

Installer manual **GreenMaster-HP**

12, 16

Exhaust air heat pump for
properties

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1 Important information

Safety information

This manual describes installation and service procedures for implementation by specialists.

The manual must be left with the customer.

This appliance is designed for use in a home environment and not intended to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. This in accordance to applicable parts of the low-voltage directive 2006/95/EC, LVD. The appliance is also intended for use by experts or trained users in shops, hotels, light industry, on farms and in similar environments. This in accordance to applicable parts of the machinery directive 2006/42/EC.

Children should be supervised to ensure that they do not play with the appliance. This is an original instruction manual. Translation is not allowed without approval from NIBE AirSite. Rights to make any design or technical modifications are reserved.

Symbols



NOTE

This symbol indicates danger to person or machine.



Caution

This symbol indicates important information about what you should consider when installing or servicing the installation.



TIP

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

Safety precautions

Caution

Install the system in full accordance with this installation manual.

Incorrect installation can cause bursts, personal injury, water leaks, refrigerant leaks, electric shocks and fire.

Pay attention to the measurement values before working on the cooling system, especially when servicing in small rooms, so that the limit for the refrigerant's concentration is not exceeded.

Consult an expert to interpret the measurement values. If the refrigerant concentration exceeds the limit, there may be a shortage of oxygen in the event of any leak, which can cause serious injury.

Use original accessories and the stated components for the installation.

If parts other than those stated by us are used, water leaks, electric shocks, fire and personal injury may occur as the unit may not work properly.

Ventilate the working area well – refrigerant leakage may occur during service work.

If the refrigerant comes into contact with naked flames, poisonous gas is created.

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. Installation without sufficient support can also cause vibrations and noise.

Ensure that 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.

The electrical installation must be carried out by a qualified electrician and the system must be connected as a separate circuit.

Power supply with insufficient capacity and incorrect function can cause electric shocks and fire.

Use the stated cables for the electrical connection, tighten the cables securely in the terminal blocks and relieve the wiring correctly to prevent overloading the terminal blocks.

Loose connections or cable mountings can cause abnormal heat production or fire.

Check, after completed installation or service, that no refrigerant leaks from the system in gas form.

If refrigerant gas leaks into the house and comes into contact with an aerotemp, an oven or other hot surface, poisonous gases are produced.

Use types of pipe and tools stated for this type of refrigerant.

Using existing parts for other refrigerants can cause breakdowns and serious accidents due to process circuit bursts.

Switch off the compressor before opening/breaching the refrigerant circuit.

If the refrigerant circuit is breached /opened whilst the compressor is running, air can enter the process circuit. This can cause unusually high pressure in the process circuit, which can cause bursts and personal injury.

Switch off the power supply in the event of a service or inspection.

If the power supply is not shut off, there is a risk of electric shocks and damage due to the rotating fan.

Do not run the unit with removed panels or protection.

Touching rotating equipment, hot surfaces or high voltage parts can cause personal injury due to entrapment, burns or electric shocks.

Cut the power before starting electrical work.

Failure to cut the power can cause electric shocks, damage and incorrect function of the equipment.

Care

Carry out the electrical installation 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 main switch with sufficient breaking capacity.

If the switch does not have sufficient breaking capacity, malfunctions and fire can occur.

Always use a fuse with the correct rating in the locations where fuses are to be used.

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

Cables must be routed so that they are not damaged by metal edges or trapped by panels.

Incorrect installation can cause electric shocks, heat generation and fire.

Do not install the unit in close proximity to locations where leakage of combustible gases can occur.

If leaking gases collect around the unit, fire may occur.

Do not install the unit where corrosive gas (for example nitrous fumes) or combustible gas or steam (for example thinner and petroleum gases) can build up or collect, or where volatile combustible substances are handled.

Corrosive gas can cause corrosion to the heat exchanger, breaks in plastic parts etc. and combustible gas or steam can cause fire.

Do not use the unit for specialist purposes such as for storing food, cooling precision instruments, freeze-conservation of animals, plants or art.

This can damage the items.

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

Equipment such as inverters, standby sets, medical high frequency equipment and telecommunications equipment can affect the unit and cause malfunctions and breakdowns. The unit can also affect medical equipment and telecommunications equipment, so that it functions incorrectly or not at all.

Take care when carrying the unit by hand.

All parts of the unit weigh more than 20 kg and must be carried by at least two people. Wear safety gloves to minimise the risk of cuts.

Dispose of any packaging material correctly.

Any remaining packaging material can cause personal injury as it may contain nails and wood.

Do not touch any buttons with wet hands.

This can cause electric shocks.

Do not touch any refrigerant pipes with your hands when the system is in operation.

During operation the pipes become extremely hot or extremely cold, depending on the method of operation. This can cause burn injuries or frost injuries.

Do not shut off the power supply immediately after operation has started.

Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.

Do not control the system with the main switch.

This can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.

Recovery



Leave the disposal of the packaging to the installer who installed the product or to special waste stations.

Do not dispose of used products with normal household waste. It must be disposed of at a special waste station or dealer who provides this type of service.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

Environmental information

F-Gas Regulation (EU) No. 517/2014

This unit contains a fluorinated greenhouse gas that is covered by the Kyoto agreement.

The equipment contains R407C, a fluorinated greenhouse gas with a GWP value (Global Warming Potential) of 1,774. Do not release R407C into the atmosphere.

Inspection of the installation

Current regulations require the heating installation to undergo an installation inspection before it is commissioned. The inspection must be carried out by a suitably qualified person. In addition, fill in the page for information regarding the installation data in the User Manual.

✓	Description	Notes	Signature	Date
	Ventilation			
	Filter section			
	Heat exchanger section			
	Fan section			
	Pressure sensor, exhaust air duct			
	Integral water seal			
	Flue gas extraction (option)			
	Exhaust air damper (option)			
	Brine			
	Non-return valves			
	System flushed			
	System vented			
	Antifreeze			
	Filterball (particle filter)			
	Safety valve			
	Shut off valves			
	Circulation pump setting			
	Heating medium			
	Non-return valves			
	System flushed			
	System vented			
	Expansion vessel			
	Filterball (particle filter)			
	Safety valve			
	Shut off valves			
	Circulation pump setting			
	Electricity (page 23)			
	Connections			
	Main voltage			
	Phase voltage			

✓	Description	Notes	Signature	Date
	Fuses GreenMaster-HP			
	Fuses property			
	Outside sensor			
	Room sensor			
	Current sensor			
	Safety breaker			
	Earth circuit-breaker			
	Setting of emergency mode thermostat			

2 Delivery and handling

Transport and storage

GreenMaster-HP is delivered complete in assembled version with a base frame attached below the heat pump section. On request, the unit can be supplied without liquid to allow easy disassembly and reassembly in properties where the transport route is narrow, or where it is not possible to make holes to lift in the unit. For further details, see under *Disassembly due to narrow transport routes*.

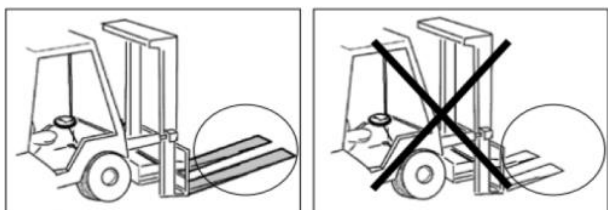
Loading, unloading and transport on site are managed using forklift trucks, pallet trucks or cranes. Suitable lifting straps must always be used.

The unit should be transported in the upright position or at an incline of less than 30°.

Ensure that GreenMaster-HP has not been damaged during transport.

Unloading and lifting with forklift truck or pallet truck

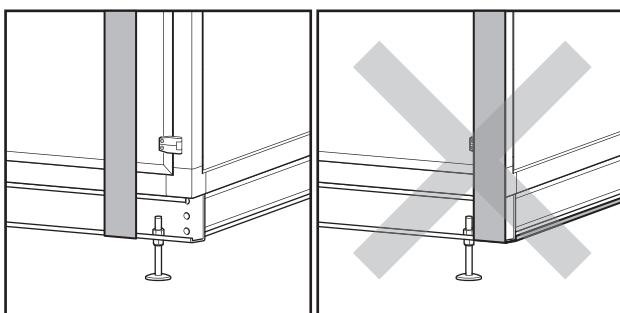
The truck's forks must be long enough to ensure there is no risk of the unit's underside being damaged. Make sure that the forks reach through to the other side of the unit.



Unloading and lifting with crane

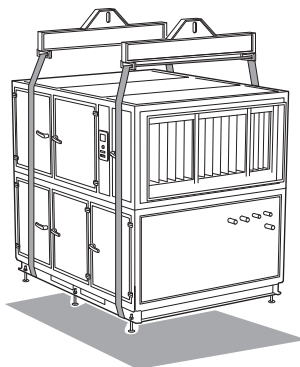
If the unit is delivered on a pallet, the unit must be lifted off using straps.

A unit that is delivered with the machine feet already fitted, has to be lifted with the straps on the inside of the machine feet and with the straps securely tightened.



A unit that is delivered without machine feet, has to be lifted using flat beams and with the straps securely tightened.

The lifting beams have to be positioned so there is no risk of the unit falling. Ensure that the beams are strong enough to lift the load, and that the straps are not in contact with and damaging the unit's upper section. Use beams or a lifting yoke to keep the straps away from the unit's upper section.



Storage before installation

The unit must be protected against the weather and impacts. The packaging must be removed and the unit covered with a tarpaulin or similar. To ensure that there is as little condensation as possible, good circulation must be guaranteed between the protective cover and the unit.

Disassembly due to narrow transport routes

If the unit is to be moved into a fan room in properties where the transport route is narrow, or where it is not possible to make holes to allow lifting in, the unit can be delivered without refrigerant. This means that the unit can be disassembled into six parts and a base frame.

To disassemble the unit, read and follow the instructions in section *Dismantling* on page 9.

The weight of each part can be found in the relevant unit specification for the installed unit.

Assembly

The surface below the unit has to be flat enough so the unit's final position is, and will remain, completely horizontal. Using the machine feet, the base frame can be adjusted so the unit attains a horizontal position. The surface must withstand the load from the unit. If the installation uses lightweight structures or has especially sensitive areas, the unit should be placed on a vibration-absorbing base with the necessary properties.



Caution

Ducts must be insulated against vibrations and noise, and must not be mounted directly on beams, beam joints or other critical building components.

Assembly for outdoor installation

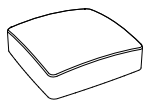
The unit has no drip mouldings between the unit and the base frame. A local fitter must install additional protection and insulation for the base frame, to ensure that water does not run down under the unit. NIBE AirSite design assumes that the unit is installed on a sealed roof, which is not at risk of moisture damage due to drainage from the condensate drip tray or external moisture such as rain or snow.

**NOTE**

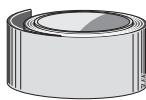
Water seals placed outdoors must be protected with heating cable (accessory set; electric heating coil) to prevent freezing when it is cold outdoors.

Installation area

A free space of at least 950 mm in front of the unit is recommended. To make maintenance and inspection easier, this space should preferably be as large as the unit is wide. In order for it to be possible to assemble the unit, and to perform future maintenance, a minimum distance of 600 mm is recommended between the wall and the unit.

Supplied components

Outdoor temperature sensor (BT1)
1 pcs



Insulation tape
1 pcs



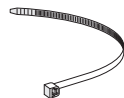
Temperature sensor
4 x



Aluminium tape
1 pcs



Heat conduction paste
3 pcs



Cable ties
8 pcs

Dismantling**NOTE****Take care when carrying the unit by hand.**

All parts of the unit weigh more than 20 kg and have to be carried by at least two people. Wear safety gloves to minimise the risk of cuts.

**Caution**

Before disassembly, note which parts are located where in order to make assembly easier.

1. Open the hatches on the lower sections and disconnect all electrical quick couplings. Roll up the cables one by one and secure them with a cable tie by each section to prevent damage.

**NOTE**

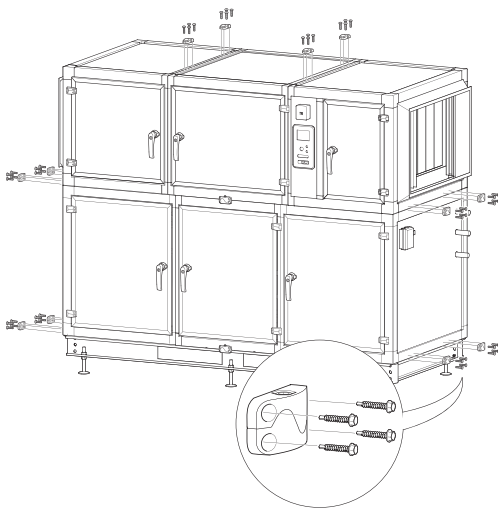
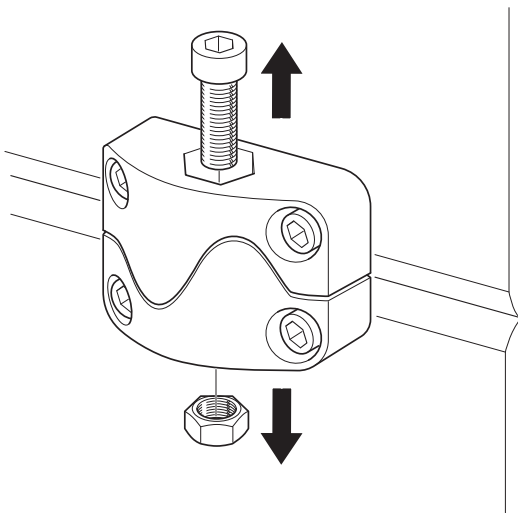
Some cables are installed with cable ties in the cable tray. Cut the cable ties when disassembling and replace them with new ones when assembling.

- 2.

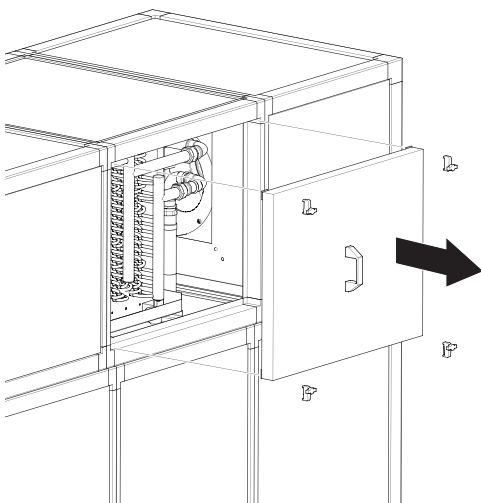
**TIP**

The cables are numbered for easy reassembly.

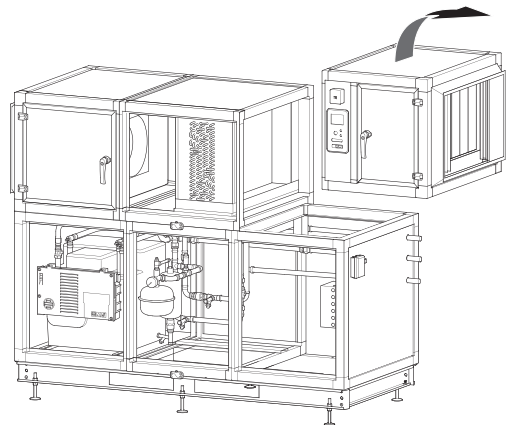
3. Open the cover on the filter section.
4. Carefully pull the air hose loose from the nozzle on the heat exchanger. Disconnect the hose from the clamps on the side and place it on the floor of the filter section.



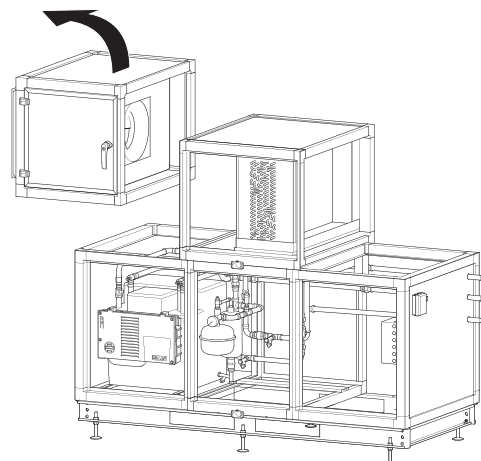
5. Unscrew the connecting brackets holding the various sections together.



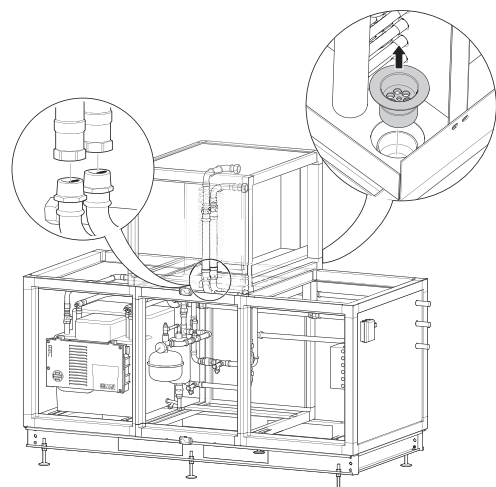
6. Lift off the rear inspection cover from the heat exchanger section.



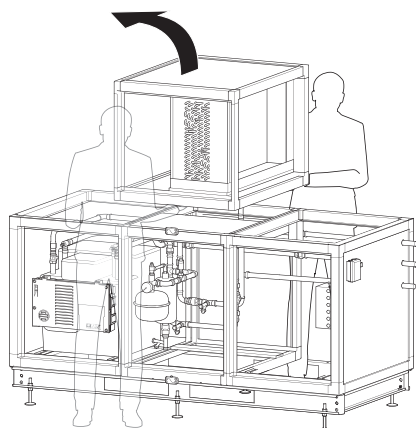
7. Lift off the filter section, taking care to disconnect all cables and pressure gauge connections.



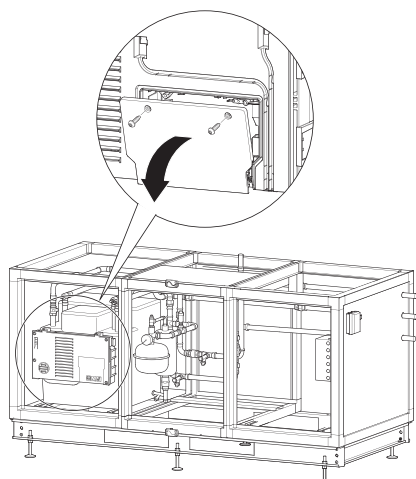
8. Lift off the fan section.



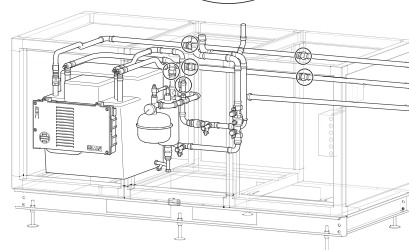
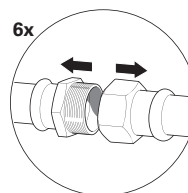
9. Unscrew the strainer valve, the water seal and the pipe connections under the heat exchanger section.



10. Lift off the heat exchanger.



11. If the cooling module does not need to be removed, skip this step: Disconnect the cables and connectors that are fitted in the distribution box in front of the cooling module. Then disassemble the distribution box in front of the cooling module by loosening the metal spacers to which the distribution box is attached. NOTE! Also loosen the two earth cables that are run out of the distribution box.

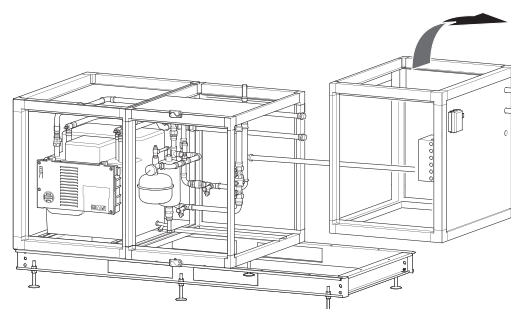


12. Disconnect all the connections connecting the centre module with the two outer modules. Also, disconnect the PVC pipe for the waste water.
13. Unscrew the wall bracket securing the expansion vessel to the stay.
14. Remove the switch on the level vessel.
15. Undo the screw joint securing the level vessel to the stay.

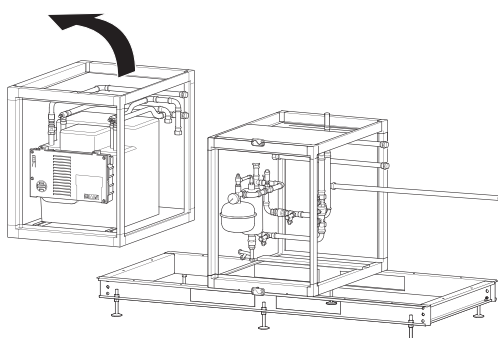


TIP

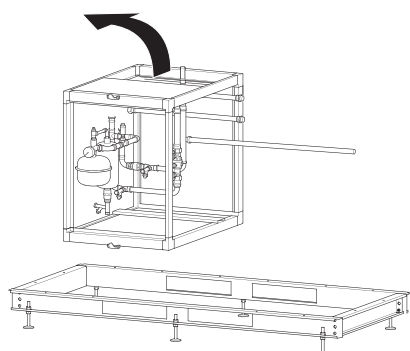
Disconnect and pull out the cooling modules according to the instructions on page 39 before dismantling the lower sections for easier handling.



16. Lift off the right-hand module and dismantle the condensation pipe in the cooling module that runs down to the floor.



17. Lift off the left-hand module.



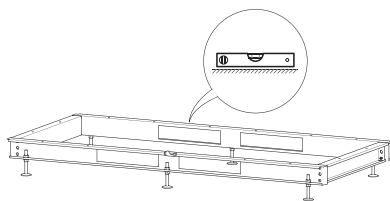
18. Finally lift off the centre module.



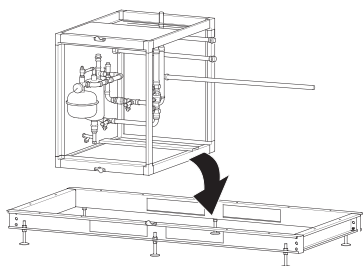
NOTE

Take care not to damage the pipes.

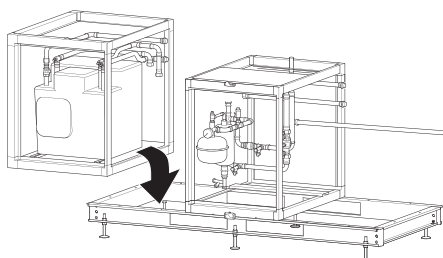
Mounting



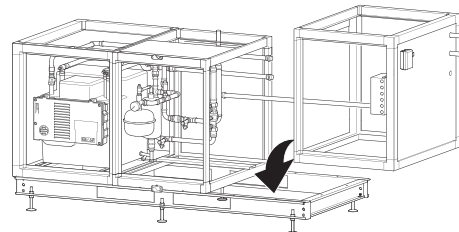
1. Place the base frame in the position where the unit is to stand, then adjust the base frame using the feet, so it is completely horizontal.



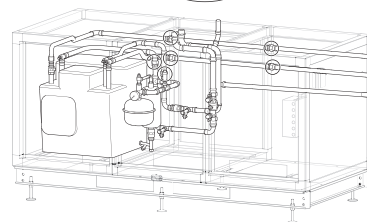
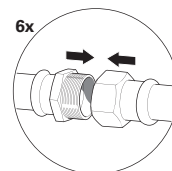
2. Lift on the centre module.



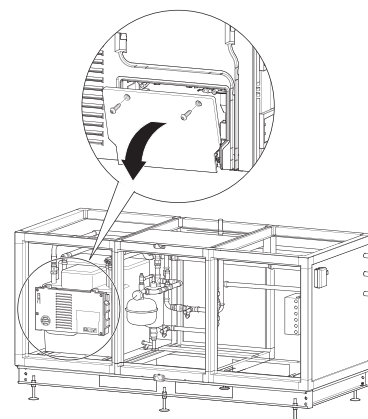
3. Lift on the left-hand module.



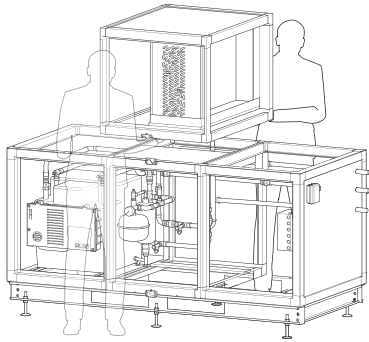
4. Lift on the right-hand module and install the condensation pipe in the cooling module that runs down to the floor.



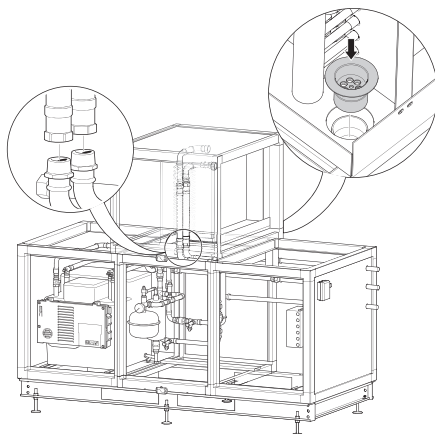
5. Connect the pipes as described.
6. Screw the wall bracket, which secures the expansion vessel to the stay, securely into place.
7. Plug in the connector on the level vessel.
8. Screw the screw joint, which secures the level vessel to the stay, securely into place.



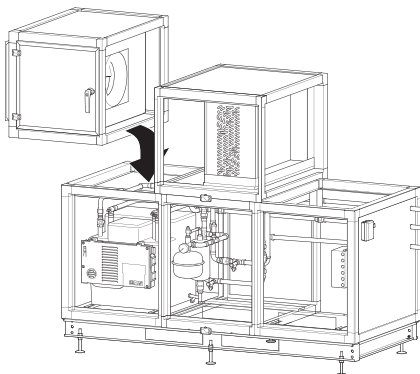
9. If the distribution box has previously been disassembled, it must be reassembled in the mountings by the cooling module. Don't forget to connect the cables and connectors, including two earth conductors, which must be installed in the distribution box.



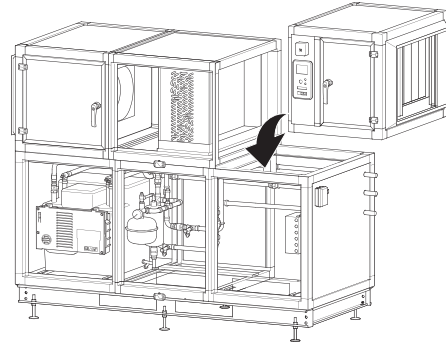
10. Carefully lift on the heat exchanger.



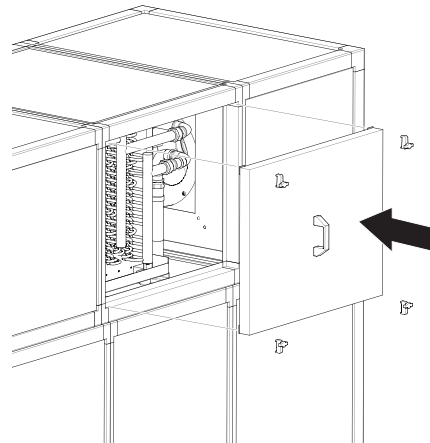
11. Connect the pipes under the heat exchanger and screw the strainer valve into place, and connect the water seal and the PVC pipe for the waste water.



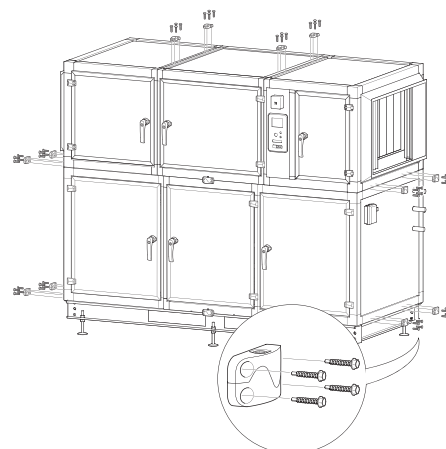
12. Lift on the fan section. Make sure you don't pinch the cables and connectors.



13. Lift on the filter section.



14. Install the rear inspection cover on the heat exchanger section.



15. Screw the connecting brackets holding the various sections together securely into place.
16. Secure the air hose to the nozzle on the heat exchanger and lay the hose in the strainer valve.

17. Connect all electrical quick couplings for each component. The cables are marked.



TIP

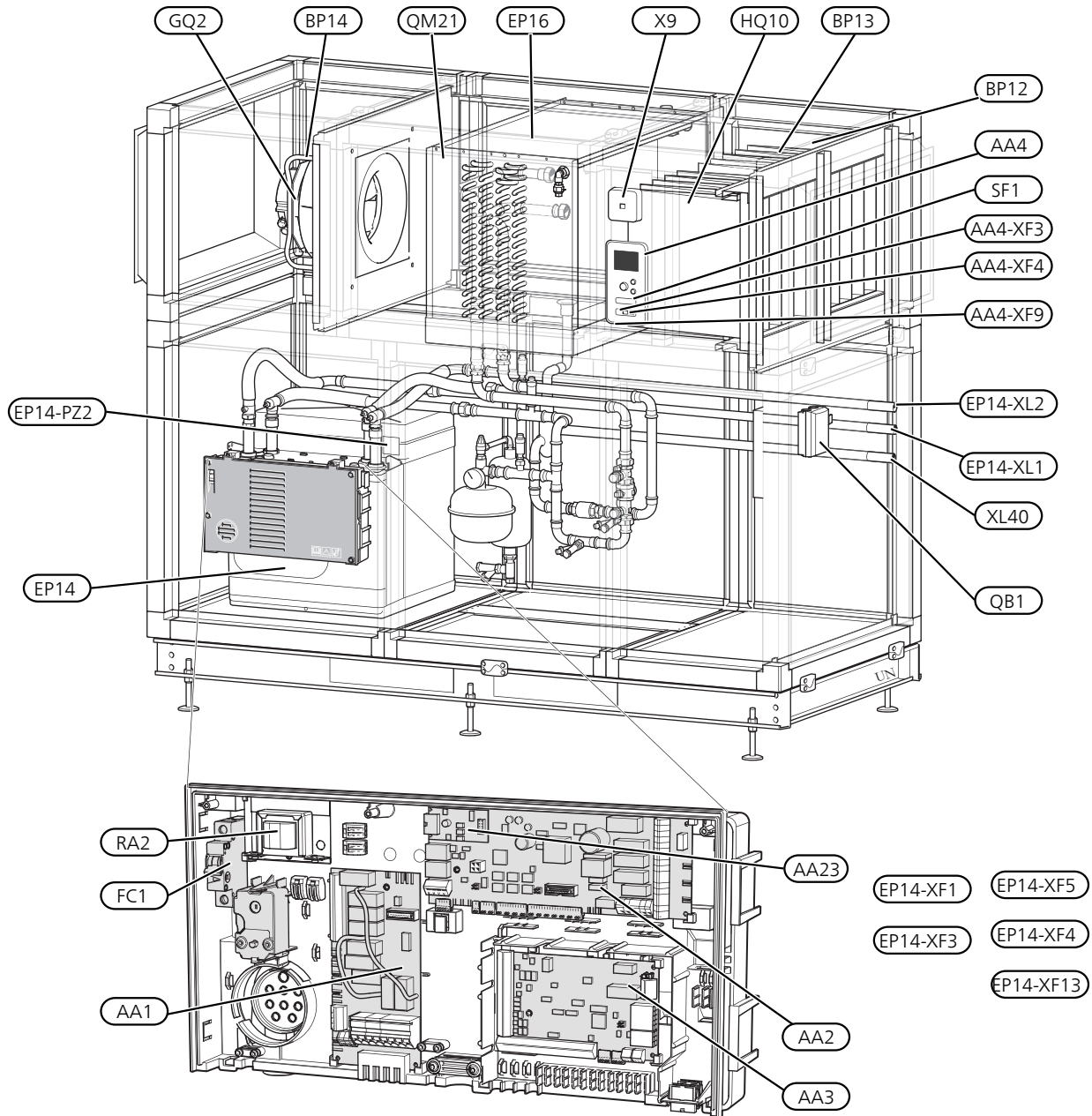
Don't forget to secure cables in the cable tray with cable ties!

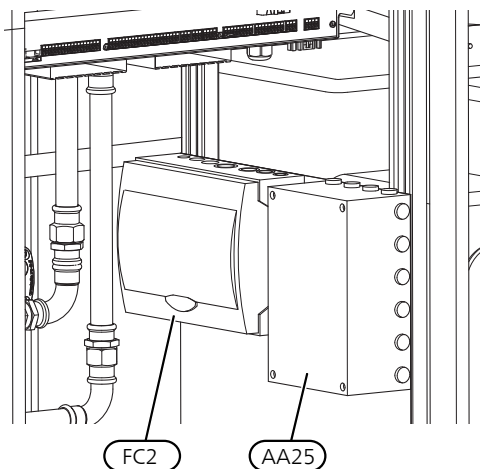
18. Prepare and fill the system according to the instructions in chapter *Commissioning and adjusting* on page 30.

3 Design of the exhaust air heat pump

General

Picture and text describe a unit with left-hand inspection. On a unit with right-hand inspection, the fan (GQ2) is located at the top right and the filter (HQ10) to the left.





Pipe connections

XL1	Connection, heating medium flow
XL2	Connection, heating medium return
XL40	Connection, condensate drain

HVAC components

EP14	Cooling module
QM21	Vent valve, heat exchanger

Sensors etc.

BP12	Pressure sensor, exhaust air duct
BP13	Pressure sensor, filter
BP14	Pressure sensor, fan
BT1	Outdoor temperature sensor ¹

¹ Not illustrated

Electrical components

AA2	Base card
AA3	Input circuit board
AA4	Display unit
AA4-XF9	Network socket (no function)
AA4-XF3	USB socket
AA4-XF4	Service outlet (No function)
AA23	Communication board
AA25	AXC module
FC1	Miniature circuit-breaker
FC2	Fuse module
QB1	Switch
RA2, RA3	Choke
SF1	Switch
XF1	Connector, electrical supply to compressor, cooling module -EP14
XF3	Connector, compressor heater -EP14
XF4	Connector, brine pump, cooling module
XF5	Connector, heating medium pump, cooling module

XF13	Communication motor module
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Ventilation

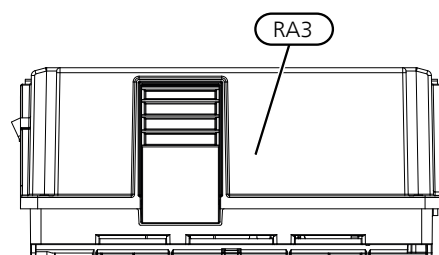
EP16	Heat exchanger
GQ2	Fan
HQ10	Air filter

Miscellaneous

PZ2	Type plate, cooling section
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Designations according to standard EN 81346-2.

Motor module



Electrical components

RA3	Choke
-----	-------

Cooling modules

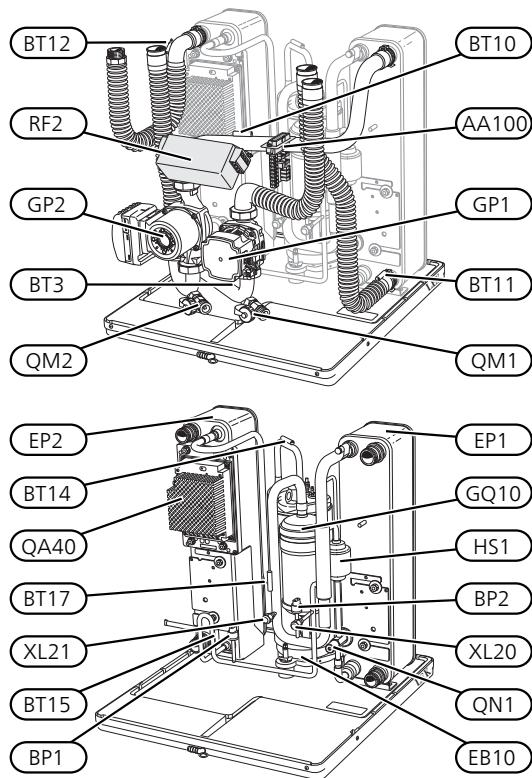


TIP

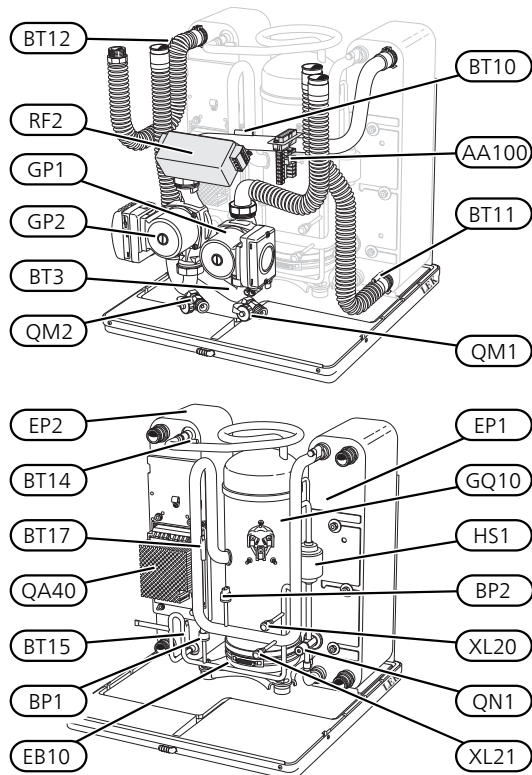
The upper image shows the whole cooling module. In the lower image, the pipe section is hidden in order to show the compressor section.

Cooling module EP14

GreenMaster-HP x-12



GreenMaster-HP x-16



Pipe connections

- XL20 Service connection, high pressure
- XL21 Service connection, low pressure

HVAC components

- GP1 Circulation pump
- GP2 Brine pump
- QM1 Drainage, climate system
- QM2 Draining, brine side

Sensors etc.

- BP1 High pressure pressostat
- BP2 Low pressure pressostat
- BT3 Temperature sensors, heating medium return
- BT10 Temperature sensor, brine in
- BT11 Temperature sensor, brine out
- BT12 Temperature sensor, condenser supply line
- BT14 Temperature sensor, hot gas
- BT15 Temperature sensor, fluid pipe
- BT17 Temperature sensor, suction gas

Electrical components

- AA100 Joint card
- EB10 Compressor heater
- QA40 Inverter
- RF2 EMC-filter

Cooling components

- EP1 Evaporator
- EP2 Condenser
- GQ10 Compressor
- HS1 Drying filter
- QN1 Expansion valve

4 Pipe and ventilation connections

General

Pipe and ventilation installation has to be performed according to applicable regulations.

GreenMaster-HP can operate with a return temperature of up to approx. 58 °C and an outgoing temperature of 65 °C.

GreenMaster-HP is not equipped with external shut off valves; these should be installed to facilitate any future servicing. In addition, non-return valves and particle filters should be installed.

GreenMaster-HP when placed indoors, is equipped with sheet metal guide connections for exhaust air and extract air ducts. When located outdoors, GreenMaster-HP is equipped with sheet metal guide connection for exhaust air duct and ventilation grille on the extract air side. Rectangular duct connections are standard on all models of GreenMaster-HP. Connection dimensions for guide connections can be found in the relevant unit specification for the installed unit.



NOTE

The pipe systems have to be flushed clean before GreenMaster-HP is connected, to prevent any contaminants from damaging the components.



NOTE

Do not solder directly on the pipes in GreenMaster-HP, because of internal sensors.
Compression ring coupling alternatively pressure connection should be used.



NOTE

The heating system's pipes must be earthed to prevent a potential difference between them and the building's protective earth.



NOTE

The potential to clean the air ducts in the future is required.

Ventilation flow

The ventilation flow must comply with the applicable national standards.

Connect the property's common exhaust air duct with the guide connection to the unit's filter side.

If flue gas extraction is required, an extra air duct with a bypass damper has to be installed and connected to the unit's prepared fan-in-operation connection.

Adjusting ventilation

In order to achieve the necessary air exchange in the property, the correct adjustment of the air flow in the air treatment unit is required.

As soon as possible after installation, the ventilation should be adjusted to ensure the air flow is set according to the planned value for the property. Incorrect adjustment can result in impaired function, recovery and comfort.

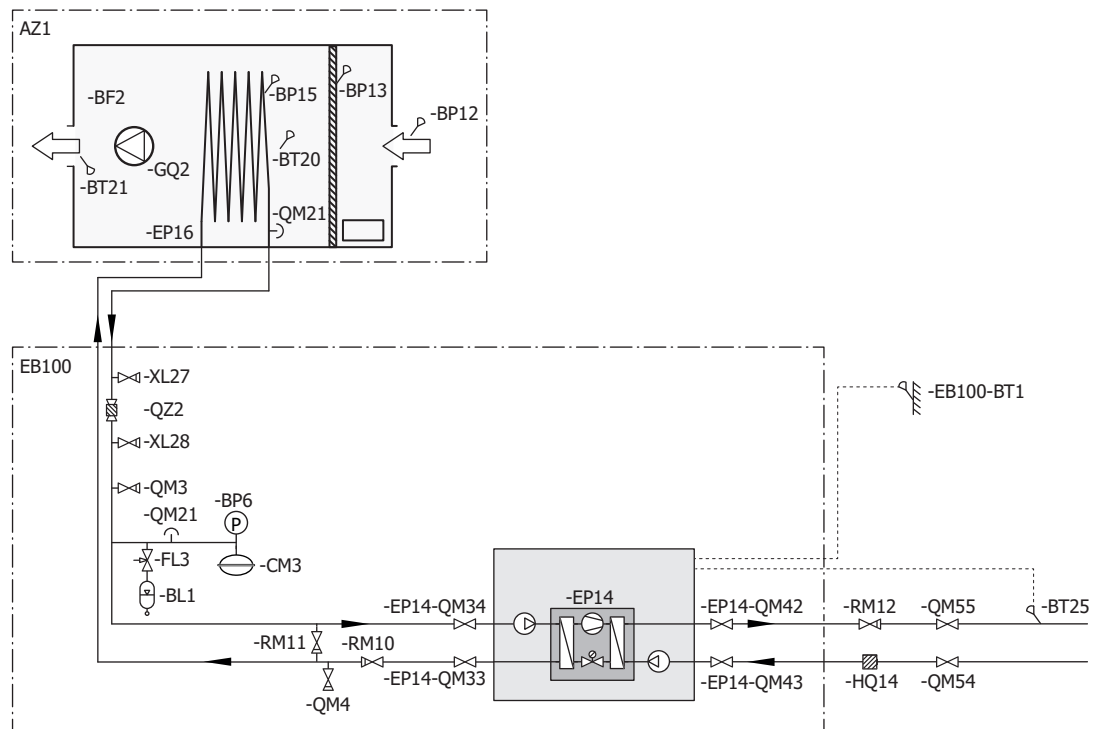
System diagram

GreenMaster-HP consists of cooling module, circulation pumps, air treatment unit and control system with possibility of additional heat. GreenMaster-HP is connected to heating medium circuit.

Explanation

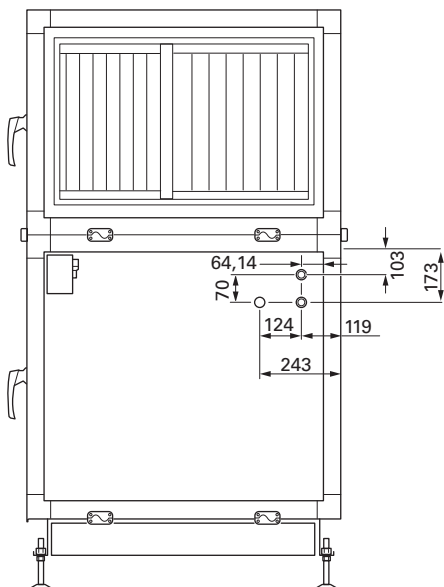
AZ1	Air treatment section
BF2	Air flow function
BP12	Differential pressure sensor, exhaust air duct
BP13	Differential pressure sensor, air filter
BP14	Differential pressure sensor, fan
BP15	Differential pressure sensor, heat exchanger
BT20	Exhaust air sensor
BT21	Extract air sensor
GQ2	Exhaust air fan
QM21	Venting valve, brine side
EP16	Heat exchanger
EB100	Heat pump system
BL1	Level monitor
BP6	Manometer, brine side
BT1	Temperature sensor, outdoor
CM3	Expansion vessel, closed, brine side
EP14	Cooling module
FL3	Safety valve, brine
QM3	Tapping valve
QM4	Tapping valve
QM21	Venting valve, brine side
QM24	Vent valve, heat exchanger
QM33	Shut off valve, brine flow
QM34	Shut off valve, brine return
QM42	Shut-off valve, heating medium flow
QM43	Shut off valve, heating medium return
QM54 - QM55	Shut-off valve, heating medium side
QZ2	Filler valve/Filterball
RM10 - RM12	Non-return valve
XL27, XL28	Connection, filling brine

GreenMaster HP x-12 / x-16



Dimensions and pipe connections

2-12, 2-16, 3-16



Pipe dimensions

Connection	
EP14-XL1 Heating medium IN (return)	28 mm
EP14-XL2 Heating medium OUT (supply)	28 mm
XL40 Drain condensation	28 mm

Brine side

Expansion vessel

The brine circuit is provided with a pressure expansion vessel.

The brine side must be pressurised to at least 0.20 MPa (2.0 bar).

Level monitor

GreenMaster-HP is equipped with a level monitor. If the safety valve is deployed, the level monitor's float interrupts heat pump operation and an alarm, "brine level sensor has tripped", is signalled on the display. Operation of the brine pump and compressor is blocked until the alarm has been reset.

Heating medium side

Connecting the climate system

A climate system is a system that regulates indoor comfort with the aid of the control system in GreenMaster-HP, e.g. radiator heating and exhaust air ventilation.

- Install shut-off valves (not enclosed) as close to the unit as possible, so the flow to the cooling modules can be shut off.
- Fit the supplied particle filter on the incoming pipe.
- A safety valve (not enclosed) has to be installed on the heating medium system's return line. The safety valve has to have an opening pressure of max. 0.45 MPa (4.5 bar). The entire length of the overflow water pipe from the safety valve has to be inclined to prevent water pockets, and must also be frost-proof.
- When connecting to a system with thermostats on all radiators, a relief valve must be fitted, or some of the thermostats must be removed to ensure sufficient flow.
- Install non-return valves (not enclosed) on outgoing pipes.



Caution

When necessary you should install vent valves in the climate system.



Caution

GreenMaster-HP is designed so that the cooling module can switch between heat production and hot water production. For this function to be achieved, pipe and electrical installation needs to be carried out with a three-way valve (not enclosed) installed close to the exhaust air heat pump.

Cold and hot water

Connecting the hot water heater

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

The settings for hot water are made in menu 5.1.1.

Connecting the hot water heater

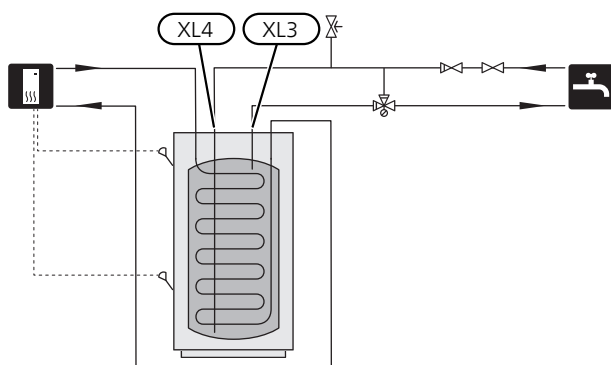
Install as follows:

- controlling hot water sensor (BT6) (placed in the middle of the water heater)
- display hot water sensor (BT7) (placed in the top of the water heater)
- shut-off valve
- non-return valve
- pressure relief valve

The safety valve must have a maximum 1.0 MPa (10.0 bar) opening pressure and be installed on the incoming domestic water line as shown.

- mixing valve

A mixer valve must also be installed, if the factory setting for hot water is changed. National regulations must be observed.



5 Electrical connections

General

All internal electrical equipment is connected at the factory. External connections have to be connected according to the applicable unit specification.

- Disconnect the air treatment unit before insulation testing the house wiring.
- If the building is equipped with an earth-fault breaker, GreenMaster-HP should be equipped with a separate one.
- If a miniature circuit breaker is used, this has to have at least motor characteristic "C". See the enclosed unit specification for fuse size.
- Communication and sensor cables to external connections must not be laid close to high current cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX or LiYY or equivalent.
- When routing a cable in GreenMaster-HP, cable grommets must be used. Secure the cables in the grooves in the bottom section of the distribution box.



NOTE

The switch (SF1) must not be set to "I" or "Δ" until the heating medium circuit has been filled. Components in the product could be damaged.



NOTE

Electrical installation and service must be carried out under the supervision of a qualified electrician. Cut the current with the circuit breaker before carrying out any servicing. Electrical installation and wiring must be carried out in accordance with the stipulations in force.



NOTE

Check the connections, main voltage and phase voltage before the machine is started, to prevent damage to the air treatment unit's electronics.

Miniature circuit-breaker

The air treatment unit's operating circuit and some of its internal components are fused internally by a miniature circuit breaker (FC1).

Accessibility, electrical connection

The plastic cap of the electrical boxes is opened using a screwdriver.

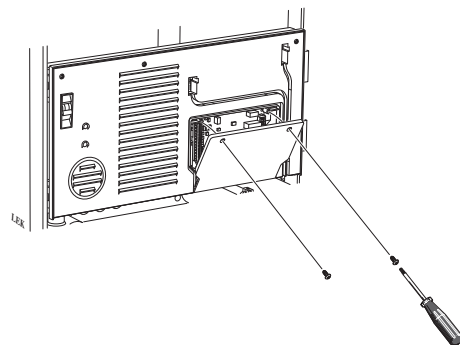


NOTE

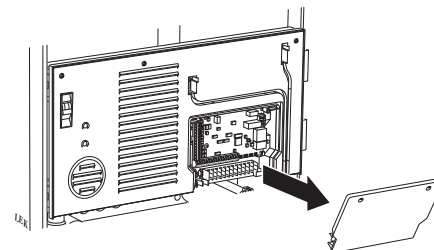
The cover for the input card is opened without a tool.

Removing the cover, input circuit board

1. Unscrew the screws and angle out the cover.

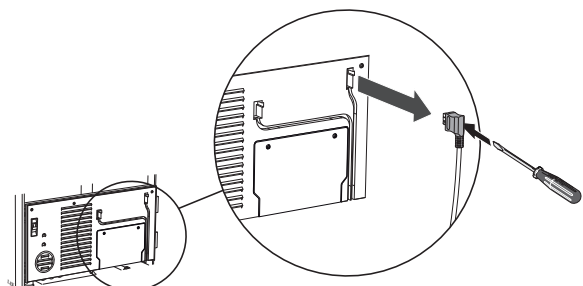


2. Pull off the cover.

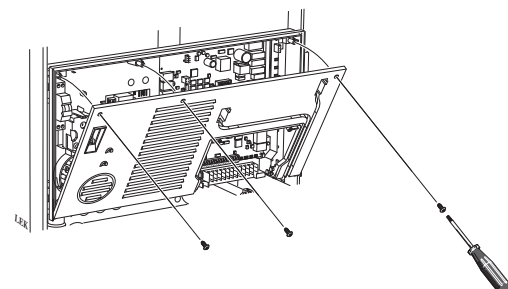


Removing the hatch, electrical cabinet

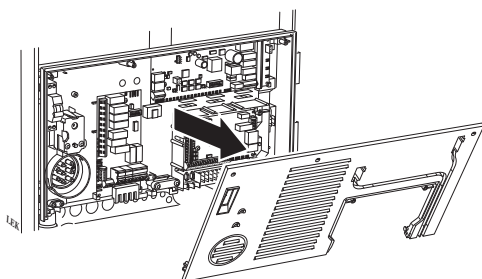
1. Disconnect the contacts.



2. Unscrew the screws and angle out the cover.

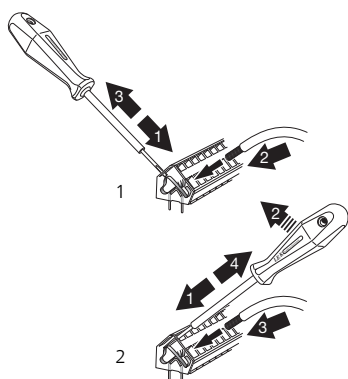


3. Pull off the cover.



Cable lock

Use a suitable tool to release/lock the cables in the air treatment unit's terminal blocks.



Connections

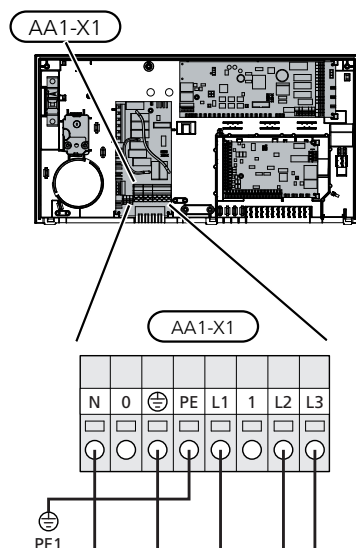


NOTE

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

Power connection

GreenMaster-HP must be installed with a disconnection option on the supply cable. Minimum cable area must be sized according to the fuse rating used. Enclosed cable for incoming supply electricity is connected to terminal block X1 on the immersion heater board (AA1). All installations must be carried out in accordance with current norms and directives.



If a separate supply to the compressor and electric heater is required, see section "External blocking of functions" on page 28.

Tariff control

If the voltage to the compressor disappears for some time, simultaneous blocking of this must take place via a software-controlled input (AUX input) to prevent an alarm, see section "External blocking of functions" page 28.

Connecting sensors

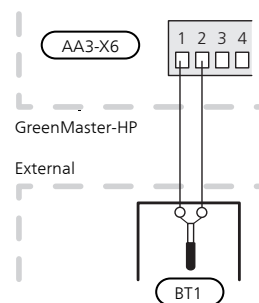
Connect the sensor(s) to terminal X6 on input board (AA3) according to the instructions below.

Outside sensor

Install the outdoor 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 terminal block X6:1 and X6:2 on the input board (AA3).

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

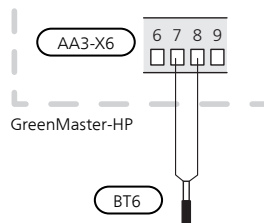


Temperature sensor, hot water charging

The temperature sensor, hot water charging (BT6) is placed in the submerged tube on the water heater.

Connect the sensor to terminal block X6:7 and X6:8 on the input card (AA3). Use a 2 core cable of at least 0.5 mm² cable area.

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



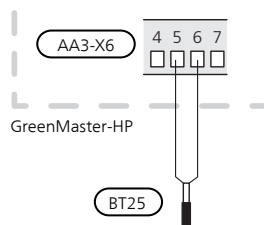
Temperature sensor, hot water top

A temperature sensor for hot water top (BT7) can be connected to GreenMaster-HP via soft inputs for showing the water temperature at the top of the tank.

The temperature sensor, hot water top (BT7) is connected to the selected input (menu 5.4, see page 27) on terminal block X6 on the input card (AA3) which is located behind the front cover and in a submerged tube on the water heater.

Temperature sensor, external flow line

If temperature sensor, external supply line (BT25) needs to be used, connect it to terminal block X6:5 and X6:6 on the input board (AA3).



Room sensor

1. Shows current room temperature in the display on GreenMaster-HP.
2. Option of changing the room temperature in °C.
3. Provides the option of fine-tuning the room temperature.

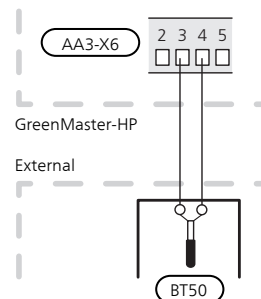
Install the sensor in a neutral position where the set temperature is wanted.

A suitable location is on a free inner wall in a hall approx. 1.5 m above the floor. It is important that the sensor is not prevented from measuring the correct room temperature, for example by being located in a recess, between shelves, behind a curtain, above or close to a heat source, in a draught from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

GreenMaster-HP operates without the sensor, but if you want to read the home's indoor temperature from the display on GreenMaster-HP the sensor must be installed. Connect the room sensor to X6:3 and X6:4 on the input board (AA3).

If the sensor is to have a controlling function, it is activated in menu 1.9.4.

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



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.

Optional connections

Load monitor

Integrated load monitor

GreenMaster-HP is equipped with a simple form of integrated load monitor, which limits the power steps for the electric additional heat by calculating whether future power steps can be connected to the relevant phase without exceeding the specified main fuse. If the current would exceed the specified main fuse, the power step is not permitted. The size of the property's main fuse is specified in menu 5.1.12.

Load monitor with current sensor

When many power-consuming products are connected in the property at the same time as the electric additional heat is operating, there is a risk of the property's main fuses tripping. GreenMaster-HP is equipped with a load monitor which, with the aid of a current sensor, controls the power steps for the electric additional heat by redistributing the power between the different phases or by disengaging the electric additional heat in event of an overload in a phase. If the overload remains despite the electric additional heat being disengaged, the compressor winds down. Reconnection occurs when the other current consumption drops.



Caution

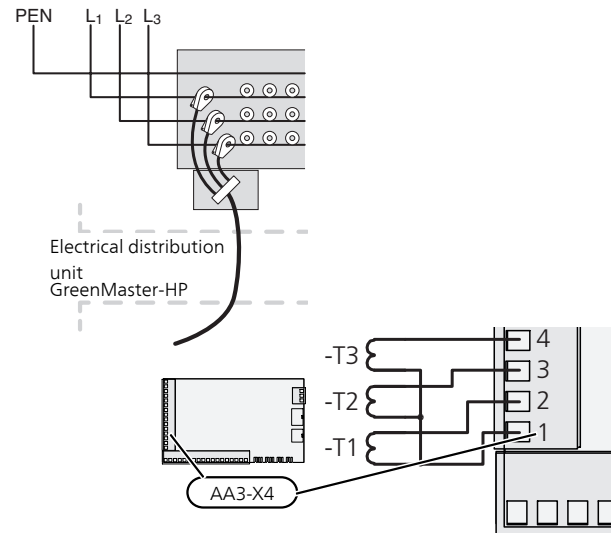
Activate phase detection in menu 5.1.12 for full functionality, if current sensors are installed.

Connecting current sensors

A current sensor should be installed on each incoming phase conductor in to the distribution box to measure the current. The distribution box is an appropriate installation point.

Connect the current sensors to a multi-core cable in an enclosure directly adjacent to the electrical distribution unit. The multi-core cable between the enclosure and GreenMaster-HP must have a cable area of at least 0.5 mm².

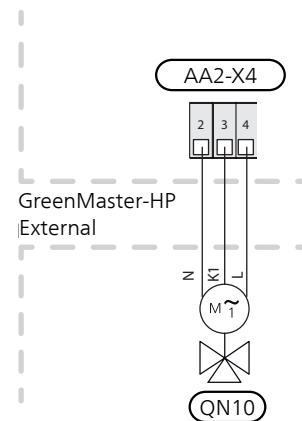
Connect the cable to the input board (AA3) on terminal block X4:1-4 where X4:1 is the common terminal block for the three current sensors.



Reversing valves

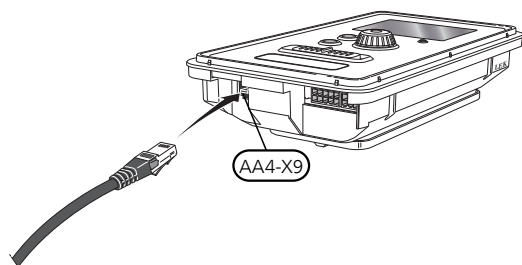
GreenMaster-HP can be supplemented with an external reversing valve (QN10) for hot water control (see page 44 for accessory).

Connect the external reversing valve (QN10) to terminal block AA2-X4:2 (N), AA2-X4:3 (operation) and AA2-X4:4 (L) as illustrated.



myUpway

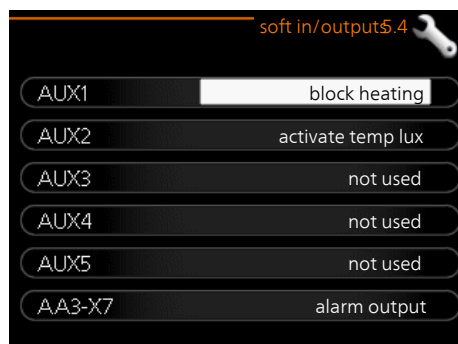
Connect a network-connected cable (straight, Cat.5e UTP) with RJ45 contact (male) to switch AA4-X9 on the display unit (as illustrated).



External connection options

GreenMaster-HP has software-controlled AUX inputs and outputs for connecting the external switch function (contact has to be potential-free) or sensor.

Go into menu 5.4 "soft in/outputs" on the display to select to which AUX connection each function connects.



For certain functions, accessories may be required.



TIP

Some of the following functions can also be activated and scheduled via menu settings.

Selectable inputs

Selectable inputs on the input board (AA3) for these functions are:

AUX1	AA3-X6:9-10
AUX2	AA3-X6:11-12
AUX3	AA3-X6:13-14
AUX4	AA3-X6:15-16
AUX5	AA3-X6:17-18

The example above uses the inputs AUX1 (X6:9-10) and AUX2 (X6:11-12) on the input board (AA3).

Selectable output

A selectable output is AA3-X7.

The output is a potential-free switching relay.

The picture shows the relay in the alarm position.

When switch (SF1) is in the "⏏" or "⚠" position the relay is in the alarm position.



Caution

The relay outputs may be subjected to a max load of 2 A at resistive load (230V AC).



TIP

The AXC accessory is required if more than one function is to be connected to the AUX output.

Possible selections for AUX inputs

Temperature sensor

Temperature sensor can be connected to GreenMaster-HP.

Available options are:

- cooling/heating (BT74), determines when it is time to switch between cooling and heating mode (can be selected when the cooling function is activated in menu 5.2.4).
- hot water top (BT7) (shows the water temperature at the top of the tank. The temperature sensor is placed in the submerged tube on the water heater.)
- external supply line (BT25) (control of temperature to the heating system)

Monitor

Available options are:

- alarm from external units. The alarm is connected to the control, which means that the malfunction is presented as an information message in the display. Potential-free signal of type NO or NC.
- level (accessory NV10)/, pressure/flow monitor for the brine (NC).
- pressure switch for climate system (NC).

External activation of functions

An external switch function can be connected to GreenMaster-HP to activate various functions. The function is activated during the time the switch is closed.

Possible functions that can be activated:

- forced control of brine pump
- hot water comfort mode "temporary lux"
- hot water comfort mode "economy"
- "external adjustment"

When the switch is closed, the temperature changes in °C (if the room sensor is connected and activated). If a room sensor is not connected or not activated, the desired change of "temperature" (heating curve offset)

is set with the number of steps selected. The value is adjustable between -10 and +10. External adjustment of climate systems 2 to 8 requires accessories.

– *climate system 1 to 8*

The value for the change is set in menu 1.9.2, "external adjustment".

- activation of one of four fan speeds.

(Can be selected if ventilation accessory is activated.)

The following five options are available:

- 1–4 is normally open (NO)
- 1 is normally closed (NC)

The fan speed is activated during the time the switch is closed. Normal speed is resumed when the switch is opened again.

- SG ready



Caution

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

"SG Ready" is a smart form of tariff control, which allows your electricity supplier to affect the indoor, hot water and/or pool temperatures (if applicable) or simply block the additional heat and/or compressor in GreenMaster-HP at certain times of the day (can be selected in menu 4.1.5 after the function is activated). Activate the function by connecting potential-free switch functions to two inputs selected in menu 5.4 (SG Ready A and SG Ready B).

Closed or open switch means one of the following:

- *Blocking (A: Closed, B: Open)*

"SG Ready" is active. The compressor in GreenMaster-HP and additional heat are blocked.

- *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 focuses on costs savings and can for example exploit a low tariff from the electricity supplier or over-capacity from any own power source (effect on the system can be adjusted in the menu 4.1.5).

- *Overcapacity mode (A: Closed, B: Closed)*

"SG Ready" is active. The system is permitted to run at full capacity at over capacity (very low price) with the electricity supplier (effect on the system is settable in menu 4.1.5).

(A = SG Ready A and B = SG Ready B)

- +Adjust

Using +Adjust, the installation communicates with the underfloor heating's control centre* and adjusts the heating curve and calculated supply temperature according to the underfloor heating system's reconnection.

Activate the climate system you want +Adjust to affect by highlighting the function and pressing the OK button.

*Support for +Adjust required



Caution

This accessory may require a software update in your GreenMaster-HP. The version can be checked in the "Service info" menu 3.1. Visit <http://www.myupway.com> and click on the "Software" tab to download the latest software to your installation.



Caution

In systems with both underfloor heating and radiators, ECS 40/41 should be used for optimum operation.

External blocking of functions

An external switch function can be connected to GreenMaster-HP for blocking various functions. The switch must be potential-free and a closed switch results in blocking.



NOTE

Blocking entails a risk of freezing.

Functions that can be blocked:

- hot water (hot water production). Any hot water circulation (HWC) remains in operation.
- heating (blocking of heating demand) compressor
- internally controlled additional heat
- tariff blocking (additional heat, compressor, heating, cooling and hot water are disconnected)

Possible selections for AUX output

Indications

- alarm
- cooling mode indication (only applies if there are cooling accessories)
- external heating medium pump

Controls

- ground water pump
- circulation pump for hot water circulation
- additional heat in charge circuit
- external heating medium pump

External circulation pump, ground water pump or hot water circulation pump is connected to the common alarm relay as illustrated below. If the pump has to work in the event of alarm, the cable is moved from position 2 to position 3.

**NOTE**

The relevant distribution box must be marked with a warning about external voltage.

Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 44 for the list of the accessories that can be used with GreenMaster-HP.

6 Commissioning and adjusting

Preparations

1. Check that the switch (SF1) is in position "⏻".
2. Check that the externally mounted filling valves are fully closed.



Caution

Check the miniature circuit-breaker. It may have tripped during transport.



NOTE

Do not start GreenMaster-HP if there is a risk that the water in the system has frozen.

Pipe

After pipe installation, but before insulating, the system's brine side has to be filled with water, vented and pressure-tested. After this, the pipes have to be flushed and vented. Finally, the system has to be filled with a 28% mixture of ethylene glycol and water.

The heating medium side should also be flushed and pressure tested with water.



NOTE

Pay attention to nearby electricity sources when you are working with liquids.



NOTE

Always wear protective gloves before starting work.



NOTE

Take care not to damage the environment in the work area. Risk of flooding.



NOTE

Check that the components necessary for unit operation are installed and connected to GreenMaster-HP.

Ventilation

Check that:

1. The fan (GQ2) can rotate freely and there are no loose parts remaining in the fan chamber.
2. Connector (HR10) next to the fan is in position AUTO.
3. Air filters (HQ10) are clean and intact.
4. The heat exchanger's (EP10) fins and pipes are clean and intact.
5. The air ducts are correctly connected to GreenMaster-HP.
6. Sensor (BP12) is connected correctly.
7. Any external accessories are correctly connected.

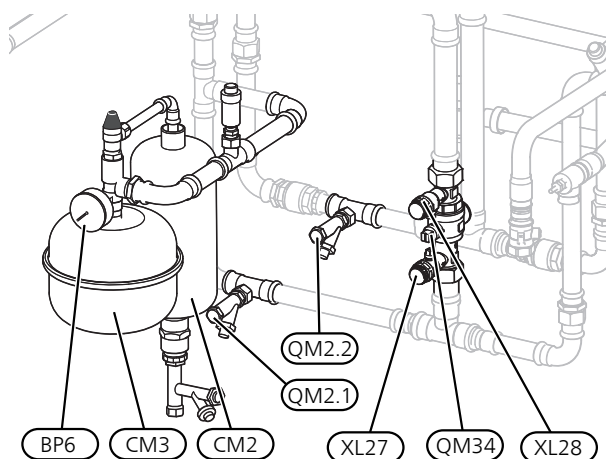
Flushing

Before you start

Make sure that:

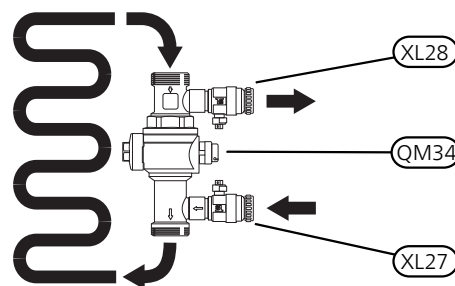
1. All shut-off valves are open.
2. All drain, service, vent and filling valves are closed.
3. No other connections in the pipe system are open.
4. Filler connection (XL27) is connected to the property's water supply.
5. Filler connection (XL28) is connected to the drain with a flexible hose.
6. Pressure gauge (BP6) is not damaged. In the event of a pressure increase above 3 bar, there is a risk of safety valves being tripped.

Brine system



Caution

Pliers are needed to change the position of the filler tap!



BP6	Pressure gauge, brine
CM2	Level vessel
CM3	Expansion vessel, brine
QM2.1	Drain valve, brine
QM2.2	Drain valve, brine
QM34	Shut-off valve
XL27	Filler connection, brine
XL28	Filler connection, brine

Flushing with water and cleaning

1. Connect a water hose from the property's cold water supply to the filler connection (XL27). Open the connection's valve.
2. Connect a flexible drain hose to the filler connection (XL28). Open the connection's valve.



NOTE

The drain hose must be long enough to reach a drain or a bucket.

3. Close the shut-off valve (QM34), in the right-hand position.



NOTE

The pressure in the water supply must not exceed 2.9 bar (higher pressure entails a risk that the safety valves will trigger).

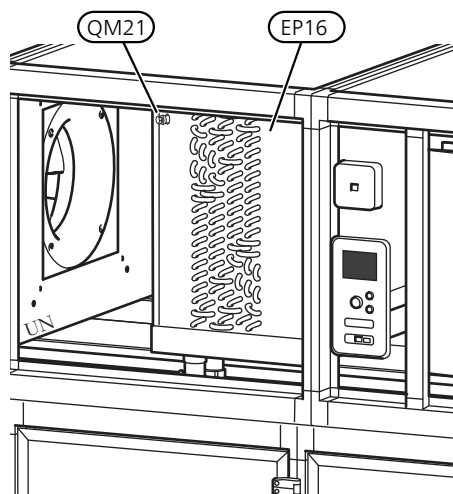
4. Slowly open the water supply until water runs out into the drain/drain hose. In this step, ensure that there are no leaks in the system. If leaks are discovered, these must be repaired. Then follow the above points again until all leaks have been eliminated.
5. Increase the liquid flow to approx. 10 l/min, or until there is a sufficient flow to flush the system. Approx. 20 litres of water are sufficient. Shut off the water supply.
6. Vent valve (QM23) (there are 3 of this type of valve in various parts of the pipe system) should remove the rest of the air from the system.
7. Air in the unit's heat exchanger (EP10) is removed using vent valve (QM21). Use a T20 screwdriver and align it with the grooves on the valve. Slowly screw anti-clockwise; the air will gradually be removed from the heat exchanger. Once venting is complete, the T20 screw must be screwed back in to its original position.



NOTE

Perform this step at the same time as flushing the system.

Vent valve (QM21), heat exchanger



8. Pressurise the system when the air has been completely removed from the pipe system.

Pressure and leakage tests

Pressure-test brine side



NOTE

Check that the filler connection (XL28) is fully closed before you start the pressure tests.

1. Connect a water hose from the property's cold water supply to the filler connection (XL27).
2. Open the filler connection's valve.
3. Start filling with water.
4. Wait until the pressure in the pipe system rises to 2.9 bar.
5. Immediately close the filler connection (XL27) once the pressure has reached 2.9 bar, and also shut off the water supply.
6. Disconnect the hose from the filler connection (XL27).



NOTE

Handle this step carefully to avoid flooding.

7. Check carefully for any leakage. If leaks are discovered, these must be repaired.
8. Leave the system pressurised for at least 6 hours. Write a suitable report for the test results.
9. Once the pressure test has been completed, connect the drain hoses to the drain valves (QM2.1) and (QM2.2).
10. Open the drain valves and wait until all the water has run out.
11. Then close both of the drain valves.

Pressure-test heating medium side

1. Connect a drain hose to connection (EP14-XL2).
2. Connect a water hose from the property's cold water supply to connection (EP14-XL1).

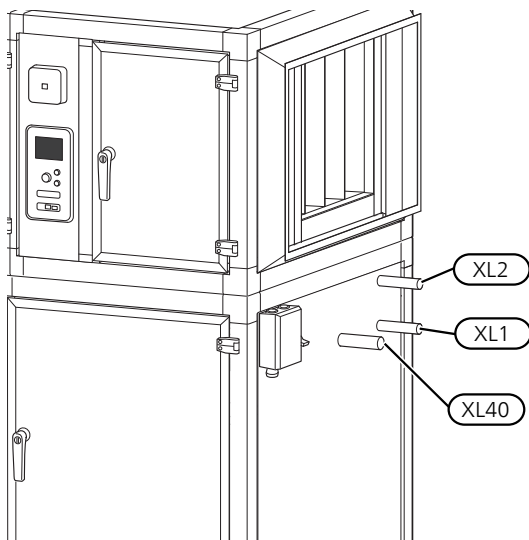
3. Open the water supply and flush the system for 10 minutes.
4. Shut off the water supply, empty the system and disconnect the drain hose from (EP14-XL2).
5. Close connection (EP14-XL2) using an end cap (not enclosed) that can withstand a pressure of up to 4 bar.
6. Open the water supply and raise the pressure to 4 bar. Read off the pressure gauge (not enclosed), which is installed in the water supply system.
7. Shut off the water supply once the pressure reaches the desired level.
8. Leave the system pressurised for at least 6 hours. Write a suitable report for the test results.
9. Check carefully for any leakage. If leaks are discovered, these must be repaired. Then follow the above points again until all leaks have been eliminated.
10. When the heating medium system has passed the pressure test, empty the heating medium system and remove all connected hoses.



Caution

Use suitable drainage systems according to local legislation to empty the pipe system.

Connections, heating medium: 2-12, 2-16, 3-16



Cleaning and filling

Filling and venting the brine system

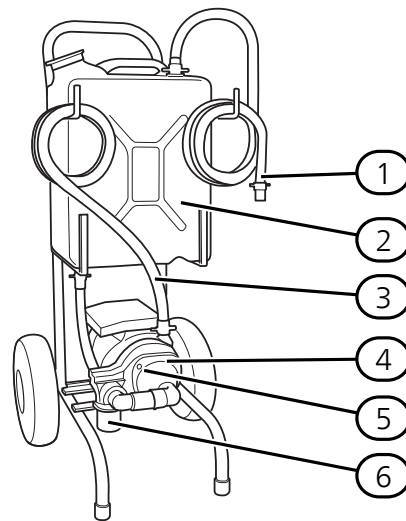


Caution

Because the temperature of the brine system varies depending on the heat source, the 5.1.7 "br pmp al set." menu must be set to a suitable value.

1. Use filling pump LK Pumpmobil FSB 30, or equivalent, in this procedure.

LK Pumpmobil FSB 30



1. Connection hose, return, 3 m
 2. Mixing vessel, 30 l
 3. Connection hose, supply, 3 m
 4. Pressure/centrifugal pump
 5. Valve screw, pump
 6. Filter/strainer
2. When filling the brine system, mix the water with antifreeze in the filling pump's mixing vessel (2). The mixture should have freezing protection down to approx. -15°C.
 3. Place the filling pump in a convenient location in the vicinity of the GreenMaster-HP to optimise user-friendliness.
 4. Connect the power supply.
 5. Connect hose (3) to filler connection (XL27).
 6. Connect hose (1) to filler connection (XL28).
 7. Ensure that shut-off valve (QM34) is in the closed position, in the right-hand position.
 8. Open the valves for the filler connections (XL27) and (XL28).
 9. Start the filling pump by pressing the filling pump's (4) start button.
 10. Vent the system by performing the activities in step 6-8 in chapter Flushing with water and cleaning, page 31.

11. Start filling slowly by closing filler connection (XL28). Check that the pressure is gradually increasing using pressure gauge (BP6).
12. When the pressure reaches 2.5 bar, close the valves for the filler connections (XL27) and (XL28) simultaneously.
13. Turn off the filling pump.
14. Check whether there is any air left in the coil. Open the heat exchanger's (EP16) vent valve (QM21) to remove any remaining air.
15. Leave the system in this state for 30 minutes.
16. Check that the pressure level has not dropped and proceed to the next step. A pressure drop in the system may be due to a leak in the system. If leaks are discovered, they must be repaired. Then follow the above steps again.
17. Open shut-off valve (QM34).
18. Disconnect the hoses (3) and (1).



NOTE

Carefully disconnect the hoses to prevent flooding.

19. Go through the start guide for the GreenMaster-HP (see page 35), keep checking the pressure level at regular intervals for at least 8 hours.



NOTE

Make sure that the brine system does not contain air before it is started up.. Failure to properly vent the system may result in damage to components.

Filling and venting heating medium system

Filling

1. Open the filling valve (external, not included in the product). Fill the climate system with water.
2. Open the vent valve (external, not included in the product).
3. When the water that exits the vent valve is not mixed with air, close the valve. After a while, the pressure starts to rise.
4. Close the filling valve when the correct pressure is obtained.

Venting

1. Vent GreenMaster-HP via a vent valve (external, not included in the product) and other climate systems via their respective vent valves.
2. Keep topping up and venting until all air has been removed and the pressure is correct.



NOTE

Make sure that the heating medium system contains no air, before start-up. Failure to properly vent the system may result in damage to components.

Start-up and inspection

Start guide



NOTE

There must be water in the climate system before the switch is set to "I".

1. Set switch (SF1) on GreenMaster-HP to position "I".
2. Follow the instructions in the display's start guide. If the start guide does not start when you start the GreenMaster-HP, start it manually in menu 5.7.



TIP

Refer to the operating manual for a more in-depth introduction to the control system in GreenMaster-HP (operation, menus, etc.).

If the building is cooled when GreenMaster-HP starts, the compressor may not be able to meet the entire demand without having to use additional heating.

Commissioning

The first time the installation is started a start guide is started. The start guide instructions state what needs to be carried out at the first start together with a run through of the installation's basic settings.

The start guide ensures that the start-up is carried out correctly and, for this reason, cannot be skipped.



Caution

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

The start guide will appear at each restart of the installation, until it is deselected on the last page.

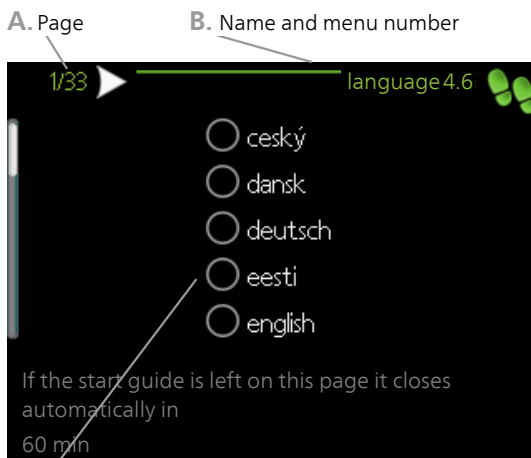


Caution

At start-up of GreenMaster-HP-30 to 60kW, preheating of the compressors starts. Preheating continues until the temperature sensor BT29 is stable 10 degrees greater than sensor BP8 (for GreenMaster-HP-60kW this can take up to 12 hours).

See the info menu for more information.

Operation in the start guide



C. Option / setting

A. Page

Here you can see how far you have come in the start guide.

Scroll between the pages of the start guide as follows:

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 pages in the start guide.

B. Name and menu number

Here, you can see which menu in the control system this page of the start guide is based on. The digits in brackets refer to the menu number in the control system.

If you want to read more about affected menus either consult the help menu or read the user manual.

C. Option / setting

Make settings for the system here.

Post adjustment and venting

Pump adjustment, automatic operation

Brine side

To set the correct flow in the brine system, the brine pump must run at the correct speed. GreenMaster-HP has a brine pump that is controlled automatically in standard mode. Certain functions and accessories may demand that it be run manually, in which case the correct speed must be set.

This automatic control occurs when the compressor is running and sets the speed of the brine pump so that the optimum temperature difference between the supply and return lines is attained.

Heating medium side

To set the correct flow in the heating medium system, the heating medium pump must run at the correct speed. GreenMaster-HP has a heating medium pump that can be automatically controlled in standard mode. Certain functions and accessories may require it to run manually and the correct speed must then be set.

This automatic control occurs when the compressor is running and sets the speed of the heating medium pump, for the relevant operating mode, so the optimum temperature difference between the supply and return lines is achieved. During heating operation, the set DOT (dimensioned outdoor temperature) and temperature differential in menu 5.1.14 are used. If necessary, the maximum speed of the circulation pump can be limited in menu 5.1.11.

Pump adjustment, manual operation

Brine side

GreenMaster-HP has a brine pump that can be automatically controlled. For manual operation: deactivate "auto" in menu 5.1.9 and then set the speed according to the diagram below.



Caution

When an accessory for passive cooling is used, the brine pump speed must be set in menu 5.1.9.

Adjust the flow so the temperature difference between brine out (BT11) and brine in (BT10) is between 2 - 5 °C. Check these temperatures in menu 3.1 "service info" and adjust the brine pump's (GP2) speed until the temperature difference is obtained. A large difference indicates a low brine flow and a small difference indicates a high brine flow.

Heating medium side

GreenMaster-HP has a heating medium pump that can be automatically controlled. For manual operation: deactivate "auto" in menu 5.1.11 and then set the speed according to the diagrams below.

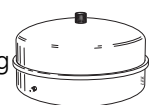
Readjusting, venting, heat medium side

Air is initially released from the hot water and venting may be necessary. If gurgling sounds can be heard from GreenMaster-HP or the climate system, the entire system requires additional venting. Check the pressure in the pressure expansion vessel (CM1) using the pressure gauge (BP5). If the pressure drops, the system should be topped up.

Readjusting, venting, collector side

Expansion vessel

Check the pressure in the pressure expansion vessel (CM3) in GreenMaster-HP using the pressure gauge (BP6). If the pressure drops, the system should be topped up.



7 Control - menus

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.



Caution

Also see the Operating Manual for false.

Start guide

The start guide appears at first start-up after installation, but is also available in menu 5.7.

Menu system

If you do not make all settings via the start guide or need to change any of the settings, this can be done in the menu system.

Menu 1.1.1 - heating

Make settings for room temperature here.

Menu 1.9.1.1 - heating curve

Make settings for your own heating curve here.

Menu 3.1 - service info

Here you will find temperatures and other operating information for GreenMaster-HP.

Menu 5.1.7 - br pmp al set.

Make settings for the brine alarm in GreenMaster-HP here.

Menu 5.1.9 - brine pump speed

Set the speed of the brine pump in GreenMaster-HP here.

Menu 5.1.11 - pump speed heating medium

Set the speed of the heating medium pump in GreenMaster-HP here.

Menu 5.1.14 - flow set. climate system

Make settings for the flow in the climate system here.

Menu 5.2.4 - accessories

Activate the air treatment unit here.

Activate: GreenMaster-HP

Menu 5.3.22 - greenmaster C-F

Make operating settings for GreenMaster-HP in this menu.

start manual motion QM41

yes/no

QM41 motion interval

Set the interval in days for how often the fire damper (QM41) is to be actuated here.

Setting range: 1–30

Default value: 14

set point value

Make settings for the control's set point value here.

Setting range: 0–400 Pa

Factory setting: 150 Pa

min. fan speed GQ2

Setting range: 1–99%

Factory setting: 10%



TIP

If both settings are set to the same value, the fan operates at fixed speed.

max. fan speed GQ2

Setting range: 2–100%

Factory setting: 100%

months btwn filter alarms

Set the number of months between filter changes in GreenMaster-HP here.

Setting range: 1–24

Factory setting: 12

runtime damper QM41

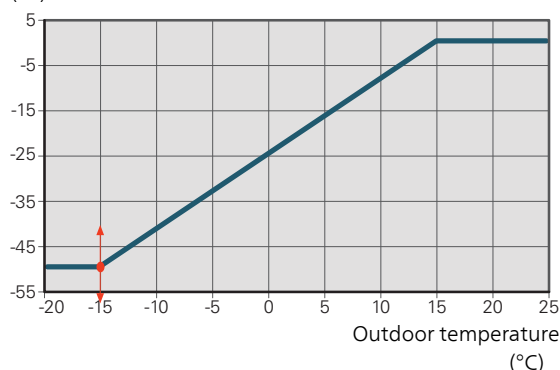
Make settings for the max. actuating time before an alarm triggers here. Set the max. actuating time before an alarm is activated here.

Setting range: 1–300 s

Factory setting: 150 s

outd temp compensation

Compensation
(Pa)



Setting range: -100–0 Pa

Default value: 0

type of fire alarm

Make settings for the fire alarm in GreenMaster-HP here.

Setting range: 1/2

Default value: 1

Fire alarm type 1

- The exhaust air damper (QM40) closes
- The fire bypass damper (QM41) opens
- Exhaust air fan (GQ2) runs at fixed fire flow, which is set in menu 5.3.22.

Fire alarm type 2

- Exhaust air fan (GQ2) stops
- The exhaust air damper (QM40) closes

fire alarm temperature BT20

Make settings here for the speed at which the fan will run in the event of fire.

Setting range: 38–45%

Factory setting: 38%

fan speed during fire alarm

Make settings here for the speed at which the fan will run in the event of fire.

Setting range: 0–100%

Factory setting: 70%

filt. alarm press.

Make settings for alarm for a clogged filter here. When the set value is exceeded, an alarm is triggered.

Setting range: 100–300 Pa

Factory setting: 150 Pa

Menu 5.6 - forced control

You can make the settings for forced control of Green-Master-HP here. Forced control must only be used by users with a good knowledge of the system. When forced control is activated, the alarm functions are disabled.

8 Service and maintenance

Service

Maintenance

Inform the user of necessary maintenance action.

Fire damper actuation

The fire damper has to be actuated at regular intervals. The setting is made in menu 5.3.22 and specified in terms of the number of days between movements.

Replacing the filter

The air filter in GreenMaster-HP has to be replaced regularly, although how often depends on the amount of dust in the surrounding air.

Service actions



NOTE

Servicing should only be carried out by persons with the necessary expertise.

When replacing components on GreenMaster-HP only replacement parts from NIBE AirSite may be used.

Emergency mode



NOTE

The switch (SF1) must not be moved to "I" or "△" until GreenMaster-HP has been filled with water. Component parts in the product can be damaged.

Emergency mode is used in event of operational interference and in conjunction with service. Hot water is not produced in emergency mode.

Emergency mode is activated by setting switch (SF1) in mode "△". This means that:

- The status lamp illuminates yellow.
- The display is not lit and the control computer is not connected.
- The compressor and brine pump are switched off, and only the heating medium pump and any electric additional heat (requires "Additional heat in emergency mode" to be connected) are active.

Draining the climate system

In order to carry out service on the climate system, it may be easier to drain the system first. This can be done in different ways depending on what needs doing:



NOTE

There may be some hot water when draining the heating medium side/climate system. There is a risk of scalding.

Draining the heating medium system

If GreenMaster-HP requires servicing, drain the heating medium side as follows:

1. Close the shut-off valves outside the heat pump for the heating medium side (return and flow line).
2. Connect a hose to the bleed valve (QM1) and open the valve. Some liquid will run out.
3. Air must get into the system for the remaining liquid to run out. To let in air, slacken off the connection slightly at the shut-off valve that joins the heat pump with the cooling module (XL2).

When the heating medium side is empty, the required service can be carried out.

Draining the entire climate system

If the entire climate system requires draining, do this as follows:

1. Connect a hose to the bleed valve (QM1) and open the valve. Some liquid will run out.
2. Air must get into the system for the remaining liquid to run out. To allow air in, unscrew the bleed screw on the highest radiator in the house.

When the climate system is empty, the required service can be carried out.

Draining the brine system

If, for example, the brine pump requires replacing or the cooling module requires servicing, drain the brine system by:

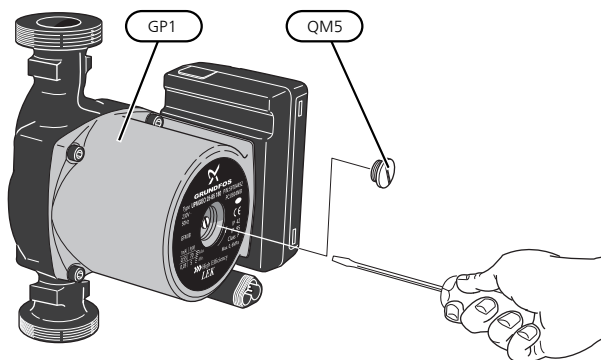
1. Close the shut-off valve (QM34) and the filterball (QZ2) for the brine system.
2. Connect a hose to the drain valve (QM2), place the other opening of the hose in a container and open the valve. A small amount of brine will flow into the container.
3. Air must enter the system in order for the remaining brine to be able to run out. To let in air, slacken off the connection slightly at the shut-off valve (QM34) that joins GreenMaster-HP with the cooling module.

When the brine system is empty, the required service can be carried out.

Helping the circulation pump to start

1. Turn off GreenMaster-HP by setting the switch (SF1) to "0".
2. Remove the front cover
3. Remove the cover for the cooling module.
4. Loosen the venting screw(QM5) with a screwdriver. Hold a cloth around the screwdriver blade as a small amount of water may run out.
5. Insert a screwdriver and turn the pump motor around.
6. Screw in the venting screw (QM5).
7. Start GreenMaster-HP by setting the switch (SF1) to "I" and check that the circulation pump is working.

It is usually easier to start the circulation pump with GreenMaster-HP running, and with the switch (SF1) set to "I". If the circulation pump is helped to start while GreenMaster-HP is running, be prepared for the screwdriver to jerk when the pump starts.



The image shows an example of what a circulation pump can look like.

Temperature sensor data

Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-40	351.0	3.256
-35	251.6	3.240
-30	182.5	3.218
-25	133.8	3.189
-20	99.22	3.150
-15	74.32	3.105
-10	56.20	3.047
-5	42.89	2.976
0	33.02	2.889
5	25.61	2.789
10	20.02	2.673
15	15.77	2.541
20	12.51	2.399
25	10.00	2.245
30	8.045	2.083
35	6.514	1.916
40	5.306	1.752
45	4.348	1.587
50	3.583	1.426
55	2.968	1.278
60	2.467	1.136
65	2.068	1.007
70	1.739	0.891
75	1.469	0.785
80	1.246	0.691
85	1.061	0.607
90	0.908	0.533
95	0.779	0.469
100	0.672	0.414

Pulling out the cooling module

Cooling module weight

Type	
GreenMaster-HP-12	120 kg
GreenMaster-HP-16	125 kg

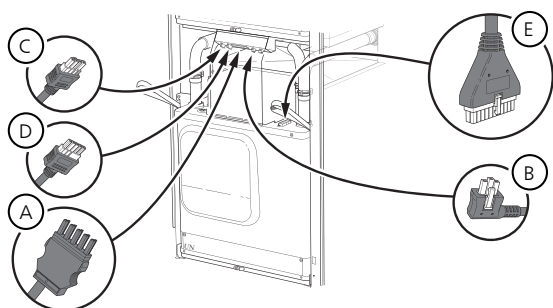


NOTE

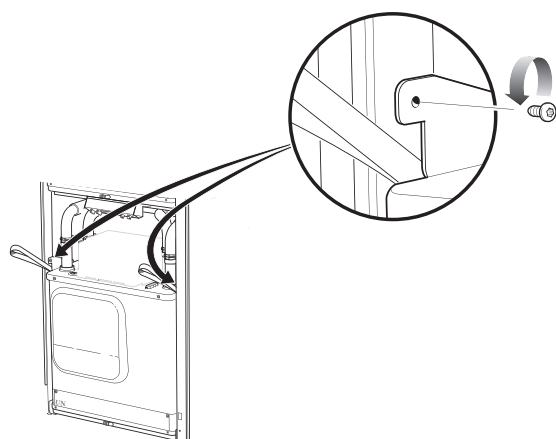
Switch off GreenMaster-HP and turn off the current at the safety breaker.

- 1 Close the shut-off valves outside the heat pump.
Drain the cooling module(s) according to the instructions on page 37.

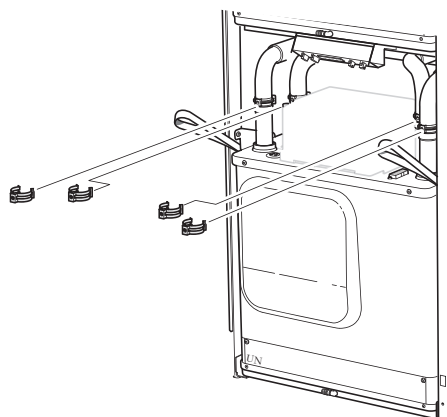
- 2
 - XF1 (A)
 - XF3 (B)
 - XF4 (C)
 - XF5 (D)
 - AA100:XF1 (E)



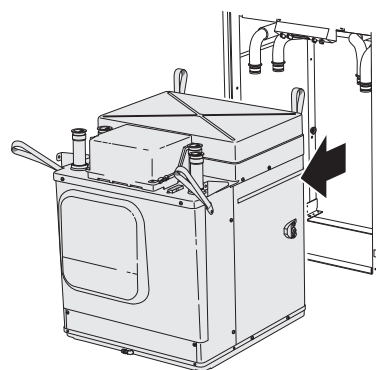
3



4



5



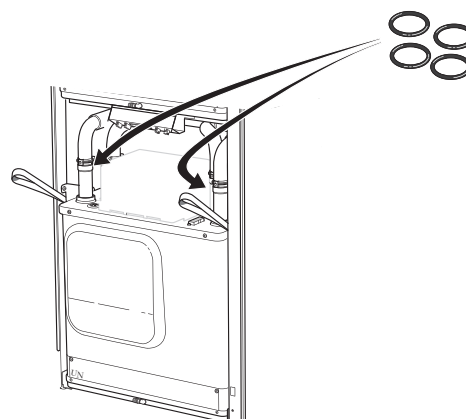
TIP

The cooling module is installed in reverse order.

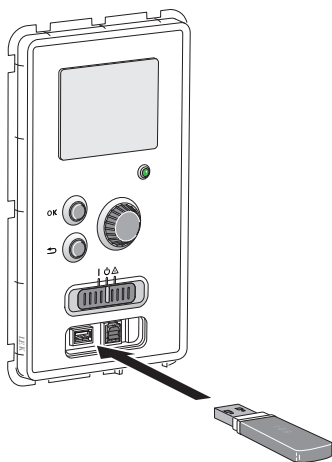


NOTE

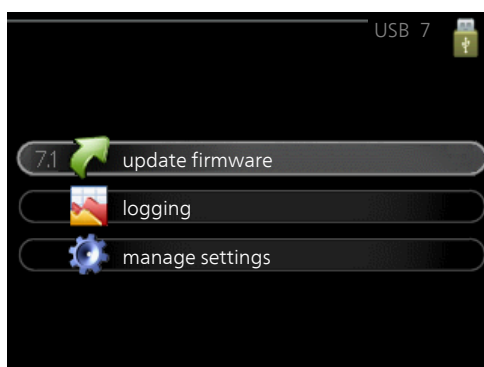
During reinstallation, new O-rings must replace the existing ones at the connections to GreenMaster-HP (see image).



USB service outlet

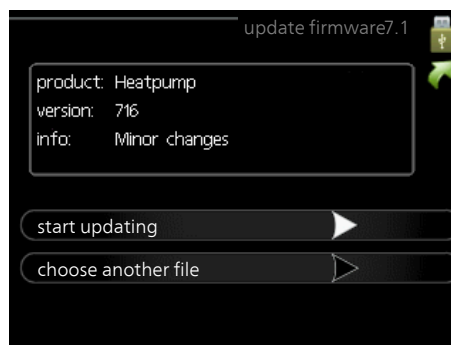


The display unit is equipped with a USB socket that can be used to update the software and save logged information in GreenMaster-HP.



When a USB memory is connected, a new menu (menu 7) appears in the display.

Menu 7.1 - update firmware



This allows you to update the software in GreenMaster-HP.



NOTE

For the following functions to work the USB memory must contain files with software for GreenMaster-HP from NIBE AirSite.

The fact box at the top of the display shows information (always in English) of the most probable update that the update software has selected from the USB memory.

This information states the product for which the software is intended, the software version and general information about it. If you want a file other than the one selected, the correct file can be selected through "choose another file".

start updating

Select "start updating" if you want to start the update. You are asked whether you really want to update the software. Respond "yes" to continue or "no" to undo.

If you responded "yes" to the previous question the update starts and you can now follow the progress of the update on the display. When the update is complete GreenMaster-HP restarts.



TIP

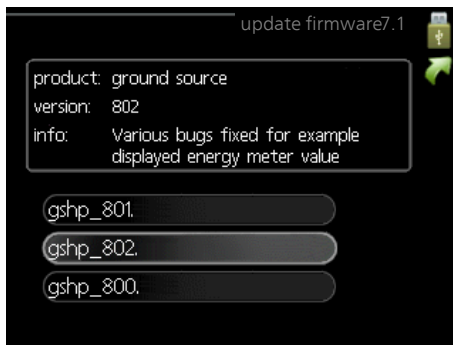
A software update does not reset the menu settings in GreenMaster-HP.



Caution

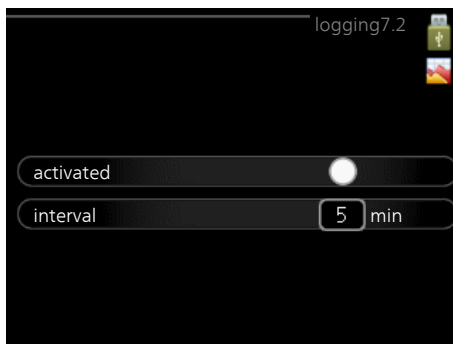
If the update is interrupted before it is complete (for example power cut etc.), the software can be reset to the previous version if the OK button is held in during start up until the green lamp starts to illuminate (takes about 10 seconds).

choose another file



Select "choose another file" if you do not want to use the suggested software. When you scroll through the files, information about the marked software is shown in a fact box just as before. When you have selected a file with the OK button you will return to the previous page (menu 7.1) where you can choose to start the update.

Menu 7.2 - logging



Setting range: 1 s – 60 min
Factory setting range: 5 s

Here you can choose how current measurement values from GreenMaster-HP should be saved onto a log file on the USB memory.

1. Set the desired interval between loggings.
2. Tick "activated".
3. The present values from GreenMaster-HP are saved in a file in the USB memory at the set interval until "activated" is unticked.



Caution

Untick "activated" before removing the USB memory.

Logging floor drying

Here you can save a floor drying log on the USB memory and in this way see when the concrete slab reached the correct temperature.

- Make sure that "floor drying function" is activated in menu 5.9.
- Select "logging floor drying activated".

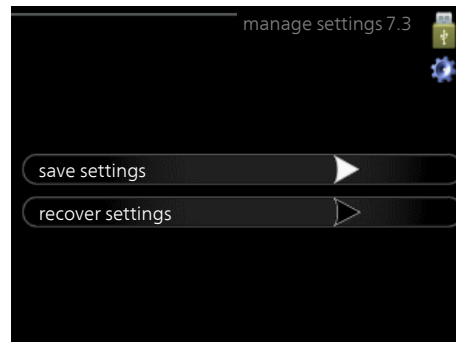
- A log file is now created, where the temperature and the immersion heater output can be read off. Logging continues until "logging floor drying activated" is deselected or until "floor drying function" is stopped.



Caution

Deselect "logging floor drying activated" before you remove the USB memory.

Menu 7.3 - manage settings



Here you can manage (save as or retrieve from) all the menu settings (user and service menus) in GreenMaster-HP with a USB memory.

Via "save settings" you save the menu settings to the USB memory in order to restore them later or to copy the settings to another GreenMaster-HP.



Caution

When you save the menu settings to the USB memory you replace any previously saved settings on the USB memory.

Via "recover settings" you reset all menu settings from the USB memory.



Caution

Reset of the menu settings from the USB memory cannot be undone.

9 Disturbances in comfort

Disturbances in comfort

No.	Text in display	Cause	It is reset by	May be due to
530	Control deviation BP12	The fan cannot maintain its set point value, can be set in menu 5.3.22	Resets automatically when the sensor measures below the set value for at least 60 seconds.	<ul style="list-style-type: none"> ■ Check fan. ■ Ice formation. ■ Check air filter. ■ Check damper.
531	Failed start-up of fan	No contact with the sensor or fan.	It is reset manually in menu.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on input (BP12). ■ Defective sensor (BP12). ■ Check fan connection. ■ Fuse blown
532	sensor flt GM G-F BP12	No contact with the sensor. (Pressure transmitter, extract air)	It is reset manually in menu.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
533	sensor flt GM G-F BP13	No contact with the sensor. (Pressure transmitter, filter guard extract air)	Resets automatically when the sensor has been working for at least 60 seconds.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
534	sensor flt GM G-F BP14	No contact with the sensor. (Pressure transmitter, extract air fan)	Resets automatically when the sensor has been working for at least 60 seconds.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
535	Sens flt:BT20	No contact with the sensor. (Temperature sensor, extract air)	It is reset manually in menu.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
536	Err: BT21	No contact with the sensor. (Temperature sensor, exhaust air)	Resets automatically when the sensor has been working for at least 60 seconds.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
537	fire alarm	In the event of an alarm in (BR1), the fire alarm is activated. The alarm is NC (normal closed).	It is reset manually in menu.	<ul style="list-style-type: none"> ■ Open-circuit or short-circuit on sensor input. ■ Defective sensor
538	fire alarm	If the exhaust air temperature (BT20) exceeds its max. value (can be set in menu 5.3.22) for one second, a fire alarm according to type 1 or type 2 is activated.	It is reset manually in menu.	Defective sensor
539	Filter guard exceeds set value	Differential pressure sensor (BP13) value has exceeded set value.	Resets automatically when the sensor measures below the set value for at least 60 seconds.	Clogged filter.
540	Fire damper actuation in progress	Actuation of damper QM41 failed.	Resets when the movement has finished.	-
541	Communication	Communication fault to accessory board (AA5).	It is reset manually in menu.	Defective communication cables.
542	Failed actuation of fire damper.	Actuation of fire damper failed.	It is reset manually in menu.	<ul style="list-style-type: none"> ■ Defective fire damper. ■ Defective limit position sensor.

No.	Text in display	Cause	It is reset by	May be due to
543	time for filt. change	Time set in menu 5.3.22 has expired.	It is reset manually in menu.	The counter for filter replacement has reached the set value in the menu since the most recent reset to zero. The counter is zeroed at start-up.

10 Accessories

Detailed information about the accessories and complete accessories list available at nibe.eu.

Active/Passive cooling in 4-pipe system

ACS 45

Part no 067 195

BoxManager 230 V

External fire monitoring/fire damper monitoring as well as Modbus RTU/TCP

This accessory is used when external fire cells need to be monitored and actuated. It is also used to convert Modbus RTU to Modbus TCP.

Part no. 880 0172

Immersion heater IU

3 kW

Part no. 018 084

6 kW

Part no. 018 088

9 kW

Part no. 018 090

External electric additional heat ELK

These accessories require accessories card AXC 40 (step controlled addition).

ELK 15

15 kW, 3 x 400 V

Part no. 069 022

ELK 26

26 kW, 3 x 400 V

Part no. 067 074

ELK 42

42 kW, 3 x 400 V

Part no. 067 075

ELK 213

7–13 kW, 3 x 400 V

Part no. 069 500

Extra shunt group ECS 40/ECS 41

This accessory is used when GreenMaster-HP is installed in houses with two or more different heating systems that require different supply temperatures.

ECS 40 (Max 80 m²)

Part no 067 287

ECS 41 (approx. 80-250 m²)

Part no 067 288

Auxiliary relay HR 10

Auxiliary relay HR 10 is used to control external 1 to 3 phase loads such as oil burners, immersion heaters and pumps.

Part no 067 309

Communications module MODBUS 40

MODBUS 40 enables GreenMaster-HP to be controlled and monitored using a DUC (computer sub-centre) in the building. Communication is then performed using MODBUS-RTU.

Part no 067 144

Communications module SMS 40

When there is no internet connection, you can use the accessory SMS 40 to control GreenMaster-HP via SMS.

Part no 067 073

Connection box K11

Connection box with thermostat and overheating protection.

(When connecting Immersion heater IU)

Part no. 018 893

Pool heating POOL 40

POOL 40 is used to enable pool heating with GreenMaster-HP.

Part no 067 062

Filling valve kit KB 25/32

Valve kit for filling brine in the collector hose. Includes particle filter and insulation.

KB 25 (max. 12 kW)

Part no. 089 368

KB 32 (max. 30 kW)

Part no. 089 971

Solar package NIBE AirSite PV

Solar panel package, 3.2 – 22.4 kW (10 – 80 panels), which is used to produce your own electricity.

SIOX SC:UNO

Fire/fire damper module for controlling and monitoring 1 fire dampers.

Part no. 800 9214

SIOX SC:DUO

Fire/fire damper module for controlling and monitoring 2 fire dampers.

Part no. 800 9213

Accessory card AXC 40

This accessory is used to enable connection and control of shunt controlled additional heat, step controlled additional heat, external circulation pump or ground water pump.

Part no. 067 060

Buffer vessel UKV

A buffer vessel is an accumulator tank that is suitable for connection to a heat pump or another external heat source, and can have several different applications. It can also be used during external control of the heating system.

UKV 200

Part no. 080 300

UKV 300

Part no. 080 301

UKV 500

Part no. 080 114

Water heater/Accumulator tank

VPA

Water heater with double-jacketed vessel.

VPA 300/200

Copper Part no. 082 023

Enamel Part no. 082 025

VPA 450/300

Copper Part no. 082 030

Enamel Part no. 082 032

VPB

Water heater without immersion heater with charging coil.

VPB 500

Copper Part no. 081 054

VPB 1000

Copper Part no. 081 053

Hot water control

VST 11

Reversing valve, cu-pipe Ø28

(Max recommended power,
17 kW)

Part no. 089 152

VST 20

Reversing valve, cu-pipe Ø35

(Max recommended power,
40 kW)

Part no 089 388

Heating coil

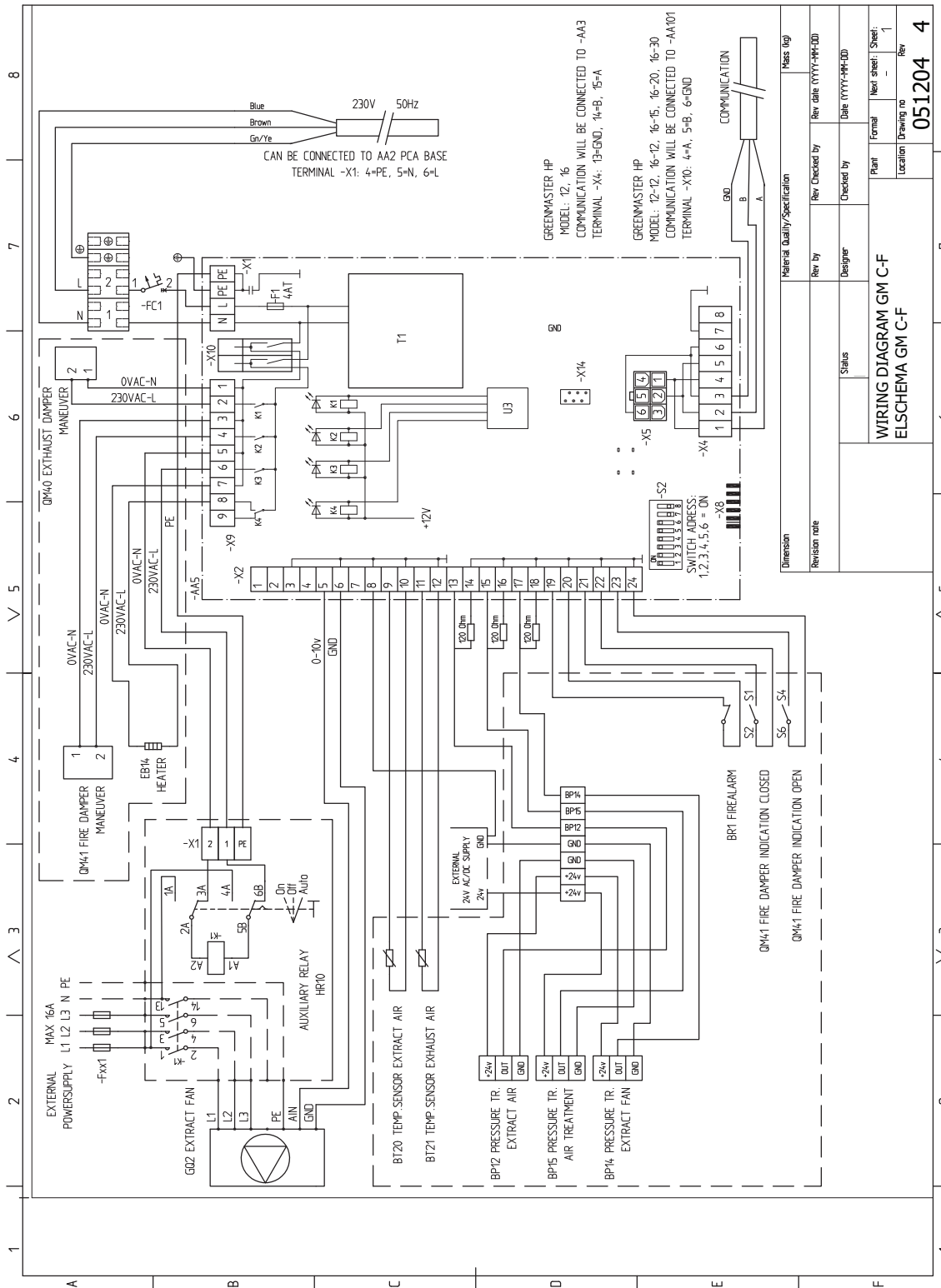
This accessory is installed in water seals that are placed outdoors, and is used to prevent freezing when it is cold outdoors

Part no. 801 7598

11 Technical data

Electrical circuit diagram

Air treatment section



WIRING DIAGRAM GM-HP-12
ELSCHEMA GM-HP-12

400V 3N~ 50Hz, 12kW

Material Quality/Specification

Revision

Rev by

Rev Checked by

Checked by

Date (YYYY-MM-DD)

Plant

Formal

Location

Drawing no

1

2

3

4

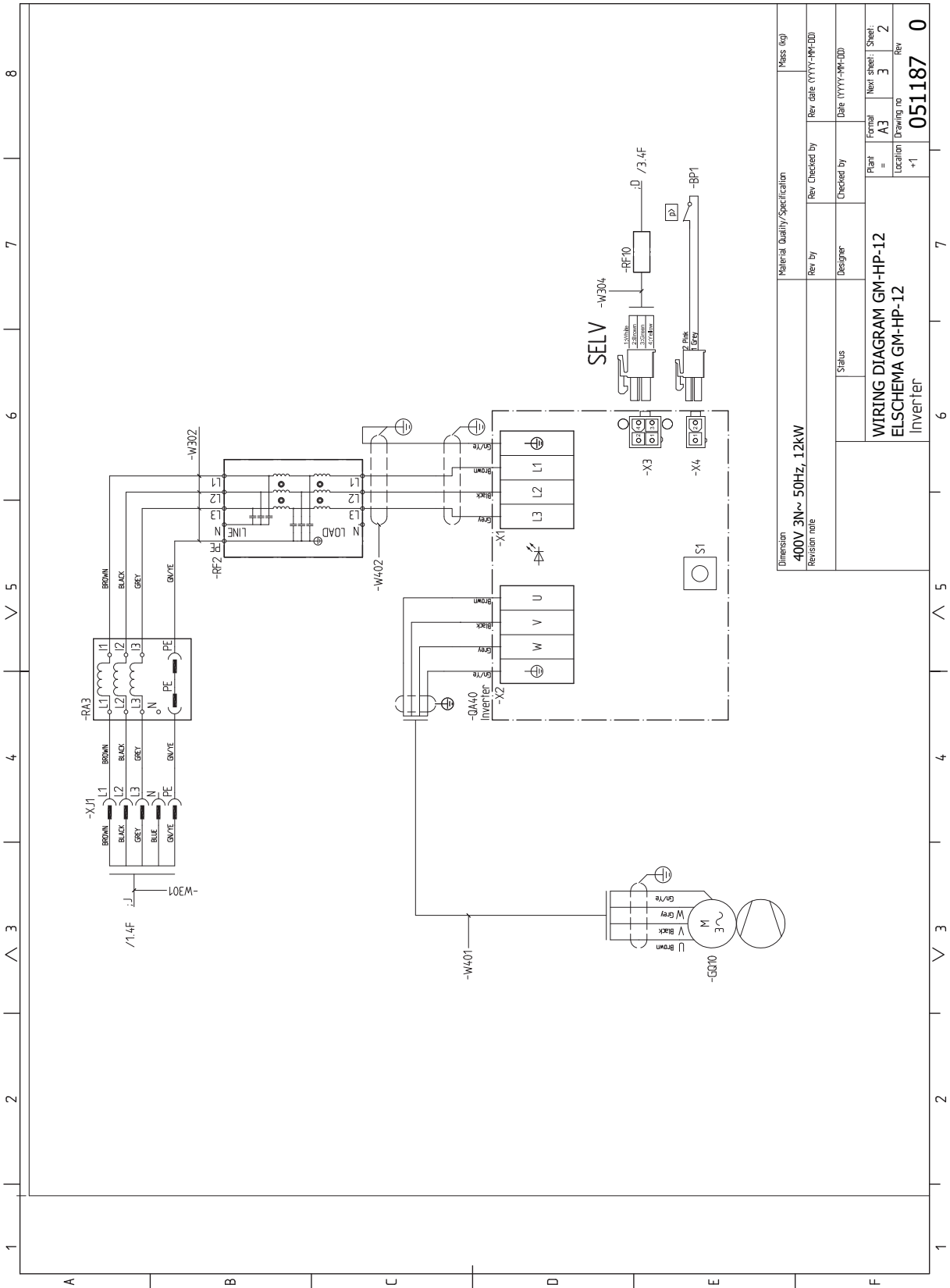
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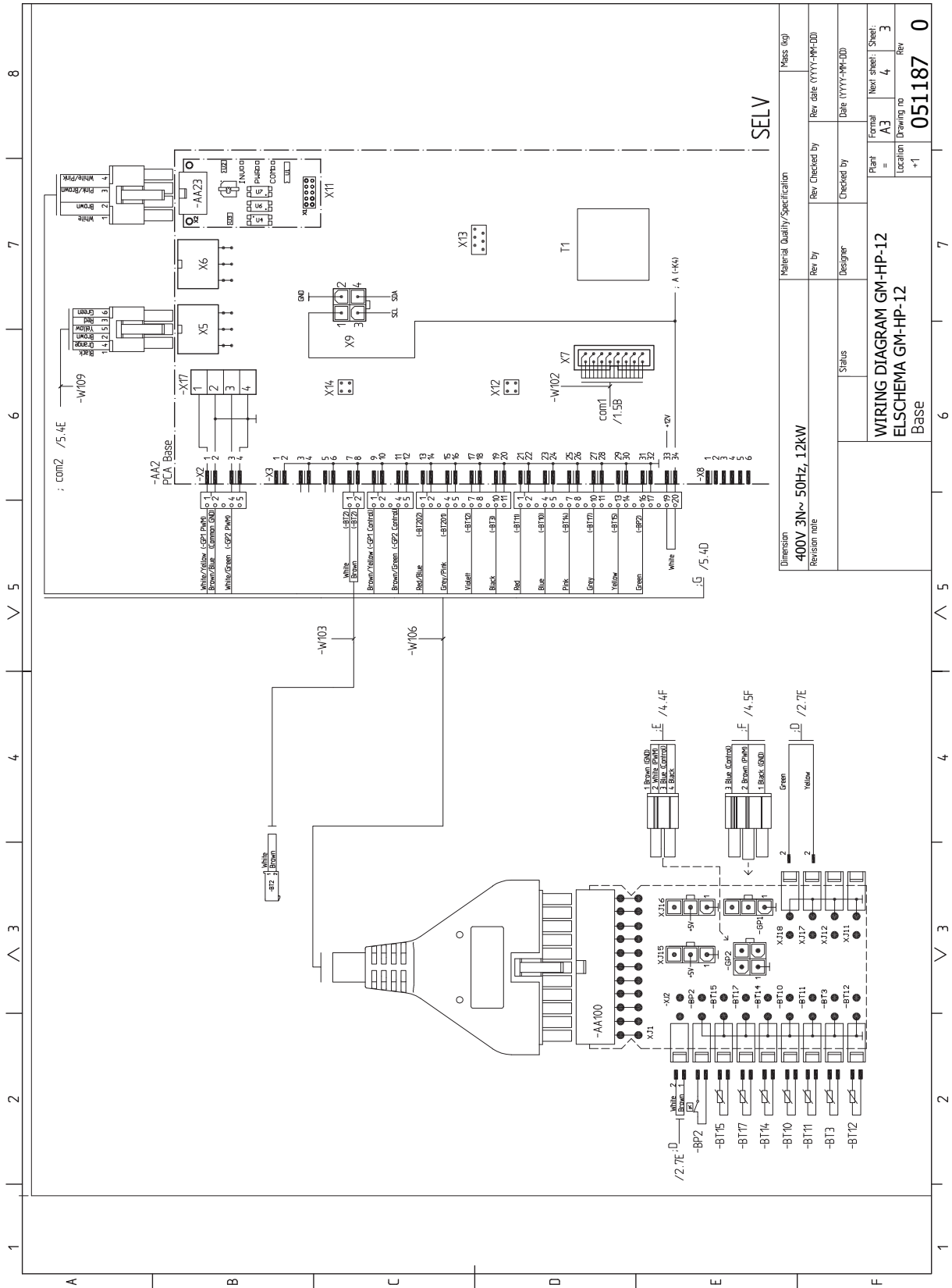
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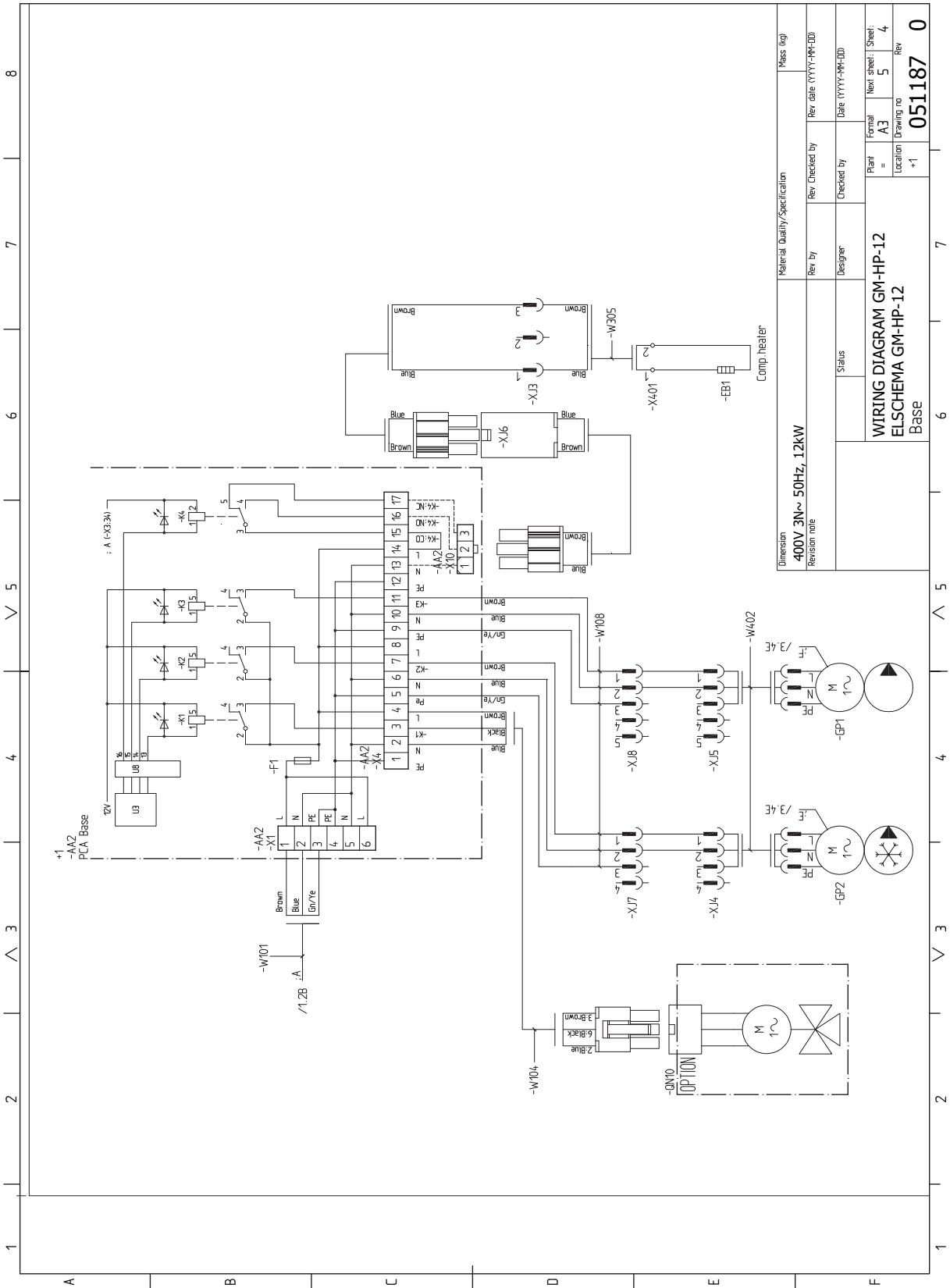
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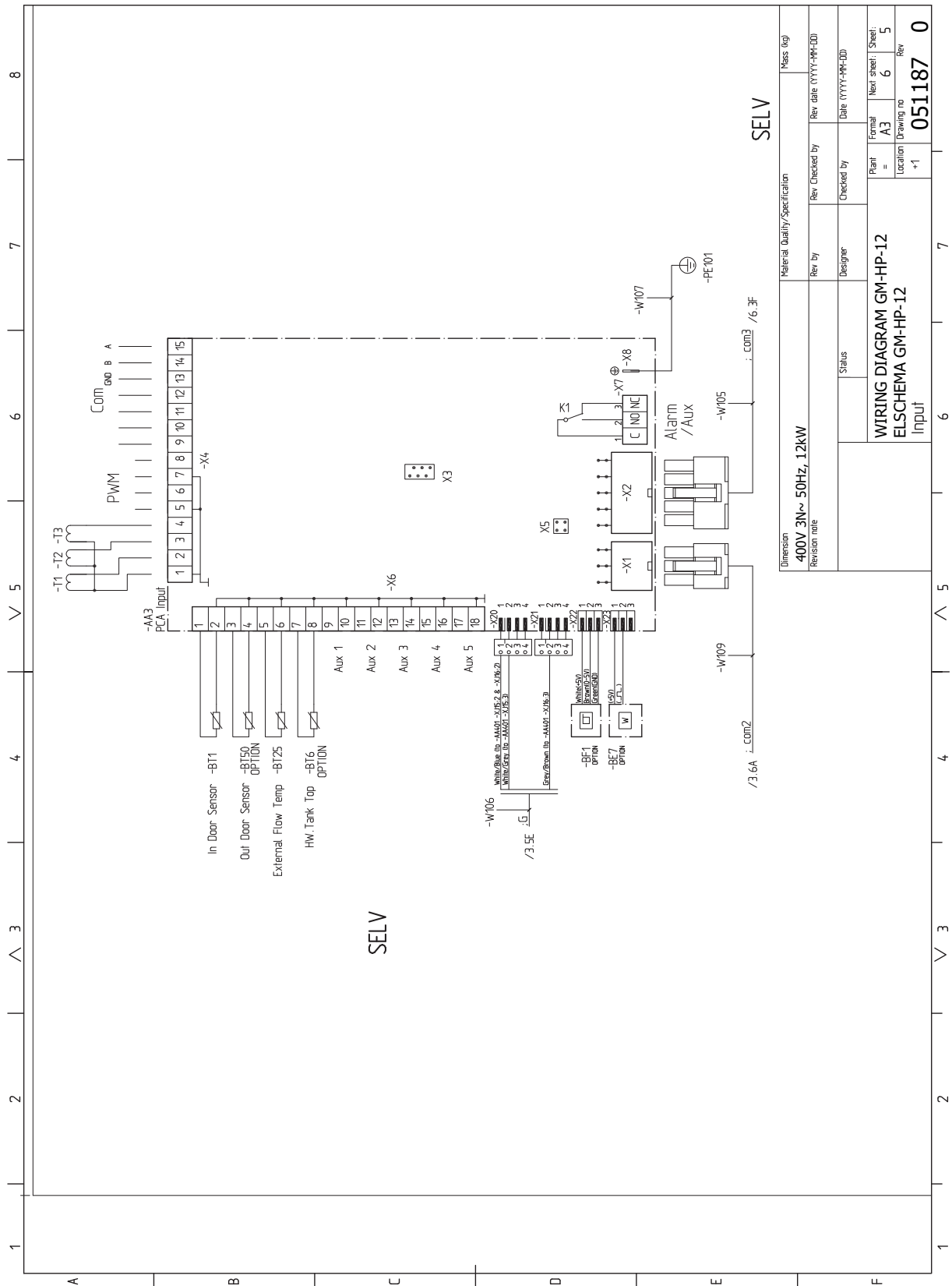
8

Dimension	Material Quality/Specification	Mass (kg)
400V 3N~ 50Hz, 12kW		
Revision note	Rev by	Rev date (YYYY-MM-DD)
	Designer	Date (YYYY-MM-DD)
Status	Checked by	
	Plant	Formal sheet
	= A3	Sheet
	Location	Drawing no
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		0

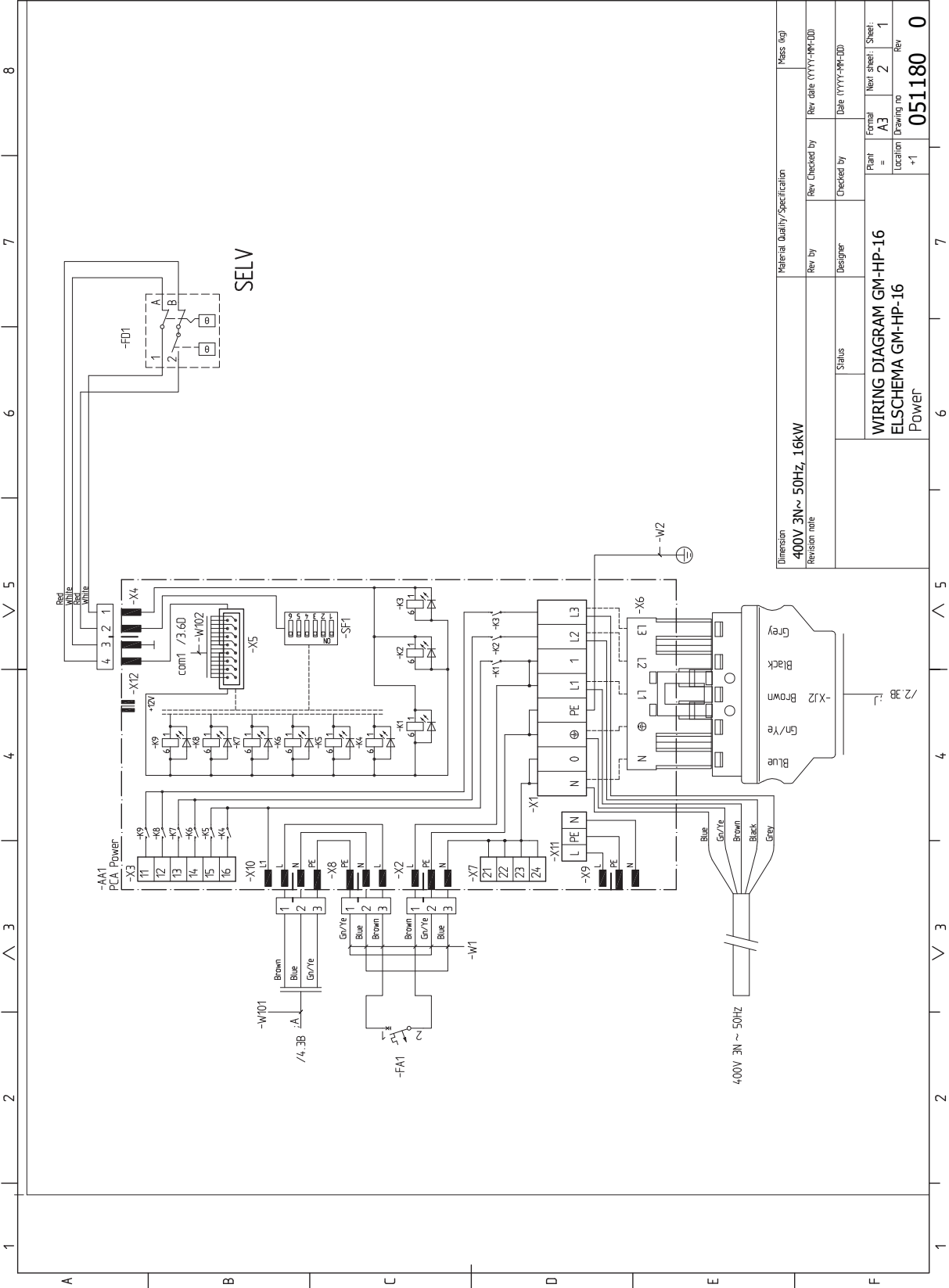


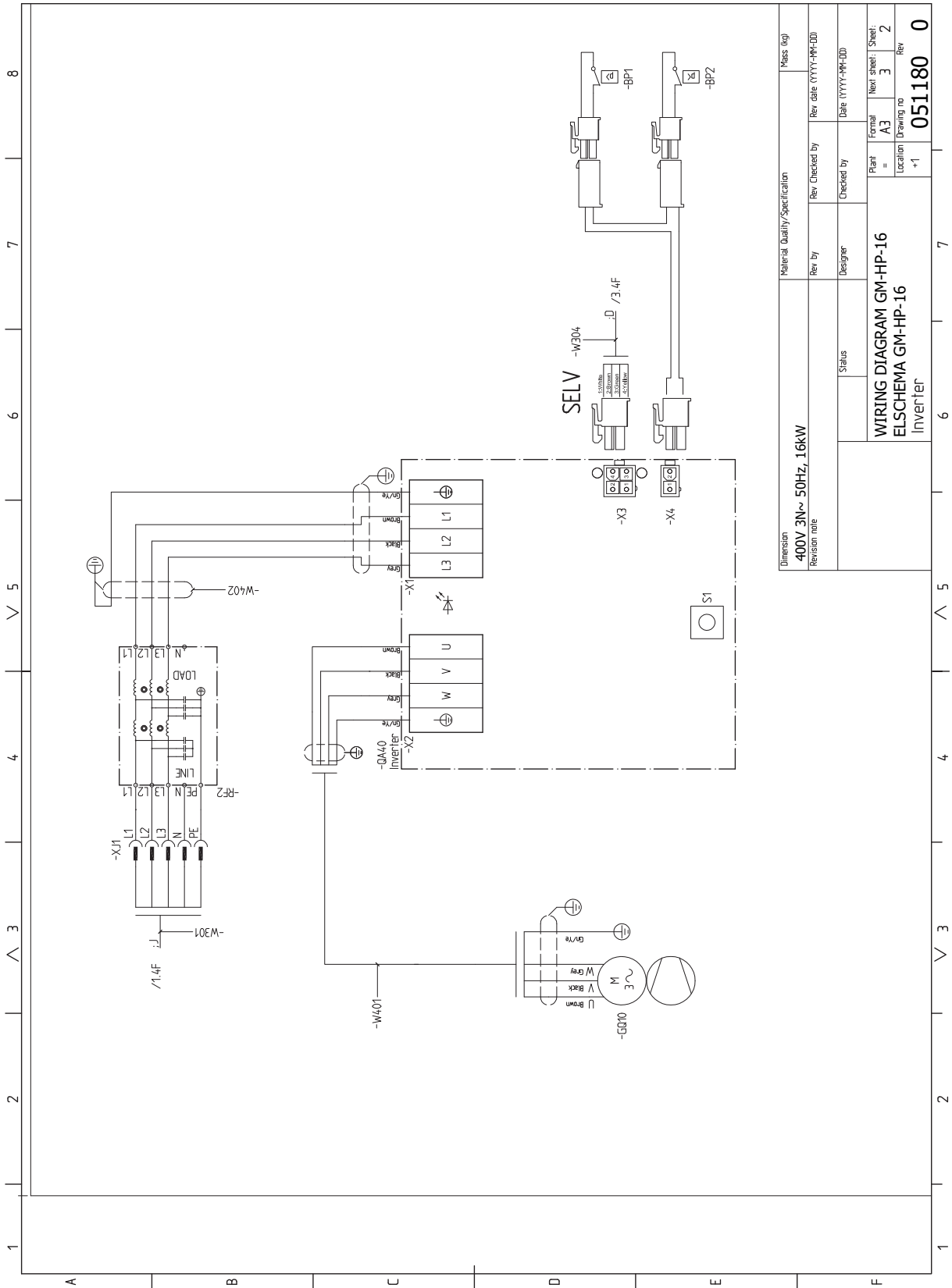


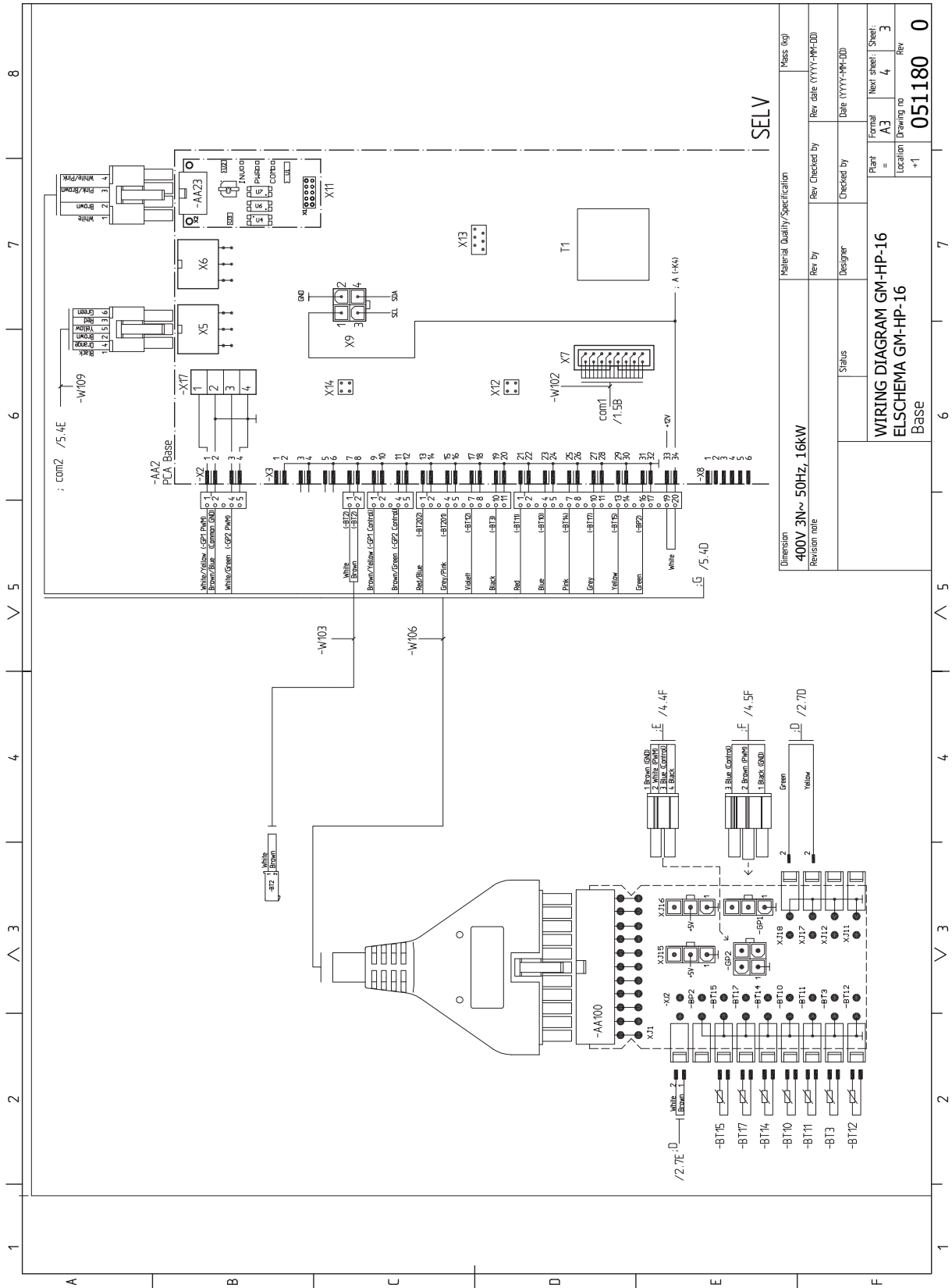


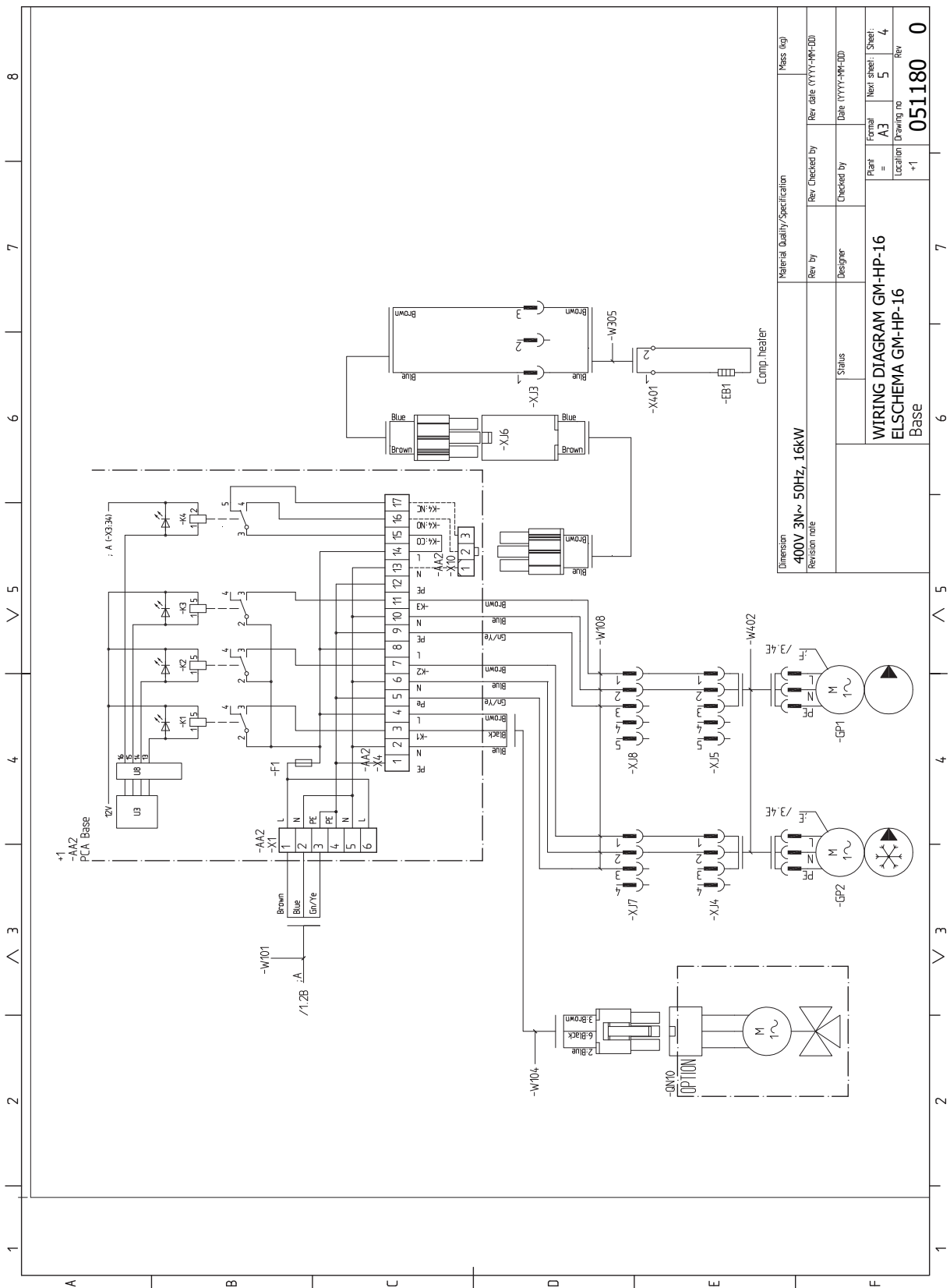


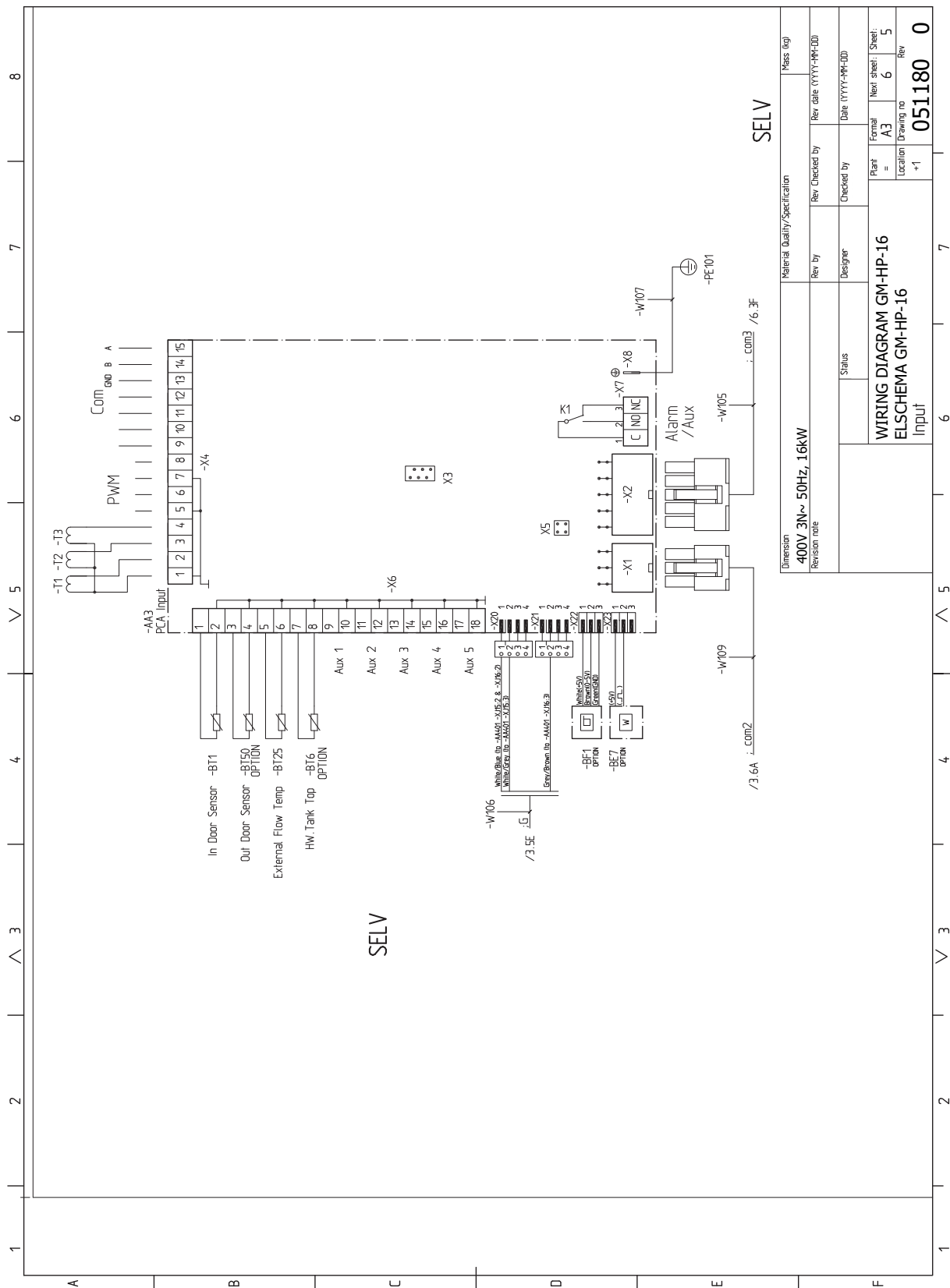
GreenMaster-HP-16

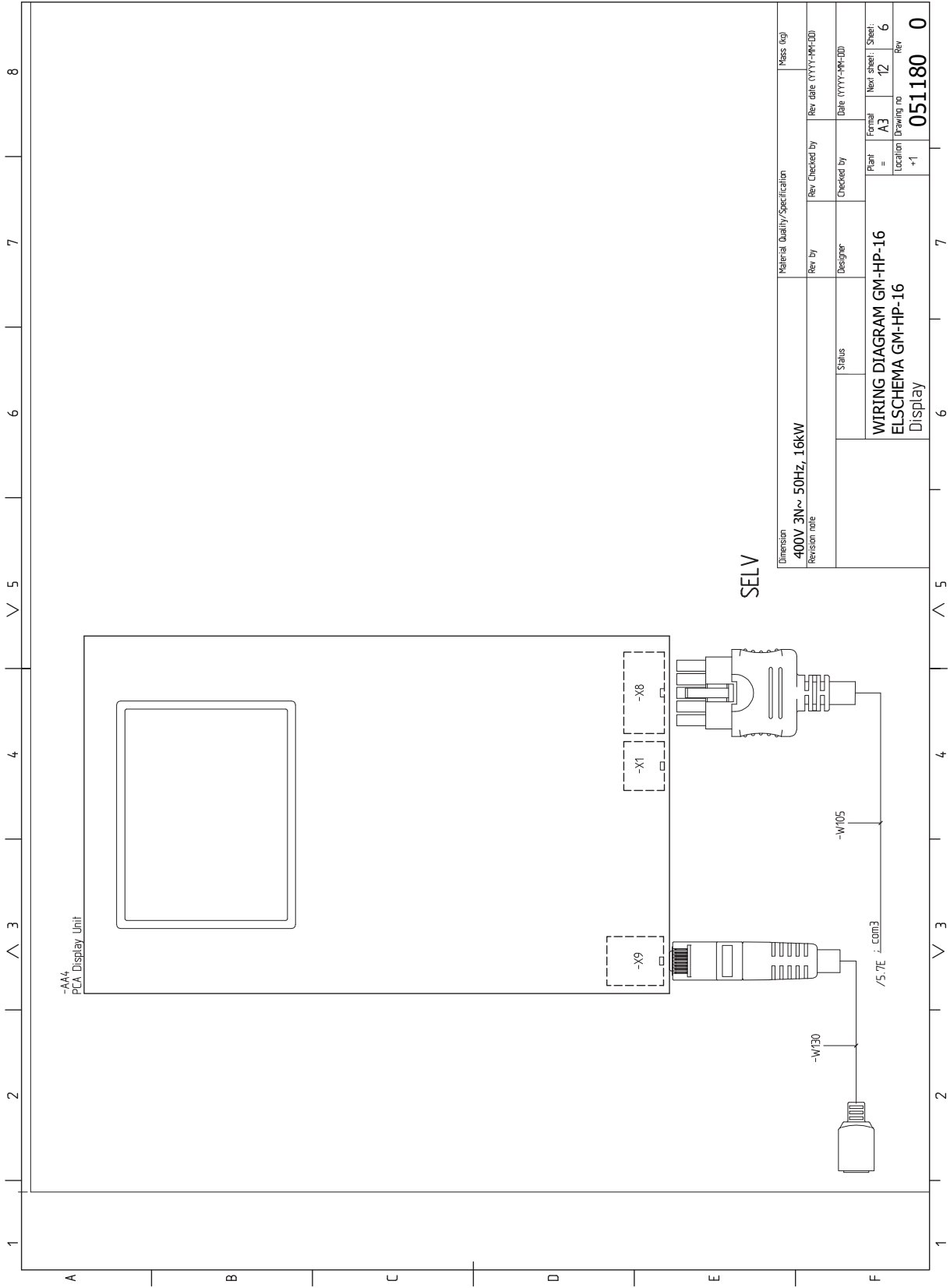












Dimension		Material Quality/Specification		Mass (kg)	
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Revision note		Designer		Date (YYY-MM-DD)	
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				Next sheet	
				12	
				Sheet	
				6	
				Rev	
				+1	
				051180	
				0	

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Item register

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