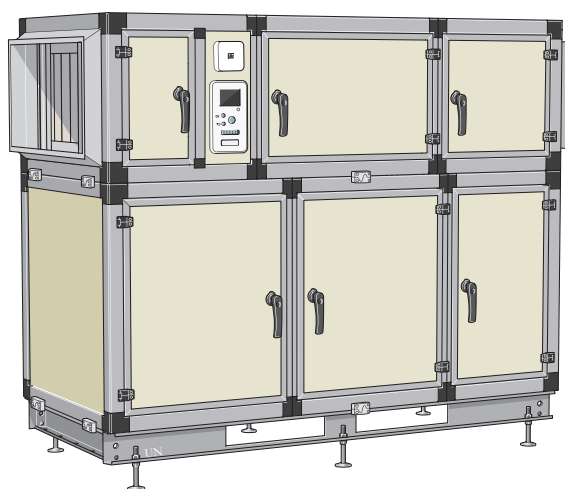




# Installer manual **GreenMaster-HP**

3-12/12, 3-16/12, 3-16/15, 4-16/12, 4-16/15, 4-16/20,  
4-16/30, 5-16/30

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 can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. The product is intended for use by experts or trained users in shops, hotels, light industry, farming and similar environments.

Children must be instructed/supervised to ensure that they do not play with the appliance.

Do not allow children to clean or maintain the appliance unsupervised.

This is an original manual. It may not be translated without the approval of NIBE AirSite.

Rights to make any design or technical modifications are reserved.

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.

## 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.



**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.

### ***Especially for units intended for R407C and R410A***

- Do not use other refrigerants than those intended for the unit.
- Do not use charging bottles. These types of bottles change the composition of the refrigerant, which makes the performance of the system worse.
- When filling refrigerant, the refrigerant must always leave the bottle in liquid form.
- R410A means that the pressure is about 1.6 times as high as for conventional refrigerants.
- The filling connections on units with R410A are different sizes, to prevent the system being filled with the incorrect refrigerant by mistake.

### **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 and R410A, fluorinated greenhouse gases with GWP values (Global Warming Potential) of 1774 and 2088 respectively. Do not release R407C or R410A 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 28)             |       |           |      |
|   | 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

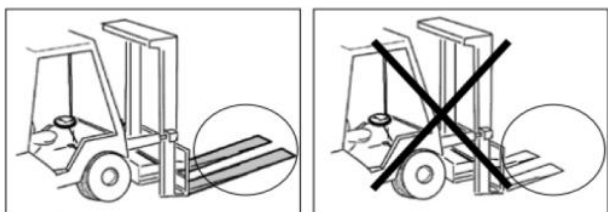
GreenMaster-HP is delivered complete in assembled version with a base frame attached below the heat pump section. On request, the unit can be supplied without liquid to allow easy disassembly and reassembly in properties where the transport route is narrow, or where it is not possible to make holes to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

### Unloading and lifting with forklift truck or pallet truck

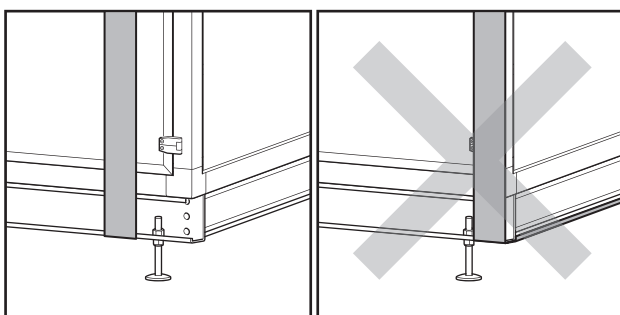
The truck's forks must be long enough to ensure there is no risk of the unit's underside being damaged. Make sure that the forks reach through to the other side of the unit.



### Unloading and lifting with crane

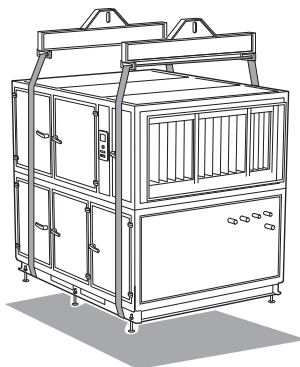
If the unit is delivered on a pallet, the unit must be lifted off using straps.

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

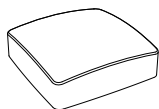
The unit has no drip mouldings between the unit and the base frame. A local fitter must install additional protection and insulation for the base frame, to ensure that water does not run down under the unit. NIBE AirSite design assumes that the unit is installed on a sealed roof, which is not at risk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

**NOTE**

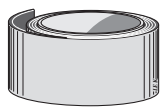
Water seals placed outdoors must be protected with heating cable (accessory set; electric heating coil) to prevent freezing when it is cold outdoors.

**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**

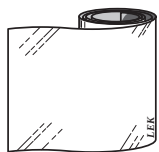
Outdoor temperature sensor  
1 x



Insulation tape  
1 x



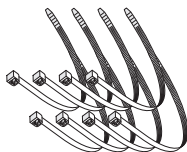
Temperature sensor  
4 x



Aluminium tape  
1 x



Heat conducting paste  
3 x



Cable tie  
8 x

**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**

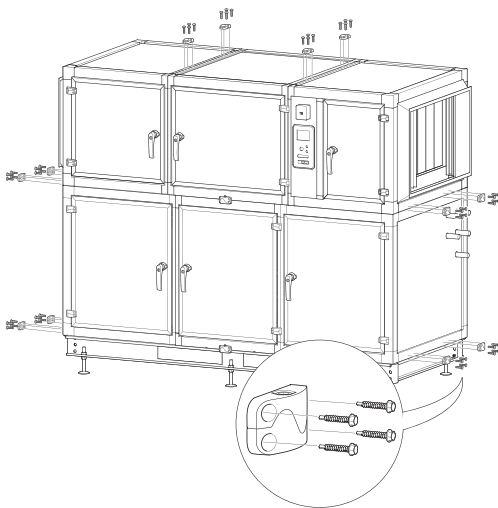
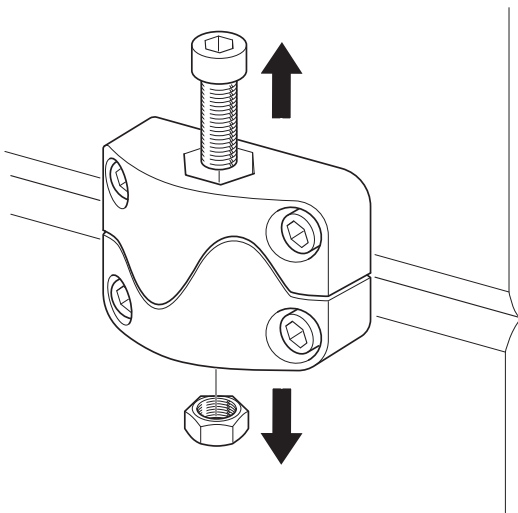
Some cables are installed with cable ties in the cable tray. Cut the cable ties when disassembling and replace them with new ones when assembling.

- 2.

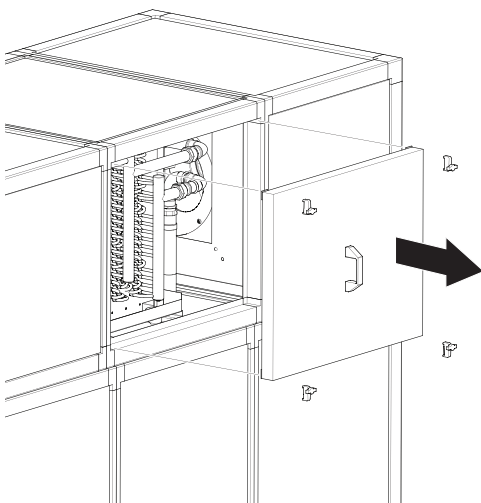
**TIP**

The cables are numbered for easy reassembly.

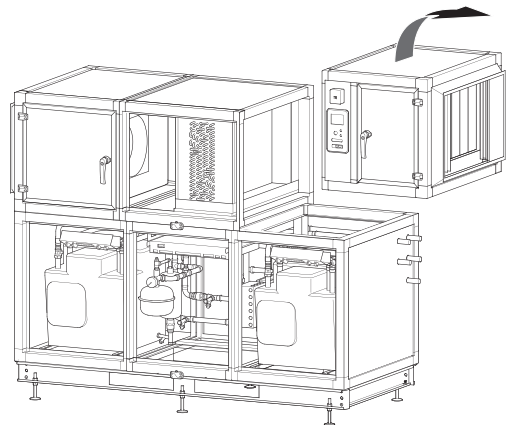
3. Open the cover on the filter section.
4. Carefully pull the air hose loose from the nozzle on the heat exchanger. Disconnect the hose from the clamps on the side and place it on the floor of the filter section.



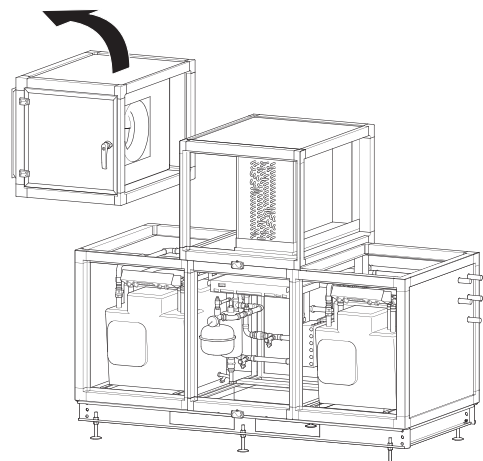
5. Unscrew the connecting brackets holding the various sections together.



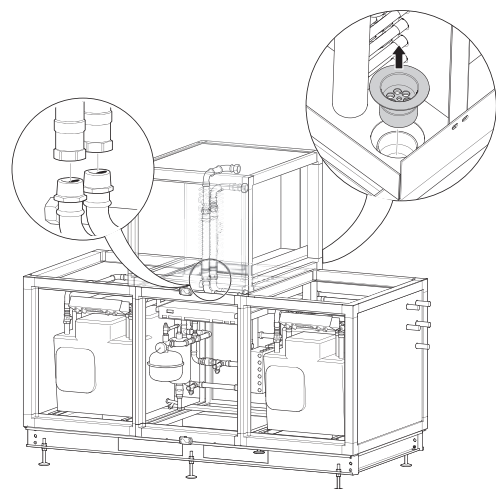
6. Lift off the rear inspection cover from the heat exchanger section.



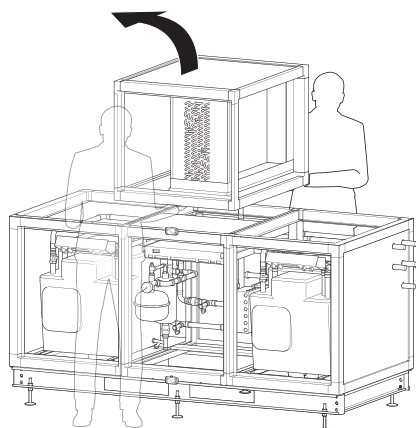
7. Lift off the filter section, taking care to disconnect all cables and pressure gauge connections.



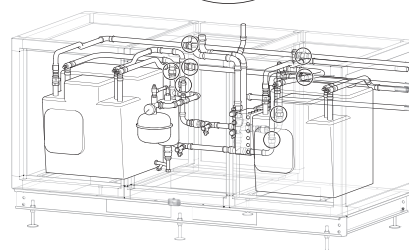
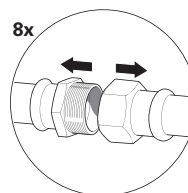
8. Lift off the fan section.



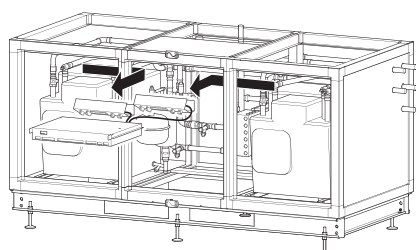
9. Unscrew the strainer valve, the water seal and the pipe connections under the heat exchanger section.



10. Lift off the heat exchanger.



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.

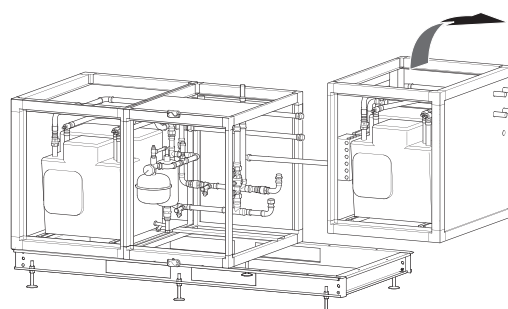


11. Dismantle the distribution box from the lower centre module, by loosening the screws on either side. A split box is installed in each cooling section, which must be disconnected. Disconnect the connectors between cooling section and split box, then take out the split boxes through the centre module.

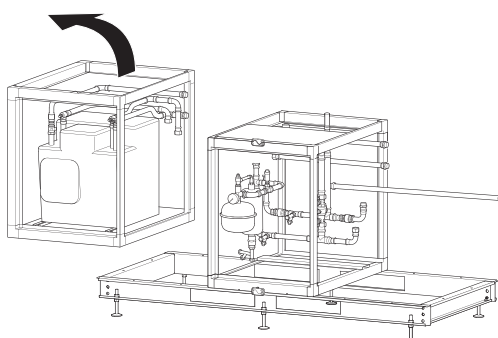


**TIP**

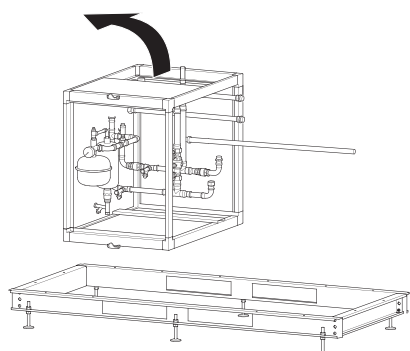
Disconnect and pull out the cooling modules according to the instructions on page 47 before dismantling the lower sections for easier handling.



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.

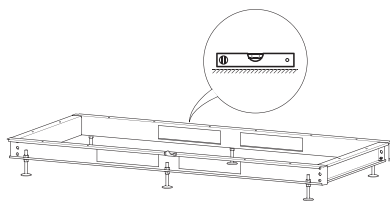


**NOTE**

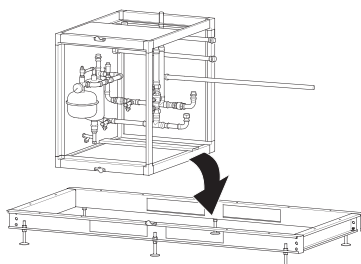
Take care not to damage the pipes.



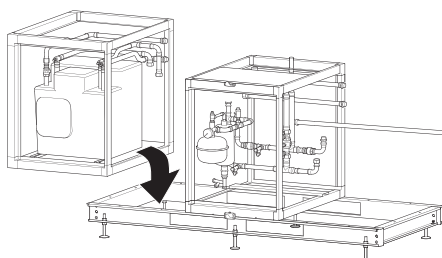
# Mounting



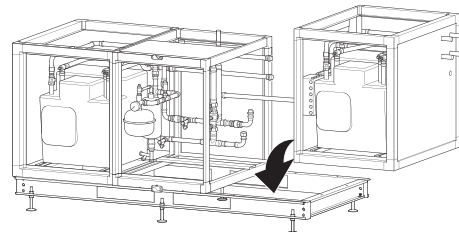
1. Place the base frame in the position where the unit is to stand, then adjust the base frame using the feet, so it is completely horizontal.



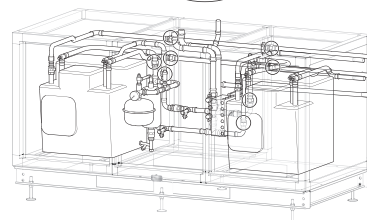
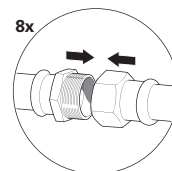
2. Lift on the centre module.



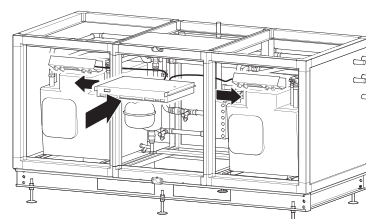
3. Lift on the left-hand module.



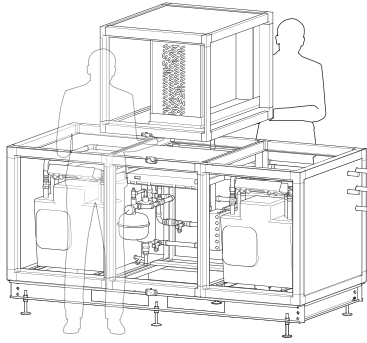
4. Lift on the right-hand module and install the condensation pipe in the cooling module that runs down to the floor.



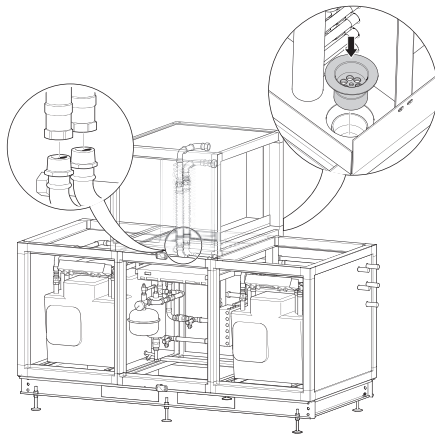
5. Connect the pipes as described.
6. Screw the wall bracket, which secures the expansion vessel to the stay, securely into place.
7. Plug in the connector on the level vessel.
8. Screw the screw joint, which secures the level vessel to the stay, securely into place.



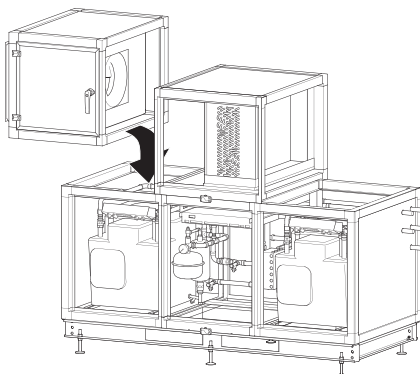
9. Insert the split boxes through the centre module and screw into place above the cooling modules, then install the distribution box in the centre module.



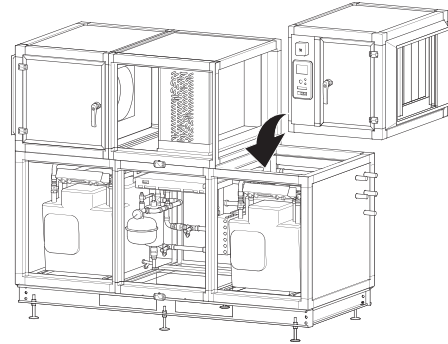
10. Carefully lift on the heat exchanger.



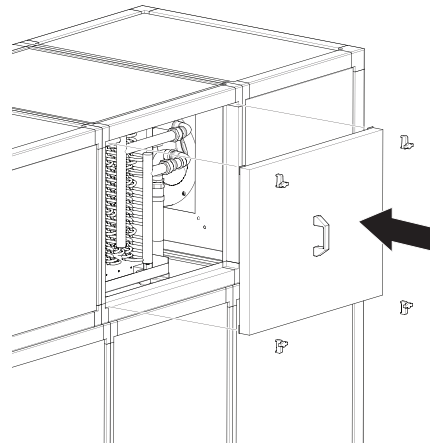
11. Connect the pipes under the heat exchanger and screw the strainer valve into place, and connect the water seal and the PVC pipe for the waste water.



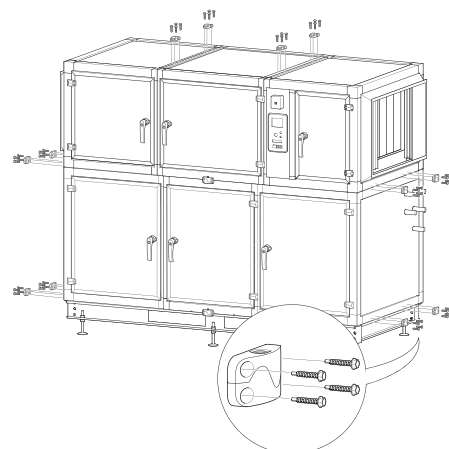
12. Lift on the fan section. Make sure you don't pinch the cables and connectors.



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!

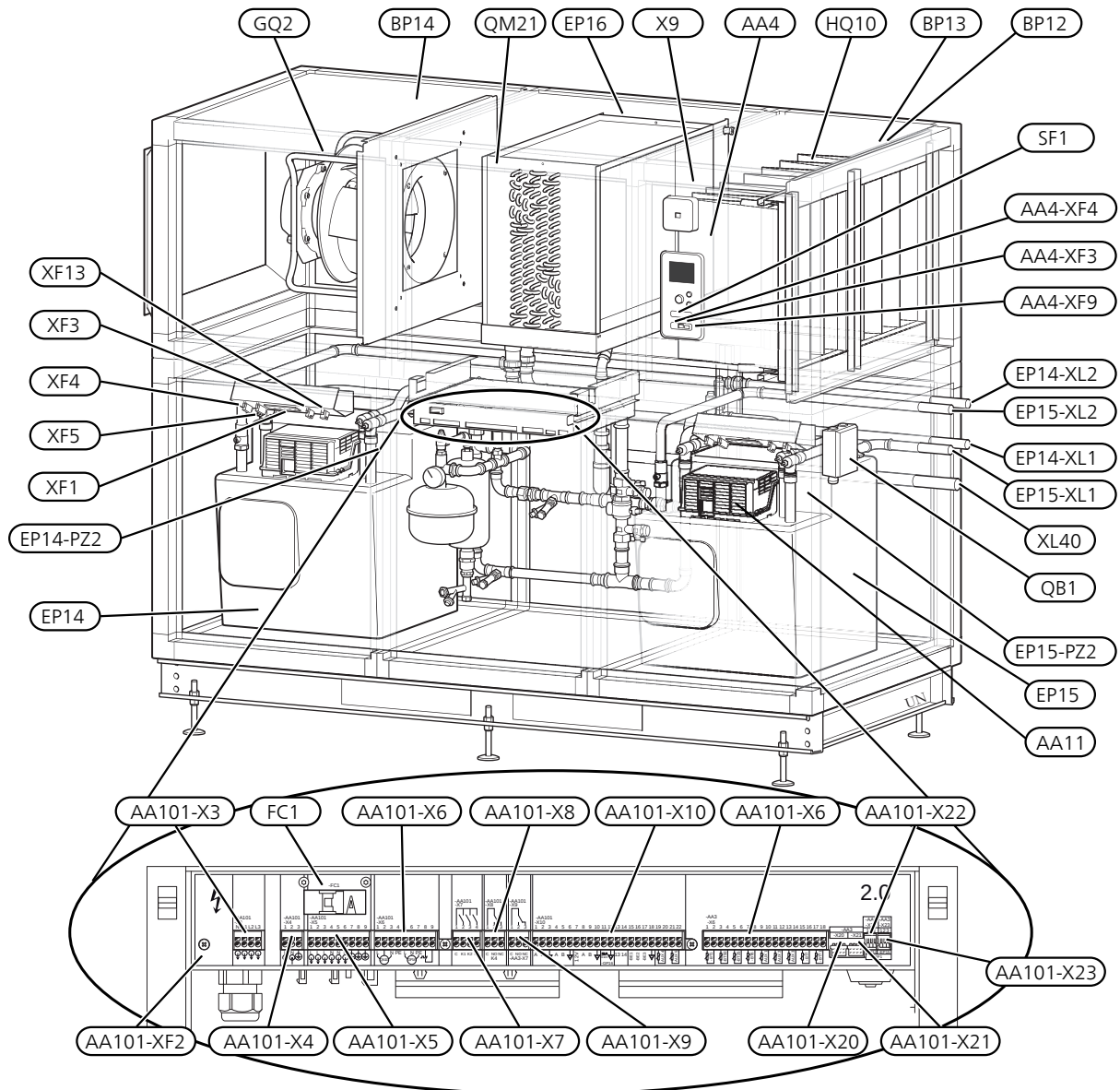
18. Prepare and fill the system according to the instructions in chapter *Commissioning and adjusting* on page 38.

# 3 Design of the exhaust air heat pump

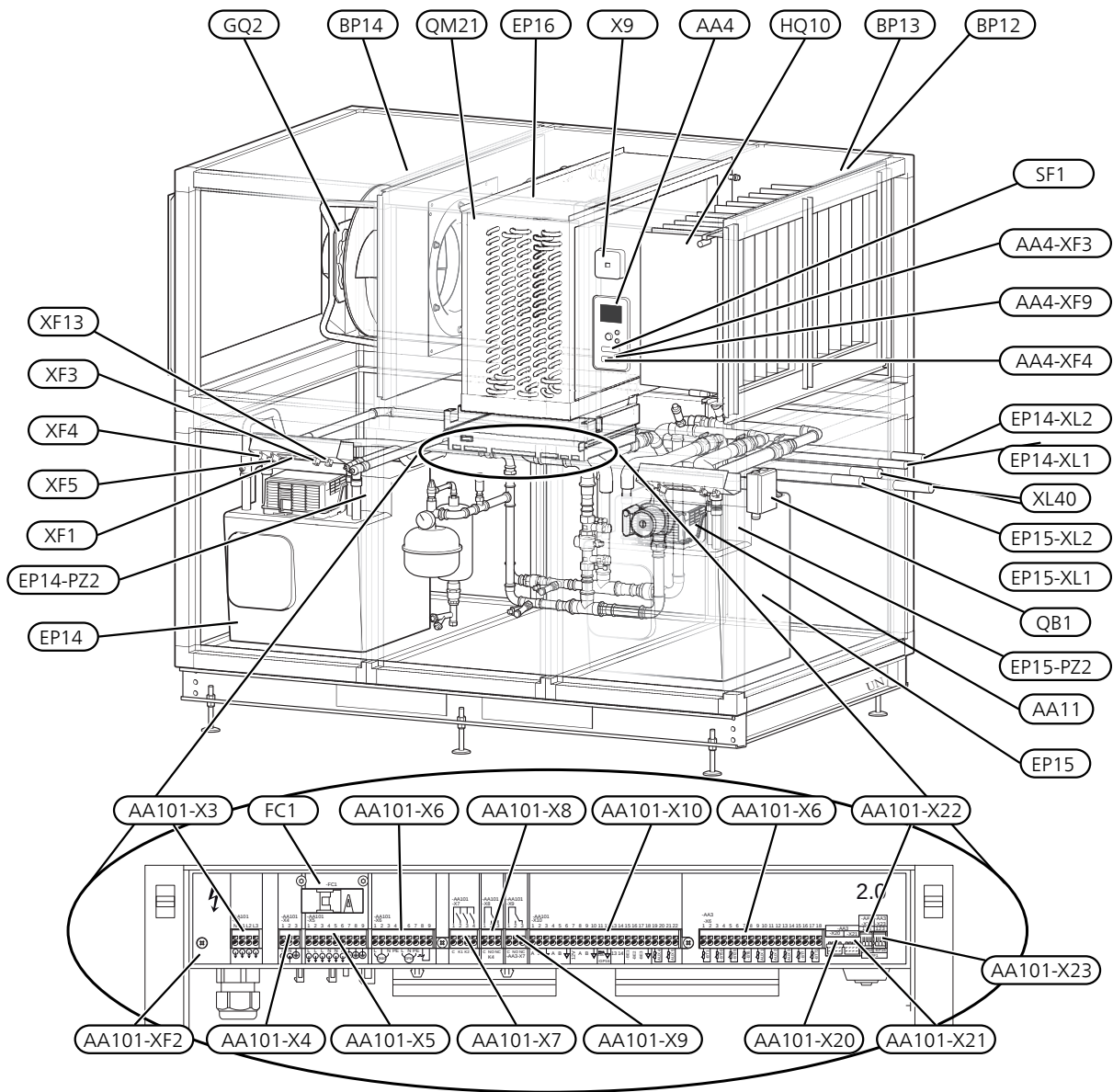
## General

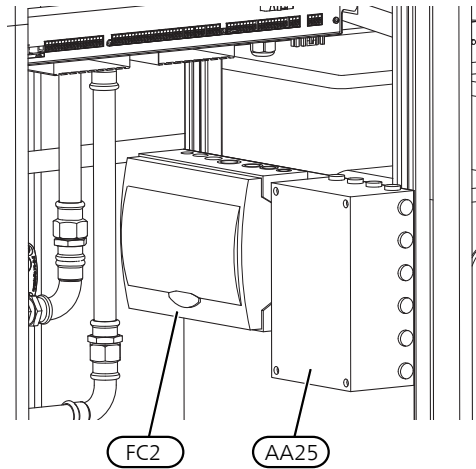
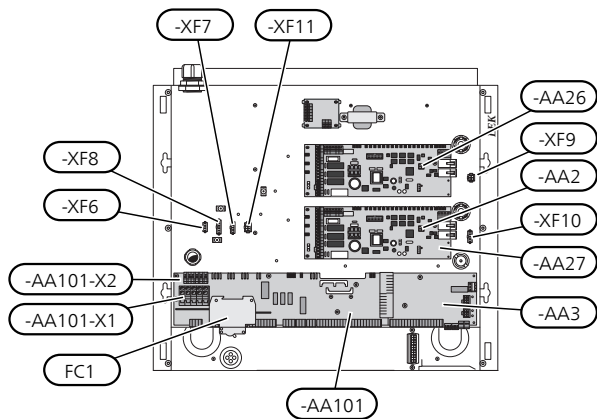
Picture and text describe a unit with left-hand inspection.  
3-12/12, 3-16/12, 3-16/15

On a unit with right-hand inspection, the fan (GQ2) is located at the top right and the filter (HQ10) to the left. In the lower part, the design is the same for both variants.



4-16/12, 4-16/15, 4-16/20, 4-16/30, 5-16/30





### Pipe connections

|          |                                   |
|----------|-----------------------------------|
| EP14-XL1 | Connection, heating medium return |
| EP14-XL2 | Connection, heating medium flow   |
| EP15-XL1 | Connection, heating medium return |
| EP15-XL2 | Connection, heating medium flow   |
| XL40     | Connection, condensate drain      |

### HVAC components

|      |                |
|------|----------------|
| EP14 | Cooling module |
| EP15 | Cooling module |

### Electrical components

|          |                                                      |
|----------|------------------------------------------------------|
| AA2      | Base card                                            |
| AA3      | Input circuit board                                  |
| AA3-X6   | Terminal block, sensor                               |
| AA3-X20  | Terminal block -EP14 -BP8                            |
| AA3-X21  | Terminal block -EP15 -BP8                            |
| AA3-X22  | Terminal block, flow meter -EP14 -BF1                |
| AA3-X23  | Terminal block, flow meter -EP15 -BF1                |
| AA4      | Display unit                                         |
| AA4-XF9  | Network socket (no function)                         |
| AA4-XF3  | USB socket                                           |
| AA4-XF4  | Service outlet (No function)                         |
| AA11     | Motor module                                         |
| AA23     | Communication board                                  |
| AA25     | AXC module                                           |
| AA26     | Base card 2                                          |
| AA27     | Relay board for base                                 |
| AA101    | Interface board                                      |
| AA101-X1 | Terminal block, incoming electrical supply           |
| AA101-X2 | Terminal block, supply -EP14                         |
| AA101-X3 | Terminal block, operating voltage out -X4            |
| AA101-X4 | Terminal block, operating voltage in (tariff option) |
| AA101-X5 | Terminal block, supply, external accessories.        |
| AA101-X6 | Terminal block -QN10 and -GP16                       |

|           |                                                                  |
|-----------|------------------------------------------------------------------|
| AA101-X7  | Terminal block, step-controlled or shunted additional heat       |
| AA101-X8  | Emergency mode relay                                             |
| AA101-X9  | Alarm relay, AUX relay                                           |
| AA101-X10 | Communication, PWM, power supply                                 |
| FC1       | Miniature circuit-breaker                                        |
| FC2       | Fuse module                                                      |
| QB1       | Switch                                                           |
| RA2, RA3  | Choke                                                            |
| RF3       | EMC-filter                                                       |
| SF1       | Switch                                                           |
| X9        | Network socket                                                   |
| XF1       | Connector, electrical supply to compressor, cooling module -EP14 |
| AA101-XF2 | Connector, electrical supply to compressor, cooling module -EP15 |
| XF3       | Connector, compressor heater -EP14                               |
| XF4       | Connector, brine pump, cooling module                            |
| XF5       | Connector, heating medium pump, cooling module                   |
| XF6       | Connector, compressor heater -EP15                               |
| XF7       | Connector, brine pump, cooling module -EP15                      |
| XF8       | Connector, heating medium pump, cooling module -EP15             |
| XF9       | Communication motor module -EP15                                 |
| XF10      | Communication motor module -EP14                                 |
| XF11      | Pumps, compressor heater -EP14                                   |
| XF13      | Communication motor module                                       |

### Ventilation

|      |                                   |
|------|-----------------------------------|
| BP12 | Pressure sensor, exhaust air duct |
| BP13 | Pressure sensor, filter           |
| BP14 | Pressure sensor, fan              |
| EP16 | Heat exchanger                    |
| QM21 | Vent valve, heat exchanger        |
| GQ2  | Fan                               |

HQ10    Air filter

### **Miscellaneous**

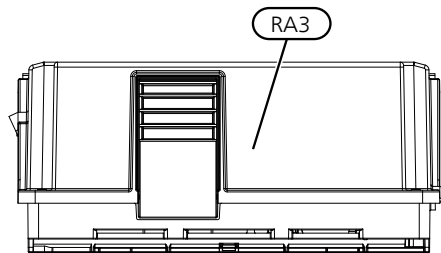
PZ2       Identification plate, cooling module

Designations according to standard EN 81346-2.

## Motor modules

GreenMaster-HP has various motor modules on the cooling modules (EP14, EP15). The motor module on EP15 differs between the different variants of GreenMaster-HP.

### Motor module EP14

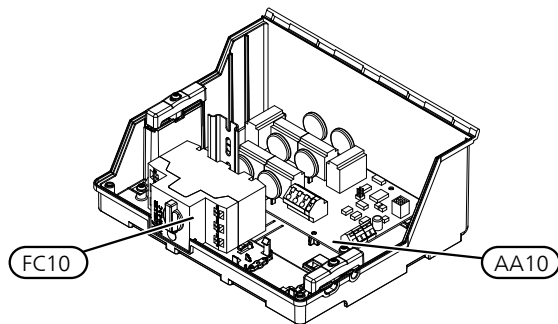


### Electrical components

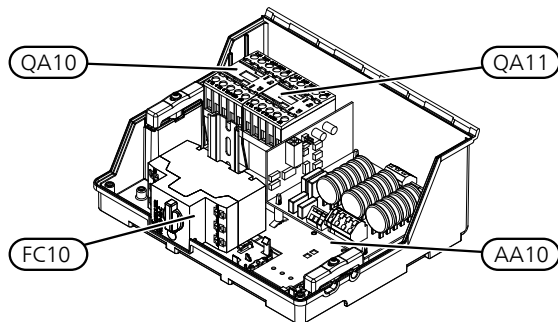
|      |                           |
|------|---------------------------|
| AA10 | Soft-start card           |
| FC10 | Motor cut-out             |
| FC1  | Miniature circuit-breaker |
| QA10 | Contactor, compressor     |
| QA11 | Contactor, compressor     |
| RA3  | Choke                     |

### Motor module (AA11) EP15

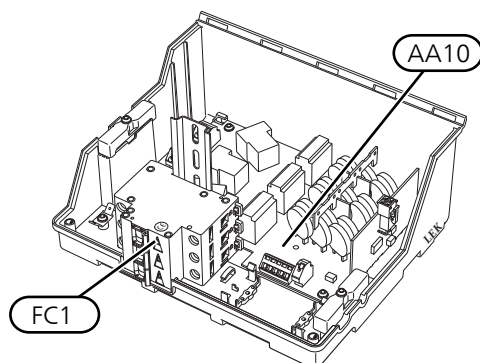
#### *GreenMaster HP x-xx/12*



#### *GreenMaster HP x-xx/15*



#### *GreenMaster HP x-xx/20, x-xx/30*





## Cooling modules

GreenMaster-HP has two cooling modules, EP14 and EP15.

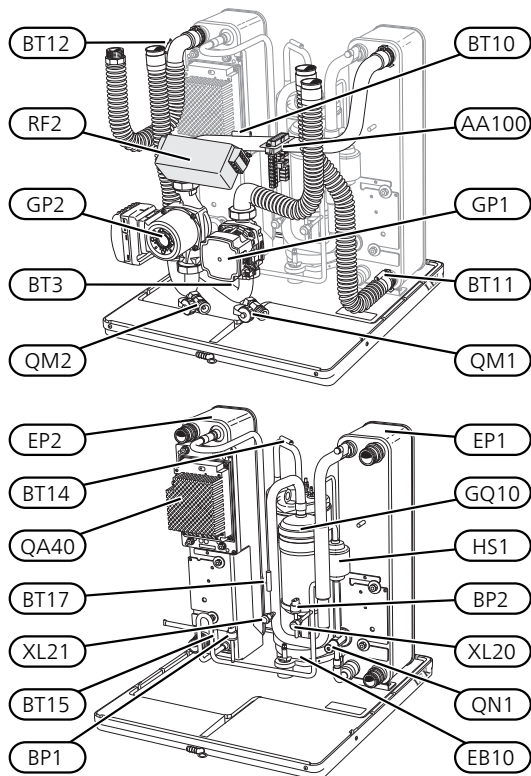


### TIP

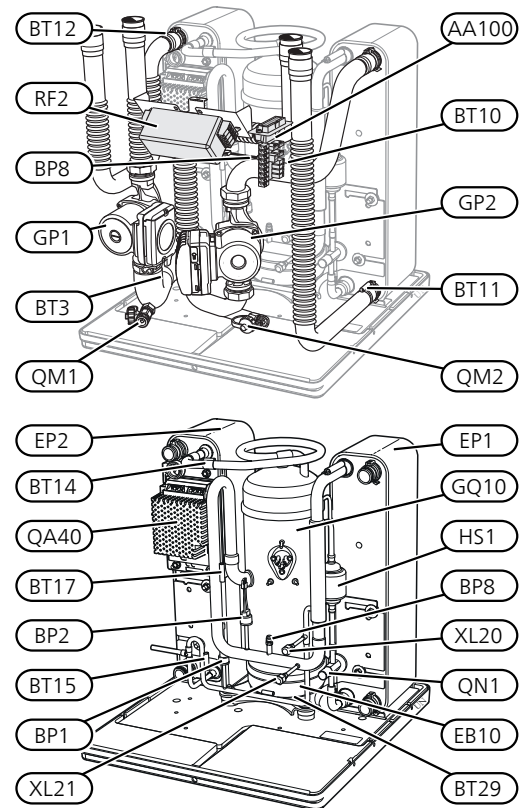
The upper image shows the whole cooling module. In the lower image, the pipe section is hidden in order to show the compressor section.

### Cooling module EP14

*GreenMaster-HP x-12/xx*

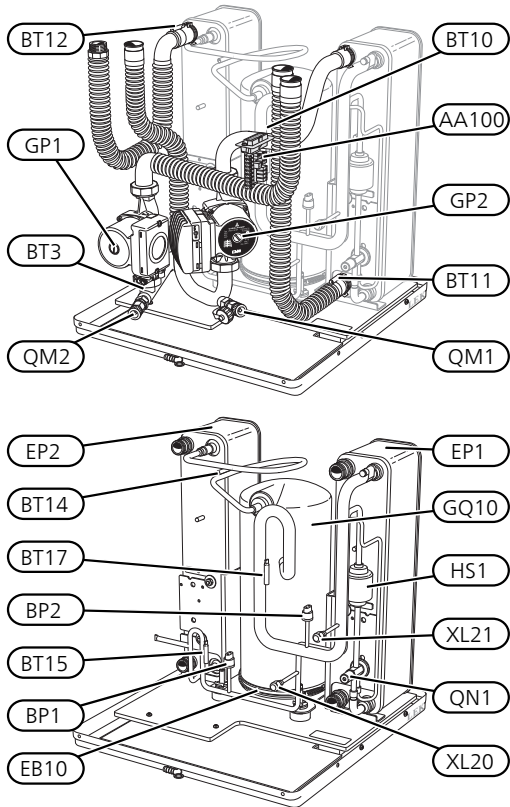


### *GreenMaster-HP x-16/xx*

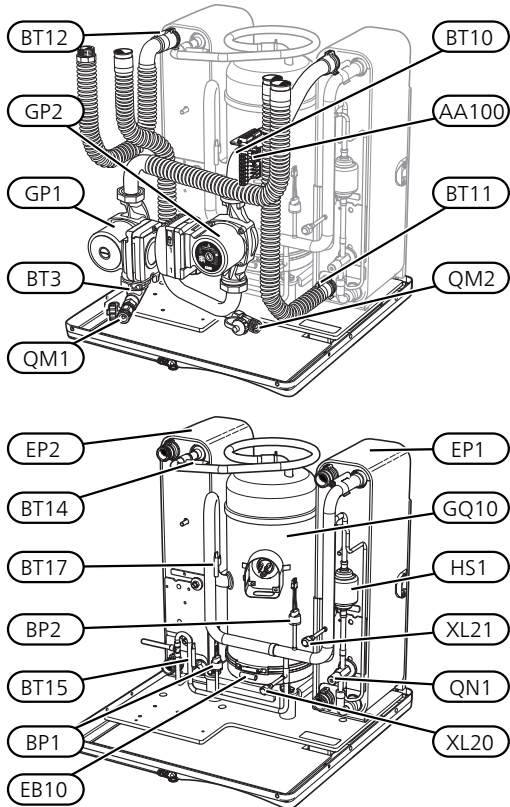


## Cooling module EP15

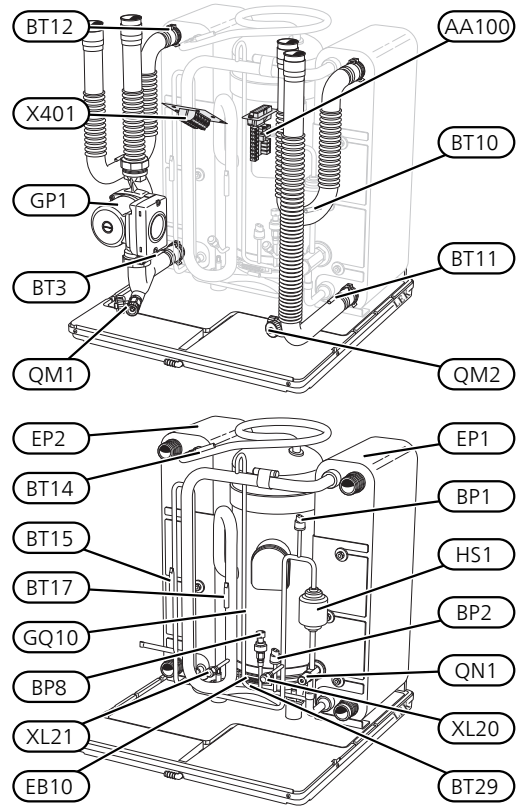
### GreenMaster-HP x-xx/12



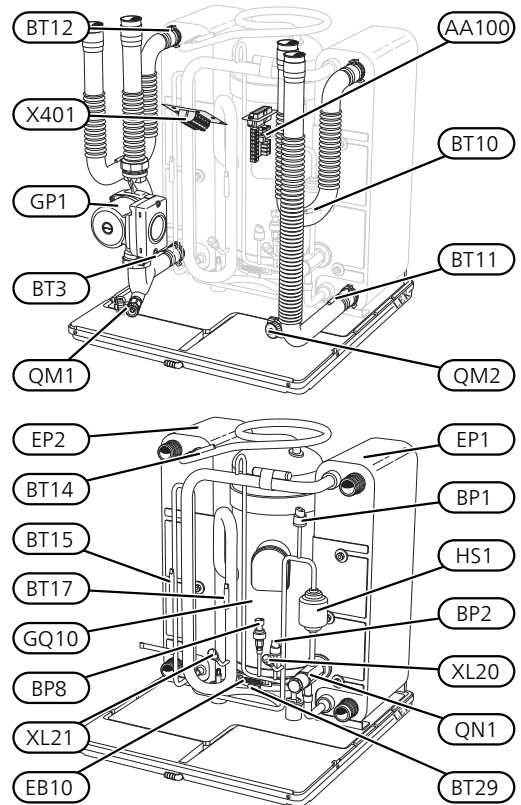
### GreenMaster-HP x-xx/15



## GreenMaster-HP x-xx/20



## GreenMaster-HP x-xx/30



### **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                    |
| BP8  | Sensor, low pressure                       |
| 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            |
| BT29 | Temperature sensor, compressor             |

### **Electrical components**

|       |                                              |
|-------|----------------------------------------------|
| AA100 | Joint card                                   |
| EB10  | Compressor heater                            |
| QA40  | Inverter                                     |
| RF2   | EMC-filter                                   |
| X401  | Joint connector, compressor and motor module |

### **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

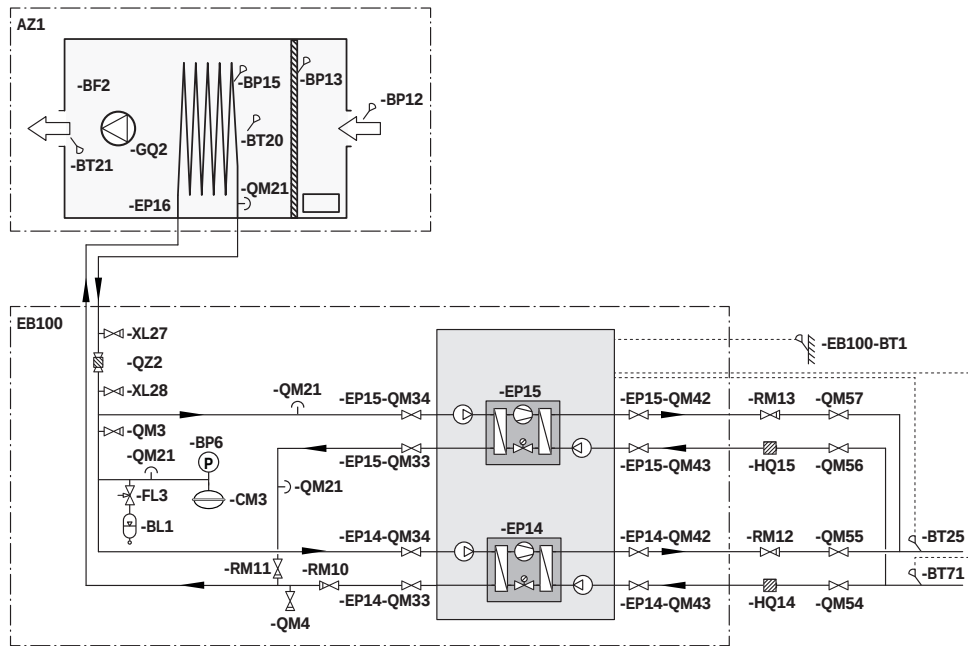
GreenMaster-HP consists of two cooling modules, circulation pumps, air treatment unit, brine circuit and control system, with the option for additional heat. GreenMaster-HP is connected to the property's heating medium circuit.

## Explanation

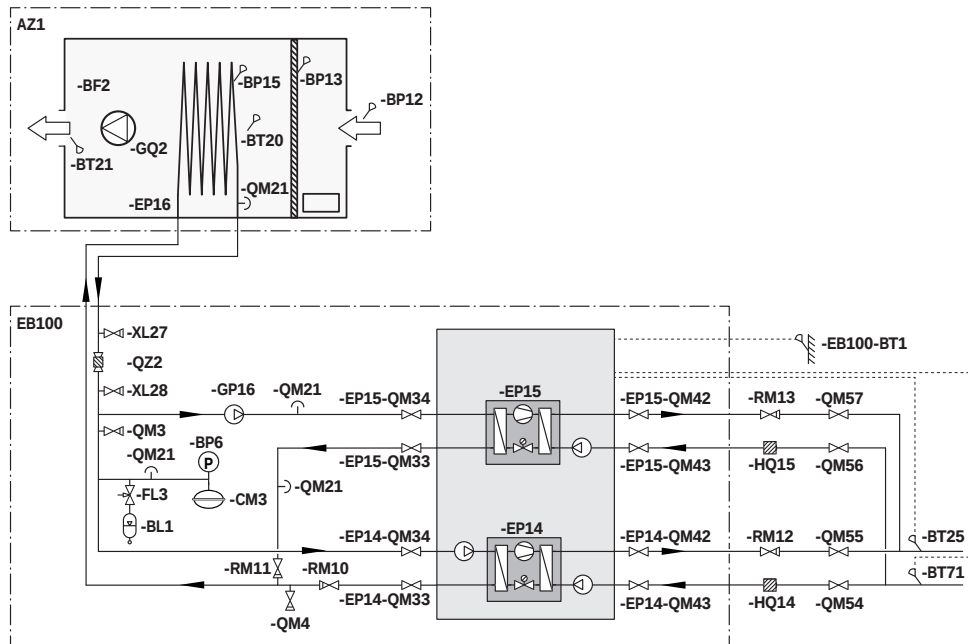
|              |                                                |
|--------------|------------------------------------------------|
| <b>AZ1</b>   | Air treatment section                          |
| BF2          | Air flow function                              |
| BP12         | Differential pressure 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                                 |
| <b>EB100</b> | Heat pump system                               |
| BL1          | Level monitor                                  |
| BP6          | Manometer, brine side                          |
| BT1          | Temperature sensor, outdoor                    |
| CM3          | Expansion vessel, closed, brine side           |
| EP14         | Cooling module A                               |
| EP15         | Cooling module B                               |
| FL3          | Safety valve, brine                            |
| GP16         | Brine pump <sup>1</sup>                        |
| 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 - QM57  | Shut-off valve, heating medium side            |
| QZ2          | Filler valve/Filterball                        |
| RM10 - RM13  | Non-return valve                               |
| XL27, XL28   | Connection, filling brine                      |

<sup>1</sup> Included in GreenMaster-HP 4-16/20, 4-16/30 and 5-16/30.  
The brine pump (GP16) is installed outside the cooling module.

GreenMaster HP x-xx/12, x-xx/15

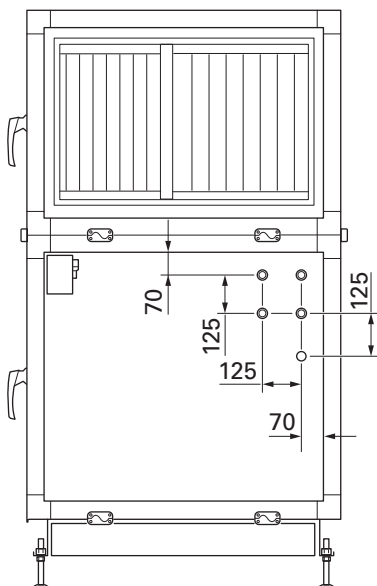


GreenMaster HP x-xx/20, x-xx/30

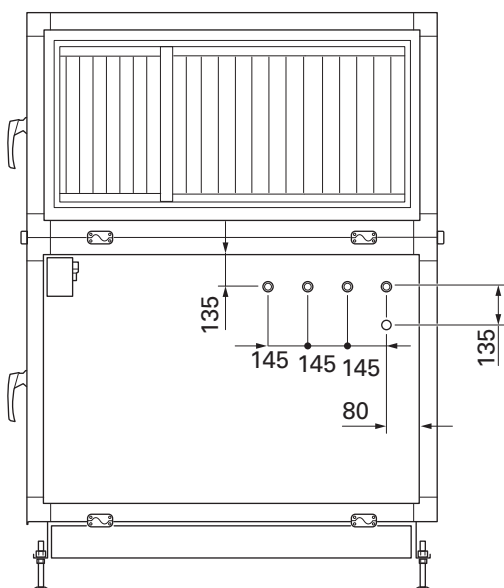


## Dimensions and pipe connections

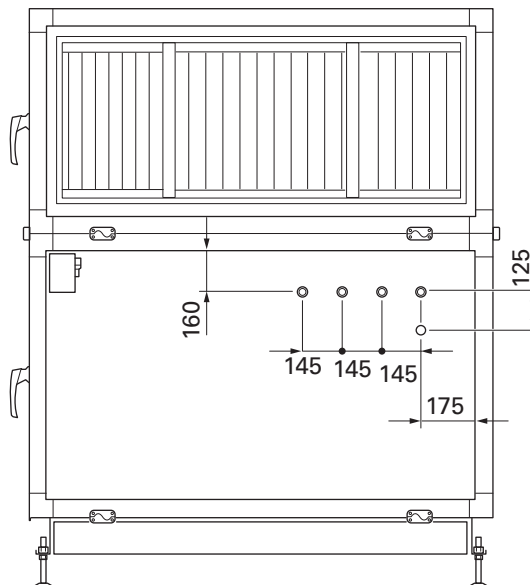
3-12/12, 3-16/12, 3-16/15



4-16/12, 4-16/15, 4-16/20, 4-16/30



5-16/30



### Pipe dimensions

| Connection                           |                                                                                        |
|--------------------------------------|----------------------------------------------------------------------------------------|
| EP14-XL1 Heating medium IN (return)  | 28 mm                                                                                  |
| EP14-XL2 Heating medium OUT (supply) | 28 mm                                                                                  |
| EP15-XL3 Heating medium IN (return)  | 3-12/12, 3-16/12, 3-16/15, 4-16/12, 4-16/15: 28 mm<br>4-16/20, 4-16/30, 5-16/30: 35 mm |
| EP15-XL4 Heating medium OUT (supply) | 3-12/12, 3-16/12, 3-16/15, 4-16/12, 4-16/15: 28 mm<br>4-16/20, 4-16/30, 5-16/30: 35 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.



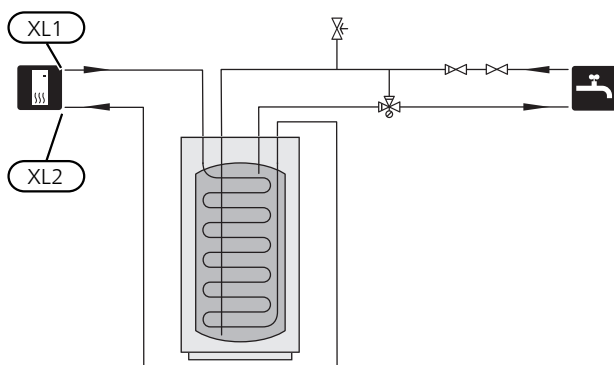
#### Caution

GreenMaster-HP is designed so that heating production can be performed using one or two cooling modules. However, this entails different pipe or electrical installations.

## Cold and hot water

### Connecting the hot water heater

- Fit shut-off valve, non-return valve and safety valve as illustrated.
- 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.
- A mixer valve must also be installed, if the factory setting for hot water is changed. National regulations must be observed.
- Hot water production is activated in the start guide or in menu 5.2.



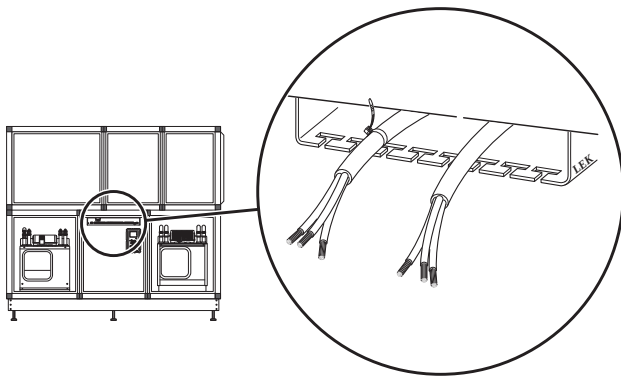


# 5 Electrical connections

## 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 mm<sup>2</sup> up to 50 m, for example EKKX or LiYY or equivalent.
- When cable routing in GreenMaster-HP, cable grommets must be used. Secure the cables in the grooves in the panel using cable ties (see image).



### 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.



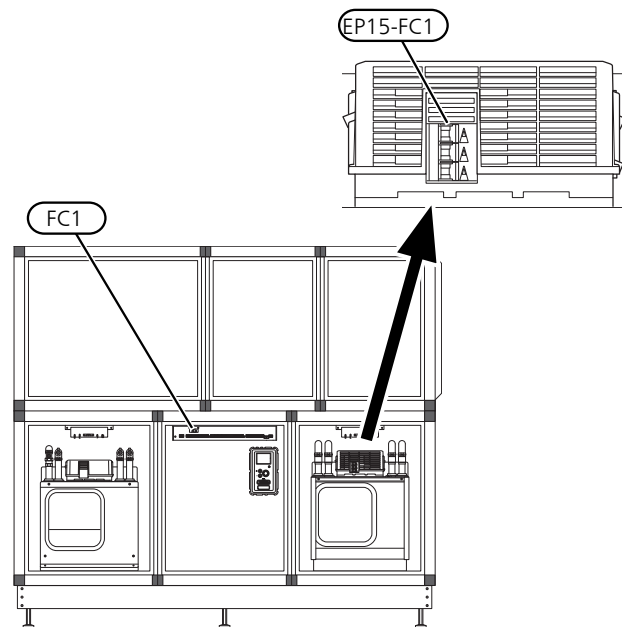
### NOTE

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).

Fuse (EP15-FC1) cuts the power to the compressor if the current is too high.

## Resetting

Fuse (EP15-FC1) is accessible behind the front cover. The miniature circuit breakers are reset by pushing back to the fused position.



### Caution

Check the miniature circuit-breakers. They may have tripped during transportation.

## Accessibility, electrical connection

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

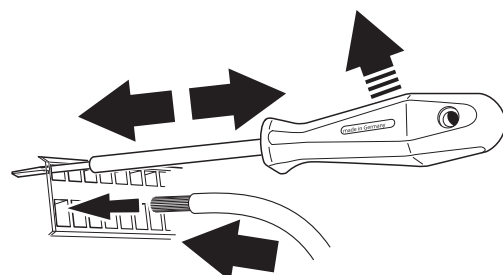


### NOTE

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

## Cable lock

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





## Connections

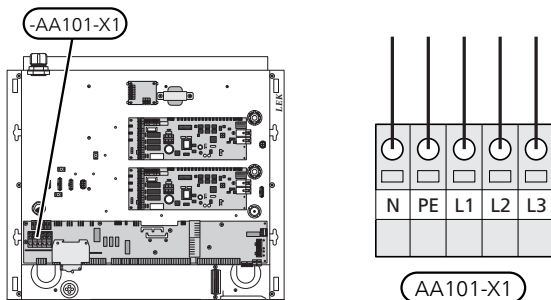


### NOTE

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

### Power connection

GreenMaster-HP has to be installed with a disconnection option on the supply cable. Minimum cable area has to be dimensioned based on the fuse rating used. Enclosed cable for incoming supply electricity has to be connected between terminal block X1 and the safety switch on the outside of the unit. Power supply connection has to be routed to the safety switch. The safety switch must not be moved from its position. All installation has to be performed in accordance with applicable regulations.



### NOTE

It is important that the electrical connection is made with the correct phase sequence. With the incorrect phase sequence, the compressor does not start and an alarm is displayed.

### Tariff control

If the voltage to the compressors disappears for a given period, simultaneous blocking of these must take place via software controlled input (AUX input) to avoid alarm, see page 29.

At the same time, external operating voltage for the control system must be connected to GreenMaster-HP, see section "Connecting external operating voltage for the control system".

## Connecting external operating voltage for the control system

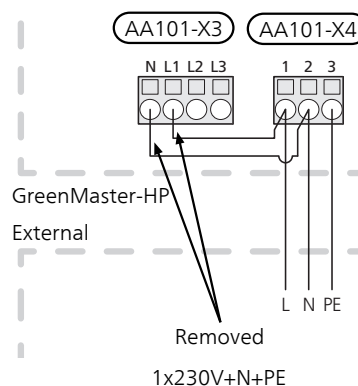


### NOTE

Mark up any junction boxes with warnings for external voltage.

When connecting external operating voltage with separate earth-fault breaker, remove the cables between terminal block AA101-X3:N and AA101-X4:2 and between terminal block AA101-X3:L1 and AA101-X4:1 (as illustrated).

Operating voltage (1x230V+N+PE) is connected to AA101-X4:3 (PE), AA101-X4:2 (N) and AA101-X4:1 (L) (as illustrated).

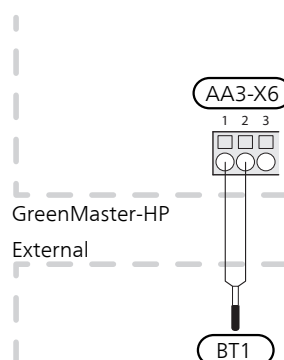


### Outdoor temperature sensor (BT1)

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

Connect the sensor to terminal block AA3-X6:1 and AA3-X6:2. Use a twin core cable with a cable area of at least 0.5 mm<sup>2</sup>.

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

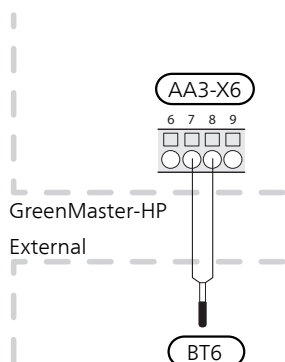


### Temperature sensor, hot water charging (BT6)

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

Connect the sensor to terminal block AA3-X6:7 and AA3-X6:8. Use a twin core cable with a cable area of at least 0.5 mm<sup>2</sup>.

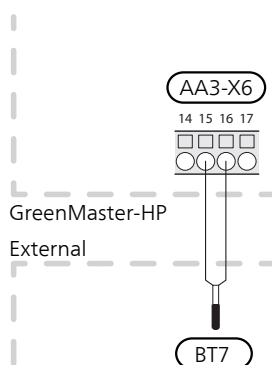
Hot water charging is activated in menu 5.2 or in the start guide.



### Temperature sensor, hot water top (BT7)

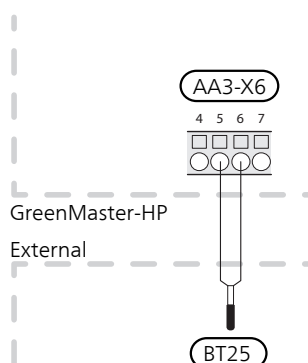
A temperature sensor for hot water top (BT7) can be connected to GreenMaster-HP for showing the water temperature at the top of the tank (if possible).

Connect the sensor to terminal block AA3-X6:15 and AA3-X6:16. Use a twin core cable with a cable area of at least 0.5 mm<sup>2</sup>.



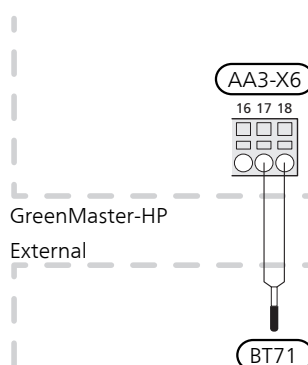
### Temperature sensor, external supply line (BT25)

Connect temperature sensor, external supply line (BT25) to terminal block AA3-X6:5 and AA3-X6:6. Use a twin core cable with a cable area of at least 0.5 mm<sup>2</sup>.



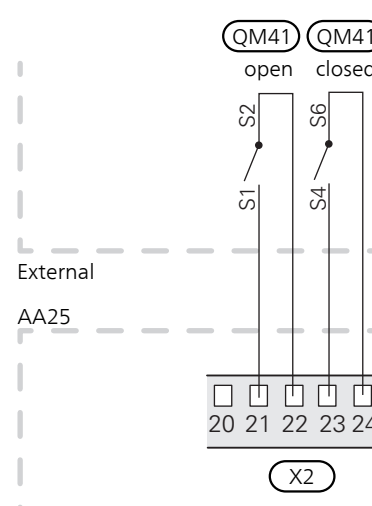
### Temperature sensor, external return line (BT71)

Connect temperature sensor, external return line (BT71) to terminal block AA3-X6:17 and AA3-X6:18. Use a twin core cable with a cable area of at least 0.5 mm<sup>2</sup>.



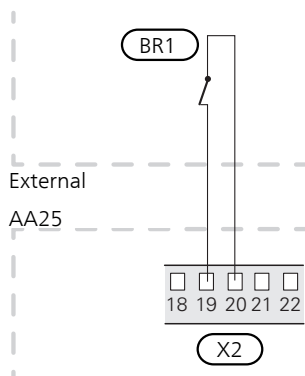
### Connection of fire damper (QM41)

The fire damper (QM41) has two sensors, one for each end position. Terminal block X2:21-22 open and terminal block X2:23-24 closed.



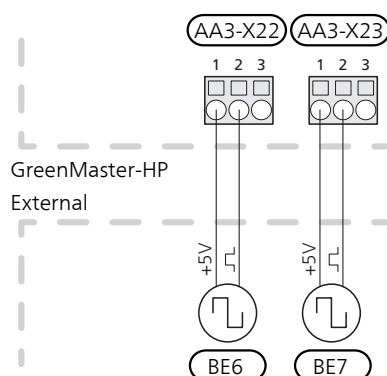
## Connection of fire alarm (BR1)

Connect fire alarm (BR1) to accessory board (AA5) terminal block X2:19-20.



## Connecting external energy meter

One or two energy meters (BE6, BE7) are connected to terminal block X22 and/or X23 on input board (AA3).



Activate the energy meter(s) in menu 5.2.4 and then set the desired value (energy per pulse) in menu 5.3.21.

## Optional connections

### Load monitor

When many electrical appliances 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 fuse tripping. GreenMaster-HP has integrated load monitors that control the power steps for the electric additional heat by redistributing the power between the different phases or 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 other current consumption is reduced.

### Connecting current sensors

A current sensor (BE1 - BE3) must be installed on each incoming phase conductor into the electrical distribution unit, to measure the current. The electrical distribution unit is an appropriate installation point.

Connect the current sensors to a multi-core cable in an enclosure next to the electrical distribution unit. Use unscreened multi-core cable of at least 0.5 mm<sup>2</sup>, from the enclosure to GreenMaster-HP.

Connect the cable to terminal block AA101-X10:15 to AA101-X10:16 and AA101-X10:17 as well as to the common AA101-X10:18 terminal block for the three current sensors.

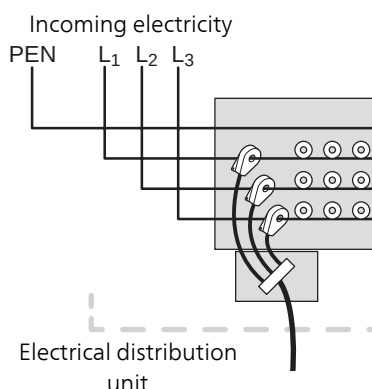
The value for the size of the fuse is set in menu 5.1.12 to correspond with the size of the property's main fuse. Here it is also possible to adjust the current sensor's transformer ratio.

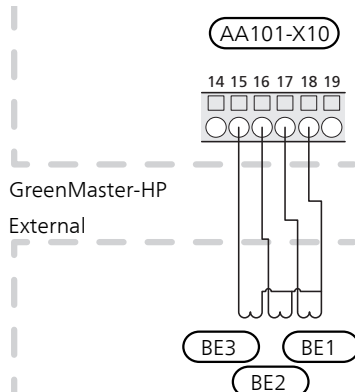
Enclosed current sensors have a transformer ratio of 300 and, if these are used, the incoming current must not exceed 50 A.



#### NOTE

The voltage from the current sensor to the input board must not exceed 3.2 V.





## Step controlled additional heat



### NOTE

Mark the relevant electrical cabinet with a warning about external voltage, in those cases where a component in the cabinet has a separate supply.

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

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

Connect the common phase to terminal block AA101-X7:1.

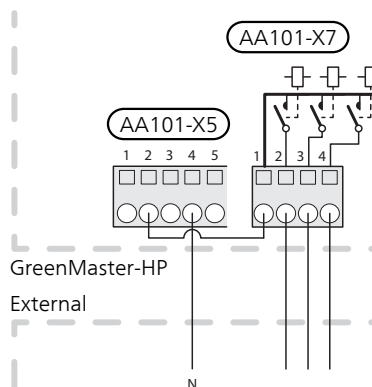
Step 1 is connected to terminal block AA101-X7:2.

Step 2 is connected to terminal block AA101-X7:3.

Step 3 is connected to terminal block AA101-X7:4.

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

All additional heat can be blocked by connecting a potential-free switch function to AUX input on terminal block AA3-X6 and AA101-X10. The function must be activated in menu 5.4.



## Step-controlled additional heat via 0-10 V

Using the accessory AXC 50, external step-controlled additional heat can be used with 0-10 V output signal, for example to a district heating valve.

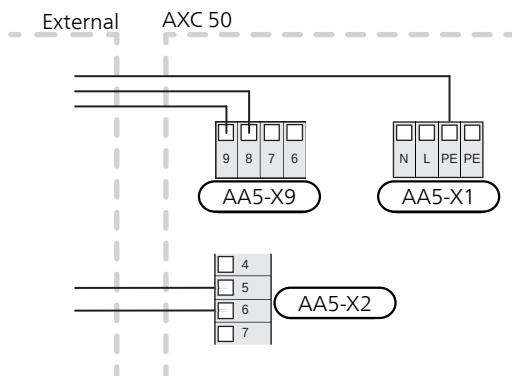
0-10 V signal and measuring neutral are connected to terminal block AA5-X2:5,6. 230 V AC supply has to be connected to terminal block AA5-X9:7,8 and AA5-X1:PE.

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



### NOTE

District heating valve with supply other than 230 V must be powered from a separate supply source.



## Shunt controlled additional heat



### NOTE

Mark up any junction boxes with warnings for external voltage.

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

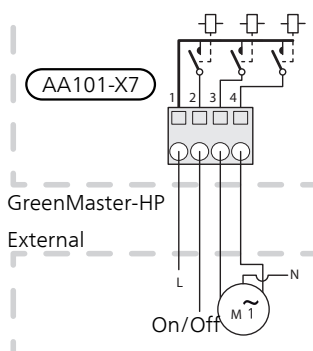
The connection requires that the boiler sensor (BT52) is connected to one of the AUX inputs in GreenMaster-HP, see page 35. The sensor is only selectable when "shunt controlled add. heat" is selected in menu 5.1.12.

GreenMaster-HP controls a shunt valve and start signal for the additional heating using three relays. If the unit does not manage to maintain the correct supply temperature, the additional heat starts. When the boiler sensor (BT52) exceeds the set value, GreenMaster-HP sends a signal to the shunt (QN11) to open from the additional heat. The shunt (QN11) is controlled to ensure the true supply temperature corresponds with the control system's theoretically calculated set point value. When the heating demand drops sufficiently so that additional heat is no longer required, the shunt (QN11) closes completely. Factory-set minimum operating time for the boiler is 12 hours (can be adjusted in menu 5.1.12).

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

Connect the shunt motor (QN11) to terminal block AA101-X7:4 (230 V, open) and 3 (230 V, close).

To control switching the additional heat on and off, connect it to terminal block AA101-X7:2.



All additional heat can be blocked by connecting a potential-free switch function to AUX input on terminal block AA3-X6 and AA101-X10. The function must be activated in menu 5.4.

## Additional heat in tank



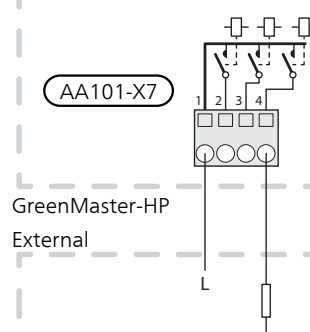
### NOTE

Mark up any junction boxes with warnings for external voltage.

This connection allows an external additional heater in the tank to assist with the production of hot water when the compressors are busy producing heating.

Additional heat in tank is activated in menu 5.1.12.

To control switching the additional heat on and off in the tank, connect it to terminal block AA101-X7:4.



All additional heat can be blocked by connecting a potential-free switch function to AUX input on terminal block AA3-X6 and AA101-X10. The function must be activated in menu 5.4.

## Relay output for emergency mode

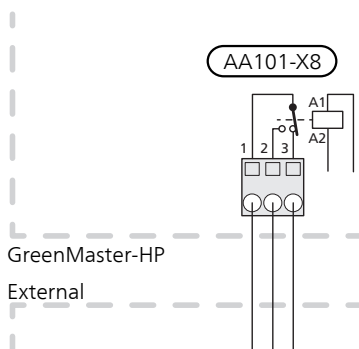


### NOTE

Mark up any junction boxes with warnings for external voltage.

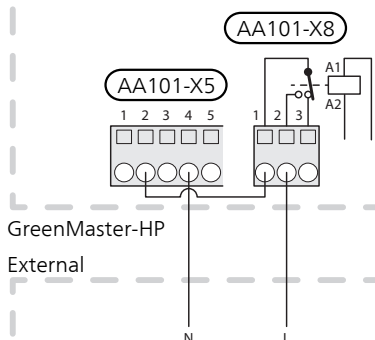
When the switch (SF1) is set to "Δ" mode (emergency mode), the internal circulation pumps (EP14-GP1 and EP15-GP1) and the potential-free variable emergency mode relay (AA101-K4) are activated. External accessories are disconnected.

The emergency mode relay can be used to activate external additional heat, an external thermostat must then be connected to the control circuit to control the temperature. Ensure that the heating medium circulates through the external additional heating.



#### Caution

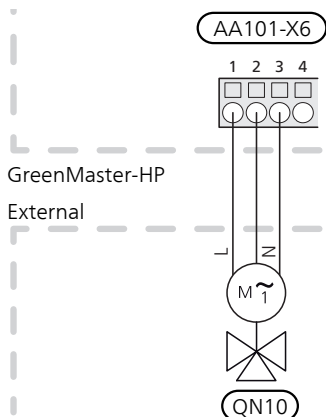
No hot water is produced when emergency mode is activated.



## Reversing valves

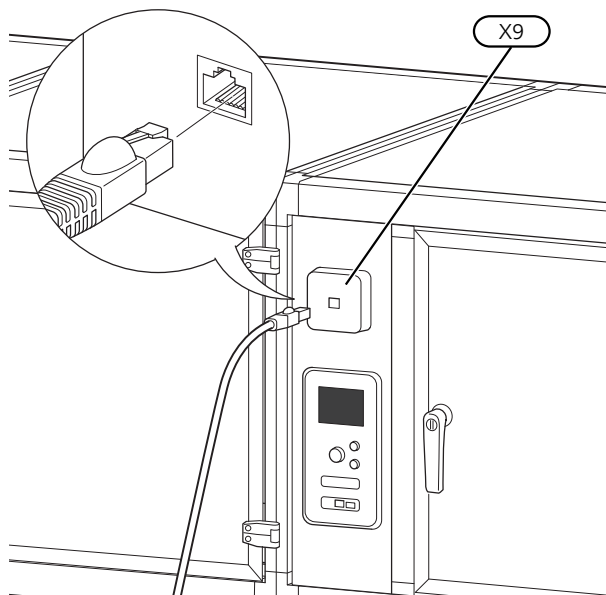
GreenMaster-HP can be supplemented with an external reversing valve (QN10) for hot water control (see page 53 for accessory).

Connect the external reversing valve (QN10) to terminal block AA101-X6:3 (N), AA101-X6:2 (operation) and AA101-X6:1 (L) as illustrated.

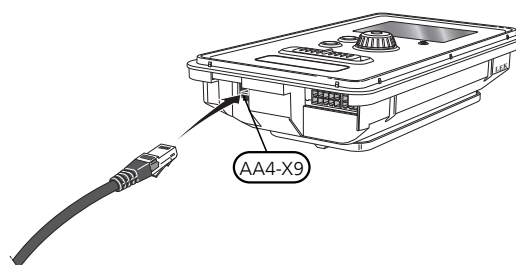


## myUpway

When placed indoors, a network-connected cable (straight, Cat.5e UTP) with RJ45 contact (male) is connected to network socket X9 above the display unit (as illustrated).



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



## External connection options

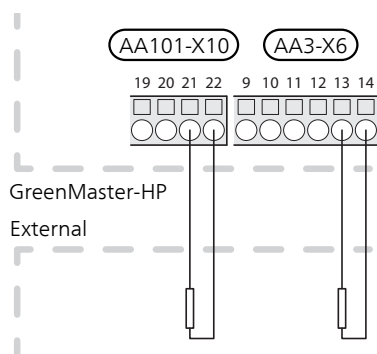
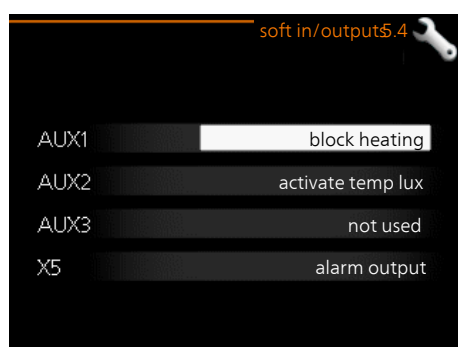
GreenMaster-HP has five software-controlled AUX inputs for connecting the external switch function. This means that an external switch function can be connected to one of five AUX inputs, where the function for the connection is determined in menu 5.4. The switch has to be potential-free.

Selectable inputs on terminal block AA3-X6 for these functions are:

|      |              |
|------|--------------|
| AUX1 | AA3-X6:9-10  |
| AUX2 | AA3-X6:11-12 |
| AUX3 | AA3-X6:13-14 |

Selectable inputs on terminal block AA101-X10 for these functions are:

|      |                 |
|------|-----------------|
| AUX4 | AA101-X10:19-20 |
| AUX5 | AA101-X10:21-22 |



The example above uses the inputs AUX3 (AA3-X6:13-14) and AUX5 (AA101-X10:21-22) on the terminal block.



### Caution

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

## 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).

When several room sensors have been installed, you can select which one of them will be controlling in menu 1.9.5.

When (BT74) has been connected and activated in menu 5.4, no other room sensor can be selected in menu 1.9.5.

- boiler (BT52) (shown if shunt-controlled additional heat is selected in menu 5.2.4 or if shunt-controlled additional heat is selected in menu 5.1.12)

### 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"
- "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.

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 in the same way as today's tariff blocking.

– *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)

### 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)
- internally controlled additional heat
- compressor (blocking of EP14 and EP15 can be combined. If you want to block both (EP14) and (EP15), this will occupy two AUX inputs).
- tariff blocking (additional heat, compressor, heating, cooling and hot water are disconnected)

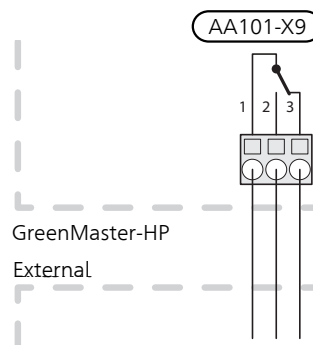
### Possible selections for AUX output

It is possible to have an external connection through the relay function via a potential-free variable relay (max 2 A) on terminal block AA101-X9.



#### NOTE

An accessory board is required if several functions are to be connected to terminal block AA101-X9 at the same time that indication of the common alarm is activated (see page 53).



The picture shows the relay in the alarm position.

When switch (SF1) is in the "ON" or "Δ" position the relay is in the alarm position.

### Indications

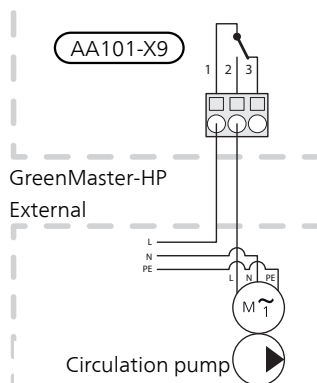
- alarm indication
- indication of common alarm
- cooling mode indication (only applies if there are cooling accessories)
- holiday indication

### Controls

- controlling ground water pump
- control of circulation pump for hot water circulation
- control of additional heat in charge circuit
- control of external circulation pump (for heating medium)

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.



#### Caution

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

## Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 53 for the list of the accessories that can be used with GreenMaster-HP.

# 6 Commissioning and adjusting

## Preparations



### TIP

If the ventilation is to be adjusted before heat pump operation starts, the cooling modules have to be deactivated in menu 5.2.3.

### 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.

1. Ensure that GreenMaster-HP has not been damaged during transport.
2. Check that the switch (SF1) is in position "⏻".
3. Check for water in any hot water heater and climate system.
4. Follow the start guide, see page 43, when the system is ready for start-up.



### Caution

Check the miniature circuit-breaker and the motor protection breakers. They may have tripped during transportation.



### NOTE

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

### 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.

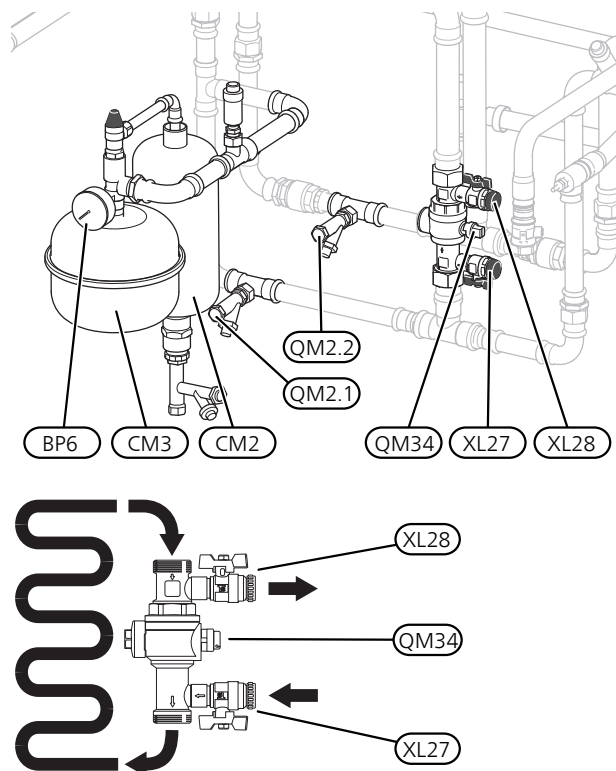
## Flushing

### 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*



|       |                          |
|-------|--------------------------|
| 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).

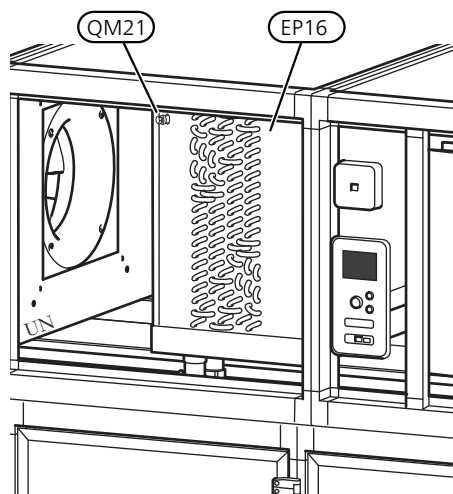
4. Slowly open the water supply until water runs out into the drain/drain hose. In this step, ensure that there are no leaks in the system. If leaks are discovered, these must be repaired. Then follow the above points again until all leaks have been eliminated.
5. Increase the liquid flow to approx. 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 drain hoses to connections (EP14-XL2) and (EP15-XL2).

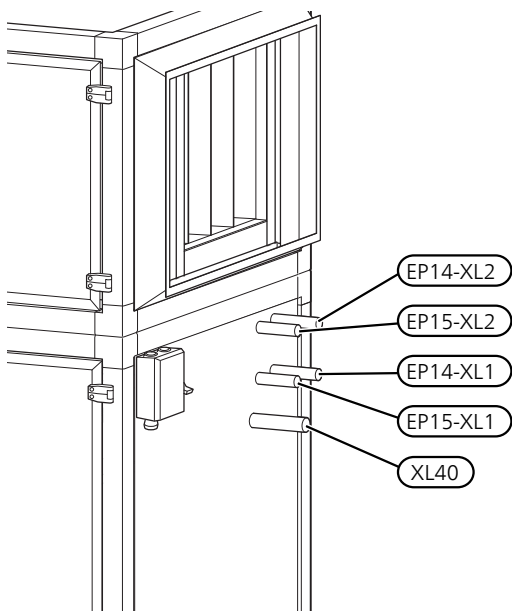
2. Connect water hoses from the property's cold water supply to connections (EP14-XL1) and (EP15-XL1).
3. Open the water supply and flush the system for 10 minutes.
4. Shut off the water supply, empty the system and disconnect the drain hoses from (EP14-XL2) and (15).
5. Close connections (EP14-XL2) and (EP15-XL2) using end caps (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.



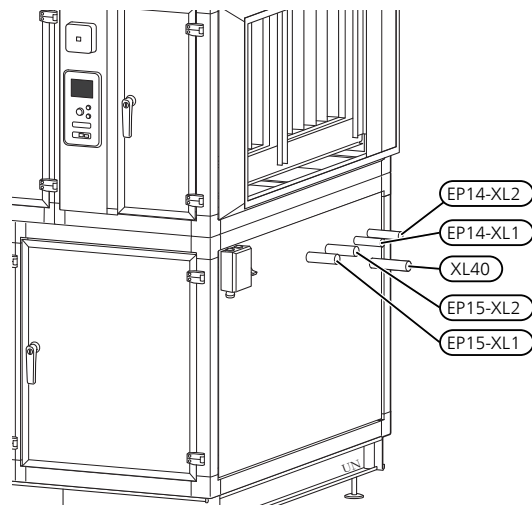
#### Caution

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

*Connections, heating medium: 3-12/12, 3-16/12, 3-16/15*



*Connections, heating medium: 4-16/12, 4-16/15, 4-16/20, 4-16/30, 5-16/30*



## Cleaning and filling

### Filling and venting the brine system

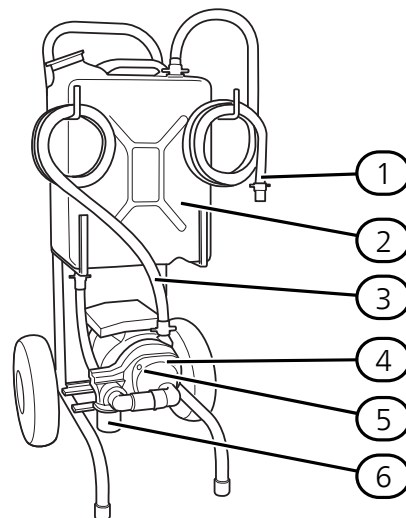


#### Caution

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 39.
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 43), 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 venting 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.

## 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 brine pumps that can be controlled automatically. For manual operation: deactivate "auto" in menu 5.1.9 and then set the speed according to the diagrams 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 pumps' (GP2) speed until the temperature difference is obtained. A high difference indicates a low brine flow and a low difference indicates a high brine flow.

**Heating medium side**

GreenMaster-HP has heating medium pumps 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.

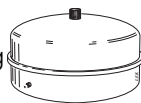
The flow must have a suitable temperature difference for the operating case (heating operation: 5 - 10 °C, hot water generation: 5 - 10 °C, pool heating: approx. 15 °C) between controlling supply temperature sensor and return line sensor. Check these temperatures in menu 3.1 "service info" and adjust the heating medium pumps' (GP1) speed until the temperature difference is obtained. A high difference indicates a low heating medium supply and a low difference indicates a high heating medium supply.

**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 GreenMaster-HP.

## 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.

#### **months btwn filter alarms**

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

Setting range: 1–24

Factory setting: 12

#### **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 flow**

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

Setting range: 0–100%

Factory setting: 70%

#### **set point**

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

Setting range: 0–400 Pa

Factory setting: 150 Pa

#### **min fan speed**

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**

Setting range: 2–100%

Factory setting: 100%

#### **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

#### **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

#### **start manual motion QM41**

yes/no

### ***operating time damper***

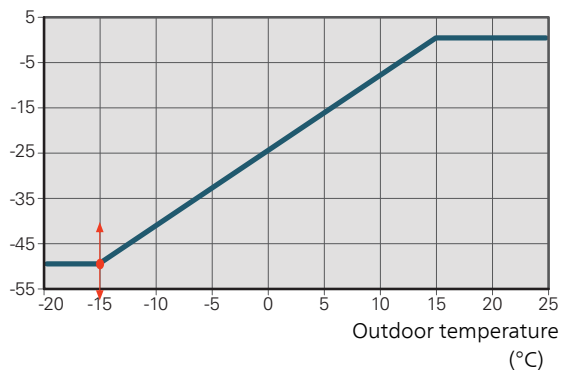
Make settings for the max. actuating time before an alarm triggers here. Set the max. actuating time before an alarm is activated here.

Setting range: 1–300 s

Factory setting: 150 s

### ***Compen. due to outd. temp***

Compensation  
(Pa)



Setting range: -100–0 Pa

Default value: 0

### **Menu 5.6 - forced control**

You can make the settings for forced control of GreenMaster-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 refrigerant pump for each cooling module are off and only the heating medium pump and electrical addition (requires "Additional heater 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:

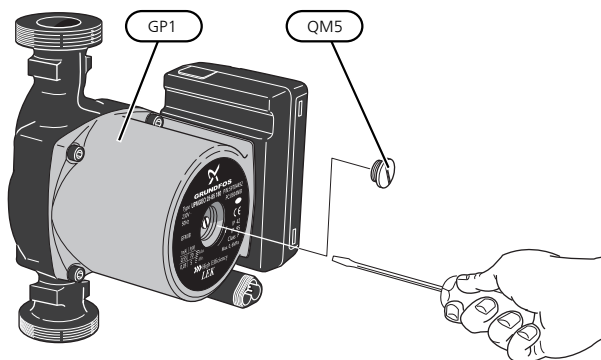
1. Close the shut-off valve (QM34) and the filterball (QZ2) for the brine system.
2. Connect a hose to the drain valve (QM2), place the other opening of the hose in a container and open the valve. A small amount of brine will flow into the container.
3. Air must enter the system in order for the remaining 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.

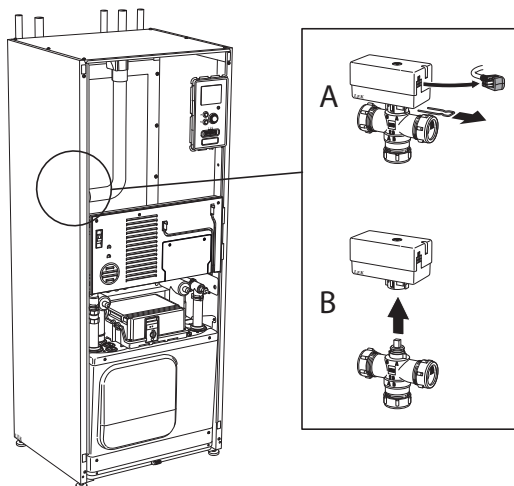
## Temperature sensor data

| 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         |

## Remove the motor on the shuttle valve

The motor on the shuttle valve can be removed to facilitate servicing.

- Disconnect the cable from the motor and remove the motor from the shuttle valve as illustrated.



## Pulling out the cooling module

### Cooling module weight

| Type (GreenMaster-HP) | EP14   | EP15   |
|-----------------------|--------|--------|
| 3-12/12               | 120 kg | 126 kg |
| 3-16/12, 4-16/12      | 125 kg | 126 kg |
| 3-16/15, 4-16/15      | 125 kg | 134 kg |
| 4-16/20               | 125 kg | 144 kg |
| 4-16/30, 5-16/30      | 125 kg | 144 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 45.

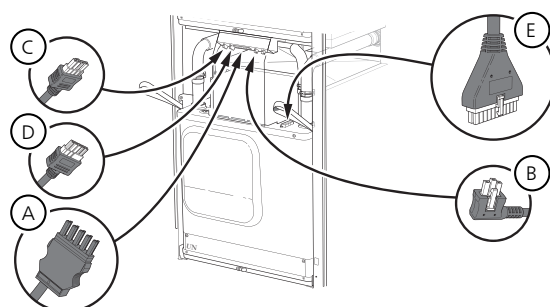
### 2 Cooling module EP14

- XF1 (A)
- XF3 (B)
- XF4 (C)
- XF5 (D)
- EP14-AA100:XF1 (E)

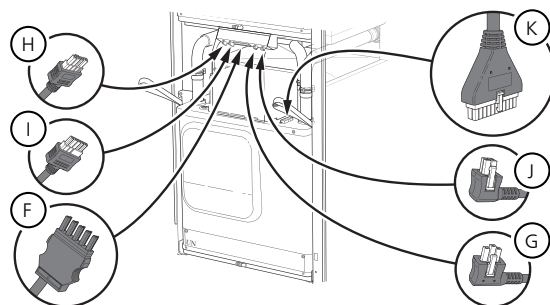
### Cooling module EP15

- XF2 (F)
- XF6 (G)
- XF7 (H)
- XF8 (I)
- XF9 (J)
- EP15-AA100:XF1 (K)

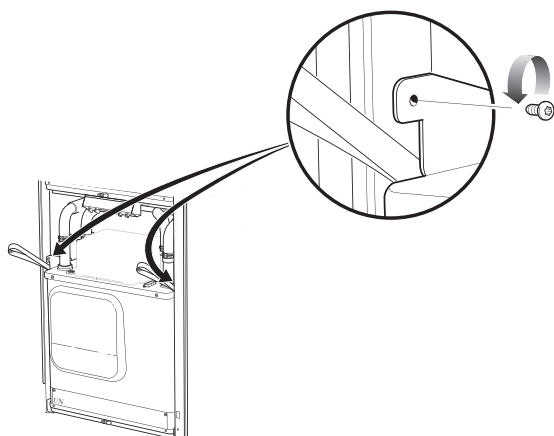
#### Cooling module EP14



#### Cooling module EP15

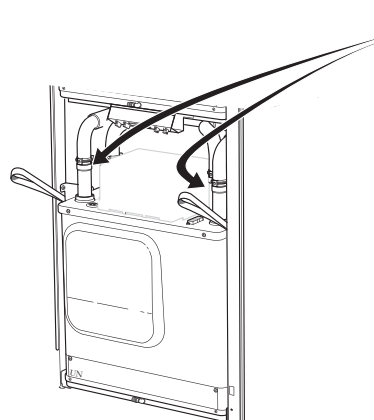


3

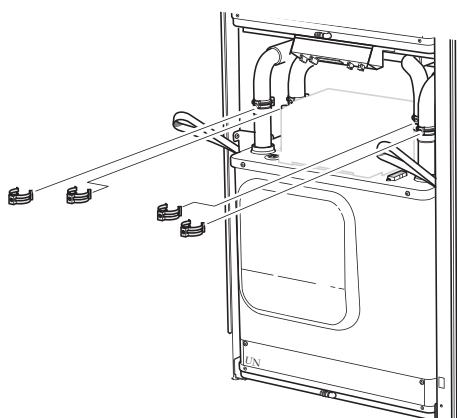


**NOTE**

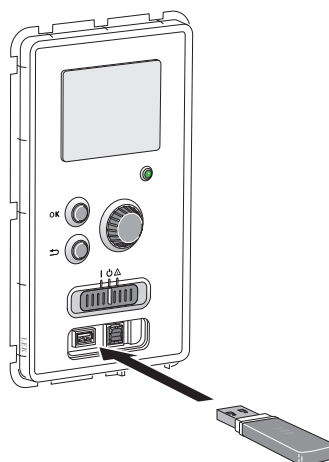
During reinstallation, new O-rings must replace the existing ones at the connections to GreenMaster-HP (see image).



4

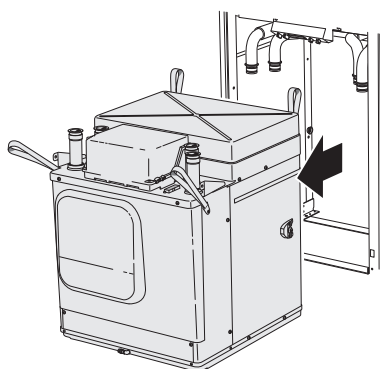


**USB service outlet**



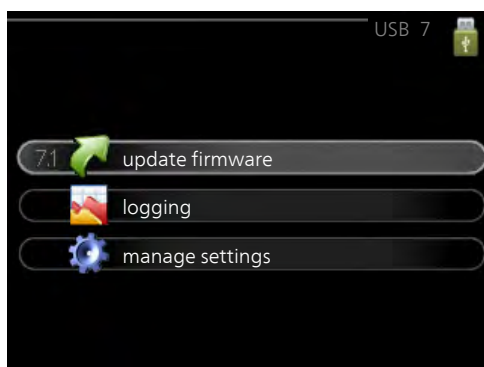
The display unit is equipped with a USB socket that can be used to update the software and save logged information in GreenMaster-HP.

5



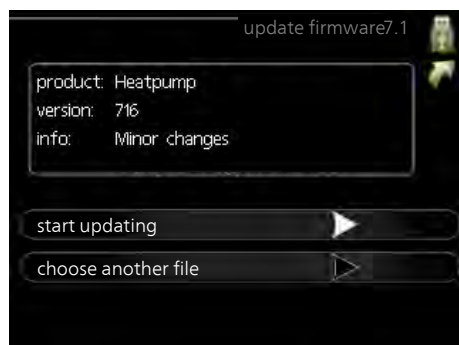
**TIP**

The cooling module is installed in reverse order.



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

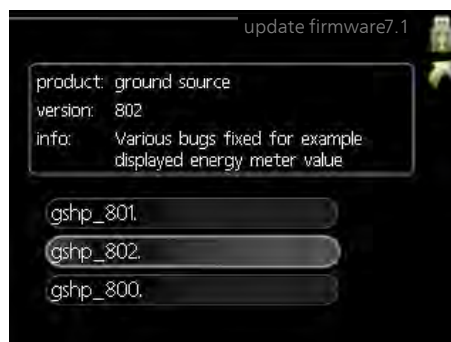
A software update does not reset the menu settings in GreenMaster-HP.



#### 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.

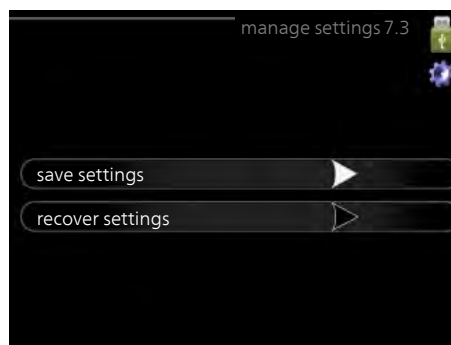
- Make sure that "floor drying function" is activated in menu 5.9.
- Select "logging floor drying activated".
- A log file is now created, where the temperature and the immersion heater output can be read off. Logging continues until "logging floor drying activated" is deselected or until "floor drying 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"> <li>■ Check fan.</li> <li>■ Ice formation.</li> <li>■ Check air filter.</li> <li>■ Check damper.</li> </ul>                                                |
| 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"> <li>■ Open-circuit or short-circuit on input (BP12).</li> <li>■ Defective sensor (BP12).</li> <li>■ Check fan connection.</li> <li>■ Fuse blown</li> </ul> |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Open-circuit or short-circuit on sensor input.</li> <li>■ Defective sensor</li> </ul>                                                                |
| 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"> <li>■ Defective fire damper.</li> <li>■ Defective limit position sensor.</li> </ul>                                                                        |

| 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

## Accessory card AXC 50

An accessory board is required if, for example, a ground water pump or external circulation pump is to be connected to GreenMaster-HP at the same time as the indication of common alarm is activated.

Part no. 067 193

## Active/Passive cooling in 4-pipe system ACS 45

Part no 067 195

## 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

## 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

## Buffer vessel UKV

UKV 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

## 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

## Docking kit Solar 42

Part no 067 153

## Energy measurement kit EMK 300

This accessory is installed externally and used to measure the amount of energy that is supplied for the pool, hot water, heating and cooling in the building.

Cu pipe Ø22.

Part no. 067 314

## Energy measurement kit EMK 500

This accessory is installed externally and used to measure the amount of energy that is supplied for the pool, hot water, heating and cooling in the building.

Cu pipe Ø28.

Part no. 067 178

## 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 m<sup>2</sup>)**

Part no 067 287

### **ECS 41 (approx. 80-250 m<sup>2</sup>)**

Part no 067 288

## 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

## Hot water control

### VST 20

Reversing valve, cu-pipe Ø35

(Max recommended power,  
40 kW)

Part no 089 388

## Immersion heater IU

### 3 kW

Part no. 018 084

### 6 kW

Part no. 018 088

### 9 kW

Part no. 018 090

## SIOX SC:DUO

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

Part no. 800 9213

## SIOX SC:UNO

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

Part no. 800 9214

## 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

### VPAS

Water heater with double-jacketed vessel and solar coil.

#### VPAS 300/450

Copper Part no. 082 026

Enamel Part no. 082 027

### VPB

Water heater without immersion heater with charging coil.

#### VPB 500

Copper Part no. 081 054

#### VPB 750

Copper Part no. 081 052

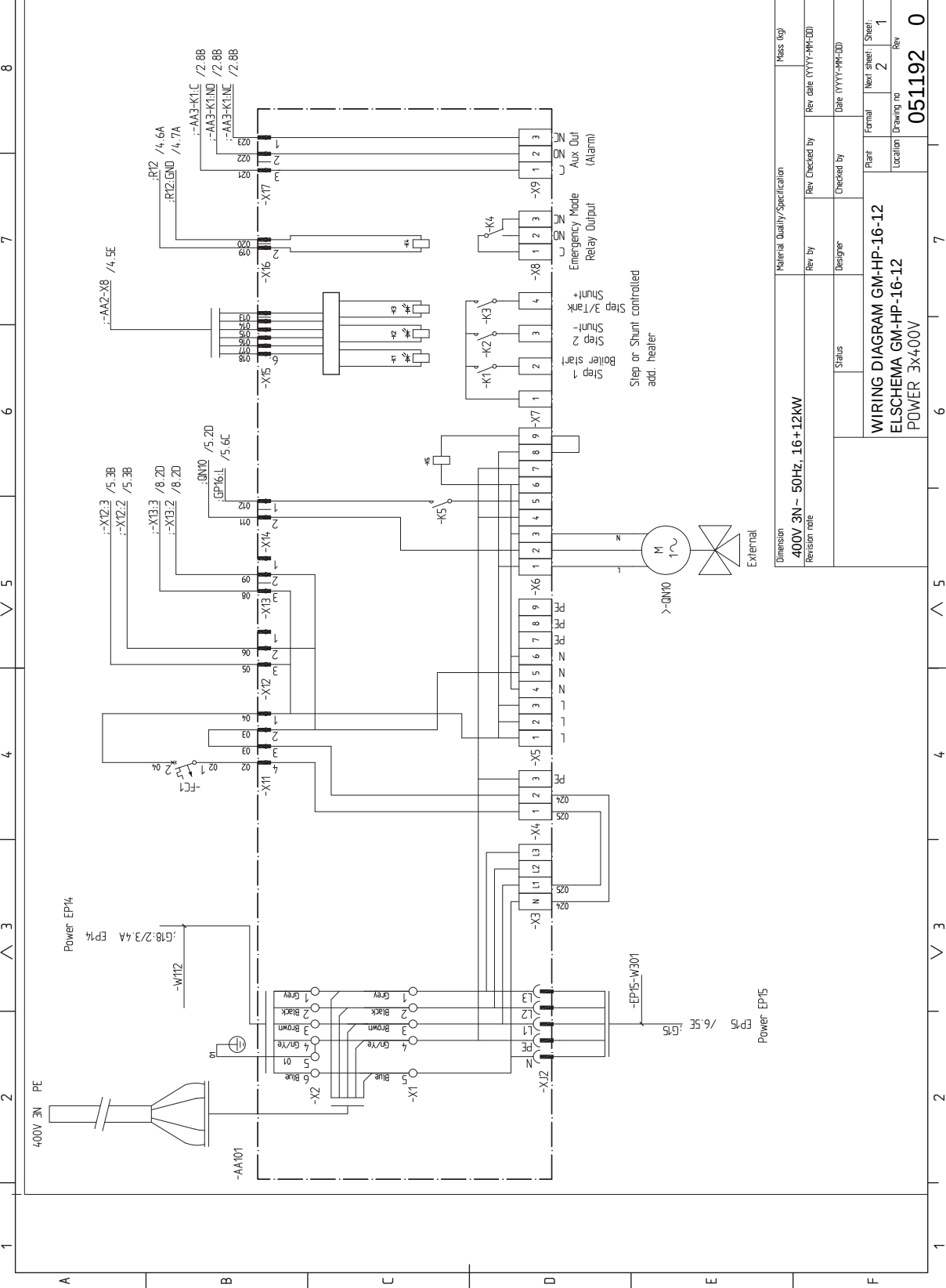
#### VPB 1000

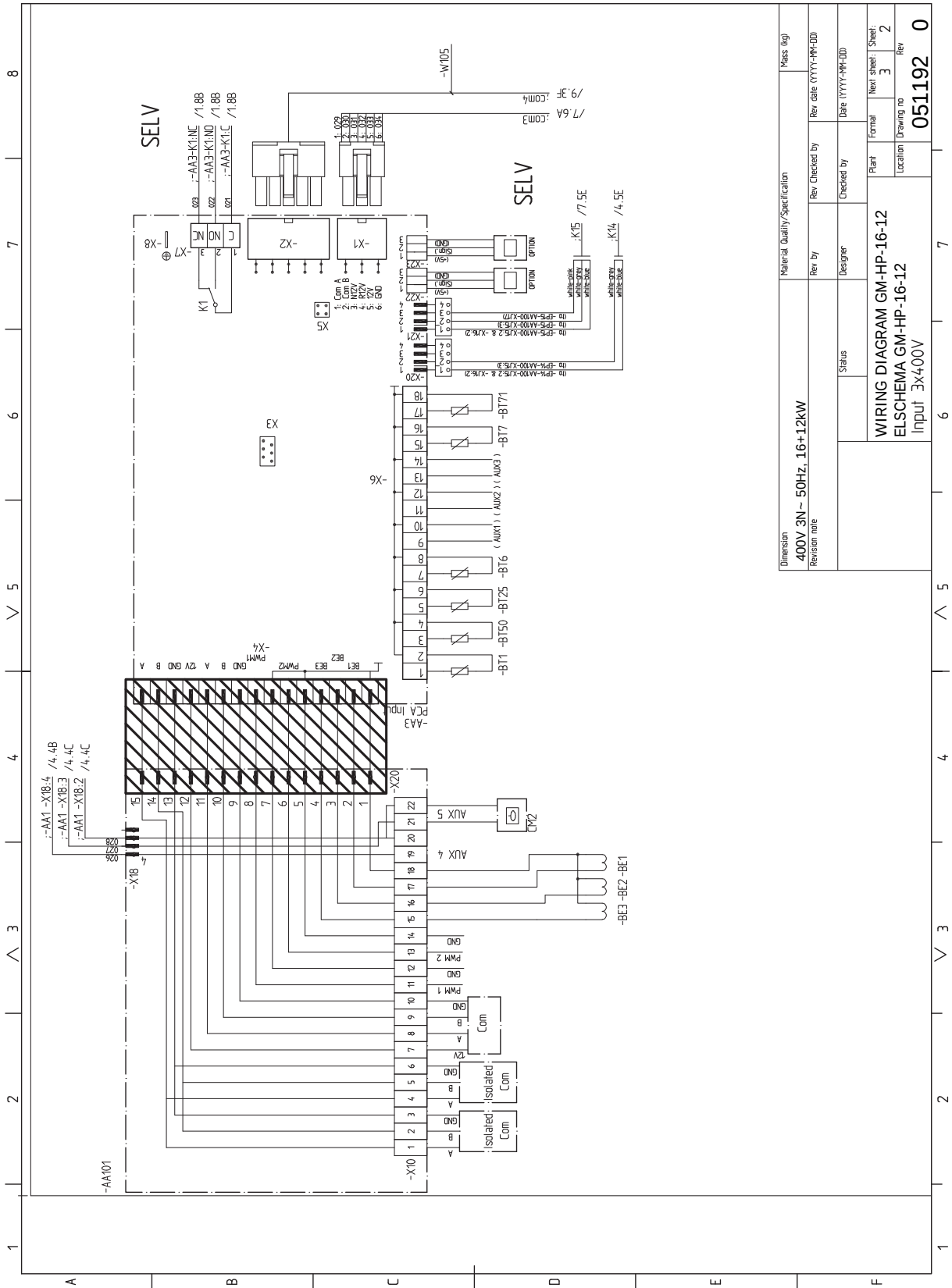
Copper Part no. 081 053

# 11 Technical data

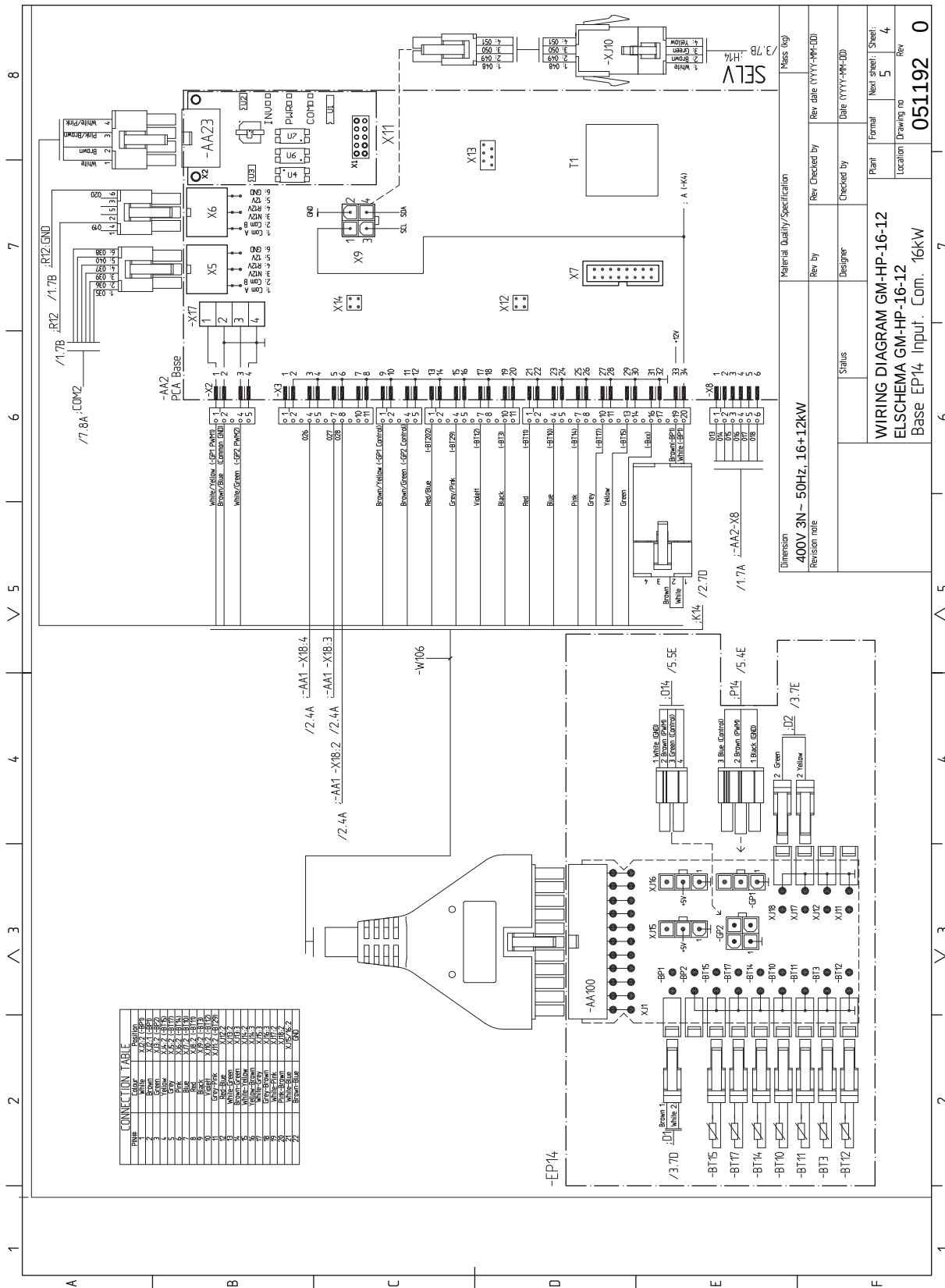
## Electrical circuit diagram

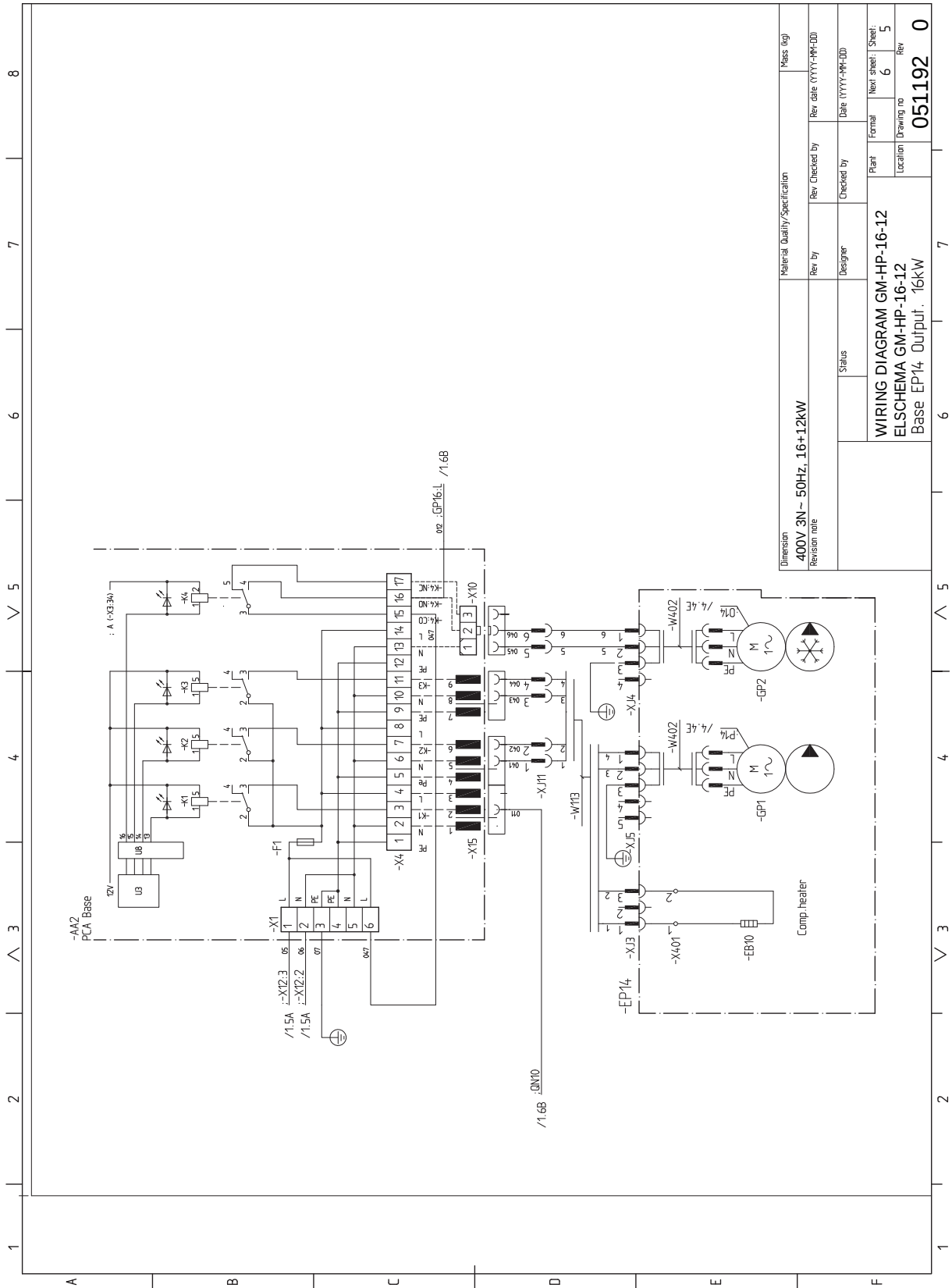
### GreenMaster-HP 3-16-12

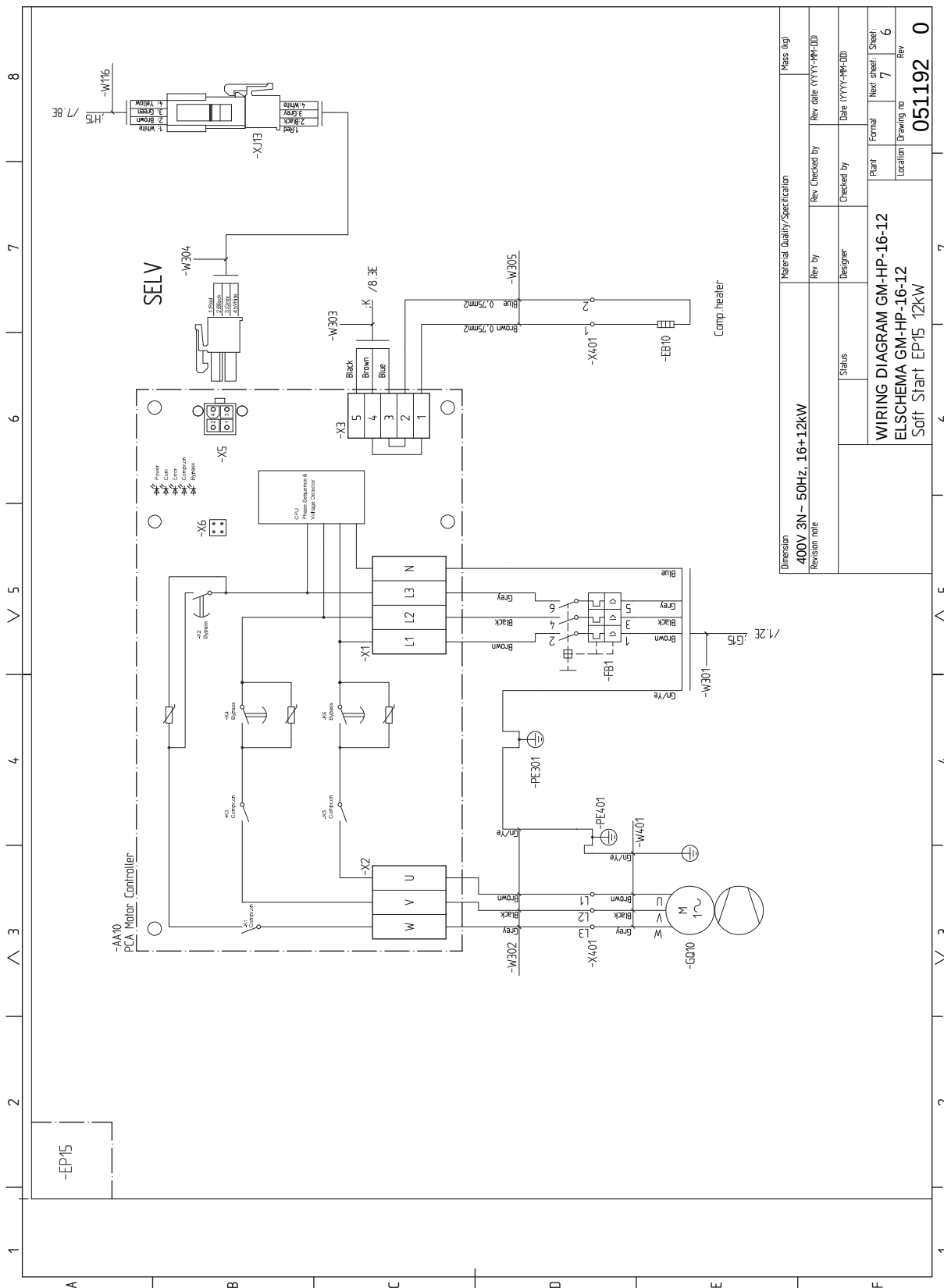




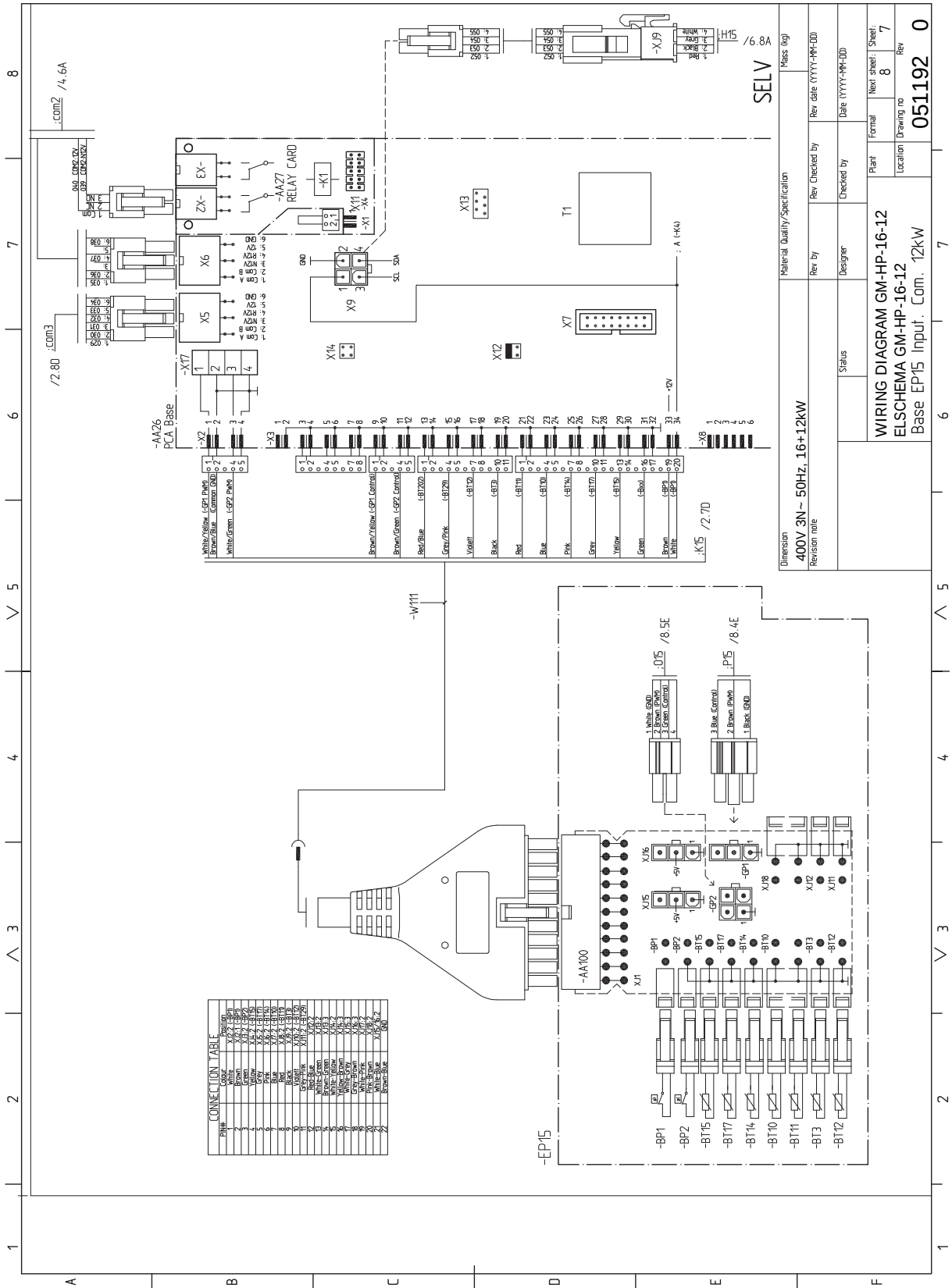


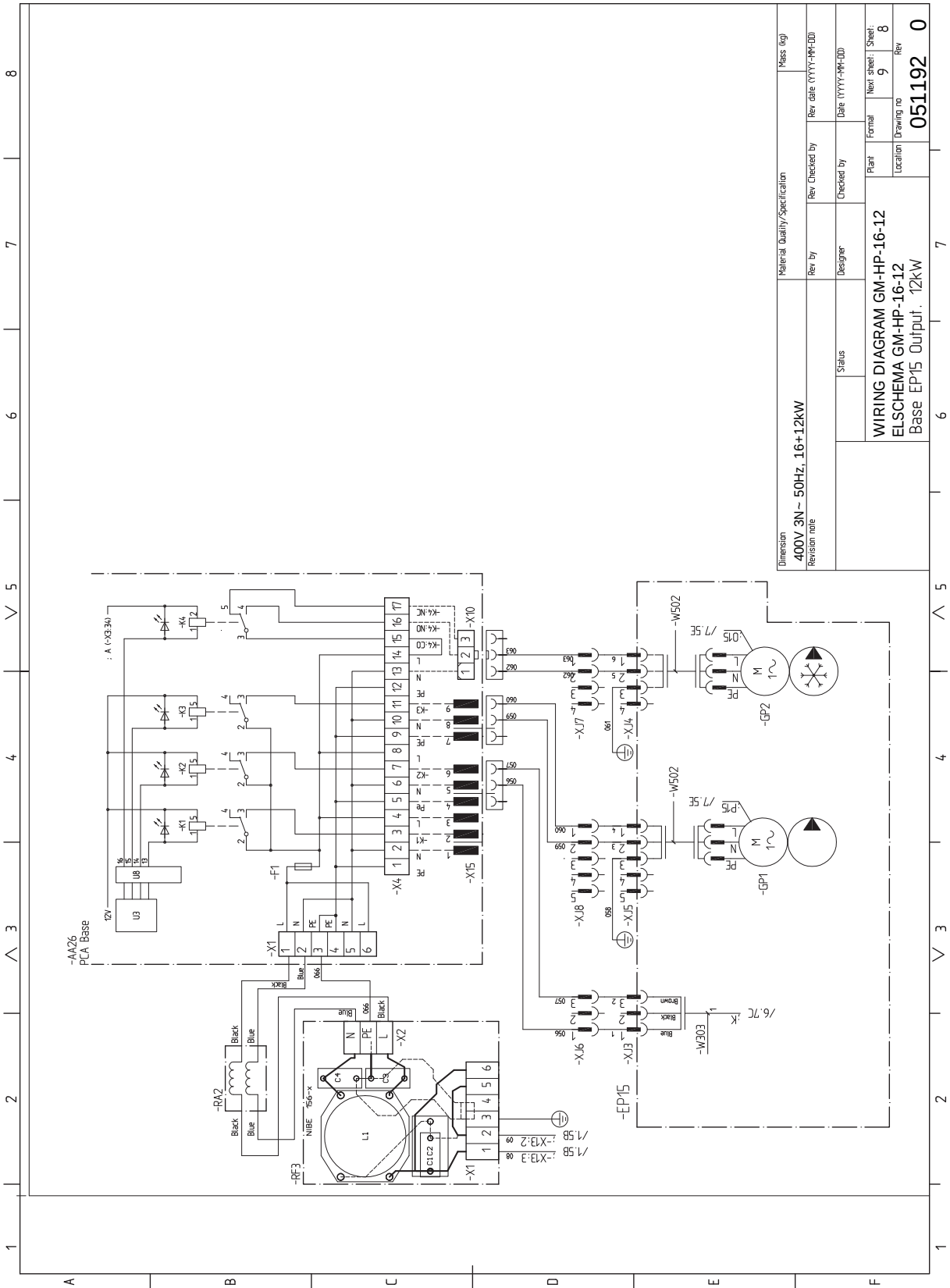




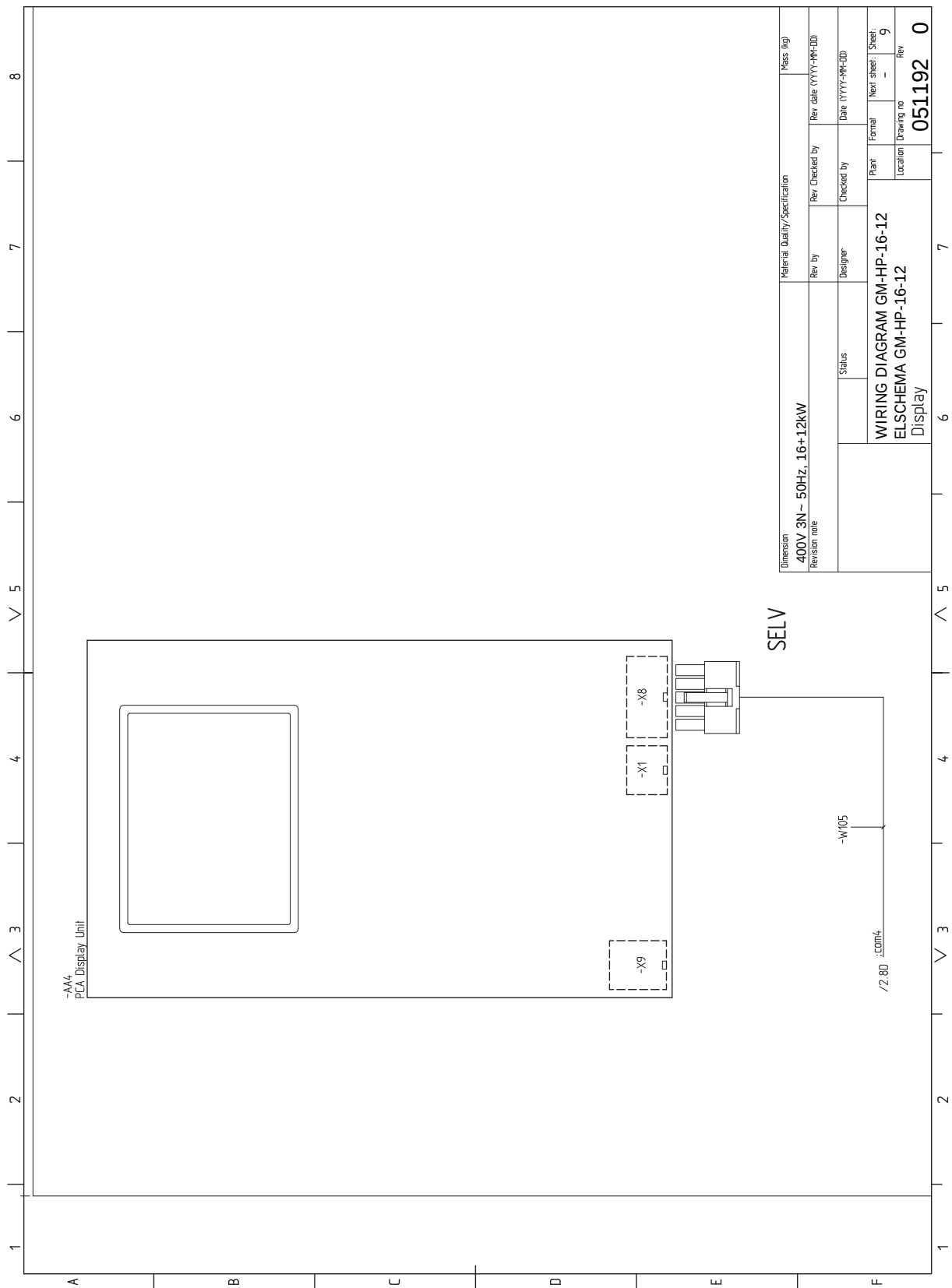




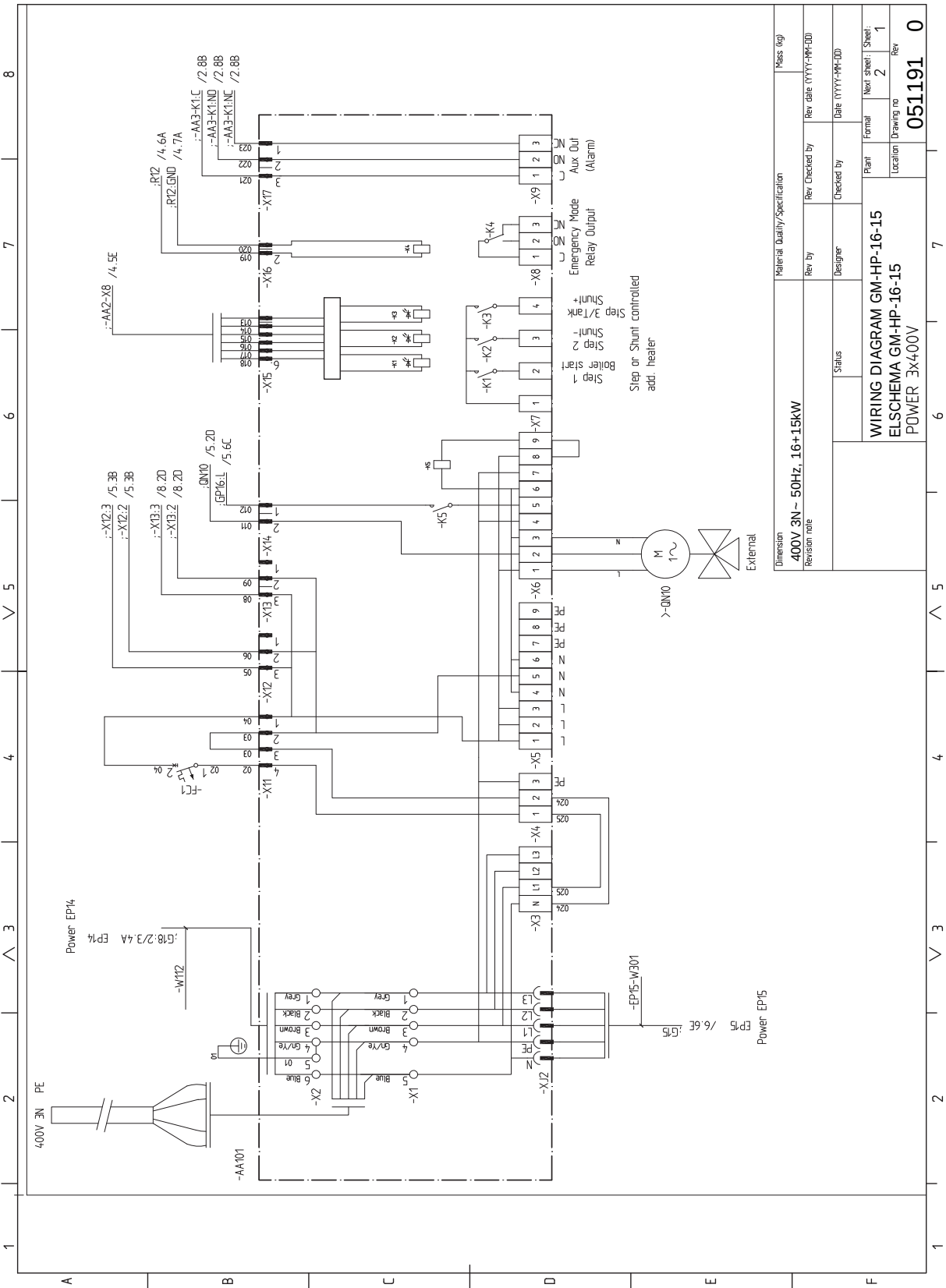


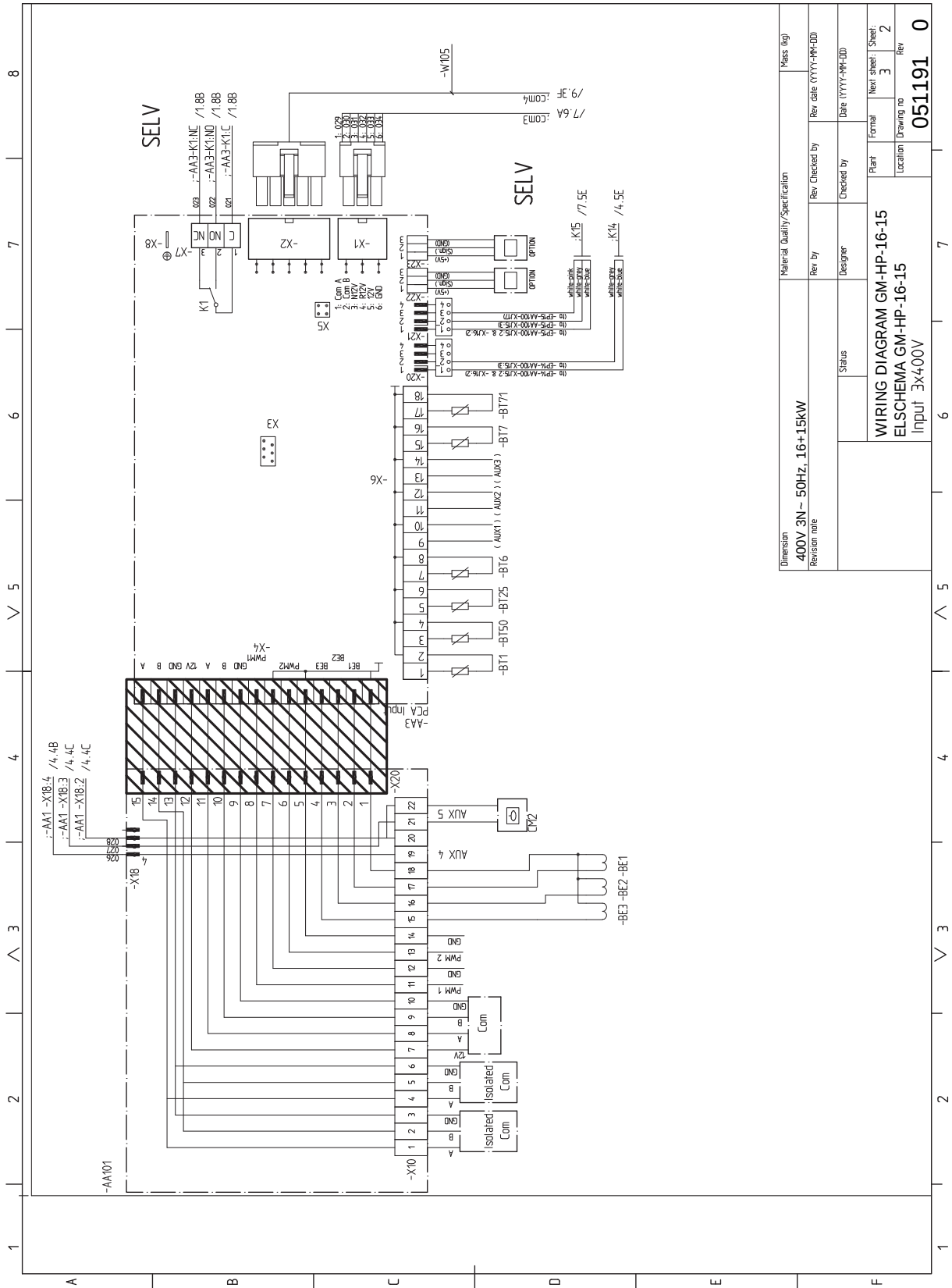


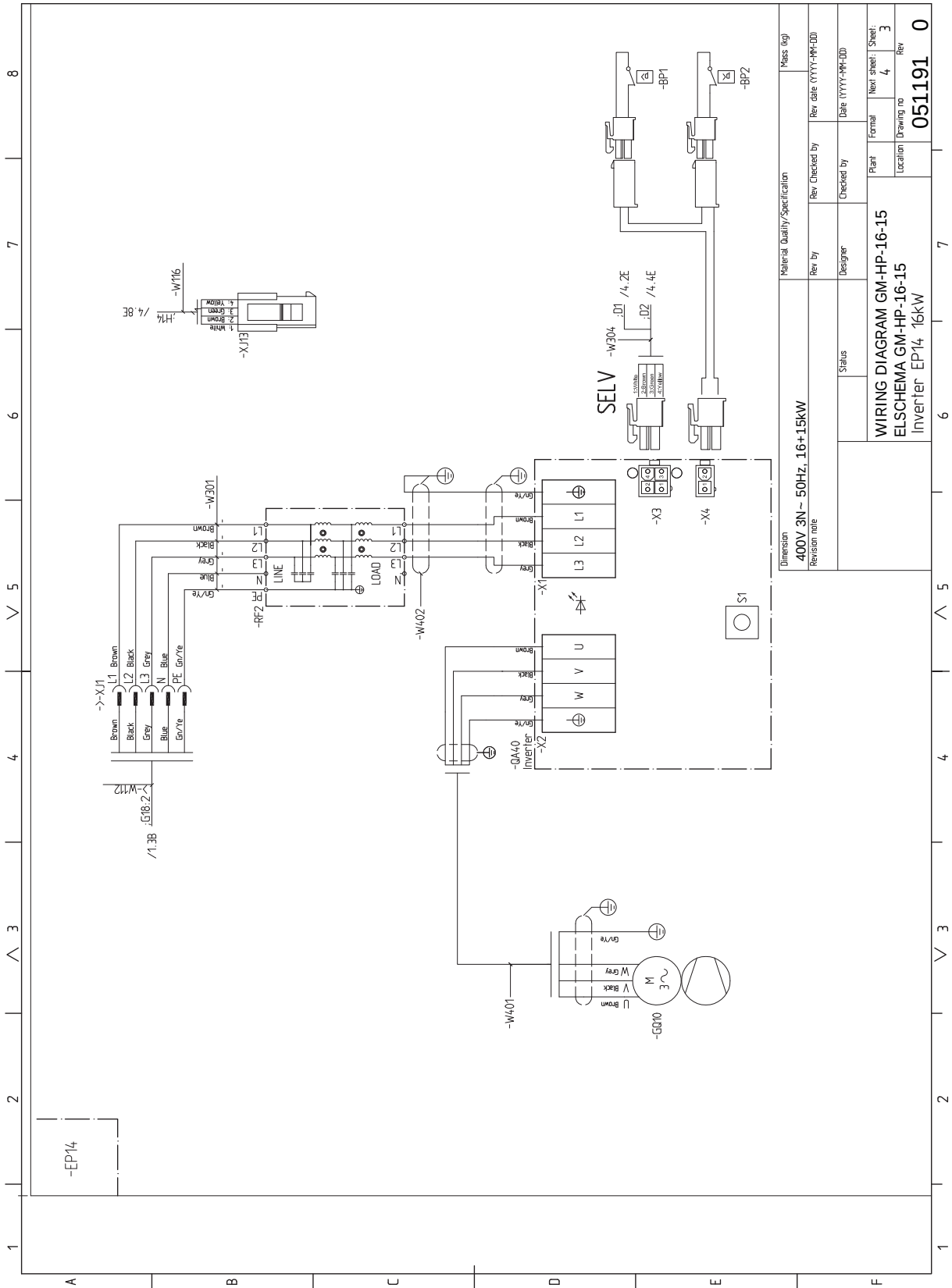
| Dimension               |  | Material Quality/Specification |                | Mass (kg)             |                      |
|-------------------------|--|--------------------------------|----------------|-----------------------|----------------------|
| 400V 3N ~ 50Hz, 16+12kW |  |                                |                |                       |                      |
| Revision note           |  | Rev by                         | Rev checked by | Rev date (YYYY-MM-DD) |                      |
|                         |  | Designer                       | Checked by     | Date (YYYY-MM-DD)     |                      |
|                         |  | Status                         |                |                       |                      |
|                         |  | WIRING DIAGRAM GM-HP-16-12     |                | Plant                 | Next sheet: Sheet: 8 |
|                         |  | ELSCHEMA GM-HP-16-12           |                | Location              | Drawing no           |
|                         |  | Base EP15 Output: 12kW         |                |                       | Rev                  |
|                         |  |                                |                | 051192                |                      |
|                         |  |                                |                | 0                     |                      |



GreenMaster-HP 3-16-15





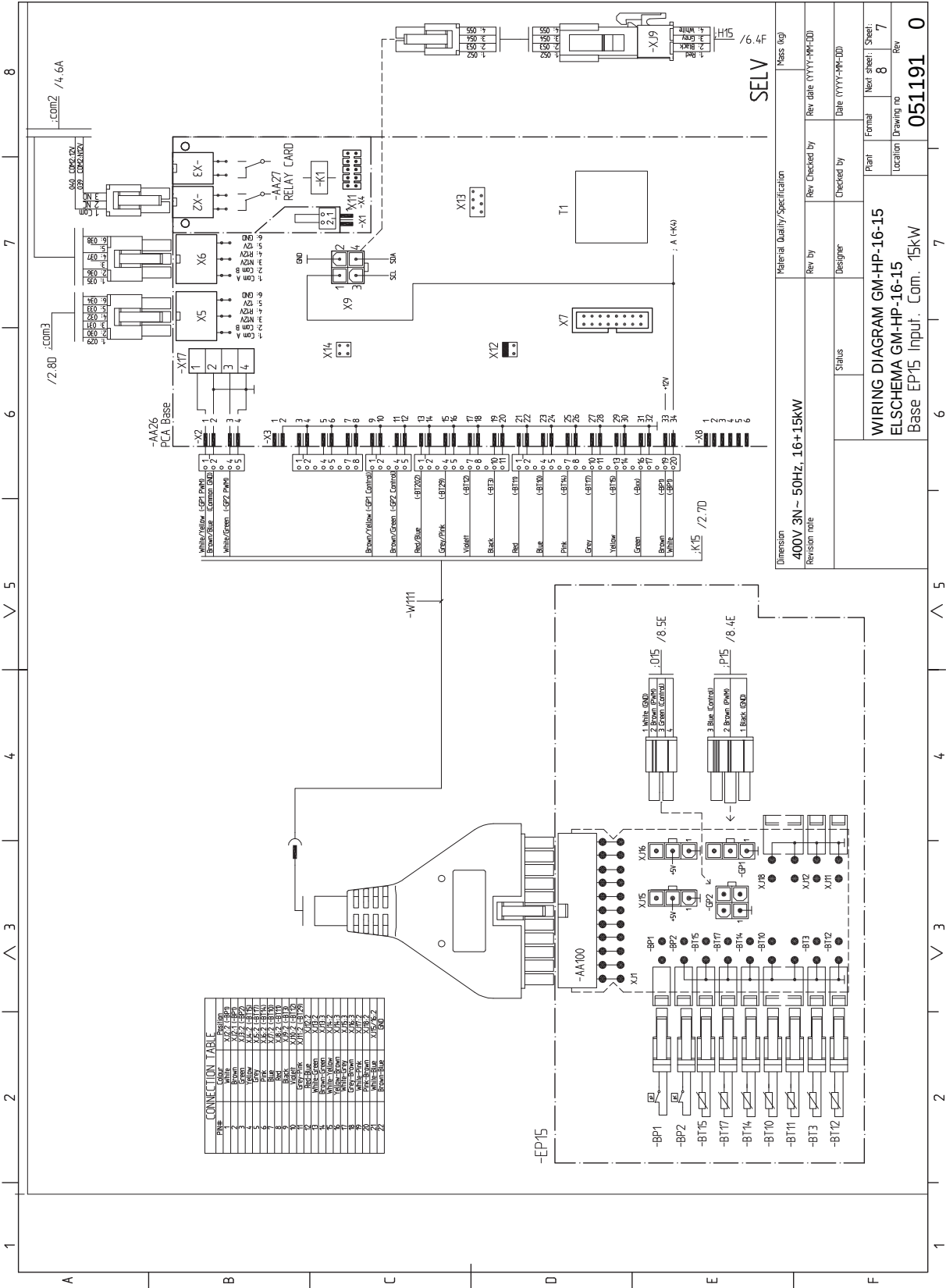




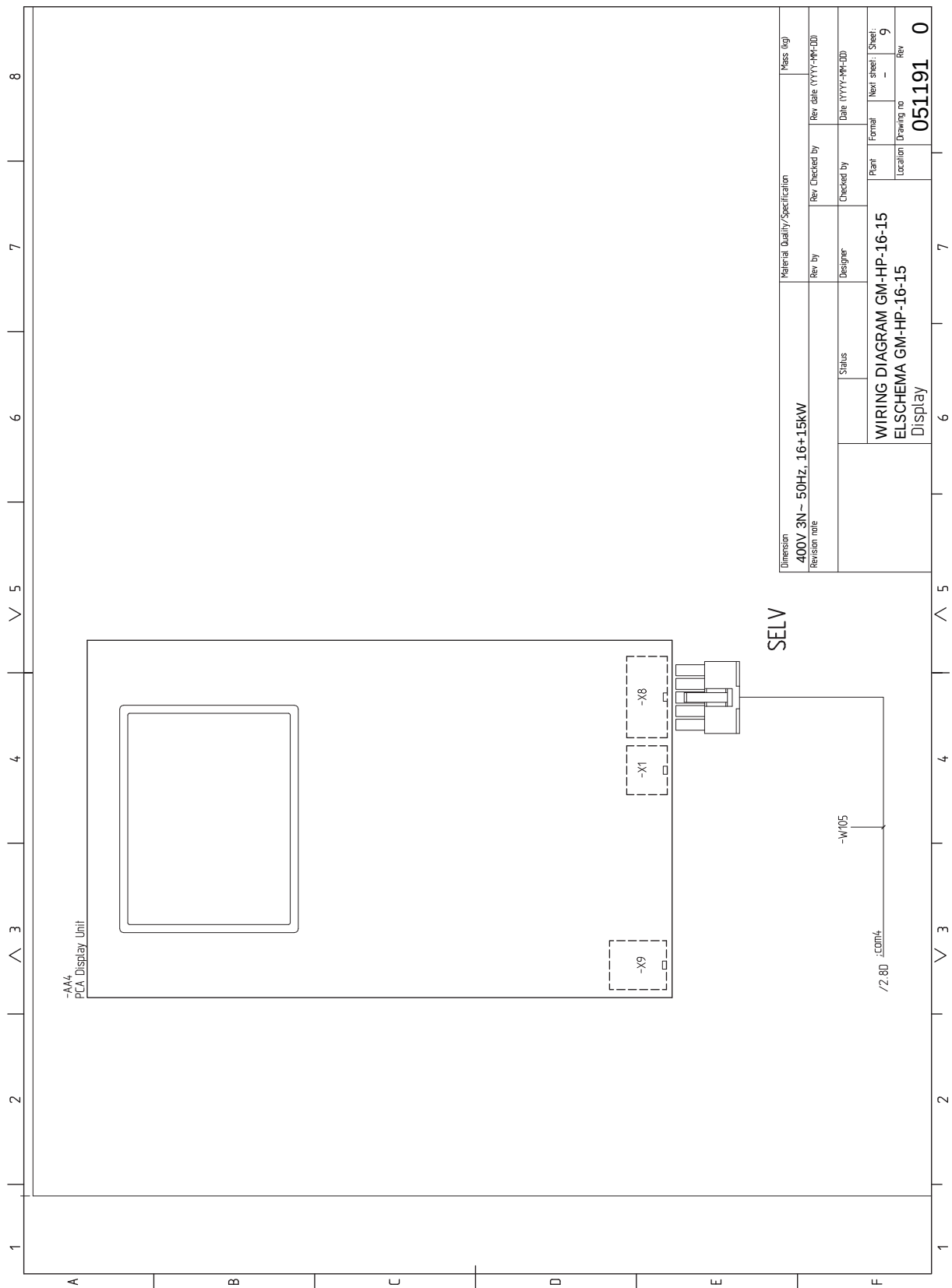












400V 3N PE

Power EP14

5.18 / 2.3 4A EP14

-W12

-AA101

-XZ

1 Grey

2 Black

3 Brown

4 Grey/ve

5 Blue

1 Blue

2 Grey

3 Black

4 Grey/ve

5 Blue

-X1

1 2 3 4 5 6 7 8 9

-X2

1 2 3 4 5 6 7 8 9

-X3

1 2 3 4 5 6 7 8 9

-X4

1 2 3 4 5 6 7 8 9

-X5

1 2 3 4 5 6 7 8 9

-X6

1 2 3 4 5 6 7 8 9

-X7

1 2 3 4 5 6 7 8 9

-X8

1 2 3 4 5 6 7 8 9

-X9

1 2 3 4 5 6 7 8 9

-X10

1 2 3 4 5 6 7 8 9

-X11

1 2 3 4 5 6 7 8 9

-X12

1 2 3 4 5 6 7 8 9

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-X14

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-X19

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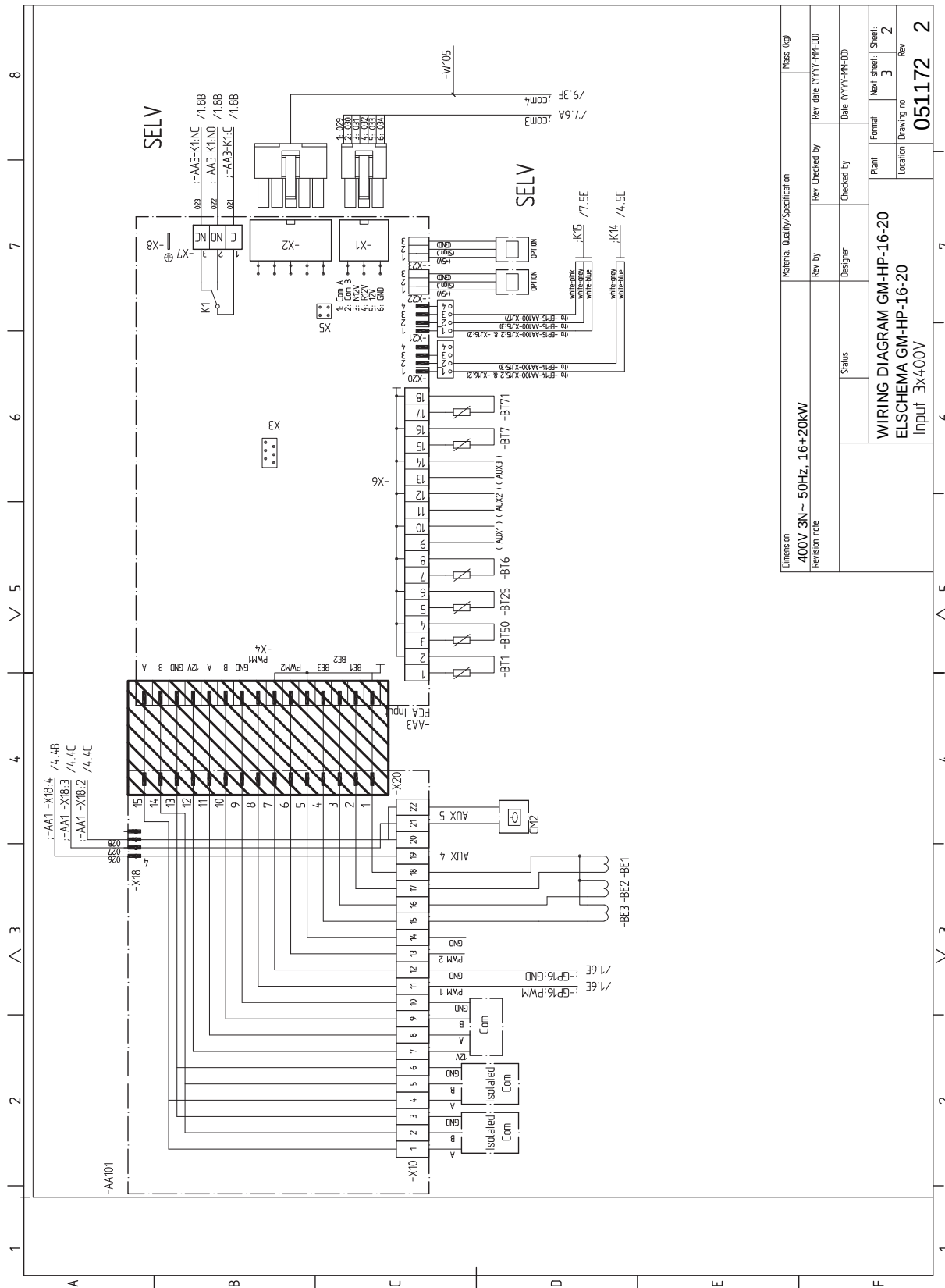
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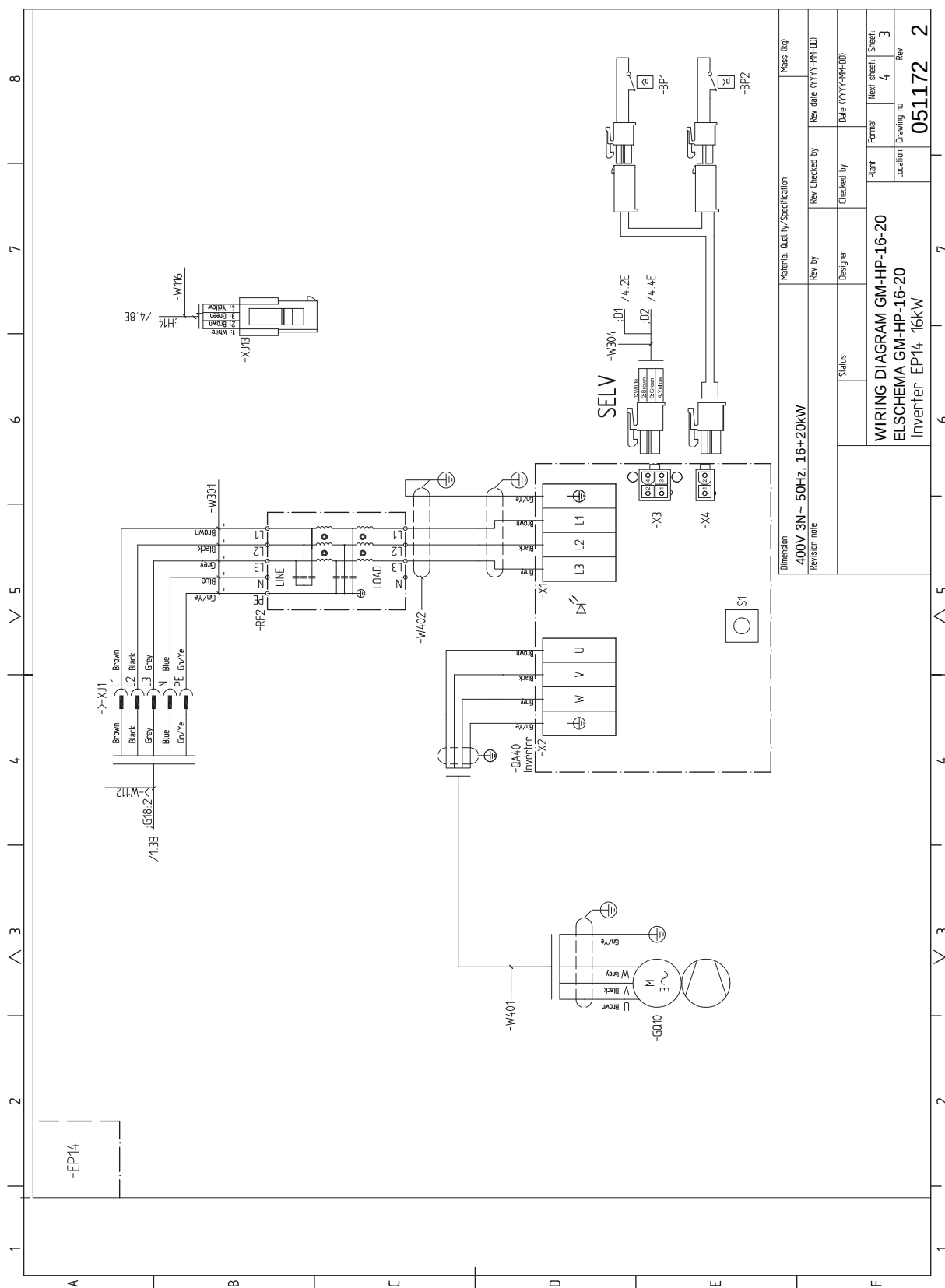
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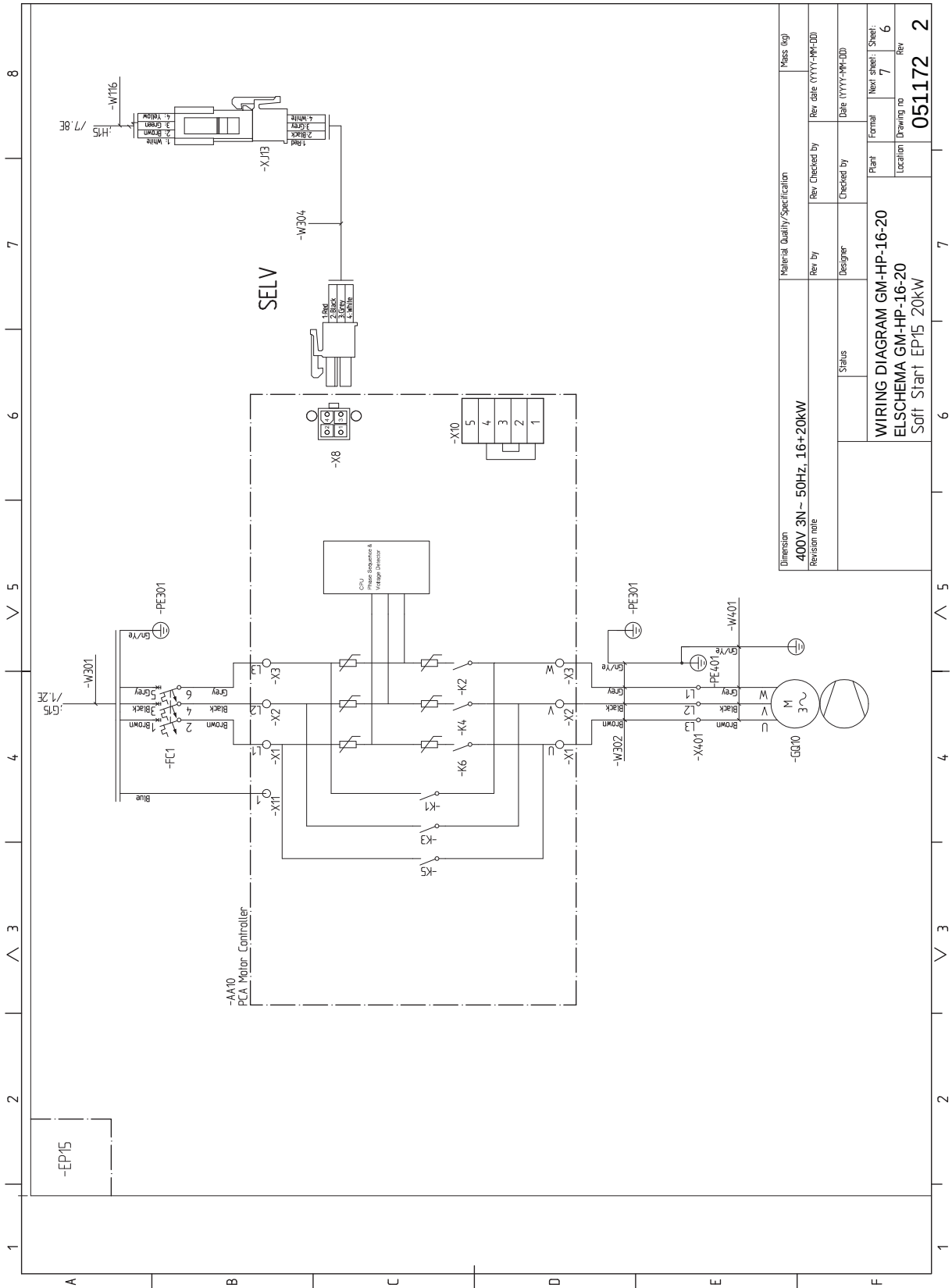


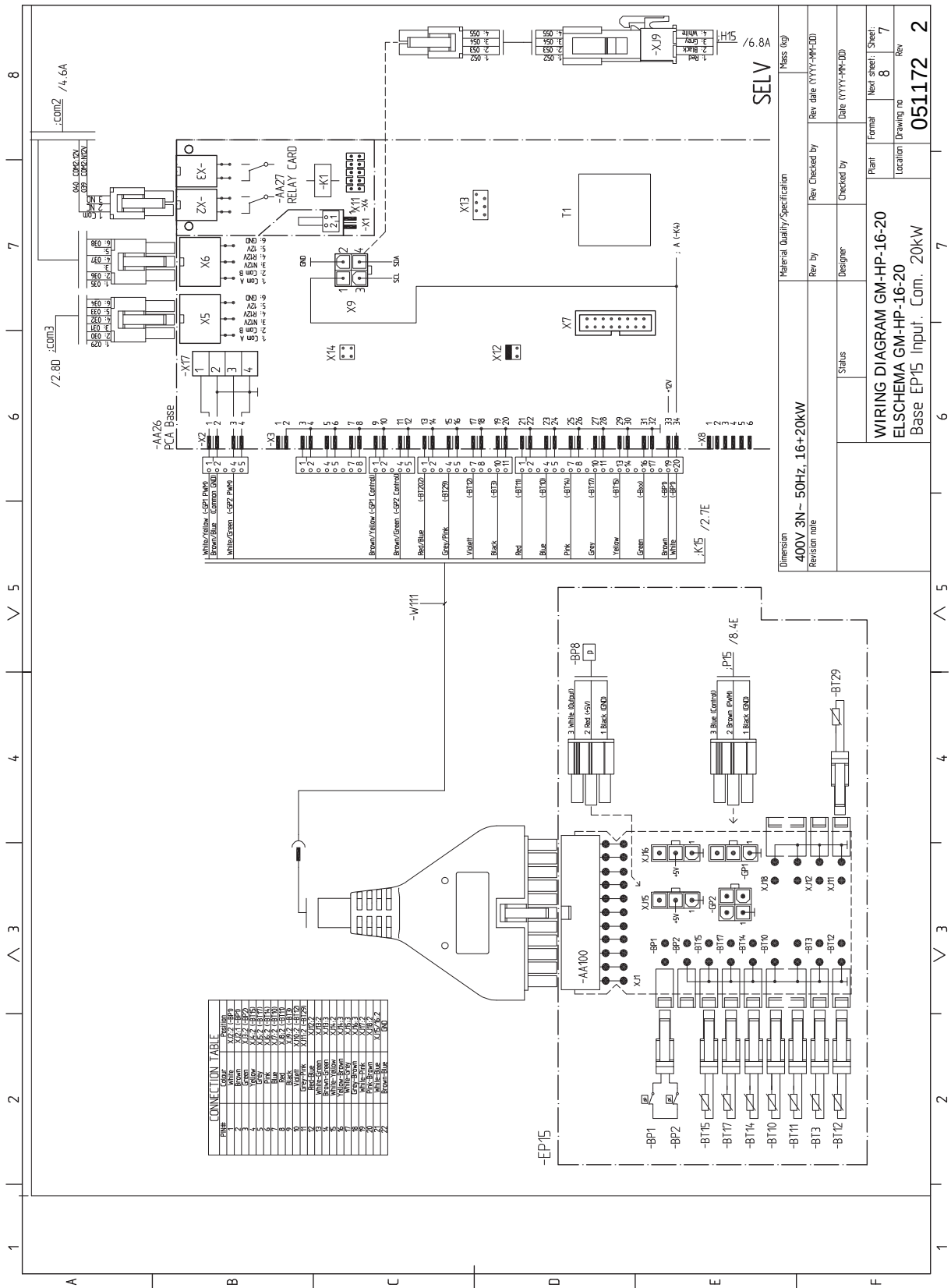


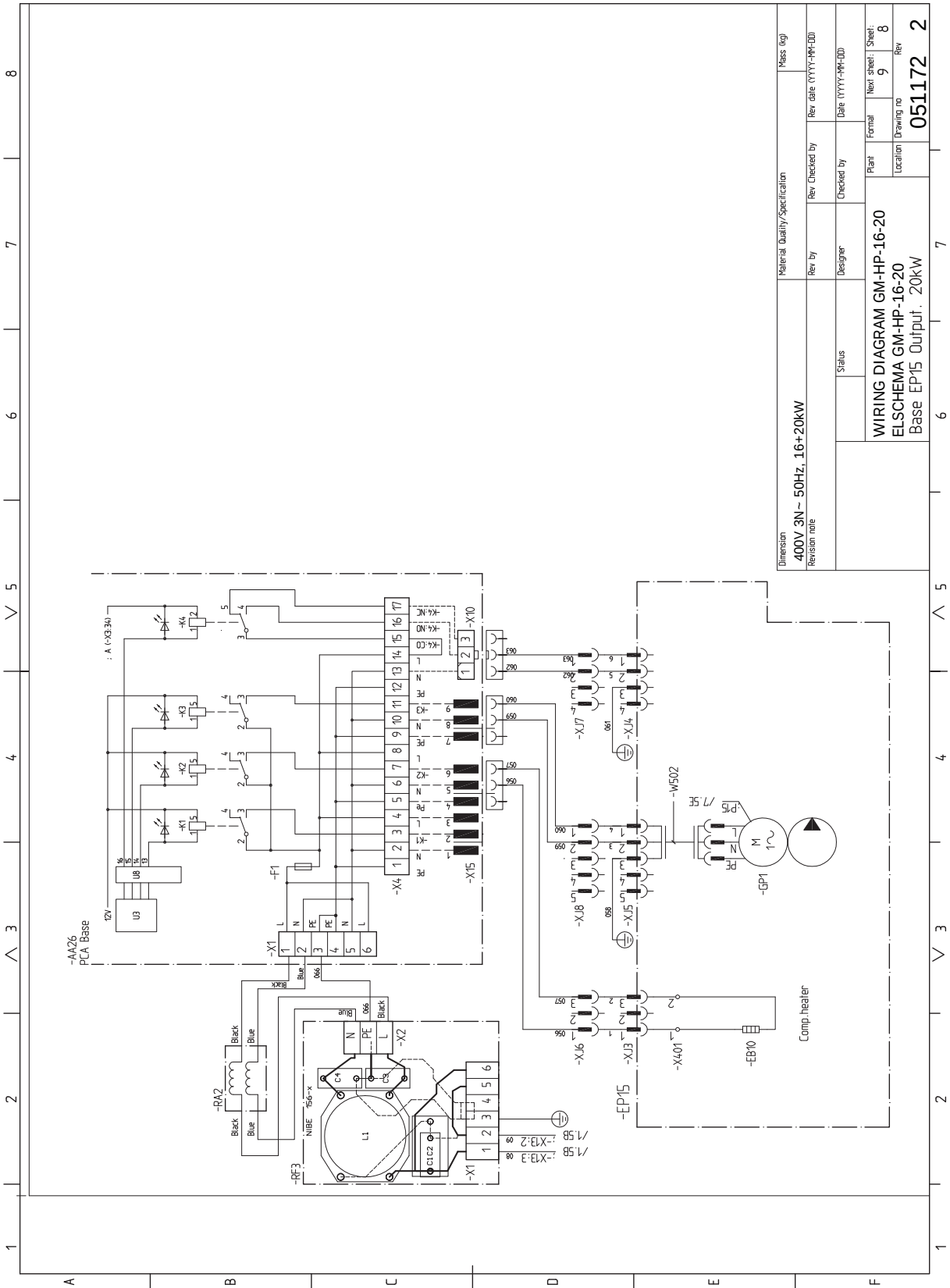


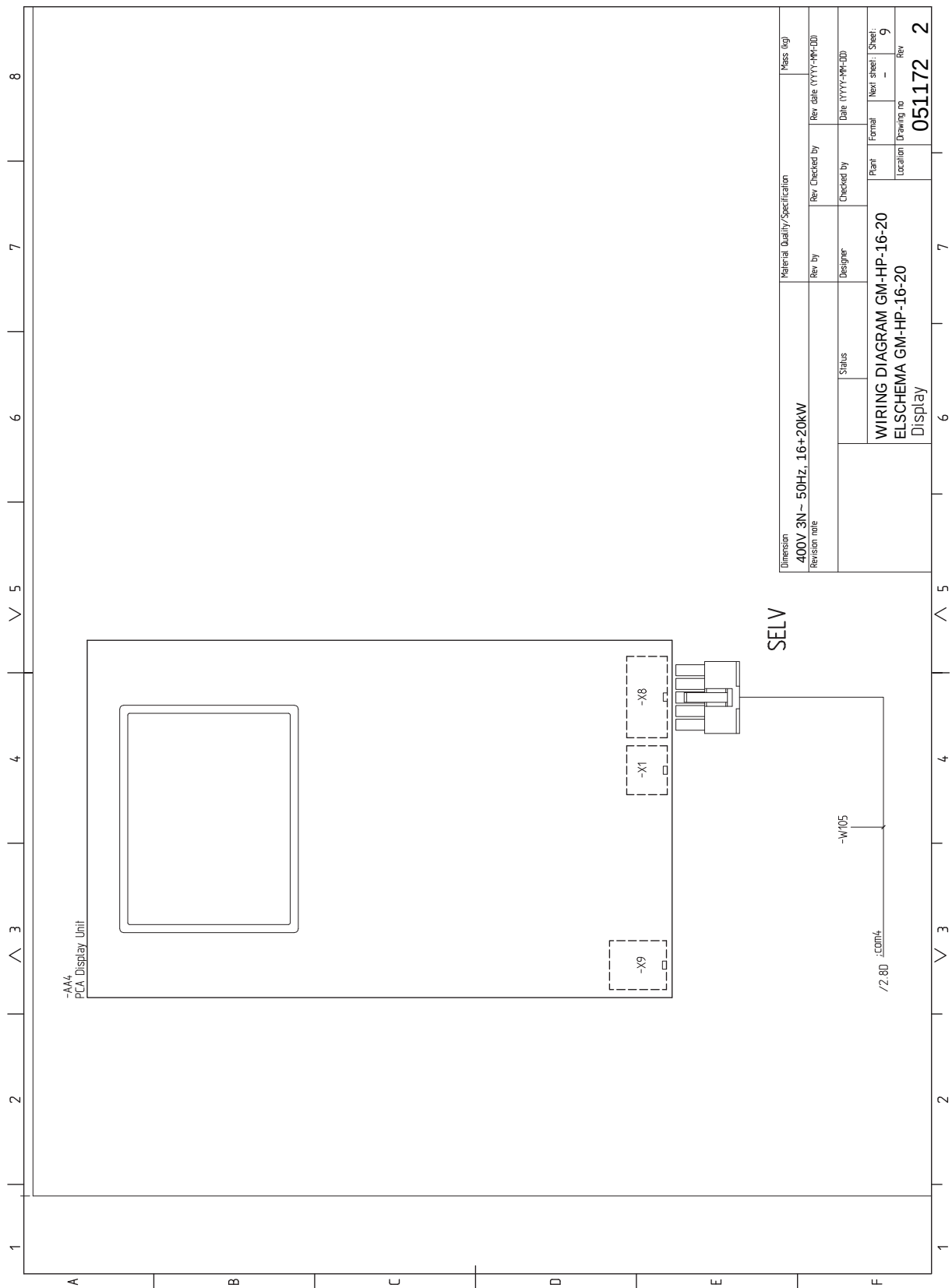












WIRING DIAGRAM GM-HP-16-30  
ELSCHEMA GM-HP-16-30  
POWER 3x400V

Dimension  
400V 3N - 50Hz, 16-30kW  
Revision note

Material Quality/Specification  
Mass tag

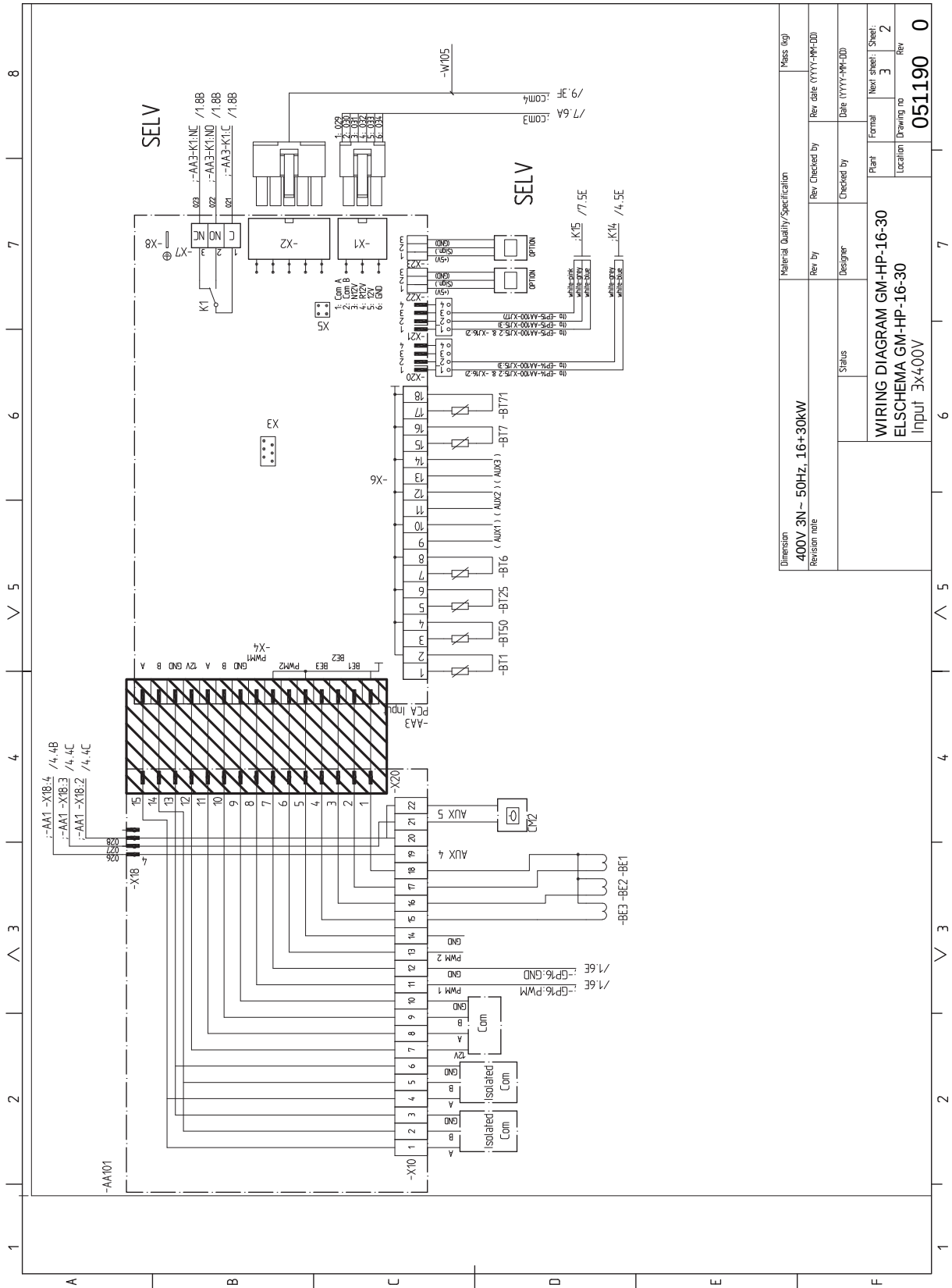
Rev by  
Rev Checked by  
Rev date (YYYY-MM-DD)

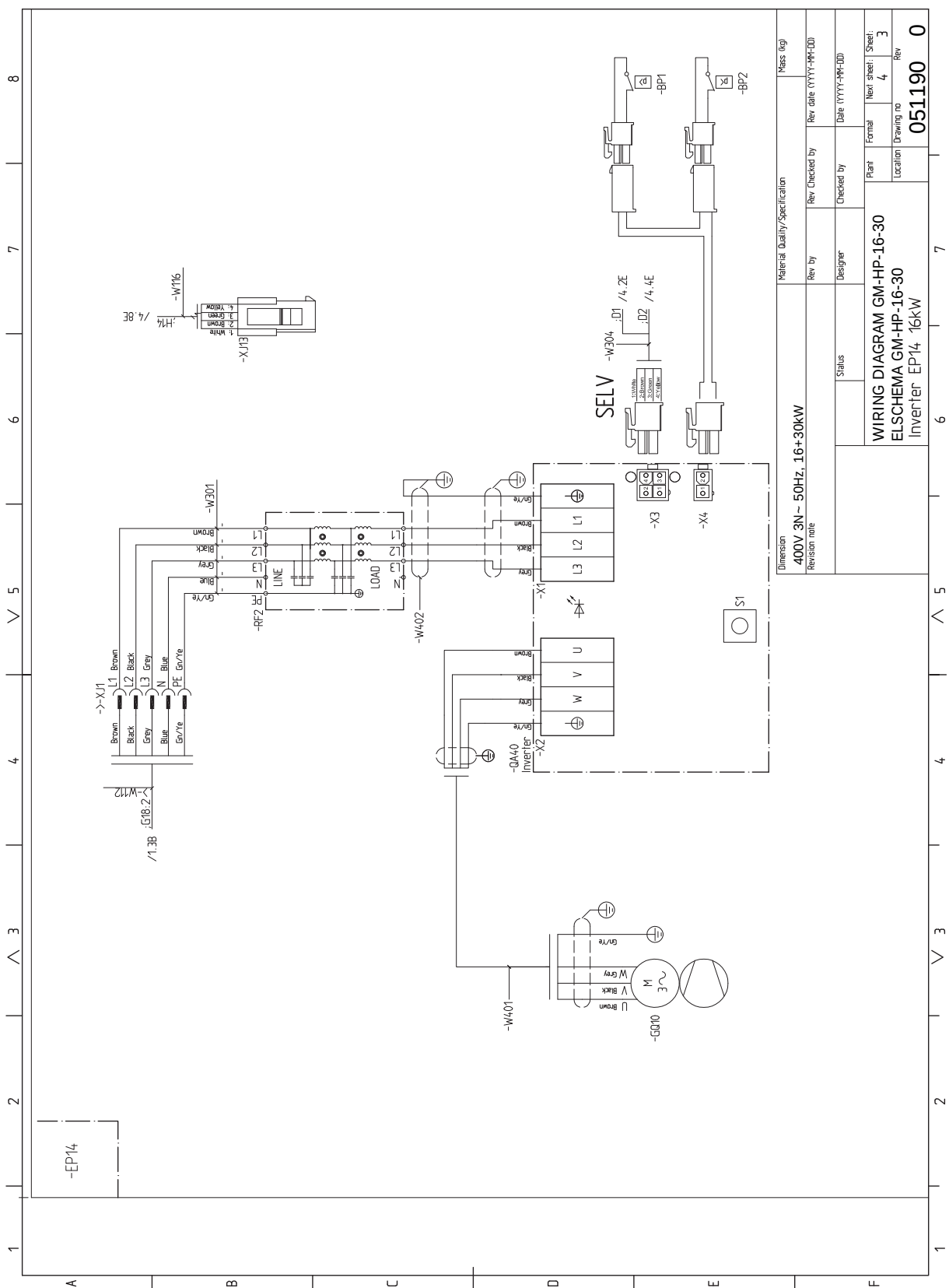
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Checked by  
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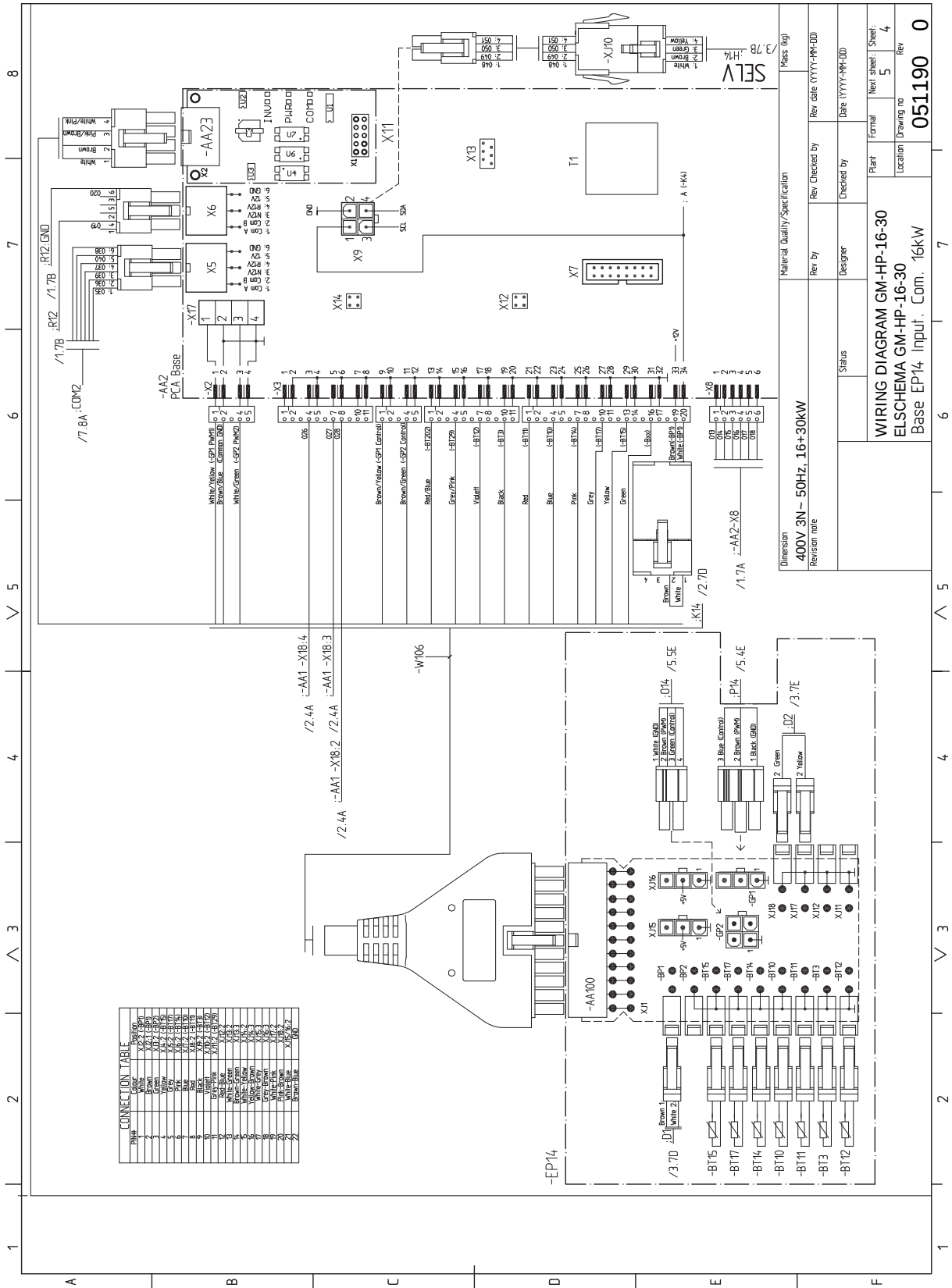
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Sheet  
Location  
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Rev

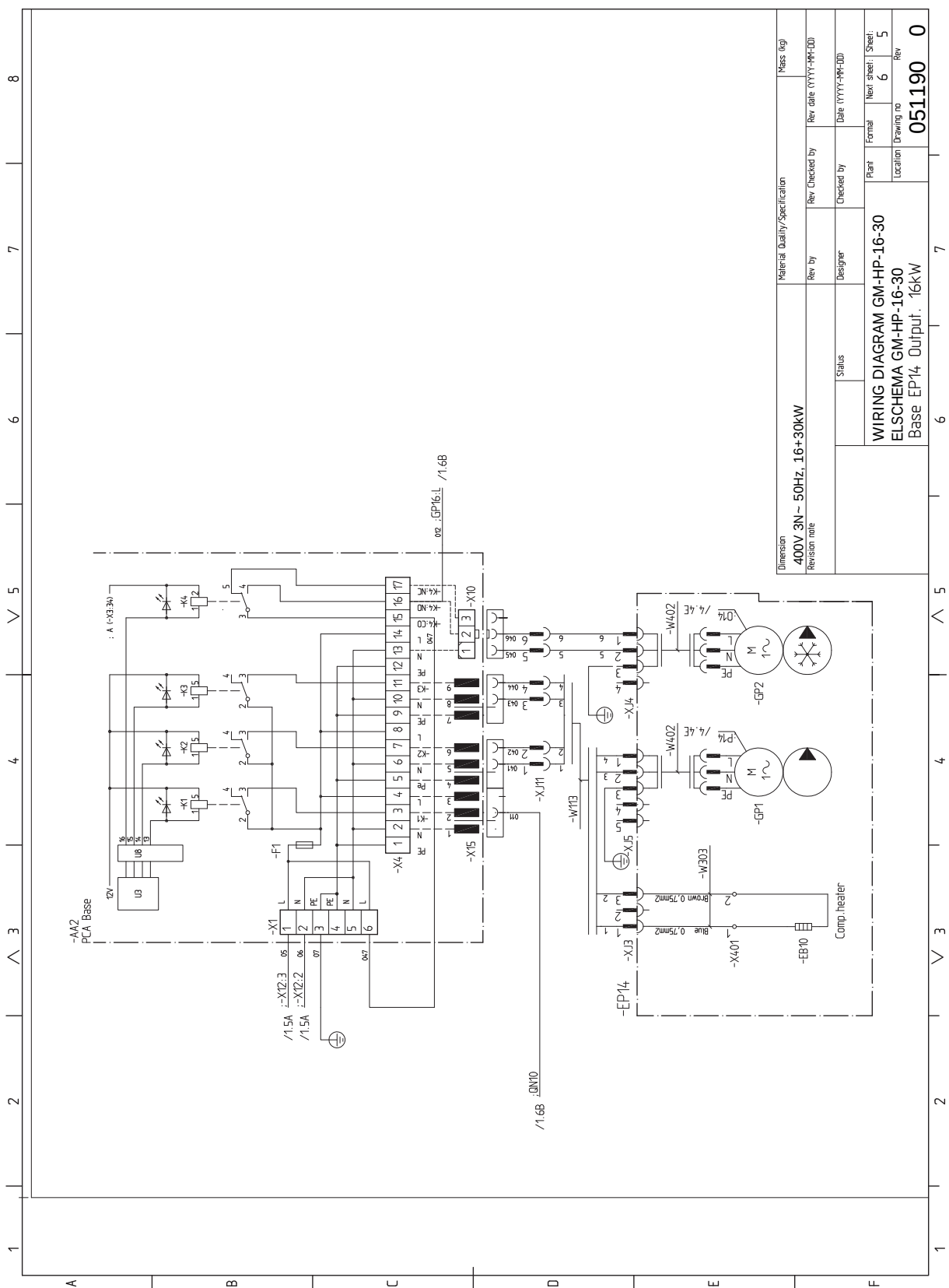
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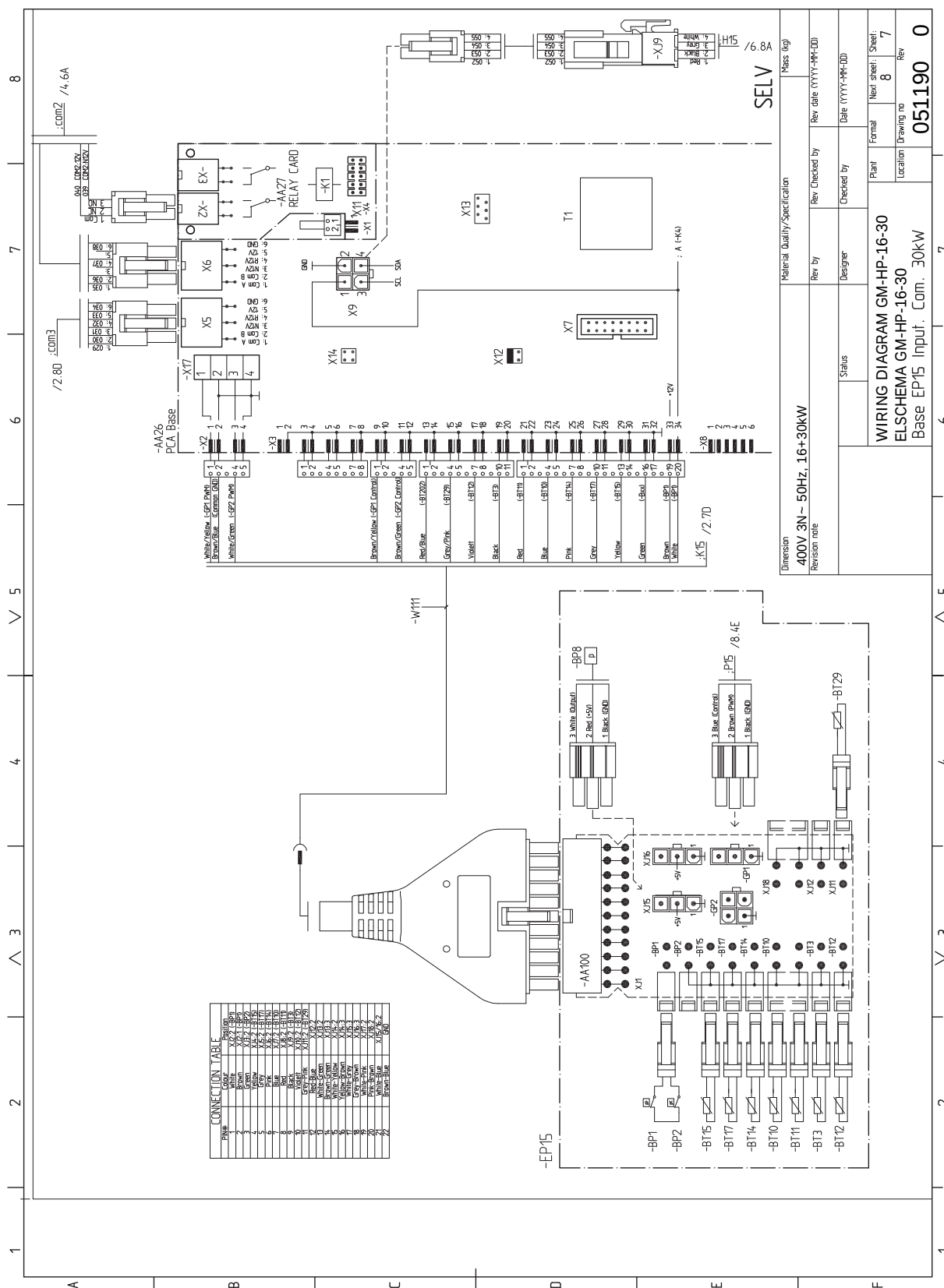


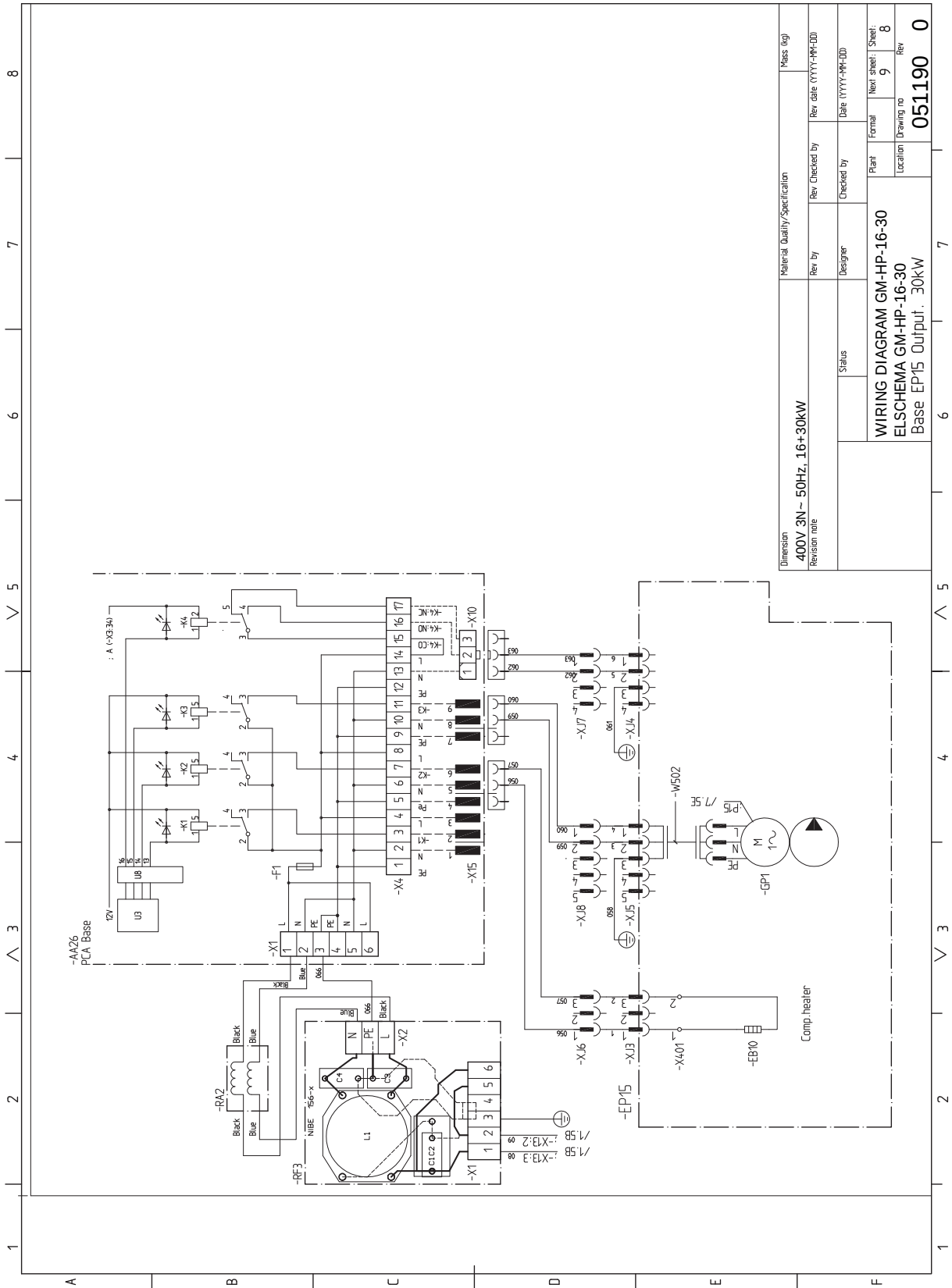


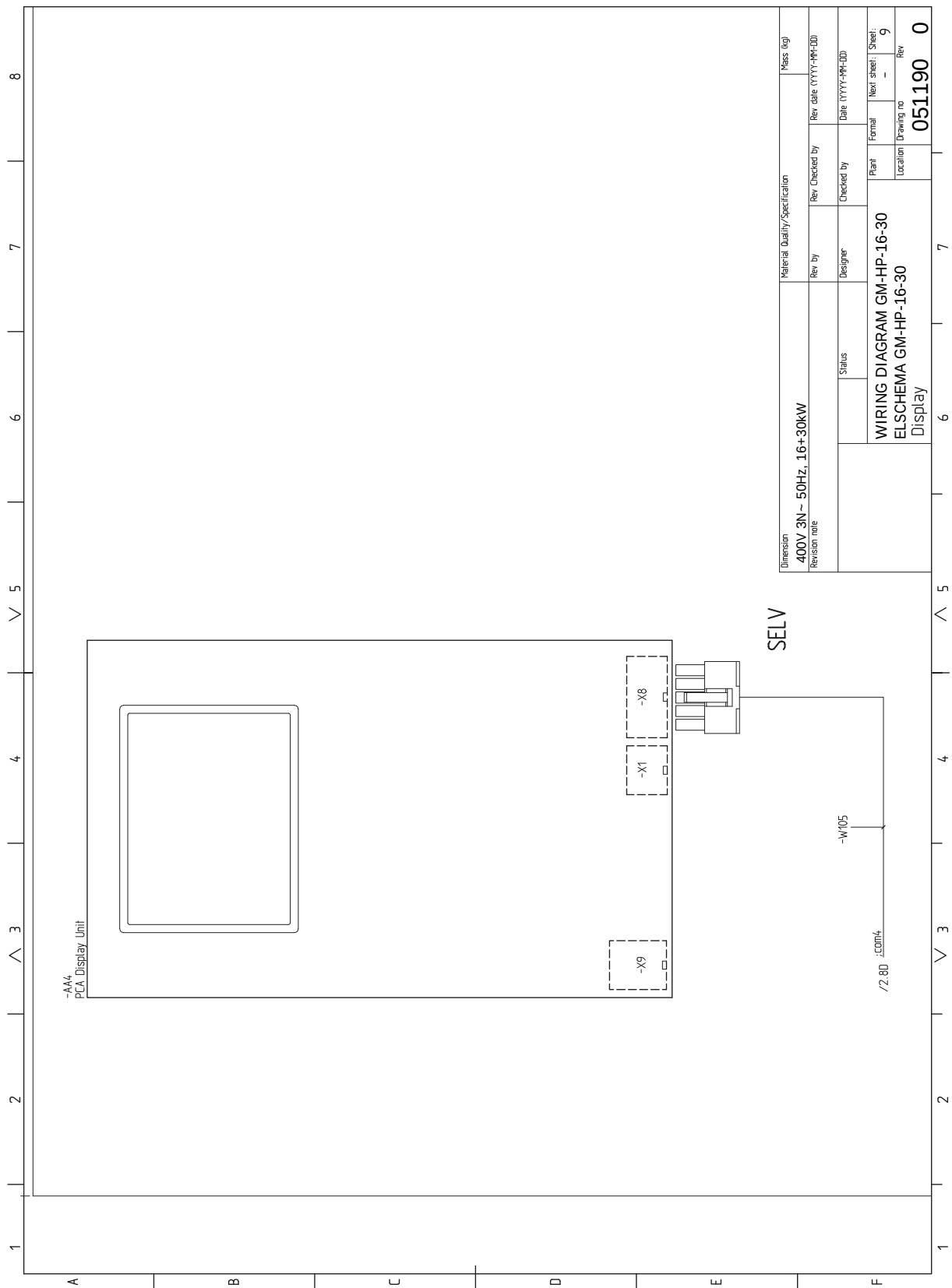












# 12 Item register

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