alarm action is selected, it can result in higher energy consumption in the event of an alarm.

Menu 5.1.12 - Addition

RC-HY20-W



Here you select wheter the step controlled additional heat is positioned before or after the reversing valve for hot water charging (QN10).

You can also set the maximum permitted number of additional steps and binary or linear stepping.

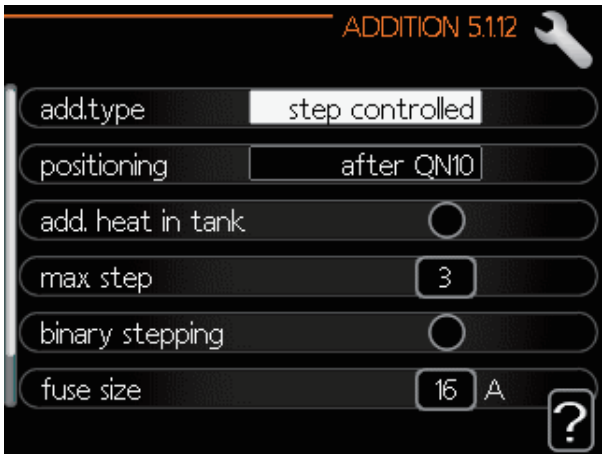
If hot water production is activated and additional heat is selected "after QN10", the number of steps are restricted to 2 steps linear or 3 steps binary because the AA7:X2:6 output is reserved for additional heat in the hot water tank (ex: ME1030M connected to PT tank).

RC-HY40-W

Make settings for connected additional heat (step controlled or shunt controlled additional heat) here.

Select wheter step controlled or sunt controlled additional heat is connected. Then you can make settings for the different alternatives.

add. type: step controlled



max step

Setting range (binary stepping deactivated): 0-3
Setting range (binary stepping activated): 0-7
Default value: 3

fuse size

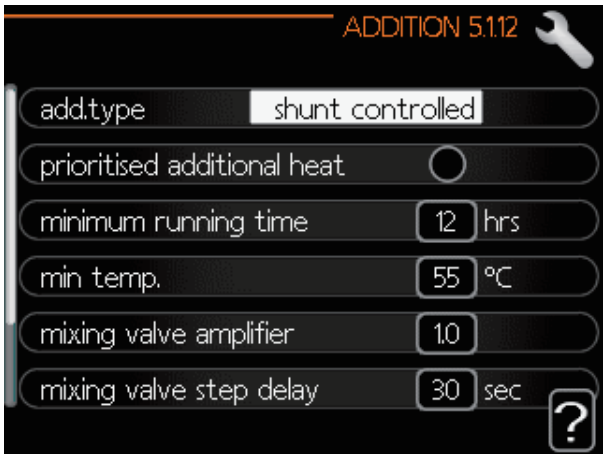
Setting range: 1-200 A
Default value: 16 A

transformation ratio

Setting range: 300 - 3000
Default value: 300

You can set the maximum number of permitted steps, if there is internal additional heat in the tank (only accessible if the additional heat is positioned after QN10), whether binary stepping is to be used and the size of the fuse.

add. type: shunt controlled



prioritised additional heat

Setting range: ON/OFF
Factory setting: OFF

minimum running time

Setting range: 0-48 h
Default value: 12 h

min temp.

Setting range: 5-90°C
Default value: 55°C

mixing valve amplifier

Setting range: 0.1 - 10.0
Default value: 1.0

mixing valve step delay

Setting range: 10-300 s
Default value: 30 s

fuse size

Setting range: 1-200 A
Default value: 16 A

transformation ratio

Setting range: 300 - 3000
Default value: 300

Select this option if shunt controlled additional heat is connected.

Set when the addition is to start, the minimum run time and the minimum temperature for external addition with shunt here.

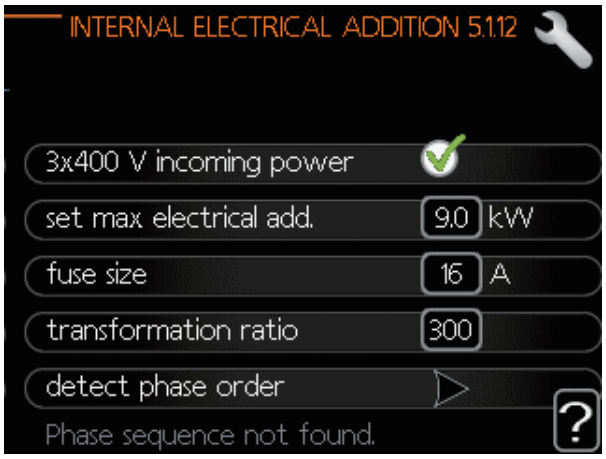
External addition with shunt is for example a wood/oil/gas/pellet boiler.

You can set the shunt valve amplification and shunt valve waiting time.

Selecting "prioritised additional heat" uses the heat from the external additional heat instead of the heat pump.

The sunt valve is regulated as long as heat is available, otherwise the shunt valve is closed.

5.1.12 – Internal electrical addition (HMA60/100-W and HMS60/100-W)



Here you set the max. electrical output out of the internal addition in HMS60/100-W and the fuse size for the installation.

Here you can also check which current sensor is installed on which incoming phase to the property (this requires current sensors to be installed).

Do this by marking “detect phase order” and pressing the OK button.

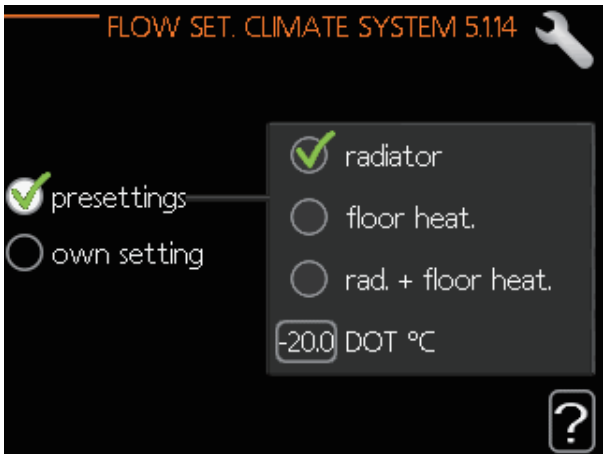
Factory setting:

- **3 x 400 V incoming power:** ON
- **Set max electrical add.:** 9 kW
- **Fuse size:** 16 A
- **Transformation ratio:** 300

Setting range:

- **3 x 400 V incoming power:**
  - OFF
  - ON
- **Set max electrical add:**
  - If 3 x 400 V incoming power is ON: 3, 6, 9 kW
  - If 3 x 400 V incoming power is OFF: 1.5, 3, 6 kW
- **Fuse size:** 1 - 200 A
- **Transformation ratio:** 300-3000

Menu 5.1.14 - flow set. climate system



presettings

Setting range: radiator, floor heat., rad. + floor heat.
Default value: radiator
Setting range DOT: -40.0 - 20.0°C
The factory setting DOT value depends on the country that has been given for the product's location.

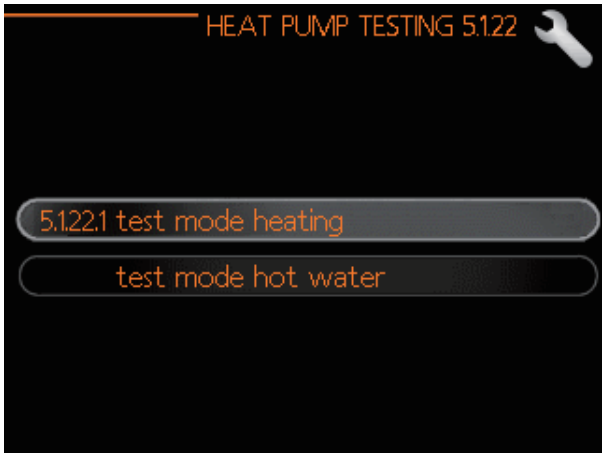
own setting

Setting range dt at DOT: 0.0 - 25.0°C
Factory setting dt at DOT: 10.0°C
Setting range DOT: -40.0 - 20.0°C
Factory setting DOT: -20.0°C

Select the type of heating distribution system.

dT at DOT is the difference in degrees between flow and return tempeatures at dimensioned outdoor temperature.

Menu 5.1.22 - heat pump testing

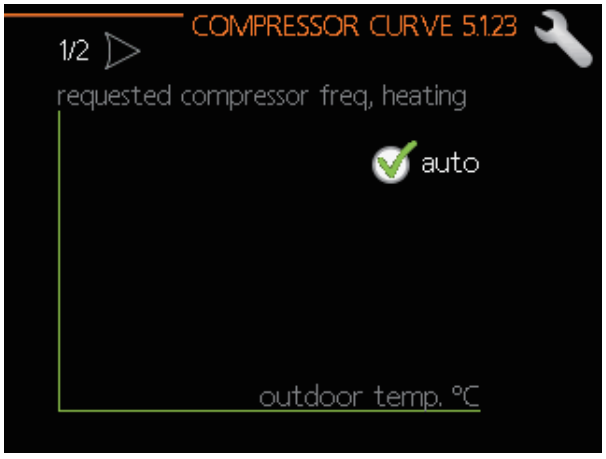


NOTE

This menu is intended for testing the heat pump according to different standards.
Use of this menu for other reasons may result in your installation not functioning as intended.

This menu contains several sub-menus, one for each standard.

Menu 5.1.23 - compressor curve



Set wether the compressor in the heat pump should work to a particular curve under specific requirements or if it should work to predefined curves.

You can set a curve for each operation mode (heat, hot water, cooling, etc.) by unclicking "auto", turning the control knob until a temperature is marked and pressing OK. You can set at what temperature max-min frequencies will occur.

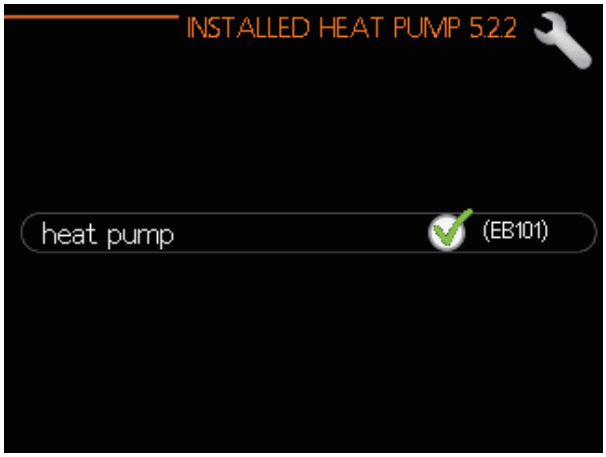
This menu consists of several windows (one for each operation mode). Use the navigation arrow in the top left corner to change between windows.

Menu 5.2 - System settings

Make different settings for your installation here, e.g activate the connected heat pump and whcih accessories are installed.

Menu 5.2.2 - Installed heat pump

RC-HY20-W



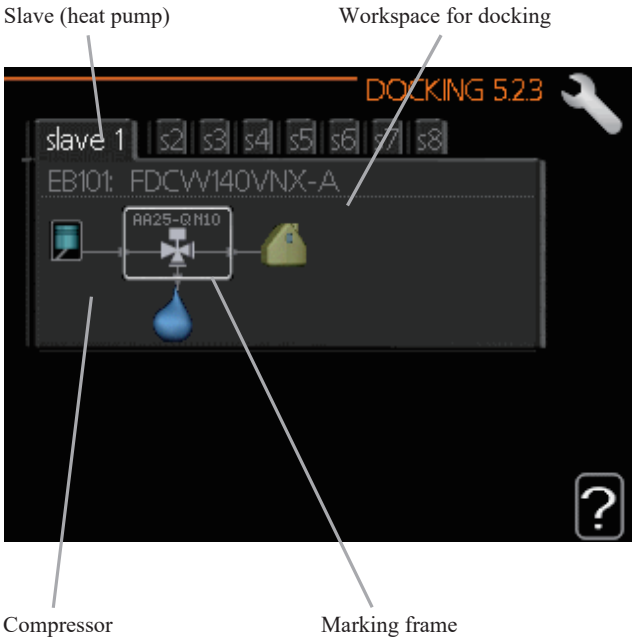
RC-HY40-W, HMA60/100-W, HMS60/100-W

If a heat pump is connected to the master installation, set it here.
For RC-HY40-W is it possible to select more than one slave (if connected). In case of HMA/HMS-W units it is only possible to select are slave.
There are two was of activating connected slaves. You can either mark the alternative on the list or use the automatic function “search installed slaves”.

Menu 5.2.3 - docking (RC-HY40-W, HMA60/100-W, HMS60/100-W)

Enter how your system is docked regarding pipes, for example to hot water heating and heating the building.

This menu as a docking memory which means the control system remembers how a particular reversing valve is docked and automatically enters the correct docking the next time you use the same reversing valve.



Slave: here you select for which heat pump the docking is to be made.

Compressor: select if the compressor in the heat pump is blocked (factory setting), or standard (docked for example to pool heating, hot water charging and heating the building).

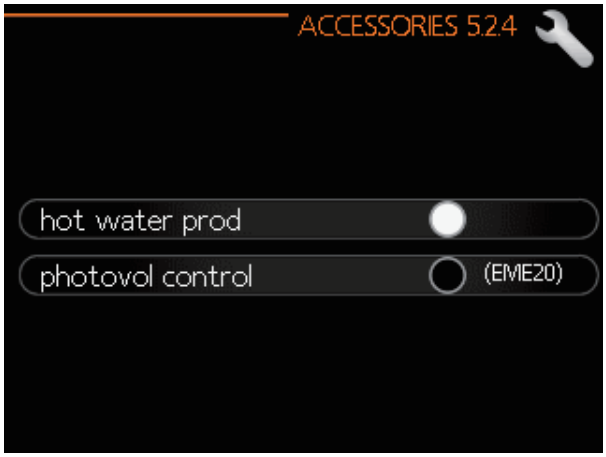
Marking frame: move around the marking frame using the control knob. Use the OK button to select what you want to change and to confirm setting is the options box that appears to the right.

Workspace for docking: the system docking is drawn here.

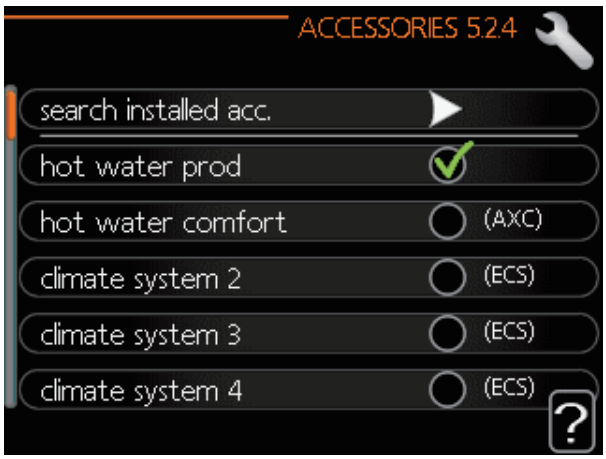
Symbol	Description
	Compressor (blocked)
	Compressor (standard)
	Reversing valves for hot water, cooling or pool heating. The designations above the reversing valve indicate whre is electrically connected (EB101 = Slave 1, etc).
	Hot water charging
	Pool 1
	Pool 2
	Heating (heating the building, includes any extra climate system)
	Cooling

Menu 5.2.4 - Accessories

RC-HY20-W



RC-HY40-W, HMA60/100-W, HMS60/100-W



Set which accessories are installed on the installation here.

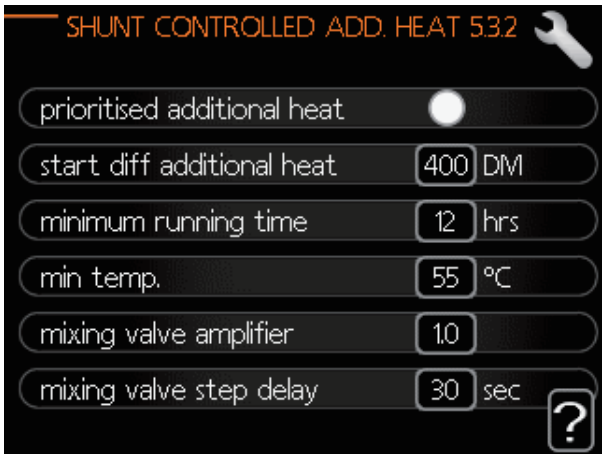
If the water heater is connected, hot water charging must be activated here.

In case of HMA60/100-W, "hot water prod" function is hidden or this menu as if needs to be always enabled.

Menu 5.3 - Accessories (RC-HY40-W, HMA60/100-W, HMS60/100-W)

The operating settings for accessories that are installed and activated are made in the sub-menus for this.

Menu 5.3.2 - Shunt controlled additional heat



prioritised additional heat

Setting range: ON/OFF
Factory setting: OFF

minimum running time

Setting range: 0-48 h
Default value: 12 h

min temp.

Setting range: 5-90°C
Default value: 55°C

mixing valve amplifier

Setting range: 0.1 - 10.0
Default value: 1.0

mixing valve step delay

Setting range: 10-300 s
Default value: 30 s

Set when the addition is to start, the minimum run time and the minimum temperature for external addition with shunt here. External addition with shunt is for example a wood/oil/gas/pellet boiler.

You can set shunt valve amplification and shunt valve waiting time.

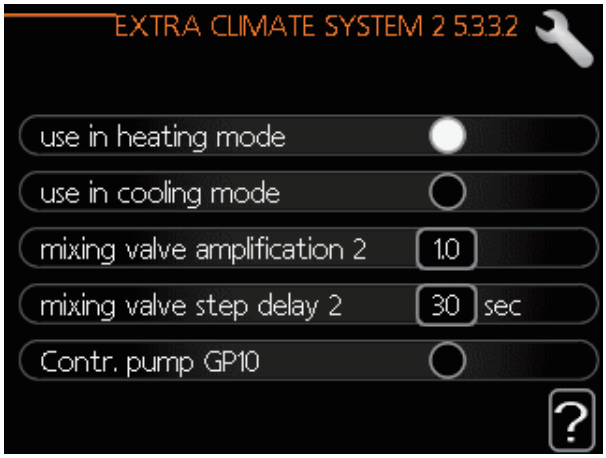
Selecting "prioritised additional heat" uses the heat from the external additional heat instead of the heat pump.

The shunt valve is regulated as long as heat is available,

otherwise the shunt valve is closed.

See accessory installation instructions for function description.

Menu 5.3.3 - Extra climate system



use in heating mode

Setting range: ON/OFF
Factory setting: ON

use in cooling mode

Setting range: ON/OFF
Factory setting: OFF

mixing valve amplifier

Setting range: 0.1 - 10.0
Default value: 1.0

mixing valve step delay

Setting range: 10-300 s
Default value: 30 s

Here you can select which climate system (2-8) you wish to set. In the next menu you can make settings for the climate system that you have selected. if this function is activated, you can set "cooling flow temp. at +20°C" and "cooling flow temp. at +40°C" for each climate system where the function is activated.

CAUTION

This setting option only appears if "cooling permitted" is activated in menu 5.11.1.1.

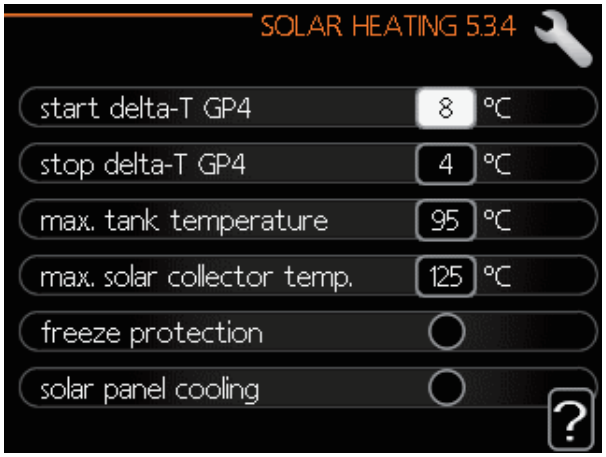
The shunt amplification and shunt waiting time for the different extra climate systems that are installed are also set here.

Activation/deactivation of "Contr. pump GP10" does not afffect "extra climate system" because the accessory's circulation pump is controlled manually.

There is the option to set a speed on the accessory's circulation pump GP10.

See the accessory installation instructions for function description.

Menu 5.3.4 - Solar heating



start delta-T GP4

Setting range: 1-40°C
Default value: 8°C

stop delta-T GP4

Setting range: 1-40°C
Default value: 4°C

max. tank temperature

Setting range: 5-110°C
Default value: 95°C

max. solar collector temp.

Setting range: 80-200°C
Default value: 125°C

freeze protection

Setting range: ON/OFF
Factory setting: OFF

solar panel cooling

Setting range: ON/OFF
Factory setting: OFF

start delta-T, stop delta-T: Here you can set the temperature difference between solar panel and solar tank at which the circulation pump (GP4) will start and stop.

max. tank temperature, max. solar collector temp.:

Here you can set the maximum temperatures in the tank and solar panel respectively at which the circulation pump will stop. This is to protect against excess temperatures in the solar tank.

If the unit has an anti-freeze function and/or solar panel cooling you can activate them here. When the function has been activated, you can make settings for them.

freeze protection

anti-freeze temperature: Here you can set the temperature in the solar panel at which the circulation pump is to start prevent freezing.

solar panel cooling

start solar collector cooling: If the temperature in the solar panel is higher than this setting, at the same time as the temperature in the solar tank is higher than the set maximum temperature, the external function for cooling is activated.

Menu 5.3.6 - Step controlled add. heat

start diff additional heat

Setting range: 0-2000 DM
Default value: 400 DM

diff. between additional steps

Setting range: 0-1000 DM
Default value: 30 DM

max step

Setting range (binary stepping deactivated): 0-3
Setting range (binary stepping activated): 0-7
Default value: 3

binary stepping

Setting range: ON/OFF
Factory setting: OFF

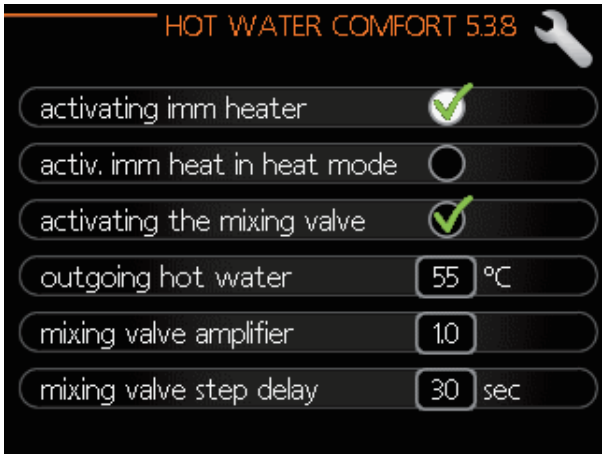
Make settings for step controlled addition here. Step controlled addition is for example an external electric boiler.

It is possible, for example, to select when the additional heat is to start, to set the maximum number of permitted steps and whether binary stepping is to be used.

When binary stepping is deactivated (OFF), the settings refer to linear stepping.

See the accessory installation instructions for function description.

Menu 5.3.8 - Hot water comfort



activating imm heater

Setting range: ON/OFF
Factory setting: OFF

activating imm heat in heat mode

Setting range: ON/OFF
Factory setting: OFF

activating the mixing valve

Setting range: ON/OFF
Factory setting: OFF

outgoing hot water

Setting range: 40-65°C
Default value: 55°C

mixing valve amplifier

Setting range: 0.1 - 10.0
Default value: 1.0

mixing valve step delay

Setting range: 10-300 s
Default value: 30 s

Make settings for hot water comfort here.

activating imm heater: The immersion heater is activated here if installed in the water heater.

activating imm heat in heat mode: Activate here whether the immersion heater in the tank (required if the alternative above is activated) will be permitted to charge hot water, if the compressors in the heat pump prioritise heating.

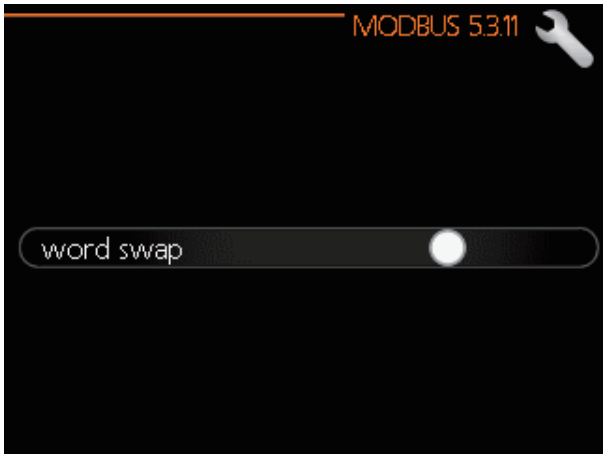
activating the mixing valve: Activate here whether a mixer valve for limiting the temperature of hot water from the water heater is installed.

If this alternative has been activated, you can set the outgoing hot water temperature, shunt amplification and shunt waiting time for the mixer valve.

outgoing hot water: Set the temperature at which the mixing valve is to restrict hot water from the water heater.

See the accessory installation instructions for function description.

Menu 5.3.11 - Modbus



address

Factory setting: address 1

word swap

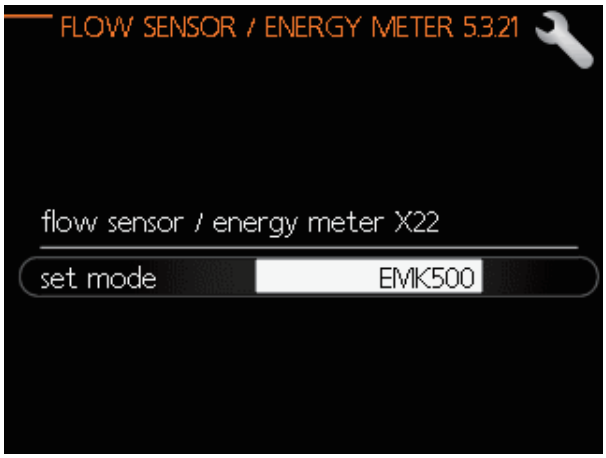
Factory setting: not activated

As from MODBUS40M version 10, the address can be set between 1-247. Earlier versions have a fixed address (address 1).

If you select "word swap", you will get "word swap" instead of the preset standard "big endian".

See the accessory installation instructions for function description.

Menu 5.3.21- Flow sensor/energy meter



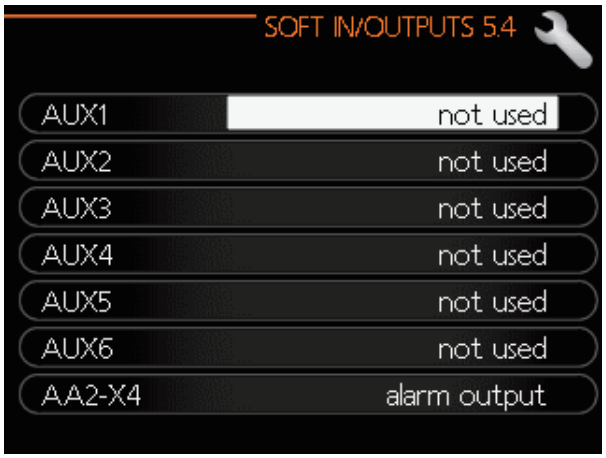
flow sensor

See option: EMK500, EMK310/300, EMK150
Factory setting: EMK500

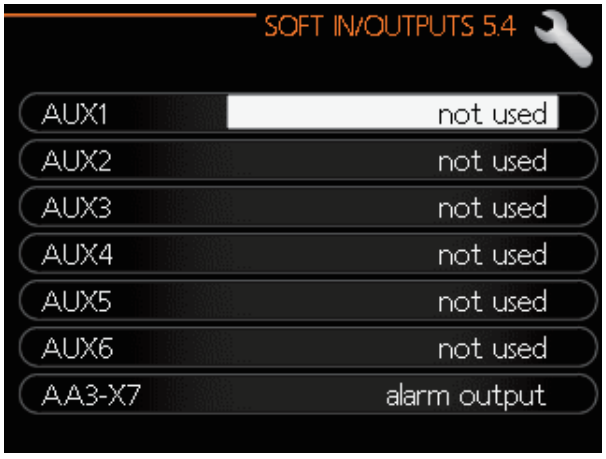
Here you select which flow sensor is used for the energy measurement.

Menu 5.4 – Soft in/outputs

RC-HY20-W



RC-HY40-W, HMA60/100-W, HMS60/100-W



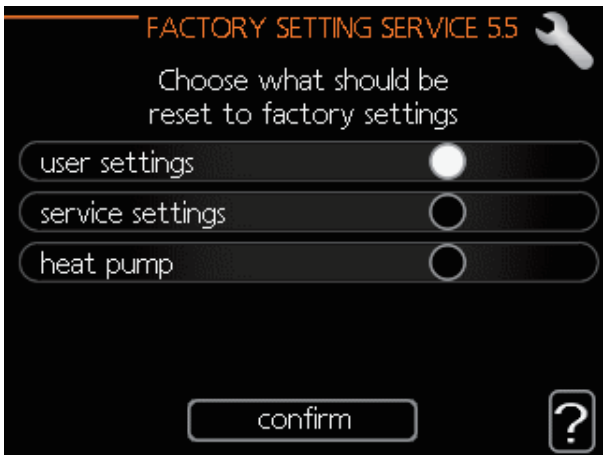
You can set the function of in/output for each terminal (AUX1-6 and output).

Position of the terminal depends on the type of controller.

RC-HY20-W: port 11-18 on X2 terminal (AUX 1-6), X4 terminal on AA2 board (output).

RC-HY40-W, HMA60/100-W, HMS60/100-W: port 9-14 on terminal X6 and port 1-4 on X2 terminal on AA3 board (AUX 1-6), X7 terminal on AA3 board (output).

Menu 5.5 - Factory setting service

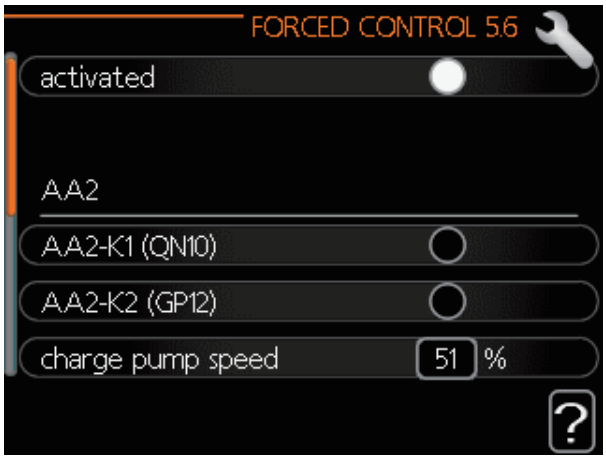


All settings can be reset (including settings available to the user) to default values here.

NOTE

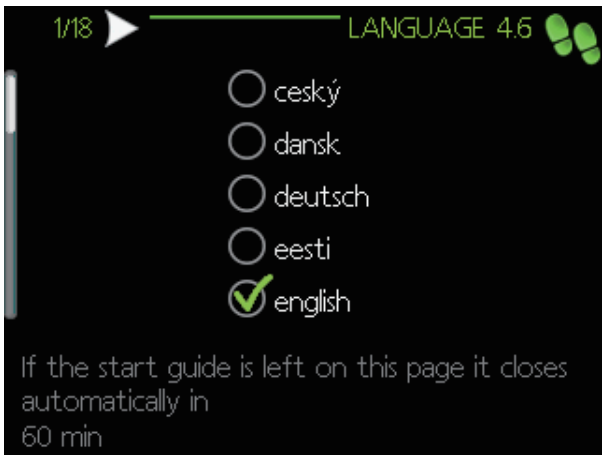
When resetting, the start guide is displayed the next time the controller is restarted.

Menu 5.6 - Forced control



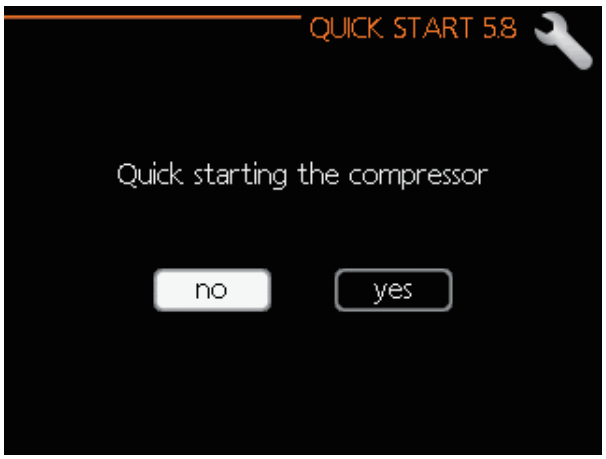
You can force control the different components in the controller and any connected accessories here.

Menu 5.7 - Start guide



When the controller is started for the first time the start guide starts automatically. Start it manually here.

Menu 5.8 - Quick start



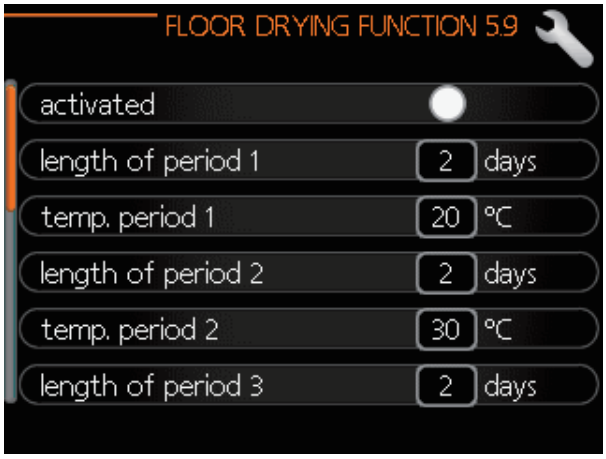
It is possible to start the compressor from here.

CAUTION

There must be heating or hot water demand to start the compressor.

Do not quick start the compressor too many times over a short perid of time as this may damage the compressor and its surrounding equipment.

Menu 5.9 - floor drying function



length of period 1-7

Setting range: 0-30 days
Factory setting, period 1-3, 5-7: 2 days
Factory setting, period 4: 3 days

temp. period 1-7

Setting range: 15-70°C
Default value:

Temp. period 1	20°C
Temp. period 2	30°C
Temp. period 3	40°C
Temp. period 4	45°C
Temp. period 5	40°C
Temp. period 6	30°C
Temp. period 7	20°C

Set the function for underfloor drying here.

You can set up to seven period times with different calculated flow temperatures. If less than seven periods are used, set remaining period times to 0 days.

Mark the active window to activate the underfloor drying function. A counter at the bottom shows the number of days the the function has been active.

TIP

If operating mode "add. heat only" is to be used, select it in menu 4.2.

Menu 5.10 - change log

Read off any previous changes to the control system here.

The date, time and ID no. (unique to certain settings) and the new set value is show for every change.

NOTE

The change log is saved at restard and remains unchanged after factory settings.

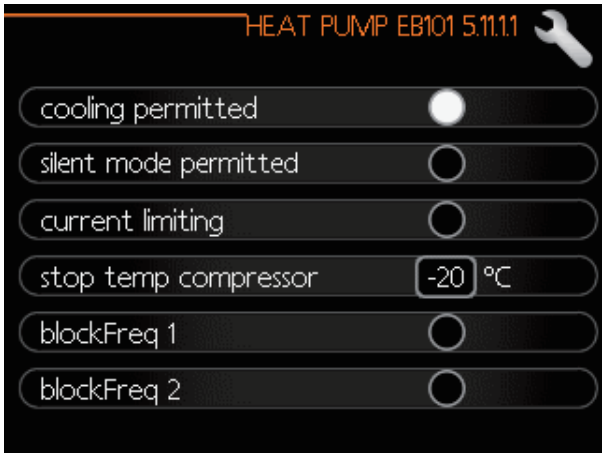
Menu 5.11 - Heat pump settings

Settings for installed heat pumps can be made in the sub-menus.

Menu 5.11.1 - EB101 - 5.11.8 - EB101

Make settings for the installed slaves here.

Menu 5.11.1.1- Heat pump EB101



Make settings for the heat pump installed here.

Cooling permitted: Here you can set whether the cooling function is to be activated for the heat pump.

Silent mode permitted: Set whether silent mode is to be activated for the heat pump.

Current limit: Set whether the current limiting function is to be activated for the heat pump here. During the active function you can limit the value of maximum current.

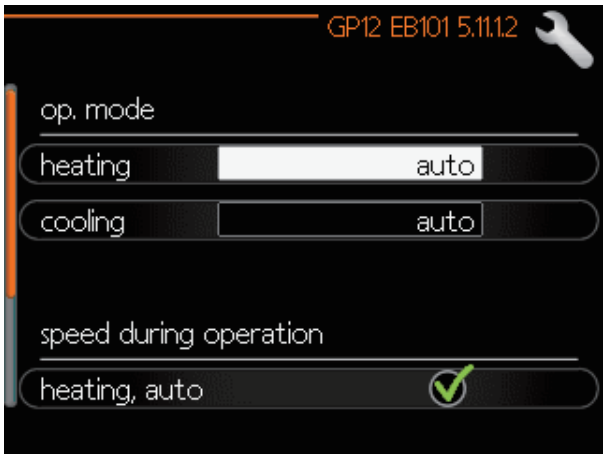
Setting range: 6-32 A
Factory setting: 32 A

Stop temperature compressor: Here you can limit the value for the set outdoor temperature down to the value the heat pump is to work.

Setting range: -20°C - -2°C
Factory setting: -20°C

BlockFreq1/2: Set a frequency range within the heat pump may work here.

Menu 5.11.1.2 - GP12 EB101



op. mode

Heating, cooling
Setting range: auto/intermittent
Default value: auto

Set the operating mode for the charge pump here.

Auto: runs according to the current operating mode set on the remote controller.

Intermittent: starts and stops 20 seconds before and after the compressor in the heat pump.

speed during operation

Heating, hot water, pool, cooling
Setting range: auto/manual
Default value: auto

Manual setting

Setting range: 1-100%
Default value: 70%

Speed in wait mode

Setting range: 1-100%
Default value: 30%

Max. allowed speed

Setting range: 80-100%
Default value: 100%

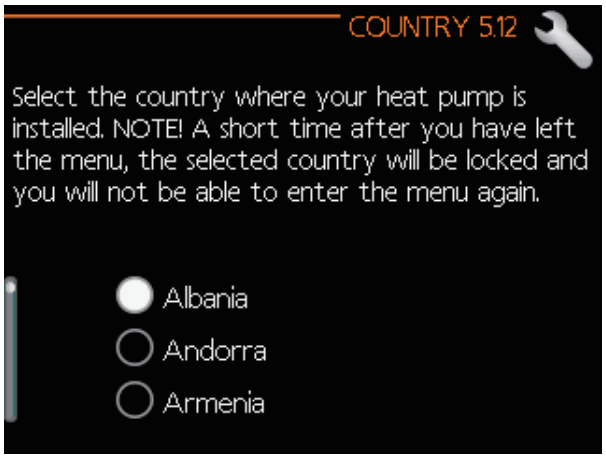
Set the speed at which the charge pump is to operate in the present operating mode. Select "auto" if the speed of the charge pump is to be regulated automatically (factory setting) for optimal operation.

If "auto" is activated for heating operation, you can also make the setting "max. allowed speed" which restricts the charge pump and does not allow it to run at a higher speed than the set value.

For manual operation of the charge pump deactivate "auto" for the current operating mode and set the value to between 1 and 100 % (the previously set value for "max. allowed speed" no longer applies).

Speed in standby mode (only used if "auto" has been selected for "Operating mode") means the charge pump operates at the set speed during the time when there is neither a need for compressor operation or additional Control heat.

Menu 5.12 - Country



Select here where the product was installed. This allows access to country specific settings in your product.

Language settings can be made regardless of this selection.

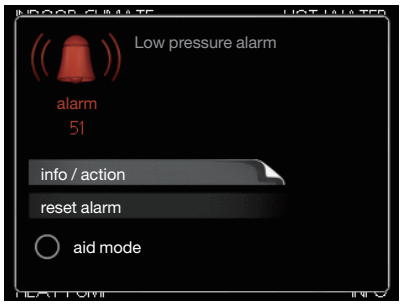
NOTE

This option locks after 24 hours, restart of display or program updating.

Disturbance in comfort

In most cases, the control module notes a malfunction and indicates this with alarms and shows instructions to rectify it in the display. See "Manage alarm" for in- formation about managing alarms. If the malfunction does not appear in the display, or if the display is not lit, the following troubleshooting guide can be used.

Manage alarm



In the event of an alarm, some kind of malfunction has occurred, which is indicated by the status lamp changing from green continuously to red continuously. In addition, an alarm bell appears in the information window.

Alarm

In the event of an alarm with a red status lamp a malfunction has occurred that the heat pump and/or control module cannot remedy itself. In the display, by turning the control knob and pressing the OK button, you can see the type of alarm it is and reset it. You can also choose to set the installation to aid mode.

info / action Here you can read what the alarm means and receive tips on what you can do to correct the problem that caused the alarm.

reset alarm In most cases it is enough to select "reset alarm" to correct the problem that caused the alarm. If a green light illuminates after selecting "reset alarm" the alarm has been remedied. If a red light is still visible and a menu called “alarm” is visible in the display, the problem that caused the alarm remains. If the alarm disappears and then returns, see the troubleshooting section.

aid mode “aid mode” is a type of emergency mode. This means that the installation produces heat and/or hot water despite there being some kind of problem. This can mean that the heat pump's compressor is not running. In this case any electrical addition produces heat and/or hot water.

NOTE

To select aid mode an alarm action must be selected in the menu 5.1.4.

CAUTION

Selecting "aid mode" is not the same as correcting the problem that caused the alarm. The status lamp will therefore continue to be red.

Troubleshooting

If the operational interference is not shown in the display the following tips can be used:

Basic actions

Start by checking the following possible fault sources:

- The switch's (SF1) position.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The control module's miniature circuit breaker (FA1).

Low hot water temperature or a lack of hot water

This part of the fault-tracing chapter only applies if the water heater is installed in the system.

- Closed or choked filling valve for the hot water heater.
  - Open the valve.
- Mixing valve (if there is one installed) set too low.
  - Adjust the mixer valve.
- Control module in incorrect operating mode.
  - If mode "manual" is selected, select "addition".
- Large hot water consumption.
  - Wait until the hot water has heated up. Temporarily increased hot water capacity (temporary lux) can be activated in menu 2.1.
- Too low hot water setting.
  - Enter menu 2.2 and select a higher comfort mode.
- Too low or no operating prioritisation of hot water.
  - Enter menu 4.9.1 and increase the time for when hot water is to be prioritised.

Low room temperature

- Closed thermostats in several rooms.
  - Set the thermostats to max, in as many rooms as possible. Adjust the room temperature via menu 1.1, instead of choking the thermostats.
- Control module in incorrect operating mode.
  - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop heating" in menu 4.9.2.
  - If mode "manual" is selected, select "heating". If this is not enough, select "addition".
- Too low set value on the automatic heating control.
  - Enter menu 1.1 "temperature" and adjust the offset heating curve up. If the room temperature is only low in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting up.
- Too low or no operating prioritisation of heat.
  - Enter menu 4.9.1 and increase the time for when heating is to be prioritised.
- "Holiday mode" activated in menu 4.7.
  - Enter menu 4.7 and select "Off".

- External switch for changing the room heating activ- ated.
  - Check any external switches.
- Air in the climate system.
  - Vent the climate system.
- Closed valves to the climate system.
  - Open the valves.
- Incorrectly adjusted flow across the heat pump.
  - Check whether alarm high condenser in (163) or high condenser out (162) is in the alarm log. Follow the instructions for adjusting charge flow.

High room temperature

- Too high set value on the automatic heating control.
  - Enter menu 1.1 (temperature) and reduce the offset heating curve. If the room temperature is only high in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting down.
- External switch for changing the room heating activated.
  - Check any external switches.

Low system pressure

- Not enough water in the climate system.
  - Top up the water in the climate system.

The compressor does not start

- There is no heating requirement.
  - The heat pump does not call on heating nor hot water.
- Temperature conditions tripped.
  - Wait until the temperature condition has been re- set.
- Minimum time between compressor starts has not been reached.
  - Wait 30 minutes and check if the compressor has started.
- Alarm tripped.
  - Follow the display instructions.

Additional heating only

If you are unsuccessful in rectifying the fault and are unable to heat the house, you can, whilst waiting for assistance, continue running the heat pump in “add. heat only”. This means that additional heating only is used to heat the house.

Set the installation to additional heat mode

1. Go to menu 4.2 op. mode.
2. Mark “add. heat only” using the control knob and then press OK button.

   Return to the main menus by pressing the Back button.

CAUTION

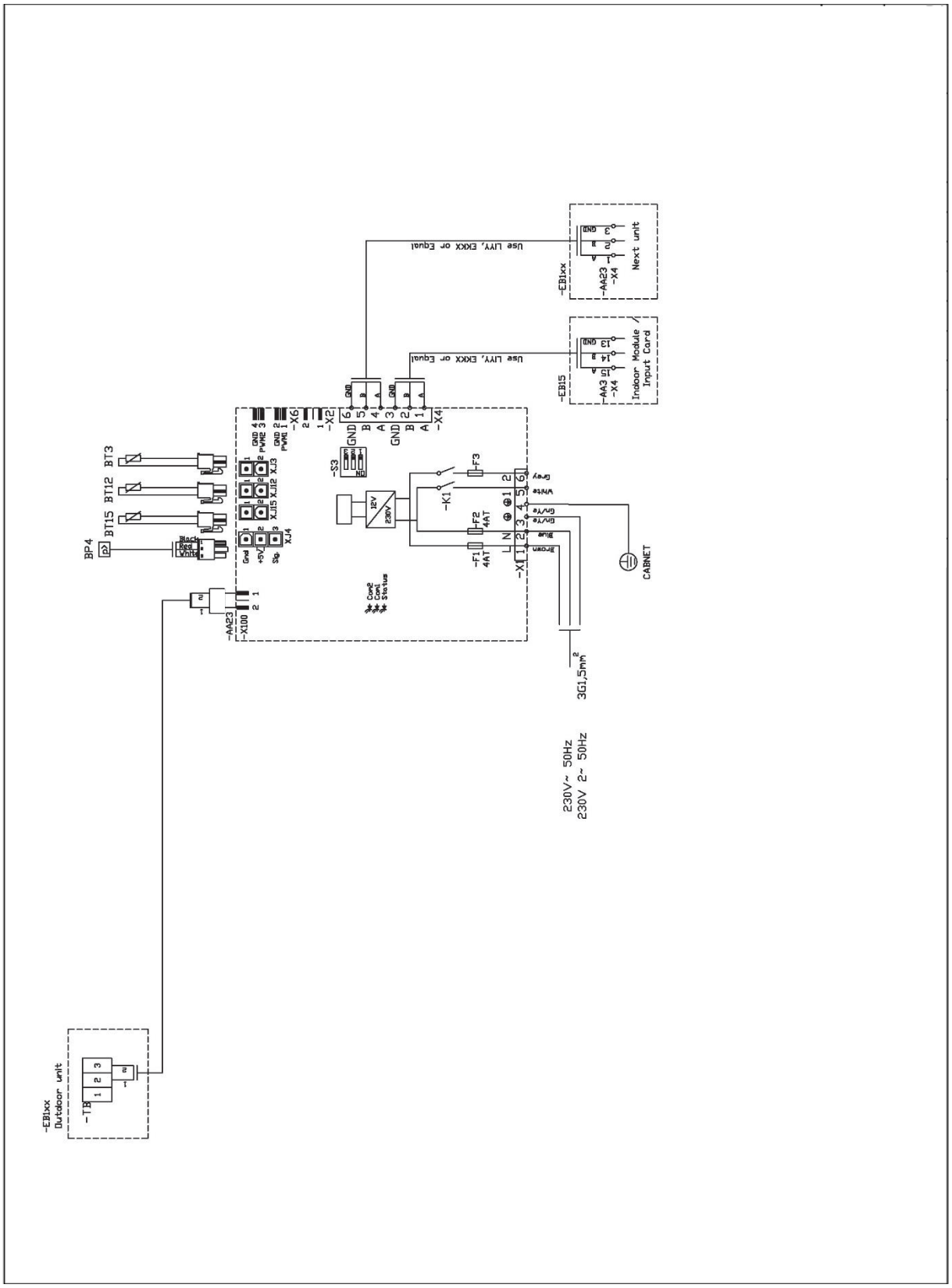
When commissioning without MTH air/water heat pump an alarm communication error may appear in the display.

The alarm is reset if the relevant heat pump is deactivated in menu 5.2.2 ("installed heat pump").

Technical data

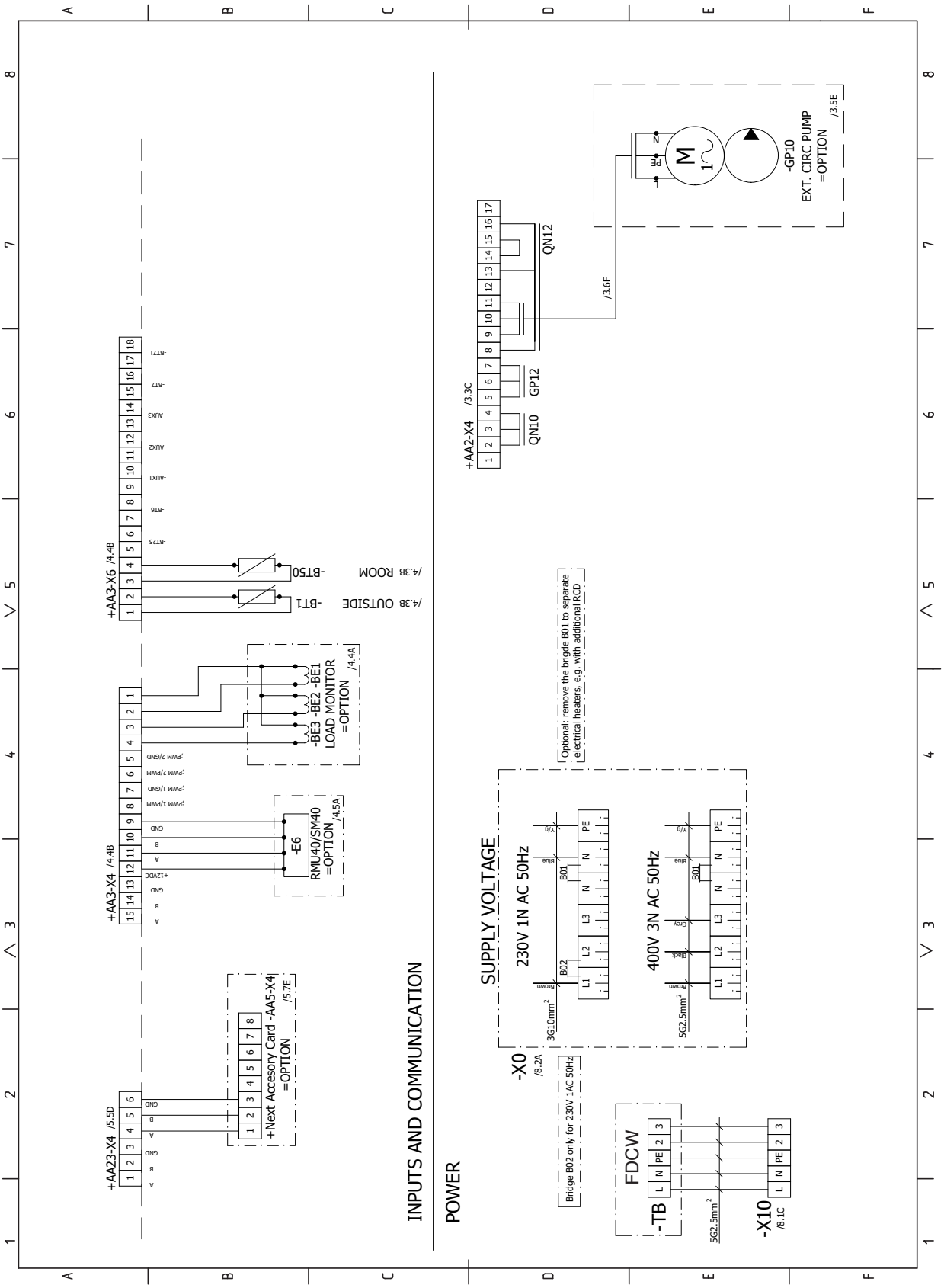
For HMA60/100-W, proceed to page 124. For RC-HY20-W, proceed to page 143.
For HMS60/100-W, proceed to page 134. For RC-HY40-W, proceed to page 147.

Electric circuit diagram - HSB60/100-W

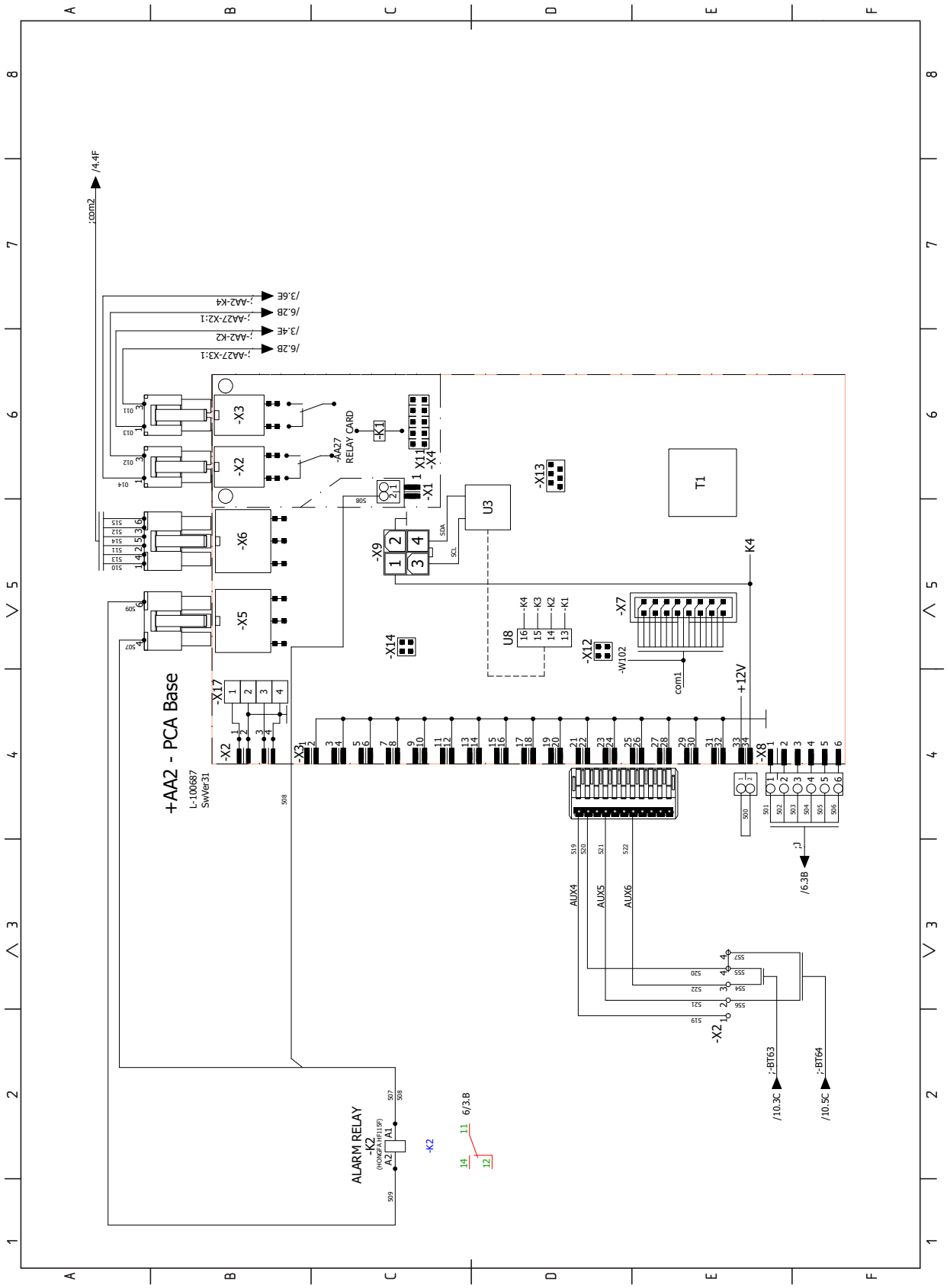


Electrical circuit diagram - HMA60/100-W

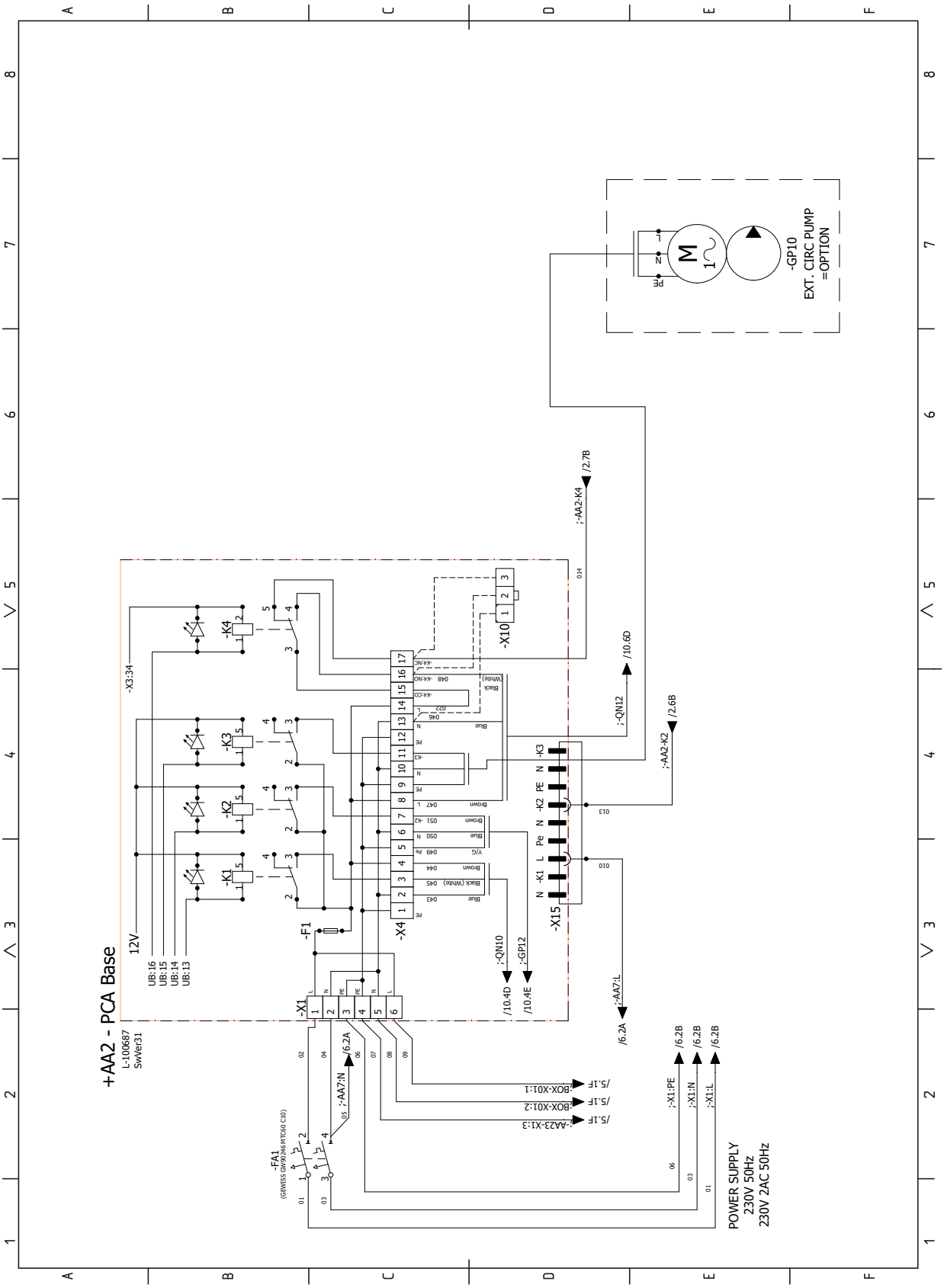
sheet 1



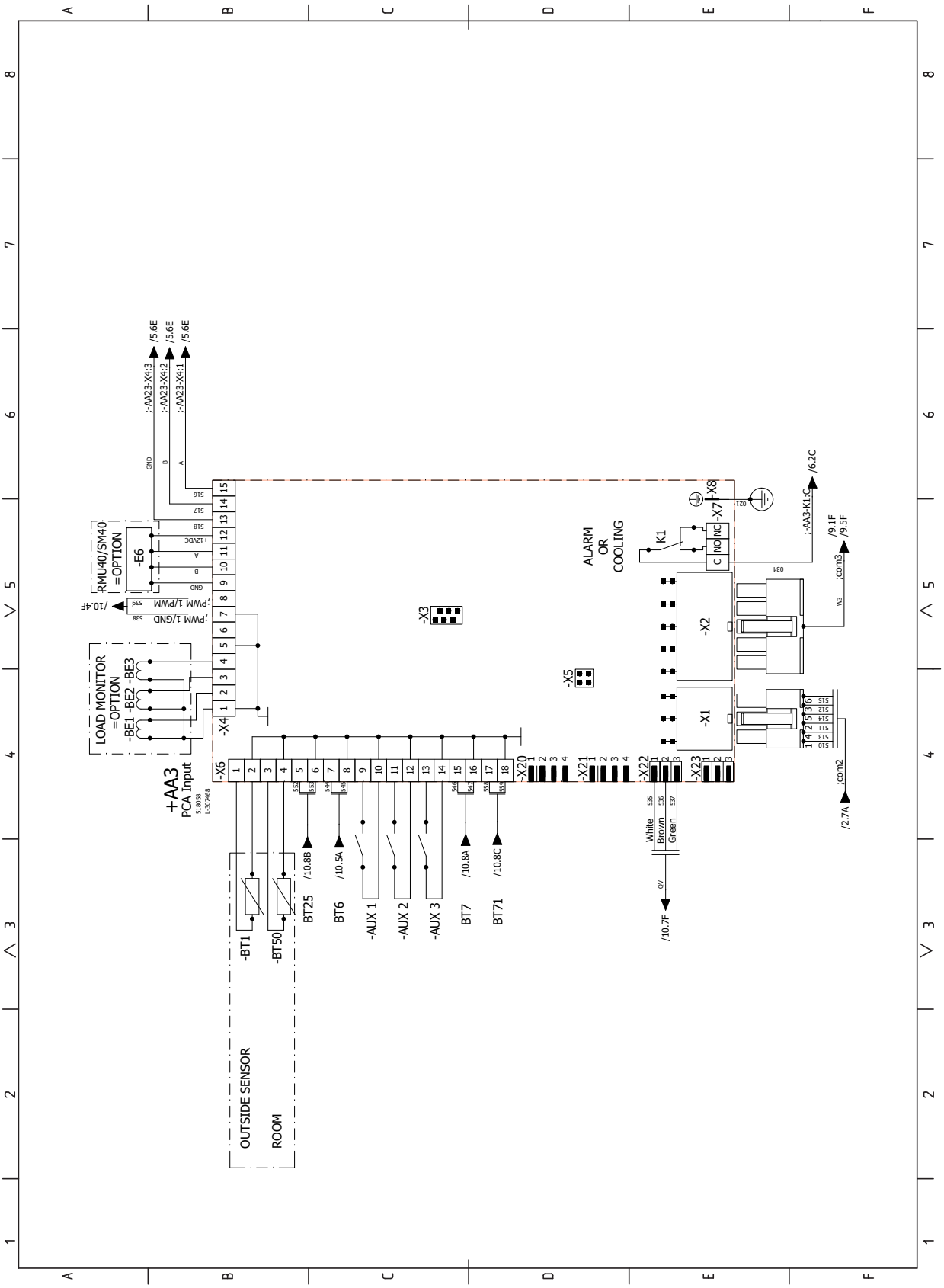
sheet 2


+AA2 - PCA Base
L-100687
SwVer31
-X1
-X2
-X3
-X4
-X5
-X6
-X7
-X8
-X9
-X11
-X12
-X13
-X14
-X17
-K1
-K2
-K4
-AA27
RELAY CARD
U3
U8
T1
-W102
com1
+12V
AUX4
AUX5
AUX6
ALARM RELAY
(HONGFA HF115F)
A1
A2
/4.4F
/6.2B
/3.4E
/6.2B
/3.6E
/6.3B
/10.3C
/10.5C
6/3.B

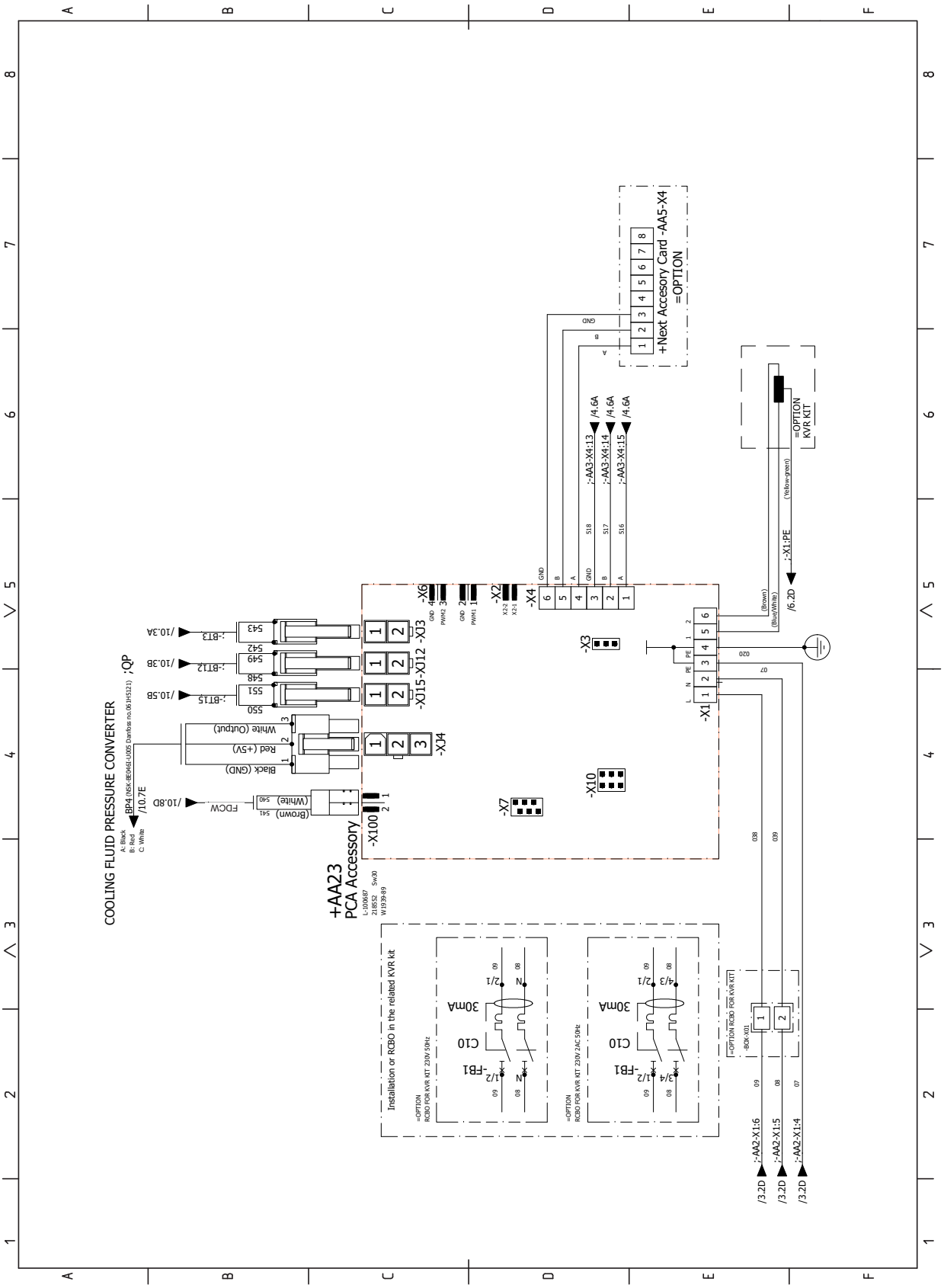
sheet 3


+AA2 - PCA Base
L-100687
SwVer31
12V
UB:16
UB:15
UB:14
UB:13
-X3:34
-F1
-X1
-X4
-X10
-X15
-K1
-K2
-K3
-K4
-FA1
(GEWISS GW90246 MTC60 C10)
-GP10
EXT. CIRC PUMP
=OPTION
POWER SUPPLY
230V 50Hz
230V 2AC 50Hz
;-AA2-K4
;-QN12
;-AA2-K2
;-QN10
;-GP12
;-AA7:L
;-AA7:N
;-X1:PE
;-X1:N
;-X1:L
/2.7B
/10.6D
/2.6B
/10.4D
/10.4E
/6.2A
/6.2B
/5.1F
;-BOX-X01:1
;-BOX-X01:2
;-AA23-X1:3

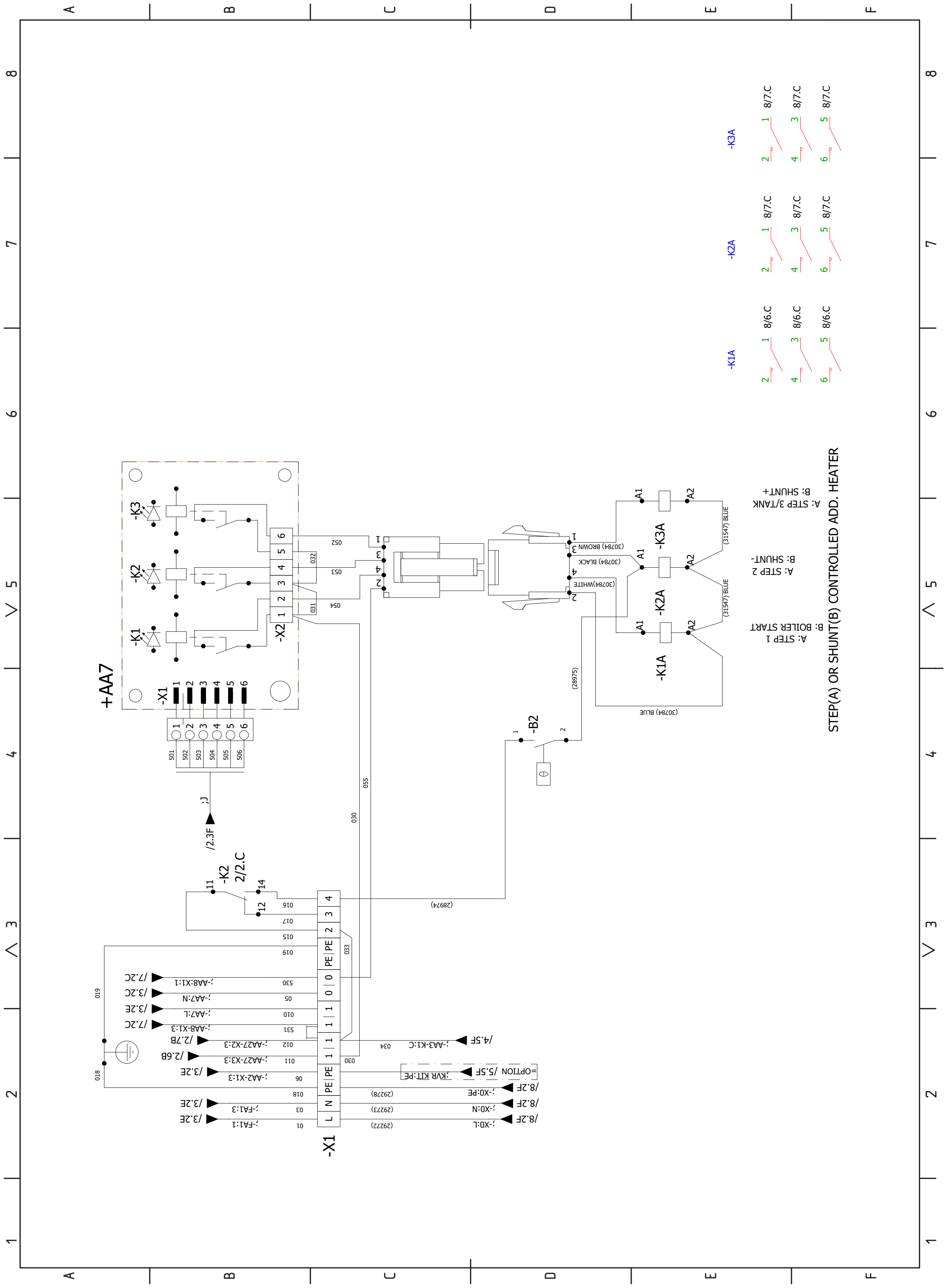
sheet 4


+AA3
PCA Input
OUTSIDE SENSOR
ROOM
-BT1
-BT50
BT25
BT6
-AUX 1
-AUX 2
-AUX 3
BT7
BT71
LOAD MONITOR
=OPTION
-BE1 -BE2 -BE3
RMU40/SM40
=OPTION
-E6
ALARM
OR
COOLING
K1
-X1
-X2
-X3
-X4
-X5
-X6
-X7
-X8
-X20
-X21
-X22
-X23
White
Brown
Green
/10.7F
/10.8B
/10.5A
/10.8A
/10.8C
/10.4F
/5.6E
/6.2C
/9.1F
/9.5F
/2.7A
:com2
:com3

sheet 5

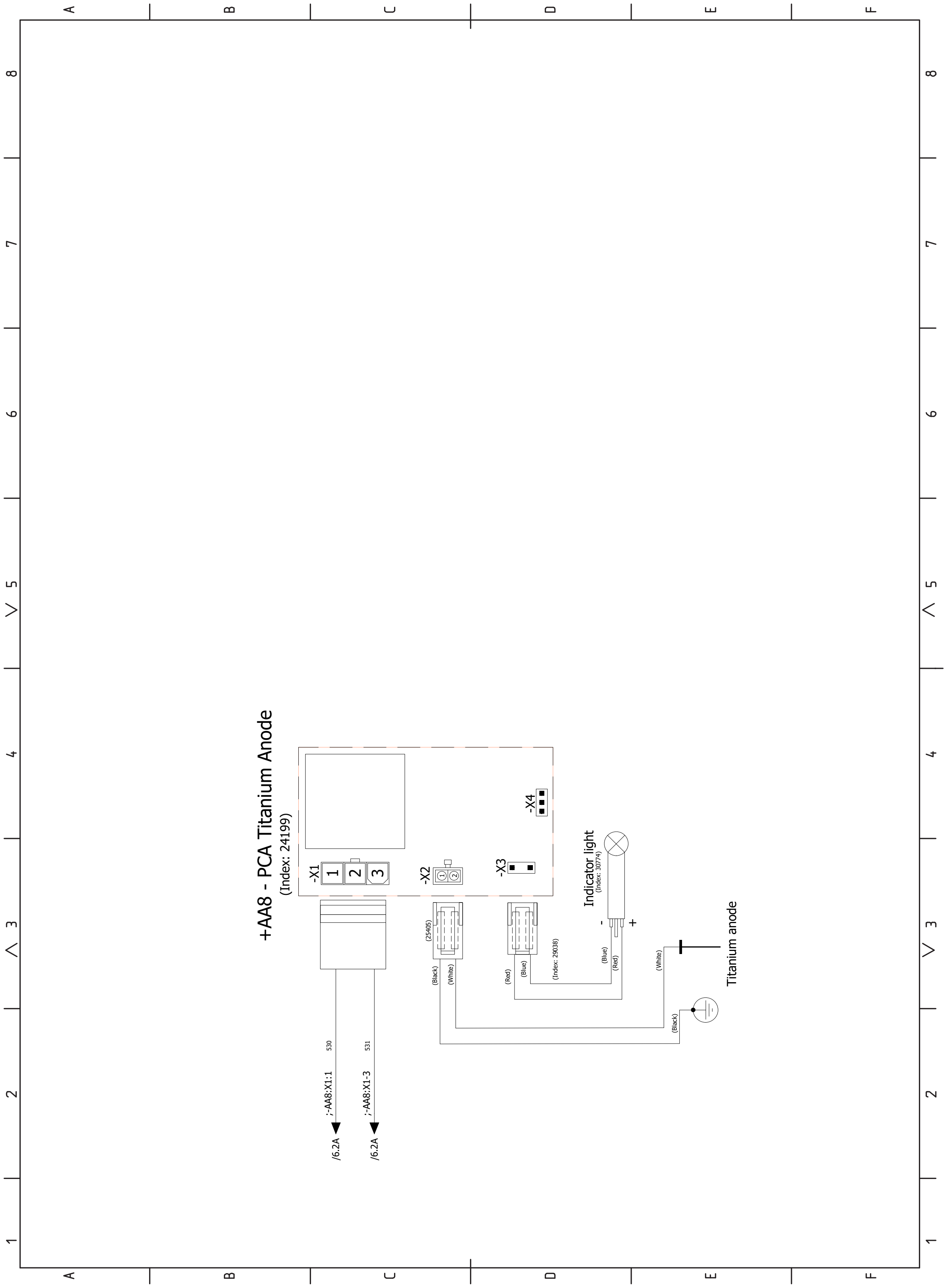

+AA23
PCA Accessory
-X100
-X3
-X4
-X6
-X2
-X7
-X10
-X1
-X15-X12 -X3
+Next Accesory Card -AA5-X4
=OPTION
=OPTION
KVR KIT
COOLING FLUID PRESSURE CONVERTER
Installation or RCBO in the related KVR kit
30mA
C10
-FB1
-AA2-X1:6
-AA2-X1:5
-AA2-X1:4
-X1:PE
-AA3-X4:13
-AA3-X4:14
-AA3-X4:15

sheet 6

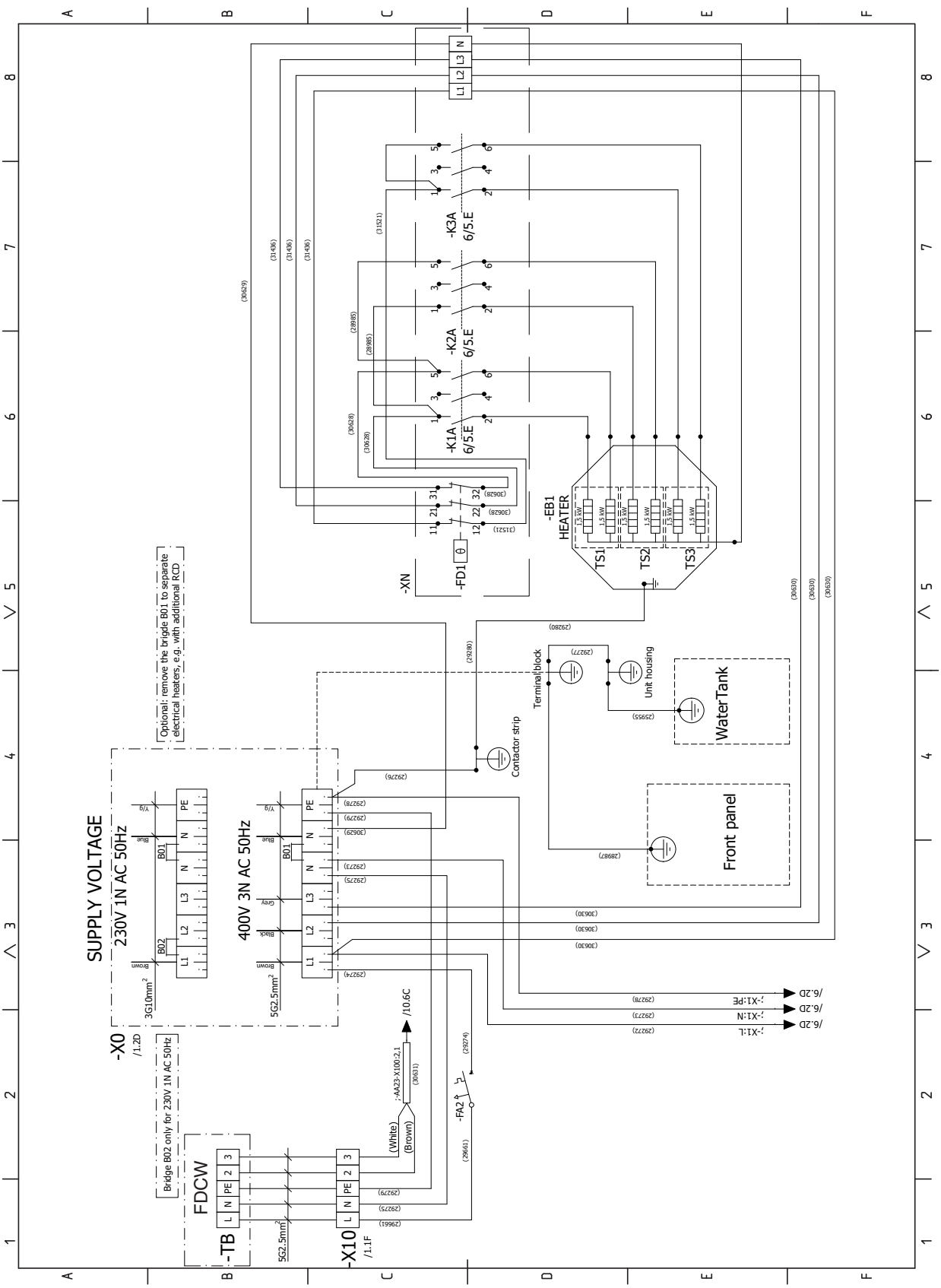


+AA7
-K1A
-K2A
-K3A
-B2
-X1
-X2
STEP(A) OR SHUNT(B) CONTROLLED ADD. HEATER
A: STEP 1
B: BOILER START
A: STEP 2
B: SHUNT-
A: STEP 3/TANK
B: SHUNT+

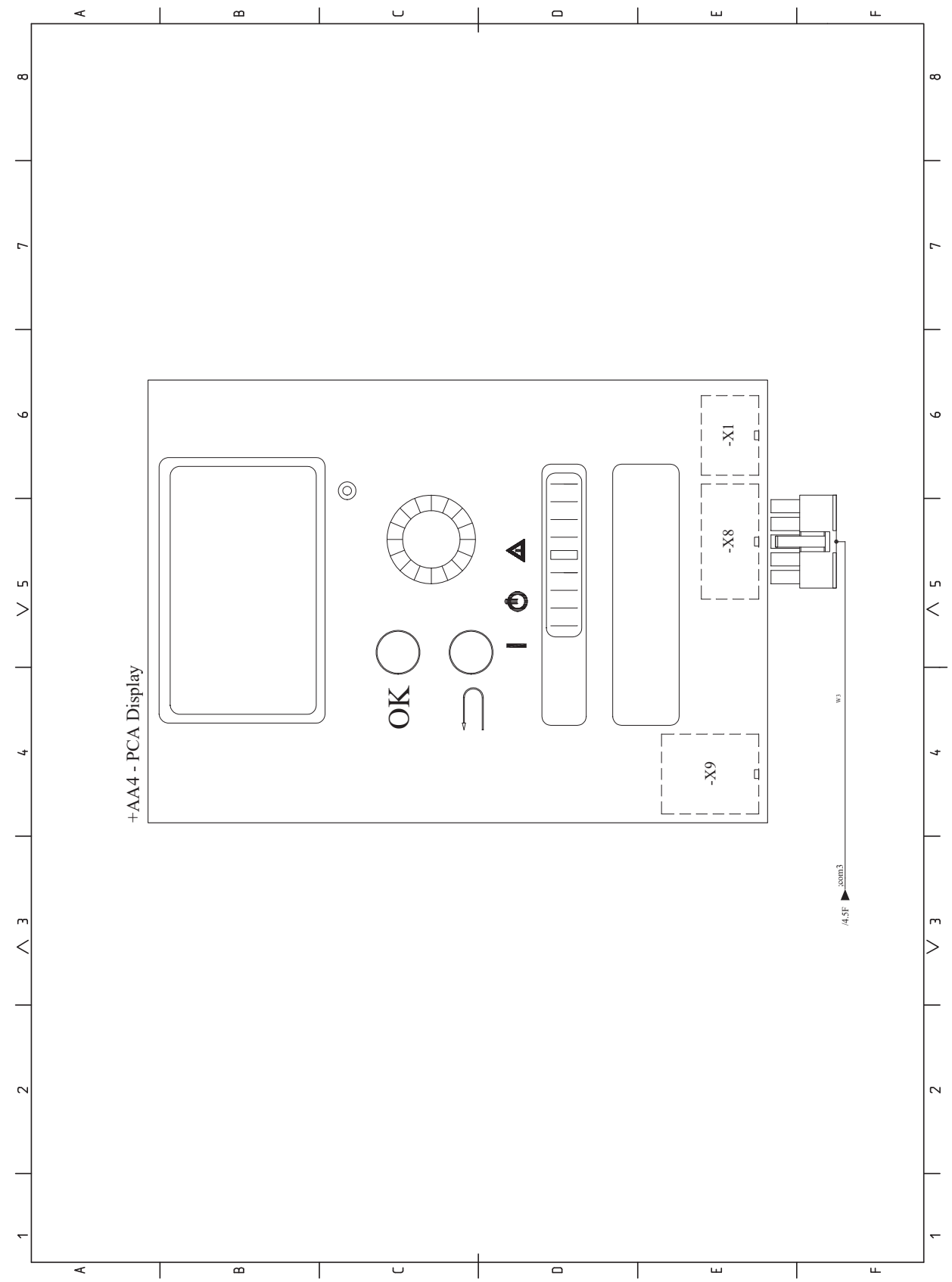
sheet 7


+AA8 - PCA Titanium Anode
(Index: 24199)
-X1
1
2
3
-X2
-X3
-X4
Indicator light
(Index: 30774)
-
+
(25405)
(Black)
(White)
(Red)
(Blue)
(Index: 29038)
(Blue)
(Red)
(White)
(Black)
Titanium anode
530
531
;-AA8:X1:1
;-AA8:X1-3
/6.2A
/6.2A
A
B
C
D
E
F
1
2
3
4
5
6
7
8

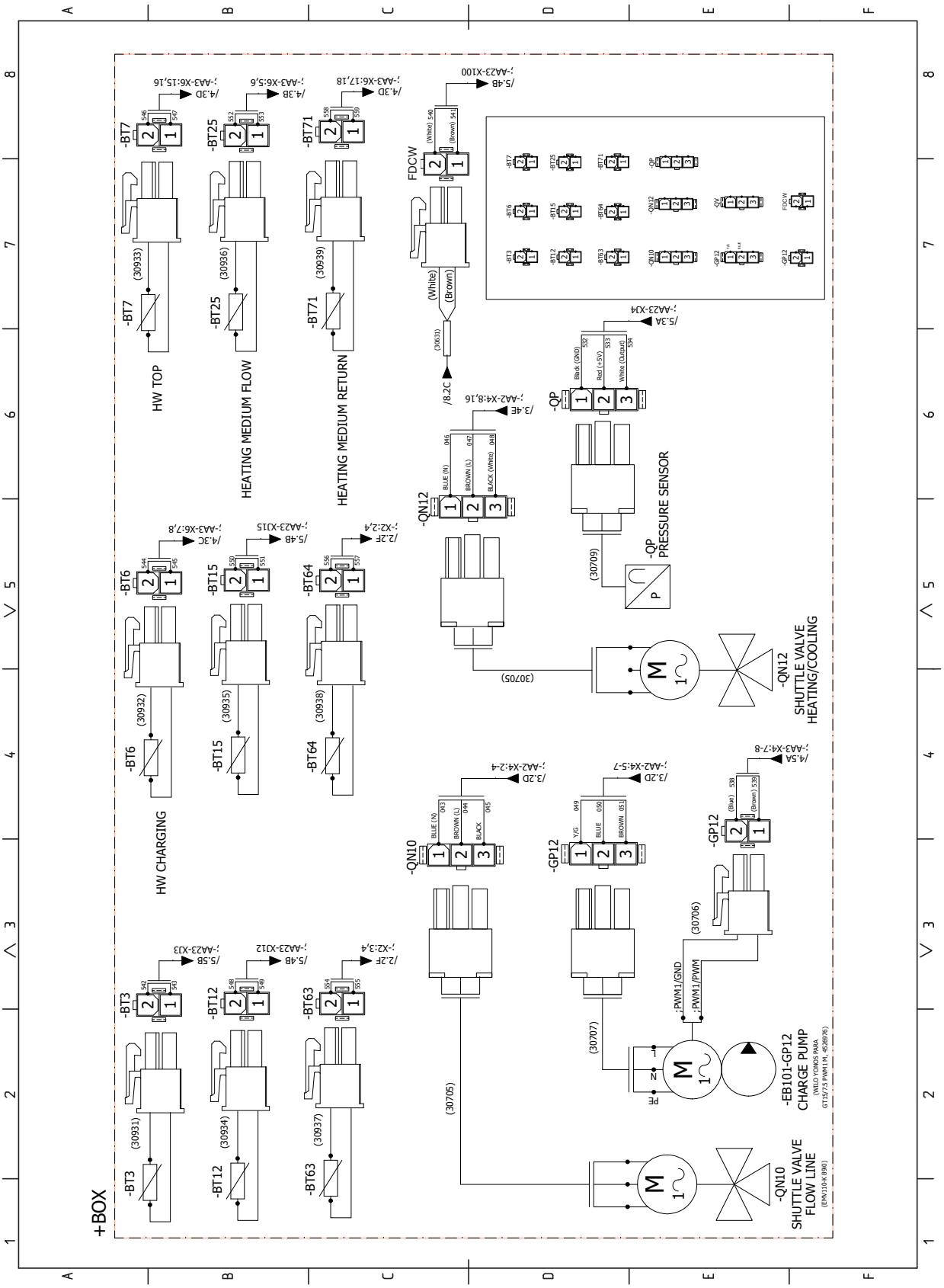
sheet 8


SUPPLY VOLTAGE
230V 1N AC 50Hz
400V 3N AC 50Hz
Optional: remove the brigde B01 to separate electrical heaters, e.g. with additional RCD
Bridge B02 only for 230V 1N AC 50Hz
-X0
/1.2D
-TB
FDCW
-X10
/1.1F
-K1A 6/5.E
-K2A 6/5.E
-K3A 6/5.E
-EB1 HEATER
1.5 kW
TS1
TS2
TS3
-FD1
-XN
-FA2
Contactor strip
Terminal block
Unit housing
WaterTank
Front panel
-AA23-X100:2,1
/10.6C
(White)
(Brown)
/6.2D
-X1:L
-X1:N
-X1:PE
3G10mm²
5G2.5mm²
5G2.5mm²

sheet 9

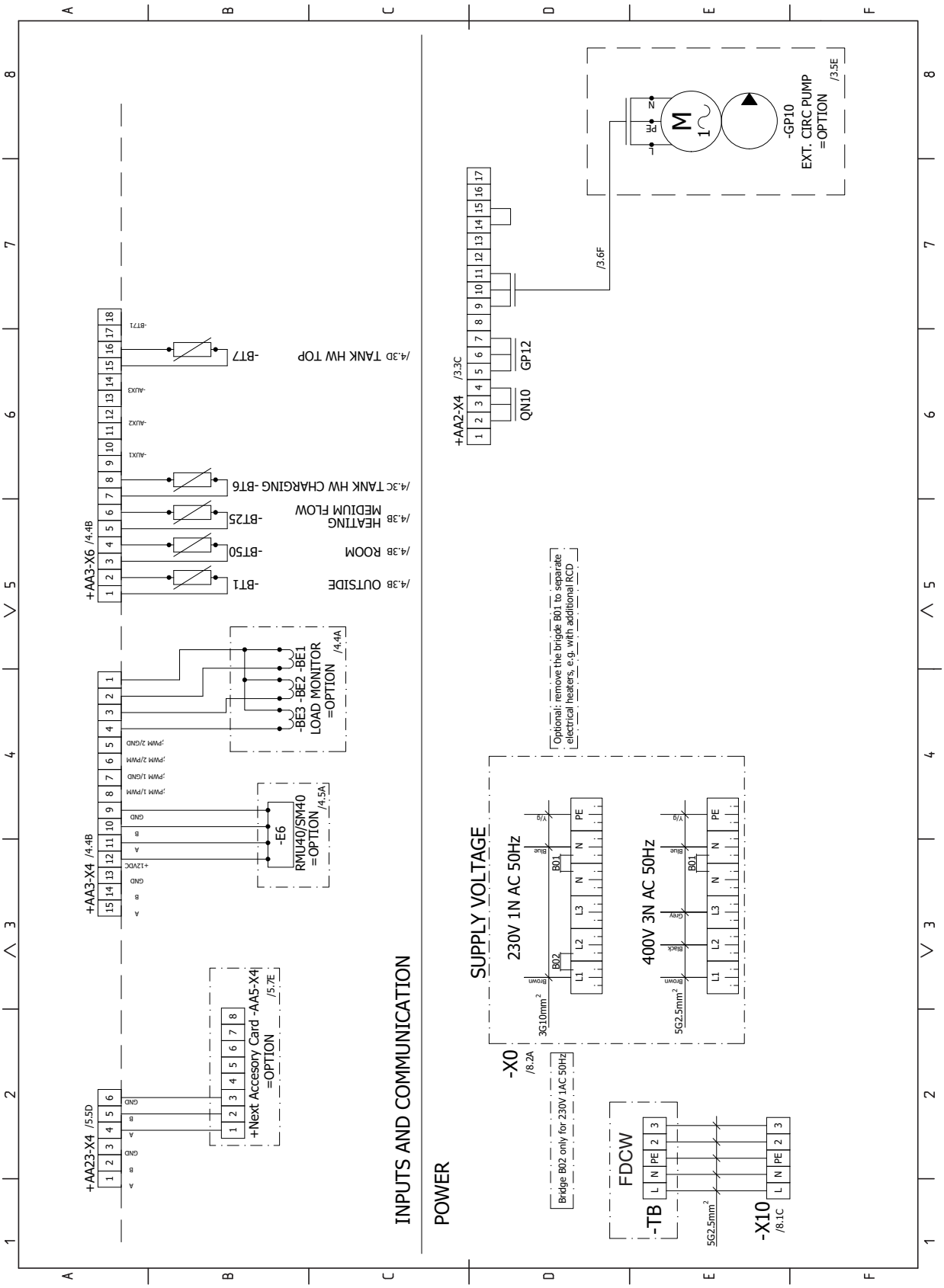


sheet 10

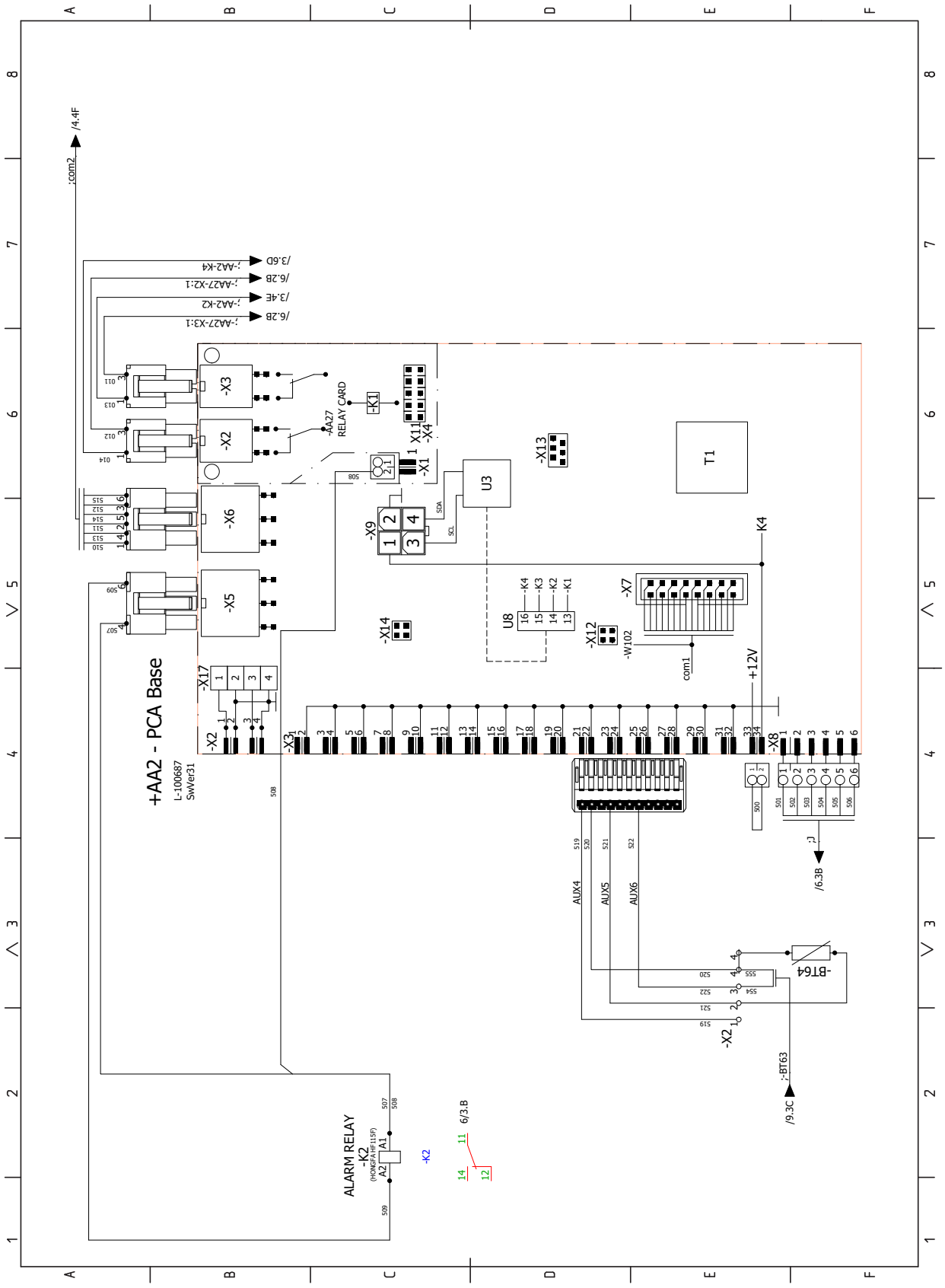

+BOX
-BT3
-BT12
-BT63
-BT6
-BT15
-BT64
-BT7
-BT25
-BT71
HW CHARGING
HEATING MEDIUM FLOW
HEATING MEDIUM RETURN
HW TOP
-QN10
SHUTTLE VALVE
FLOW LINE
-QN12
SHUTTLE VALVE
HEATING/COOLING
-EB101-GP12
CHARGE PUMP
-QP
PRESSURE SENSOR
-GP12
FDCW
PWM1/GND
PWM1/PWM

Electrical circuit diagram - HMS60/100-W

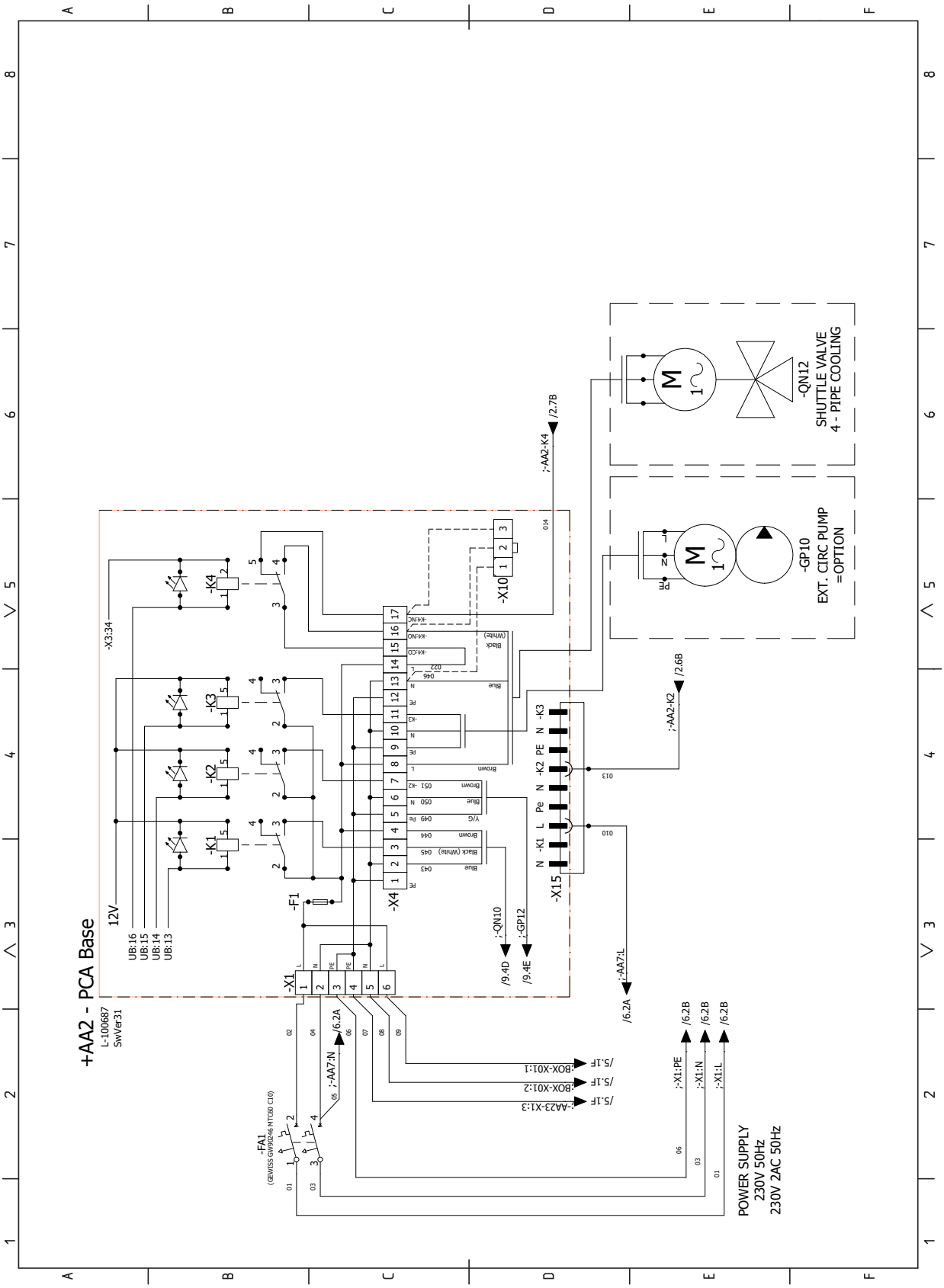
sheet 1



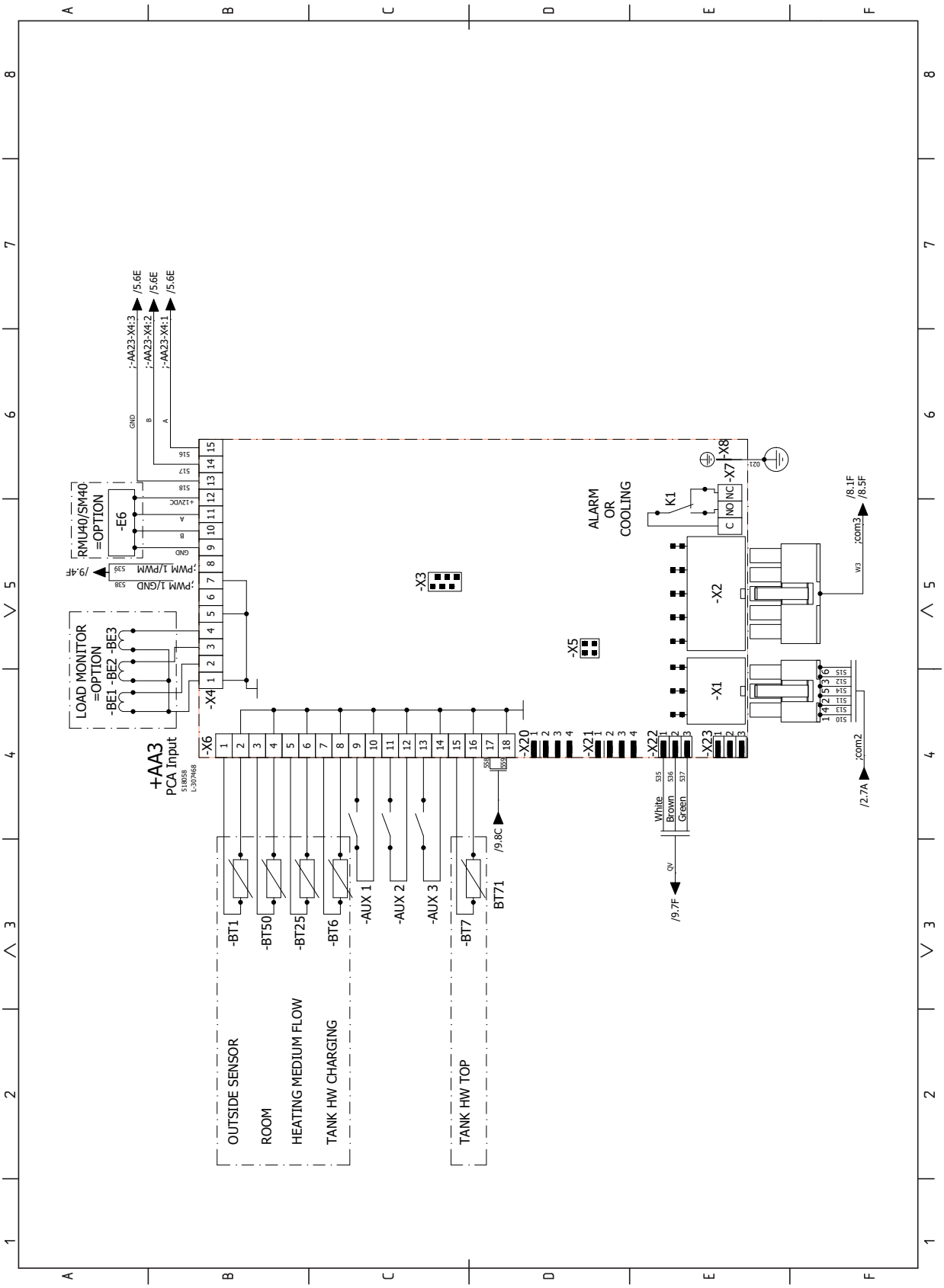
sheet 2


+AA2 - PCA Base
L-100687
SwVer31
RELAY CARD
-AA27
-X1
-X2
-X3
-X4
-X5
-X6
-X7
-X8
-X9
-X11
-X12
-X13
-X14
-X17
-K1
-K2
-K4
U3
U8
T1
-W102
com1
+12V
AUX4
AUX5
AUX6
-BT64
-BT63
ALARM RELAY
(HONGFA HF115F)
/4.4F
/6.3B
/9.3C
/3.6D
/6.2B
/3.4E
/6.2B
6/3.B

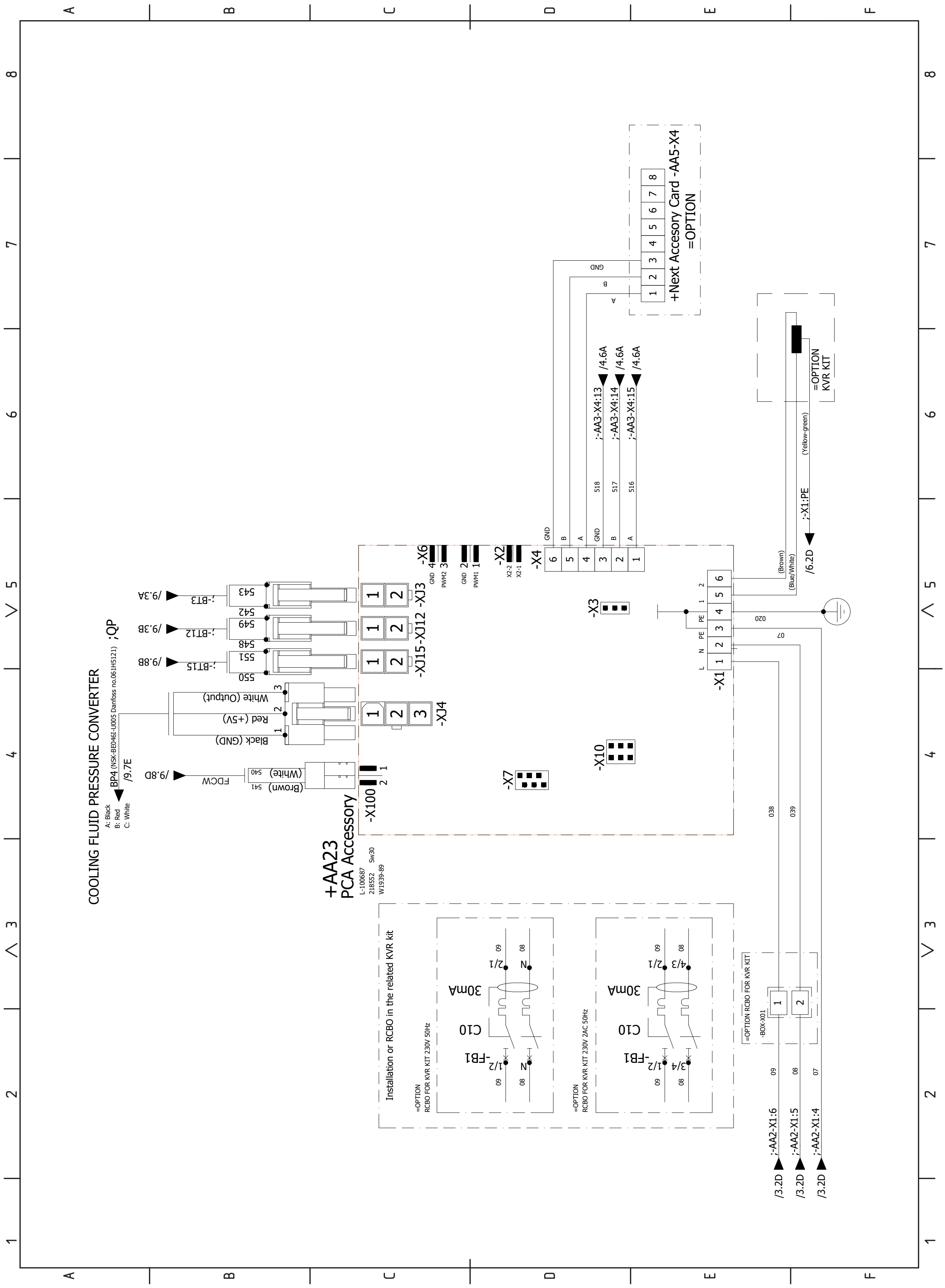
sheet 3


+AA2 - PCA Base
L-100687
SwVer31
12V
UB:16
UB:15
UB:14
UB:13
-X3:34
-K4
-K3
-K2
-K1
-F1
-X1
-X4
-X10
-X15
-QN12
SHUTTLE VALVE
4 - PIPE COOLING
-GP10
EXT. CIRC PUMP
=OPTION
-FA1
POWER SUPPLY
230V 50Hz
230V 2AC 50Hz

sheet 4

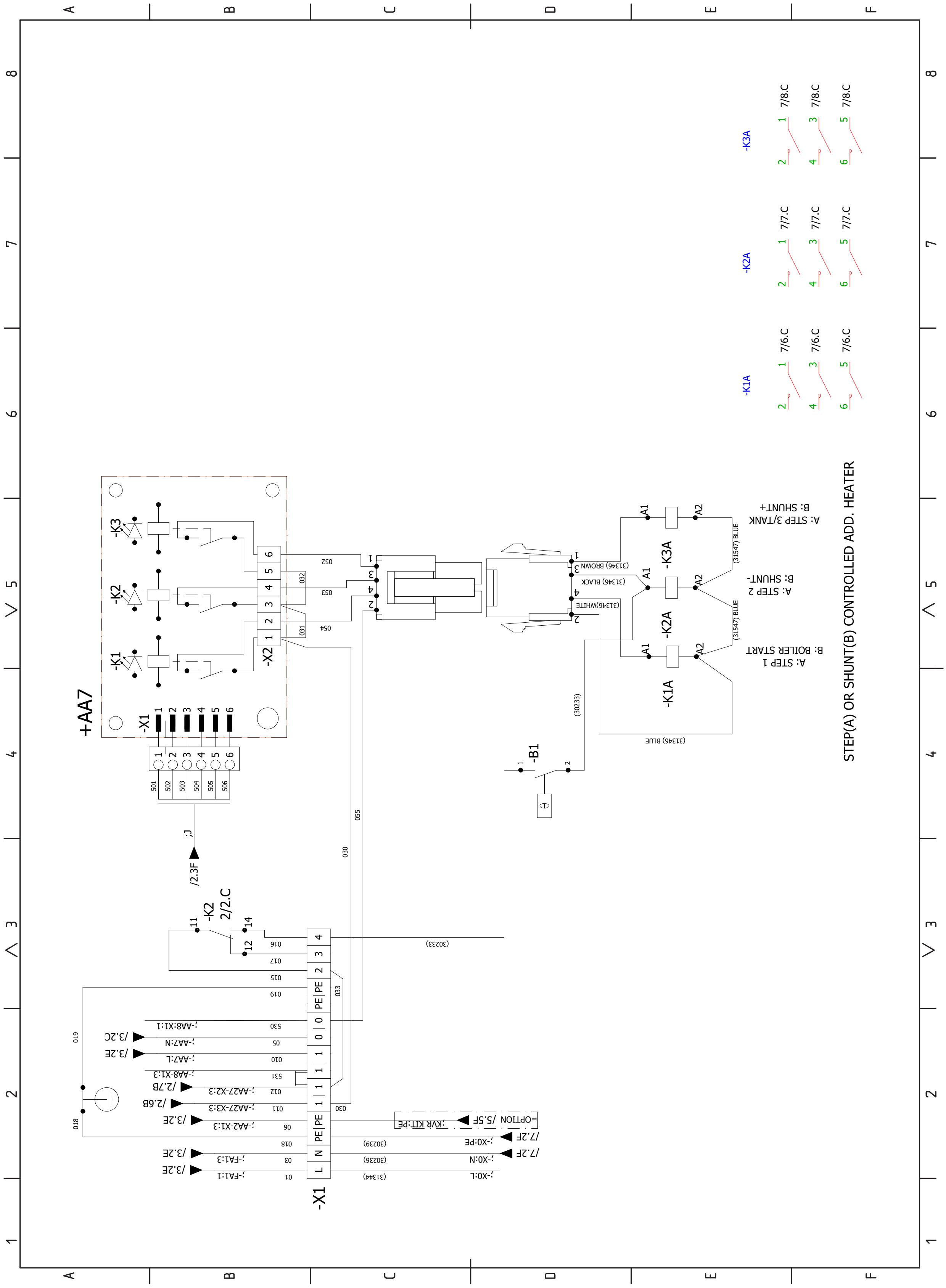

+AA3
PCA Input
-X6
-X4
-X3
-X5
-X20
-X21
-X22
-X23
-X2
-X1
-X7
-X8
-E6
RMU40/SM40
=OPTION
LOAD MONITOR
=OPTION
-BE1 -BE2 -BE3
ALARM
OR
COOLING
K1
OUTSIDE SENSOR
ROOM
HEATING MEDIUM FLOW
TANK HW CHARGING
TANK HW TOP
-BT1
-BT50
-BT25
-BT6
-BT7
BT71
-AUX 1
-AUX 2
-AUX 3
/5.6E
/9.4F
/9.8C
/9.7F
/8.1F
/8.5F
/2.7A
;com3
;com2
White
Brown
Green

sheet 5



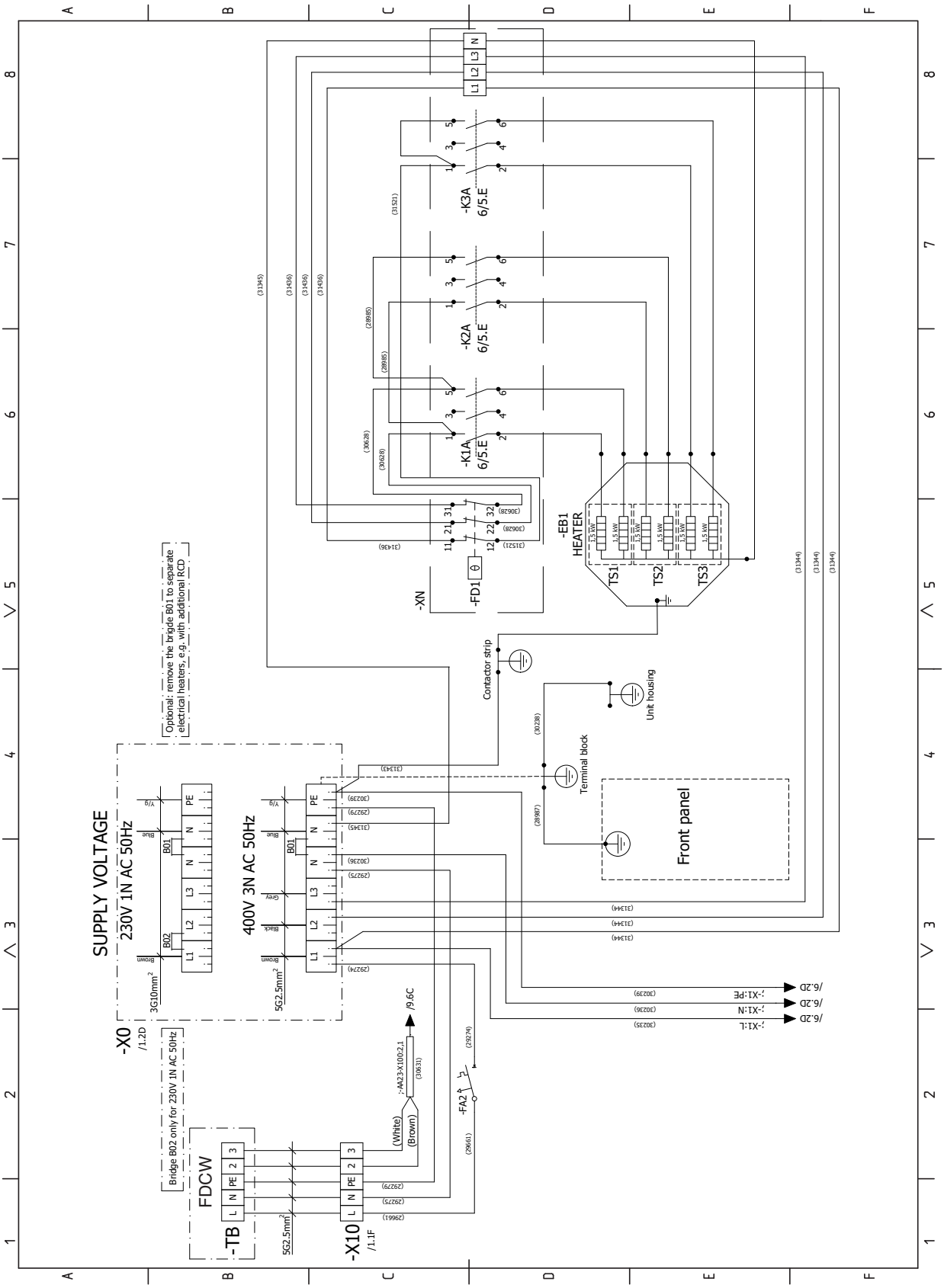
COOLING FLUID PRESSURE CONVERTER
BP4 (NSK-BE046I-U005 Danfoss no.061H5121) ;QP
A: Black
B: Red
C: White
Black (GND)
Red (+5V)
White (Output)
+AA23
PCA Accessory
L-100687
218552
W1939-89
Sw.30
-X100
-XJ4
-XJ15
-XJ12
-XJ3
-X6
-X2
-X4
-X3
-X10
-X7
-X1
(White)
(Brown)
FDCW
;-BT3
;-BT12
;-BT15
/9.3A
/9.3B
/9.8B
/9.8D
/9.7E
;-AA3-X4:13
;-AA3-X4:14
;-AA3-X4:15
/4.6A
+Next Accesory Card -AA5-X4
=OPTION
=OPTION
KVR KIT
(Yellow-green)
(Brown)
(Blue/White)
;-X1:PE
/6.2D
Installation or RCBO in the related KVR kit
=OPTION
RCBO FOR KVR KIT 230V 50Hz
=OPTION
RCBO FOR KVR KIT 230V 2AC 50Hz
-FB1
C10
30mA
=OPTION RCBO FOR KVR KIT
-BOX-X01
;-AA2-X1:6
;-AA2-X1:5
;-AA2-X1:4
/3.2D

sheet 6

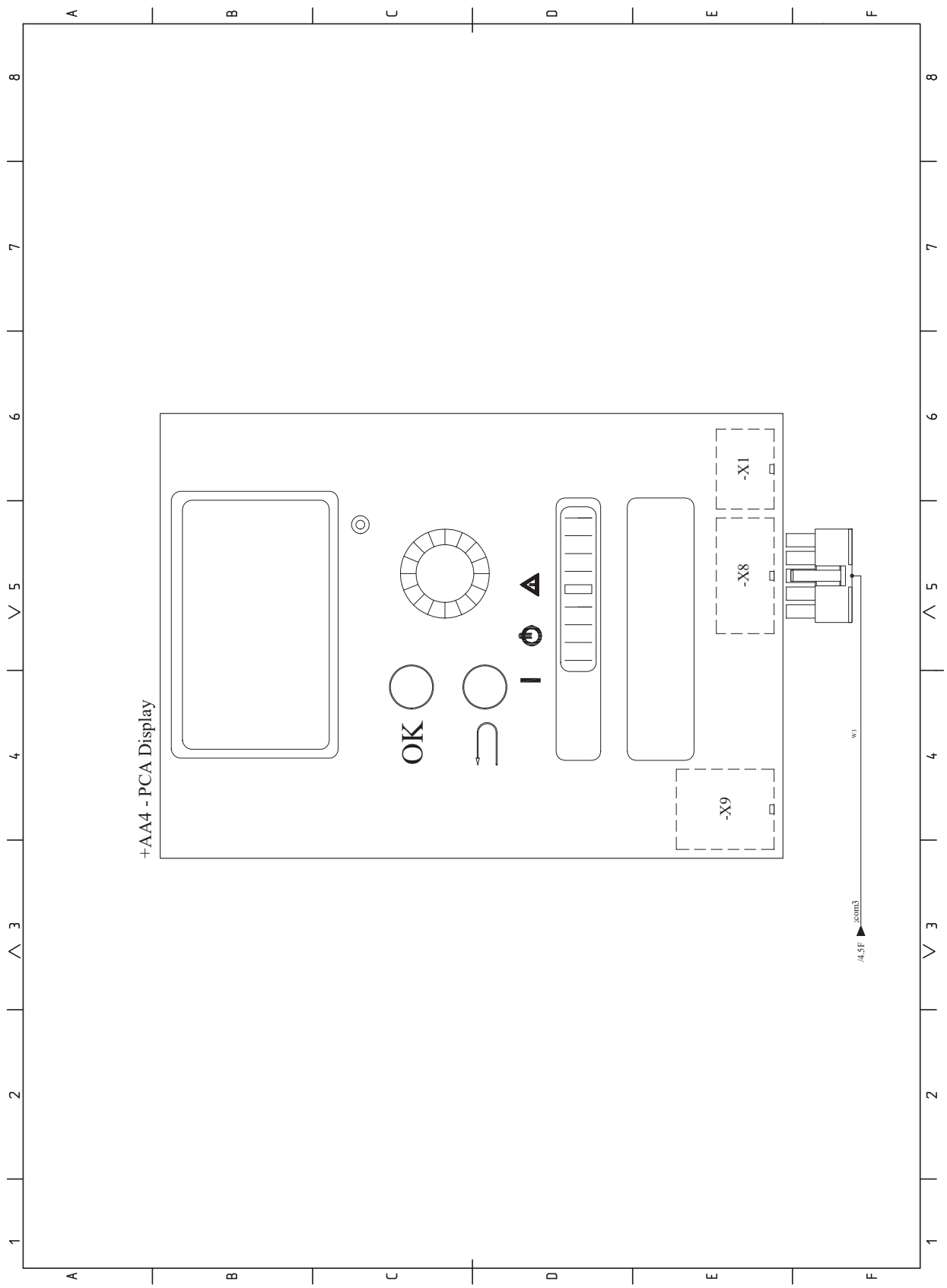


+AA7
-K1
-K2
-K3
-X1
-X2
-B1
-K1A
-K2A
-K3A
A: STEP 1
B: BOILER START
A: STEP 2
B: SHUNT-
A: STEP 3/TANK
B: SHUNT+
STEP(A) OR SHUNT(B) CONTROLLED ADD. HEATER

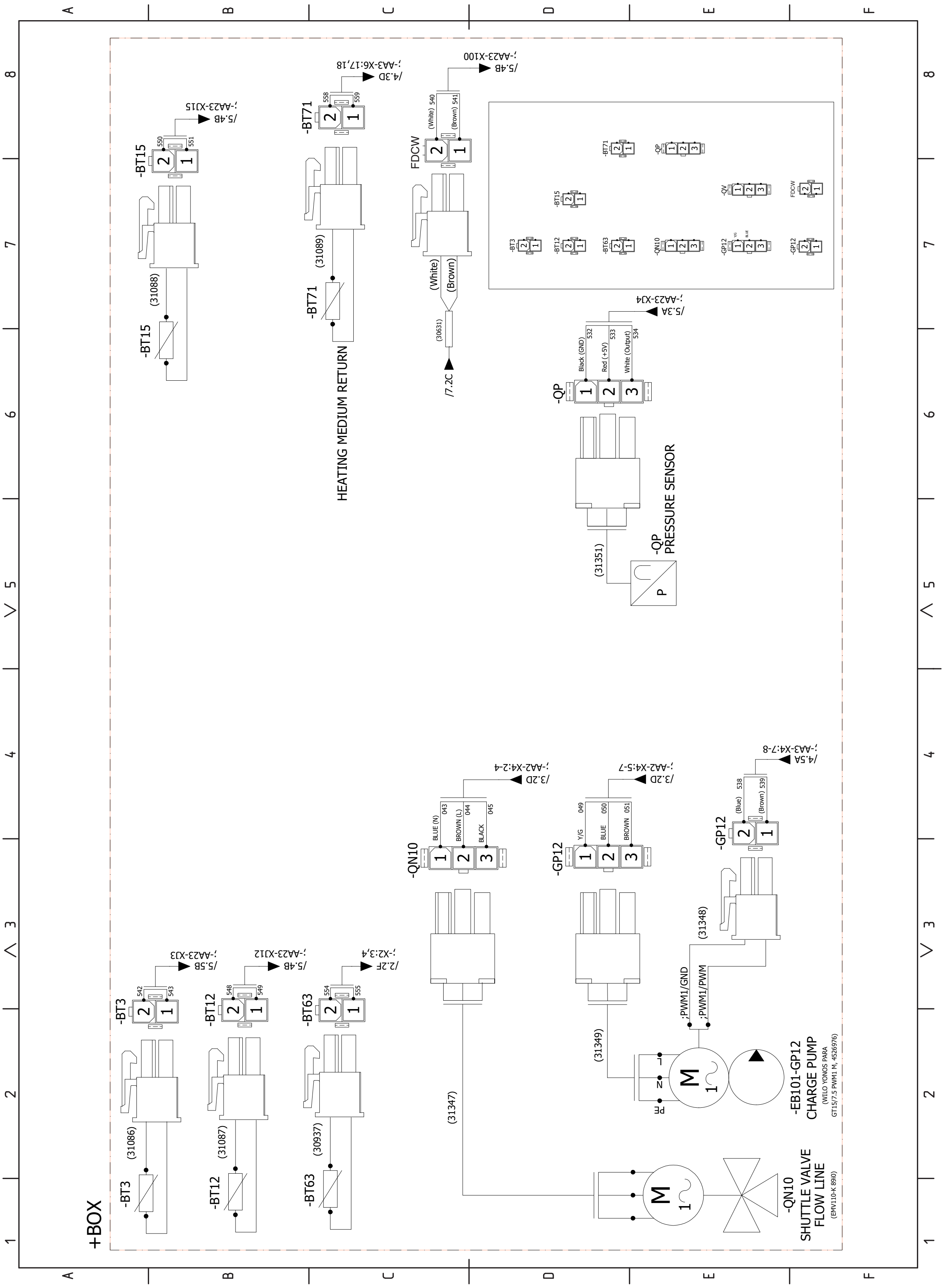
sheet 7


SUPPLY VOLTAGE
230V 1N AC 50Hz
400V 3N AC 50Hz
-X0
/1.2D
-X10
/1.1F
-TB
FDCW
Bridge B02 only for 230V 1N AC 50Hz
Optional: remove the bridge B01 to separate electrical heaters, e.g. with additional RCD
-K1A 6/5.E
-K2A 6/5.E
-K3A 6/5.E
-EB1 HEATER
TS1
TS2
TS3
-FD1
-XN
-FA2
Contactor strip
Unit housing
Terminal block
Front panel
-AA23-X100:2.1
/9.6C
/6.2D
-X1:L
-X1:N
-X1:PE

sheet 8

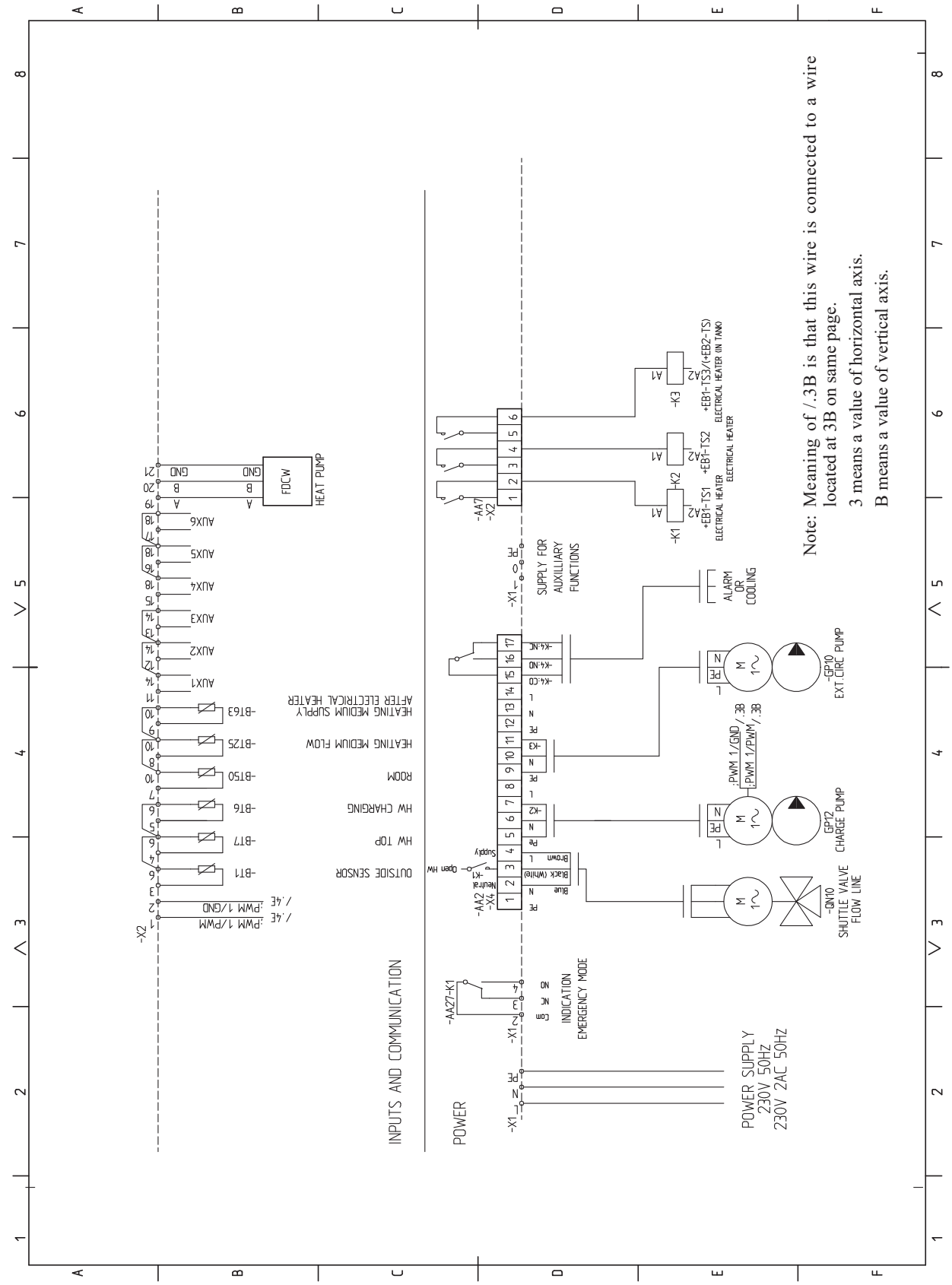


sheet 9

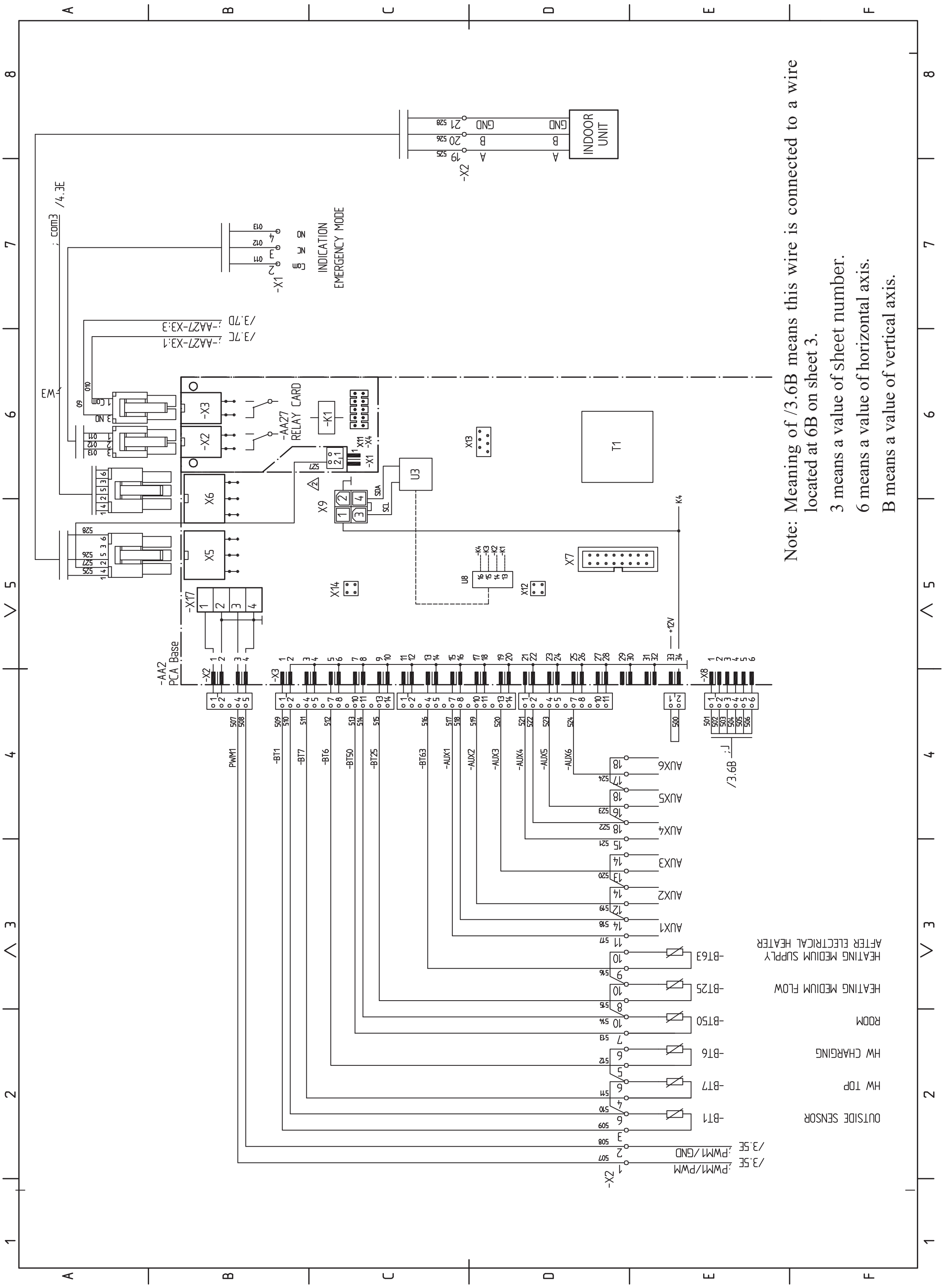

+BOX
-BT3
-BT12
-BT63
-BT15
-BT71
FDCW
-QN10
-GP12
-QP
HEATING MEDIUM RETURN
-QP PRESSURE SENSOR
-EB101-GP12 CHARGE PUMP
-QN10 SHUTTLE VALVE FLOW LINE
(31086)
(31087)
(30937)
(31088)
(31089)
(30631)
(31351)
(31347)
(31349)
(31348)
;PWM1/GND
;PWM1/PWM
/7.2C
/5.4B
/4.3D
/5.3A
/3.2D
/4.5A
/5.5B
/2.2F

Electric circuit diagram - RC-HY20-W

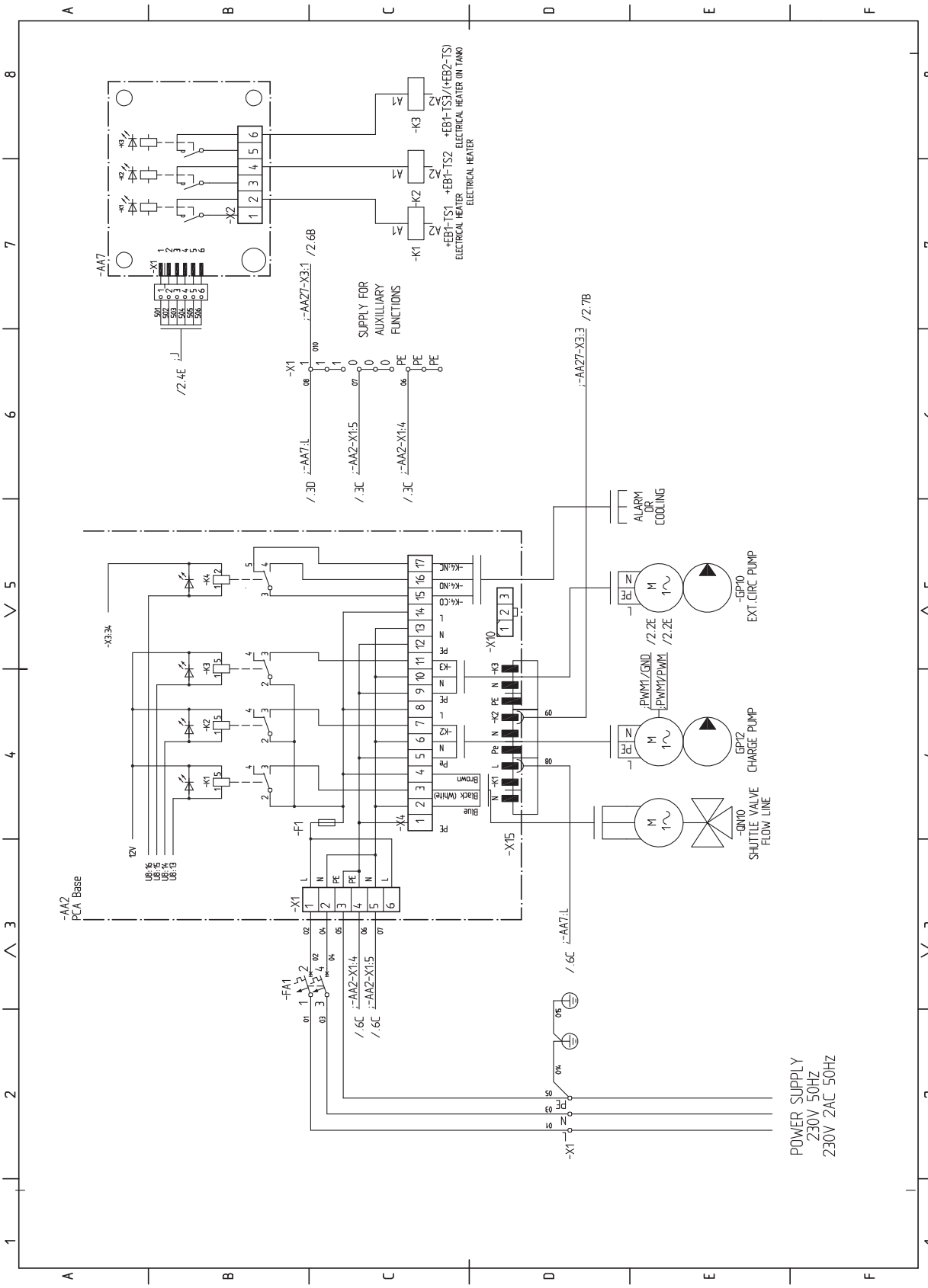
sheet 1



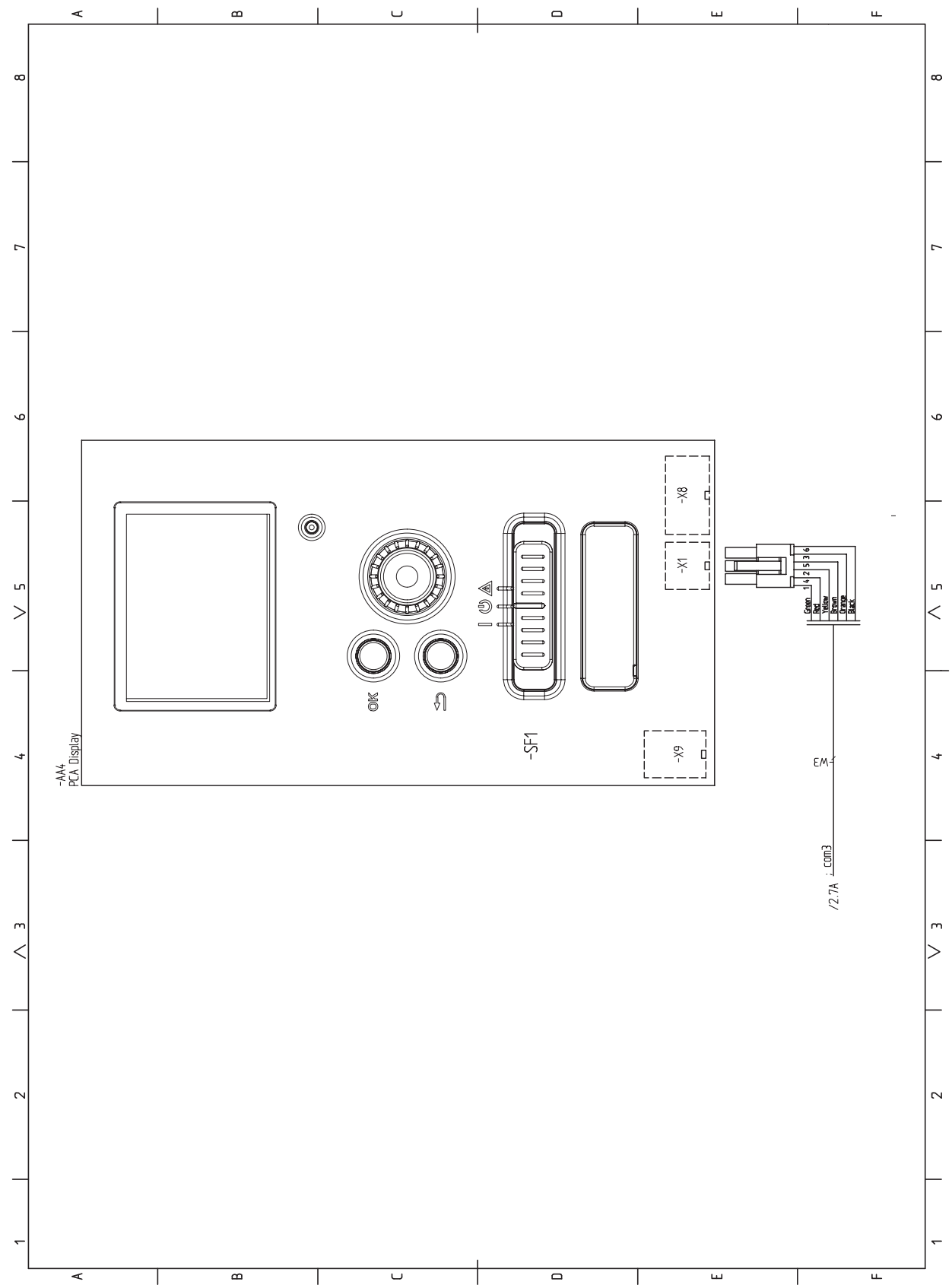
sheet 2


Note: Meaning of /3.6B means this wire is connected to a wire located at 6B on sheet 3.
3 means a value of sheet number.
6 means a value of horizontal axis.
B means a value of vertical axis.
INDOOR UNIT
INDICATION EMERGENCY MODE
-AA27 RELAY CARD
-AA2 PCA Base
OUTSIDE SENSOR
HW TOP
HW CHARGING
ROOM
HEATING MEDIUM FLOW
HEATING MEDIUM SUPPLY AFTER ELECTRICAL HEATER

sheet 3

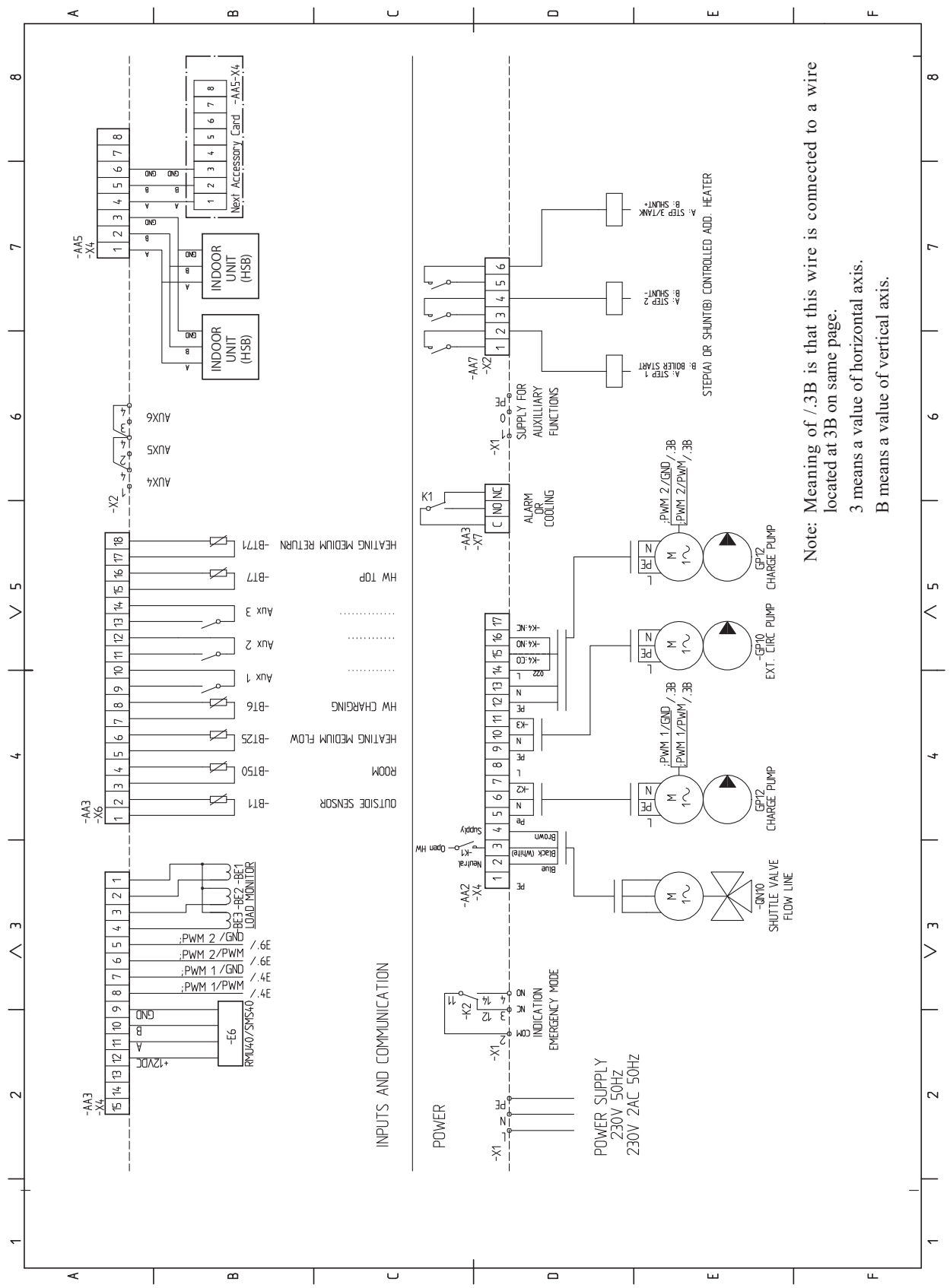

-AA2
PCA Base
-AA7
-X1
-X2
-K1
-K2
-K3
+EB1-TS1
ELECTRICAL HEATER
+EB1-TS2
ELECTRICAL HEATER
+EB1-TS3/(+EB2-TS)
ELECTRICAL HEATER (IN TANK)
/2.4E
/2.6B
-AA27-X3:1
SUPPLY FOR
AUXILLIARY
FUNCTIONS
-AA7:L
-AA2-X1:5
-AA2-X1:4
/.3D
/.3C
/.3C
-AA27-X3:3
/2.7B
ALARM
OR
COOLING
-GP10
EXT.CIRC PUMP
/2.2E
/2.2E
-PWM1/GND
-PWM1/PWM
GP12
CHARGE PUMP
-QN10
SHUTTLE VALVE
FLOW LINE
-X10
-X15
-X4
-X3.34
-F1
-FA1
/.6C
/.6C
/.6C
-AA7:L
-X1
POWER SUPPLY
230V 50Hz
230V 2AC 50Hz

sheet 4

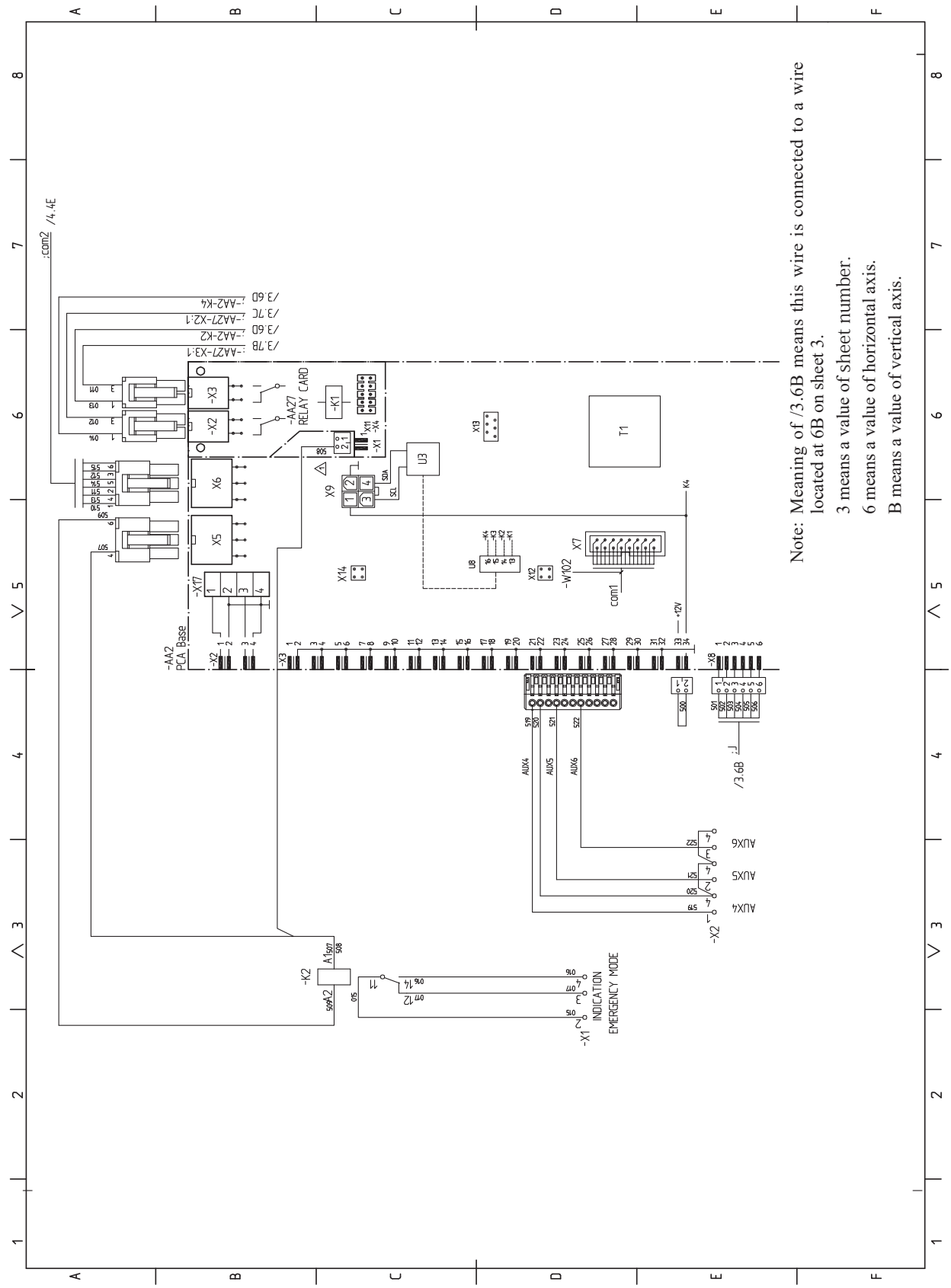

-AA4
PCA Display
OK
-SF1
-X8
-X1
-X9
Green
Red
Yellow
Brown
Orange
Black
1
4
2
5
3
6
-W3
/2:7A
-com3

Electric circuit diagram - RC-HY40-W

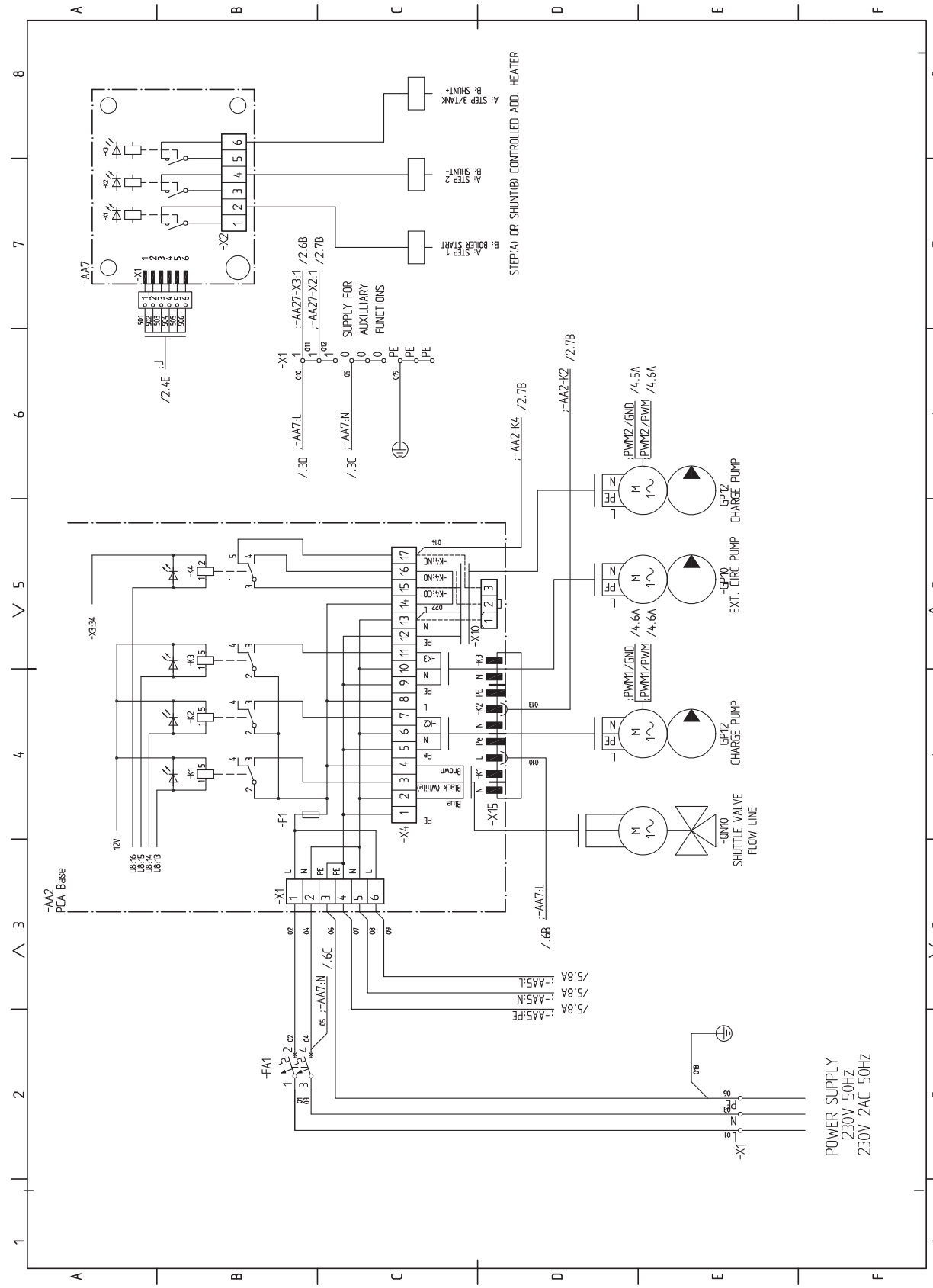
sheet 1



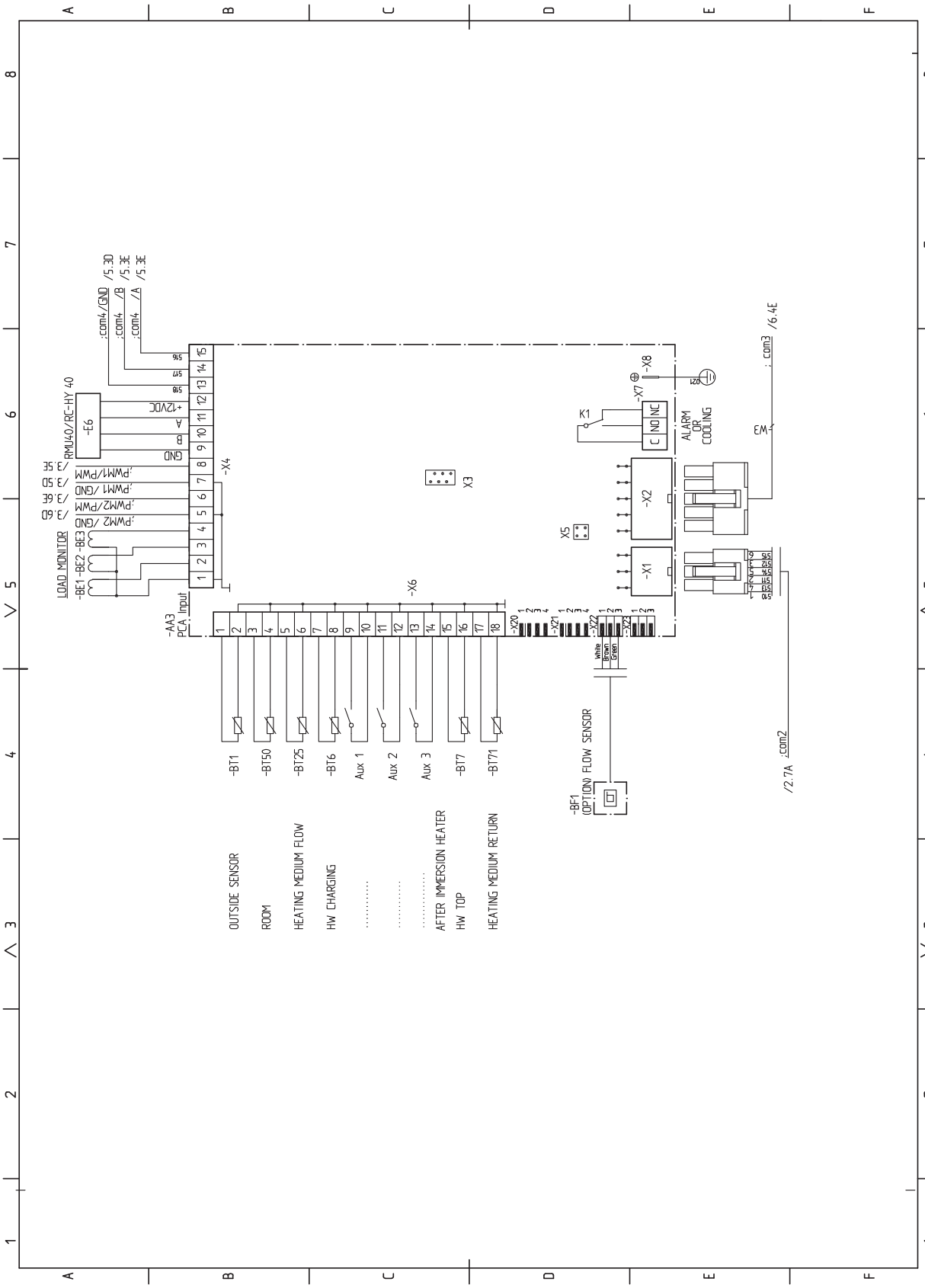
sheet 2


Note: Meaning of /3.6B means this wire is connected to a wire located at 6B on sheet 3.
3 means a value of sheet number.
6 means a value of horizontal axis.
B means a value of vertical axis.
-AA2 PCA Base
-AA27 RELAY CARD
-W102
com1
com2
+12V
AUX4
AUX5
AUX6
INDICATION EMERGENCY MODE
-K1
-K2
-K4
T1
U3
U8

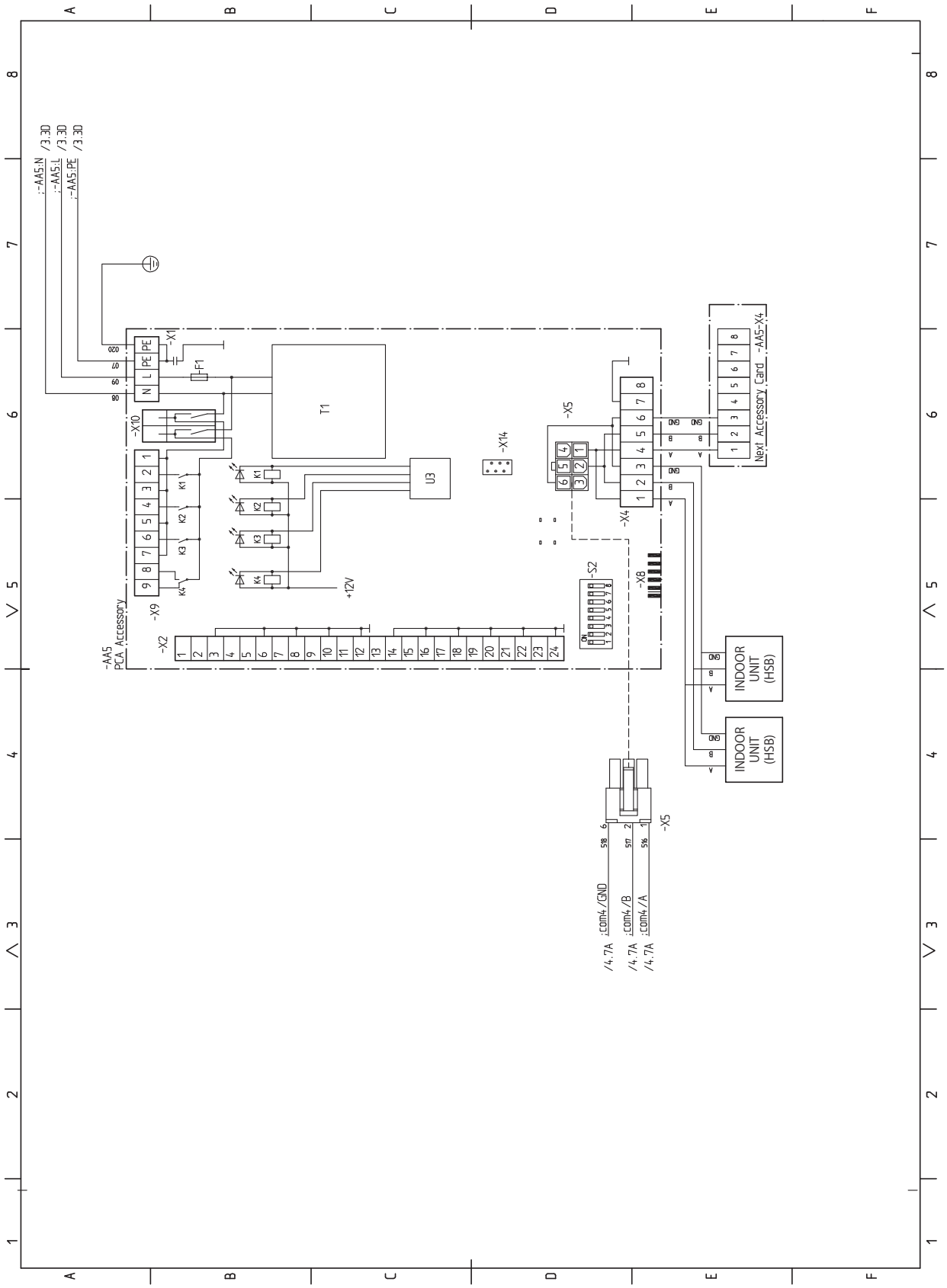
sheet 3


-AA2
PCA Base
-AA7
-X1
-X2
-X3.34
-X4
-X10
-X15
-F1
-FA1
-K1
-K2
-K3
-K4
12V
STEP(A) OR SHUNT(B) CONTROLLED ADD. HEATER
A: STEP 3/TANK
B: SHUNT+
A: STEP 2
B: SHUNT-
A: STEP 1
B: BOILER START
SUPPLY FOR AUXILLIARY FUNCTIONS
-AA27-X3:1
-AA27-X2:1
-AA7:L
-AA7:N
-AA2-K4
-AA2-K2
-PWM2/GND
-PWM2/PWM
-PWM1/GND
-PWM1/PWM
-GP12
CHARGE PUMP
-GP10
EXT. CIRC PUMP
-GP12
CHARGE PUMP
-QN10
SHUTTLE VALVE
FLOW LINE
-AA5:L
-AA5:N
-AA5:PE
POWER SUPPLY
230V 50Hz
230V 2AC 50Hz

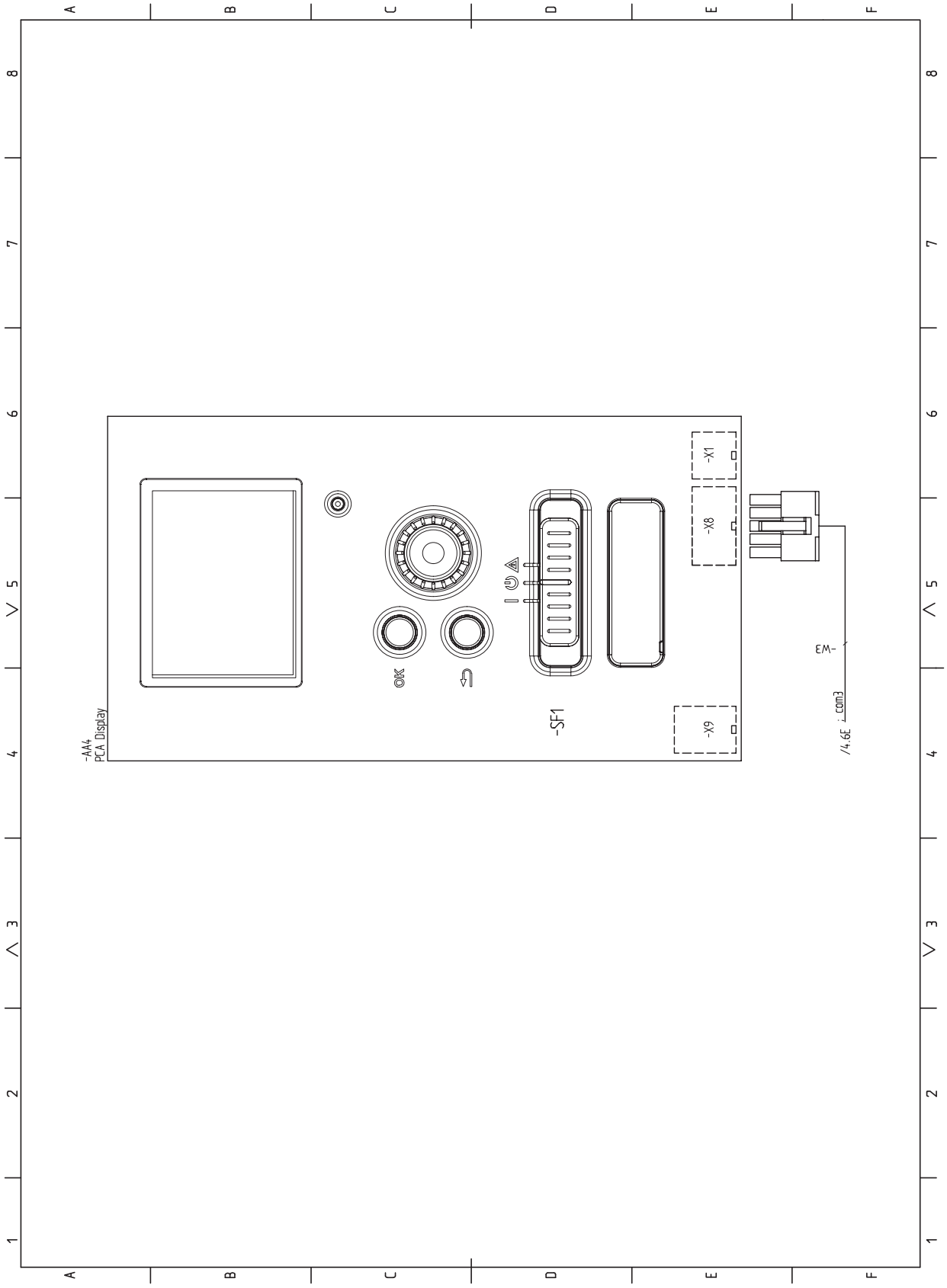
sheet 4


-AA3
PCA, Input
-X4
-X6
-X20
-X21
-X22
-X23
-X1
-X2
-X7
-X8
X3
X5
K1
C NO NC
ALARM
OR
COOLING
-F6
RMU40/RC-HY 40
+12VDC
A
B
GND
LOAD MONITOR
-BE1 -BE2 -BE3
:PWM2 /GND
:PWM2 /PWM
:PWM1 /GND
:PWM1/PWM
:com4 /A
:com4 /B
:com4/GND
/5.3D
/5.3E
/5.3E
/3.6D
/3.6E
/3.5D
/3.5E
: com3
/6.4E
-BT1
-BT50
-BT25
-BT6
-BT7
-BT71
Aux 1
Aux 2
Aux 3
OUTSIDE SENSOR
ROOM
HEATING MEDIUM FLOW
HW CHARGING
AFTER IMMERSION HEATER
HW TOP
HEATING MEDIUM RETURN
-BF1
(OPTION) FLOW SENSOR
White
Brown
Green
/2.7A
:com2

sheet 5


-AA5:N /3.3D
-AA5:L /3.3D
-AA5:PE /3.3D
-X1
PE
L
N
F1
T1
-X10
-X9
-X2
-AA5
PCA Accessory
K1
K2
K3
K4
+12V
U3
-X14
-X5
-X4
-S2
-X8
Next Accessory Card -AA5-X4
INDOOR UNIT (HSB)
INDOOR UNIT (HSB)
-X5
-com4/GND /4.7A
-com4/B /4.7A
-com4/A /4.7A

sheet 6



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http://www.mhi-mth.co.jp/

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Fax: +44-333-207-4089
http://www.mhiae.com

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