

Installer manual  
**NIBE™ F1345**  
Ground source heat pump



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# 1 Important information

## Safety information

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

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

Children should be supervised to ensure that they do not play with the appliance.

This is an original instruction manual. Translation is not allowed without approval from NIBE.

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## Symbols



### NOTE

This symbol indicates danger to machine or person.



### Caution

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



### TIP

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

## Marking

F1345 is CE marked and fulfils IP21.

The CE marking means that NIBE ensures that the product meets all regulations that are placed on it based on relevant EU directives. The CE mark is obligat-

ory for most products sold in the EU, regardless where they are made.

IP21 means that the product can be touched by hand, that objects with a diameter larger than or equivalent to 12.5 mm cannot penetrate and cause damage and that the product is protected against vertically falling drops.

## Safety precautions

### Caution

**Install the system in full accordance with this installation manual.**

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

**Observe the measurement values before working on the cooling system, especially when installing in small rooms, so that the limit for the refrigerant's density is not exceeded.**

Consult an expert to interpret the measurement values. If the refrigerant density exceeds the limit, lack of oxygen can occur in the event of any leak, which can cause serious accidents.

**Use original accessories and the stated components for the installation.**

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

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

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

**Install the unit in a location with good support.**

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury. Installation without sufficient support can also cause vibrations and noise.

**Ensure that the unit is stable when installed, so that it can withstand earthquakes and strong winds.**

Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

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

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

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

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

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

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

**Use types of pipe and tools stated for this type of refrigerant.** Using existing parts for other refrigerants can cause breakdowns and serious accidents due to process circuit bursts.

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

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

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

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

**Do not run the unit with removed panels or protection.**

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

**Cut the power before starting electrical work.**

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

**Care**

**Carry out the electrical installation with care.**

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

**Use main switch with sufficient breaking capacity.**

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

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

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

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

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

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

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

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

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

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

This can damage the items.

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

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

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

If the unit weighs more than 20 kg, it must be carried by two people. Use gloves to minimize 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 R410A**

- Only use R410A refrigerant. R410A means that the pressure is about 1.6 times as high as conventional refrigerants.

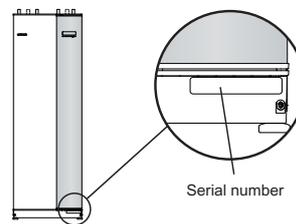
- The filling connections on units with R410A are different sizes, to prevent the system being filled with the incorrect refrigerant by mistake.

- 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.

**Serial number**

The serial number can be found at the bottom right of the front cover and in the info menu (menu 3.1).



**Caution**  
Always give the product's serial number (14 digits) when reporting a fault.

**Country specific information**

**Installer manual**

This installer manual must be left with the customer.

## Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person. Fill in the page for information about installation data in the Operating manual.

✓	Description	Notes	Signature	Date
	Brine (page 15)			
	Non-return valves			
	System flushed			
	System vented			
	Antifreeze			
	Level/Expansion vessel			
	Particle filter			
	Safety valve			
	Shut off valves			
	Circulation pumps set			
	Heating medium (page 17)			
	Non-return valves			
	System flushed			
	System vented			
	Expansion vessel			
	Particle filter			
	Safety valve			
	Shut off valves			
	Circulation pumps set			
	Electricity (page 21)			
	Fuses heat pump			
	Fuses property			
	Outside sensor			
	Room sensor			
	Current sensor			
	Safety breaker			
	Earth circuit-breaker			
	Relay output for emergency mode			

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For countries not mention in this list, please contact Nibe Sweden or check [www.nibe.eu](http://www.nibe.eu) for more information.

## 2 Delivery and handling

### Transport

F1345 should be transported and stored vertically in a dry place. When being moved into a building, the heat pump may be tilted back 45°. **NOTE!** The heat pump is top heavy.

If the cooling modules are pulled out and transported upright, F1345 can be transported on its back.



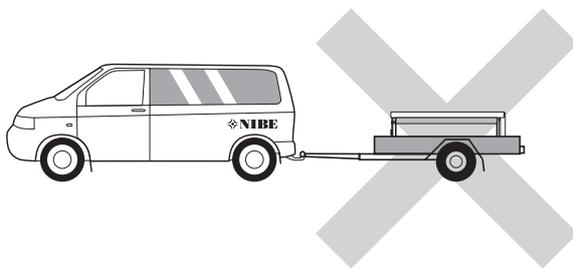
#### NOTE

Ensure that the heat pump cannot fall over during transport.



#### TIP

The side panels can be removed for easier installation in the building.



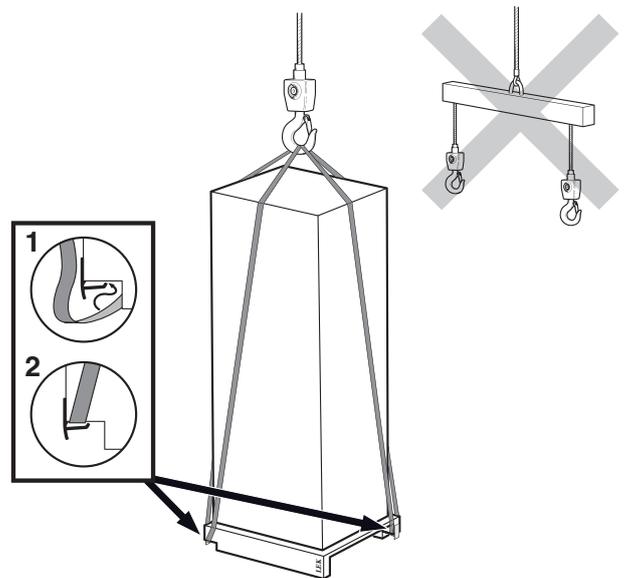
### Lift from the street to the set up location

If the base allows, the simplest thing is to use a pallet truck to move the F1345 to the set up location.



#### NOTE

The centre of gravity is offset to one side (see print on the packaging).



If F1345 needs to be transported across soft ground, such as a lawn, we recommend that a crane is used that can lift the unit to the installation location. When F1345 is raised using a crane, distribute the load according to the instructions on the packaging.

If a crane cannot be used F1345 can be transported on a sack truck. F1345 must be taken from its heaviest side (see printed material on packaging for where the centre of gravity is) and two people are required to lift F1345.

### Lift from the pallet to final positioning

Before lifting, remove the packaging and the load anchor to the pallet as well as front and side panels.

Before lifting, the heat pump must be separated by pulling the cooling modules out from the cabinet. See the service chapter in the operating manual for instructions about the separation.

Carry the heat pump by the upper cooling module's slide rails, use gloves.



#### NOTE

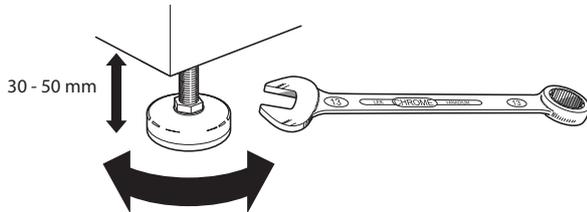
The heat pump must not be moved when only the lower cooling module has been pulled out. If the heat pump is not secured in position the upper cooling module must always be removed before the lower one can be pulled out.

### Scrapping

For scrapping, remove the product in reverse order.

## Assembly

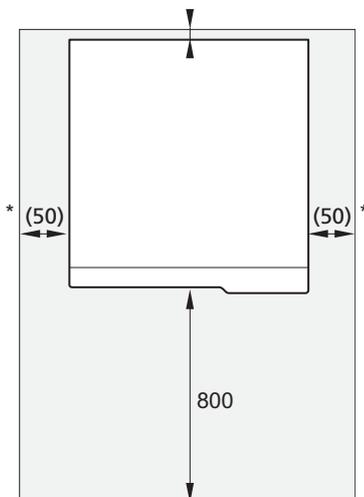
- Position F1345 on a firm base that can take the weight, preferably on a concrete floor or foundation. Use the product's adjustable feet to obtain a horizontal and stable set-up.



- The area where F1345 is located must be equipped with floor drainage.
- Install with its back to an outside wall, ideally in a room where noise does not matter, in order to eliminate noise problems. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- Wherever the unit is located, walls to sound sensitive rooms should be fitted with sound insulation.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

## Installation area

Leave a space of 800 mm in front of the product. Approx 50 mm free space is required in order to open the side hatches. The hatches do not need to be opened during service, all service on F1345 can be carried out from the front. Leave space between the heat pump and wall behind (and any routing of supply cables and pipes) to reduce the risk reproduction of any vibration.



\* A normal installation needs 300 - 400 mm (any side) for connection equipment, i.e. level vessel, valves and electrical equipment.

## Supplied components

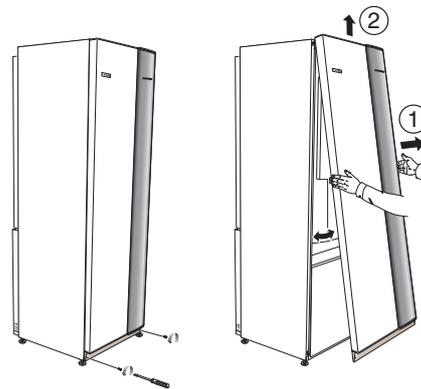
See separate list of supplied components.

### Location

The kit of supplied items is placed in packaging on top of the heat pump.

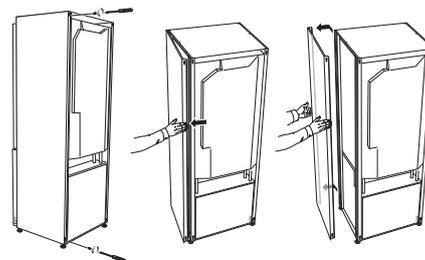
## Removing the covers

### Front cover



- Remove the screws from the lower edge of the front cover.
- Lift the cover out at the bottom edge and up.

### Side covers

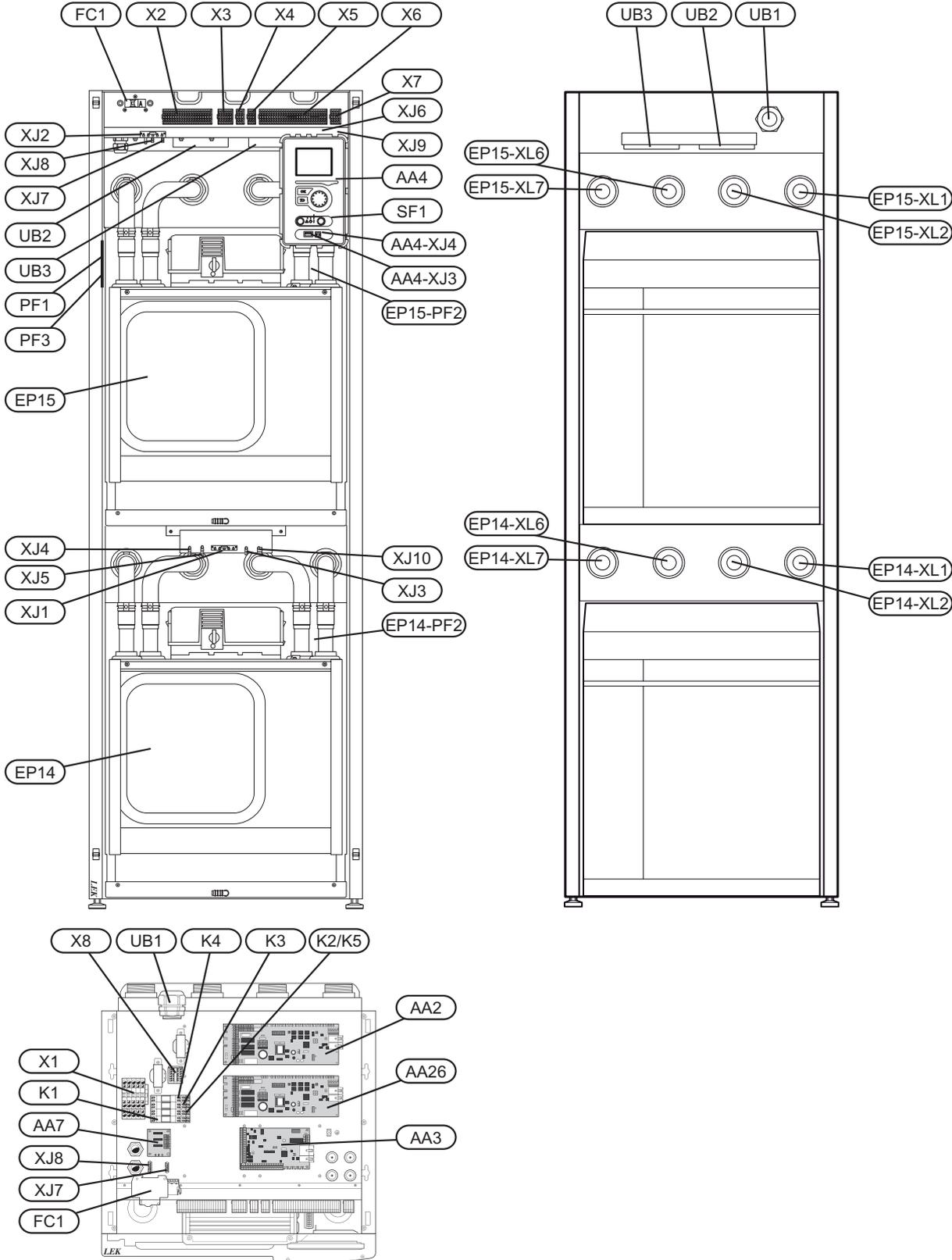


The side covers can be removed to facilitate the installation.

- Remove the screws from the upper and lower edges.
- Twist the cover slightly outward.
- Move the cover backwards and slightly to the side.
- Pull the cover to one side.
- Pull the cover forwards.

# 3 The heat pump design

## General



## Pipe connections

XL 1	Connection, heating medium flow
XL 2	Connection, heating medium return
XL 6	Connection, brine in
XL 7	Connection, brine out

## HVAC components

EP 14	Cooling module
EP 15	Cooling module

## Sensors etc.

BT 1	Outside sensor
------	----------------

## Electrical components

AA 2	Base card
AA 3	Input circuit board
AA 4	Display unit
	AA4-XJ3 USB outlet (no function)
	AA4-XJ4 Service outlet (No function)
AA 7	Extra relay circuit board
AA 26	Base card 2
FC 1	Miniature circuit-breaker
K 1	Emergency mode relay
K 2	Relay, external circulation pump (only 40 and 60 kW)
K 3	Relay, external circulation pump (only 40 and 60 kW)
K 4	Relay, external circulation pump (only 40 and 60 kW)
K 5	Relay (only 24 and 30 kW)
X 1	Terminal block, incoming electrical supply
X 2	Terminal block, non-return valve, external brine pump (only 40 and 60 kW) and external operating voltage (at tariff control)
X 3	Terminal block, step controlled additional heat
X 4	Terminal block, emergency mode relay
X 5	Terminal block, common alarm
X 6	Terminal block, communication, sensors and software controlled inputs
X 7	Terminal block, control signal external brine pump (only 40 and 60 kW)
X 8	Terminal block
XJ 1	Connector, electrical supply to compressor, cooling module EP14
XJ 2	Connector, electrical supply to compressor, cooling module EP15
XJ 3	Connector, cooling module EP14
XJ 4	Connector, brine pump, cooling module EP14 (only 24 and 30 kW)
XJ 5	Connector, heating medium pump, cooling module EP14
XJ 6	Connector, cooling module EP15

XJ 7	Connector, brine pump, cooling module EP15 (only 24 and 30 kW)
XJ 8	Connector, heating medium pump, cooling module EP15
XJ 9	Connector, cooling module EP15
XJ 10	Connector, cooling module EP14
SF 1	Switch

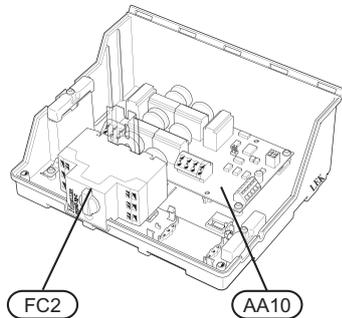
## Miscellaneous

PF 1	Rating plate
PF 2	Type plate, cooling section
PF 3	Serial number plate
UB 1	Cable gland, incoming electricity
UB 2	Cable gland, power
UB 3	Cable gland, signal

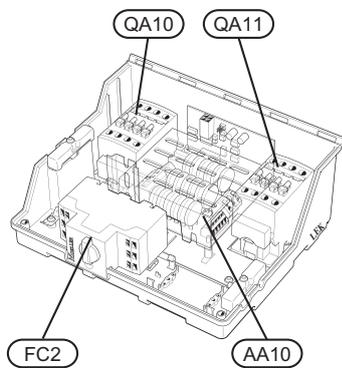
Designations in component locations according to standard IEC 81346-1 and 81346-2.

# Electrical cabinets

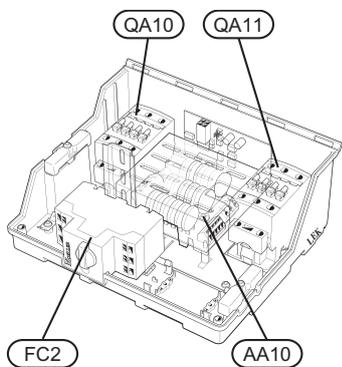
F1345 24 kW, 3x400 V



F1345 30 kW, 3x400 V



F1345 40 and 60 kW, 3x400 V



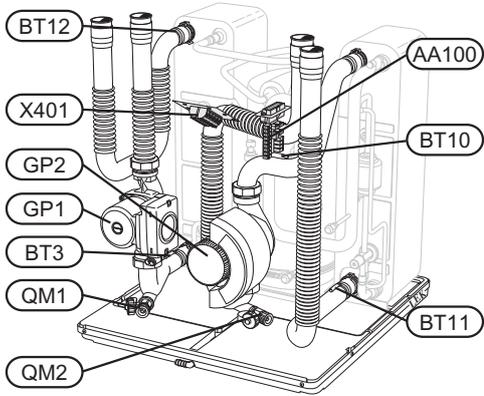
## Electrical components

- AA 10 Soft-start
- FC 2 Motor cut-out
- QA 10 Contactor, compressor
- QA 11 Contactor, compressor

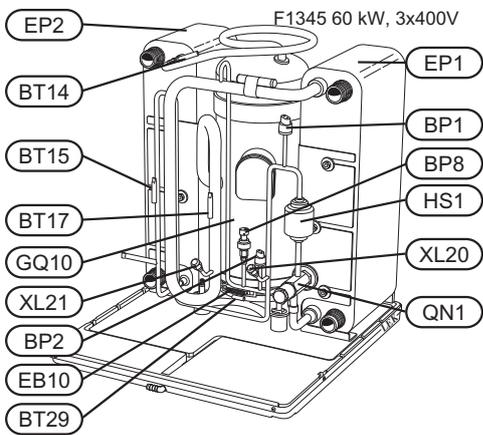
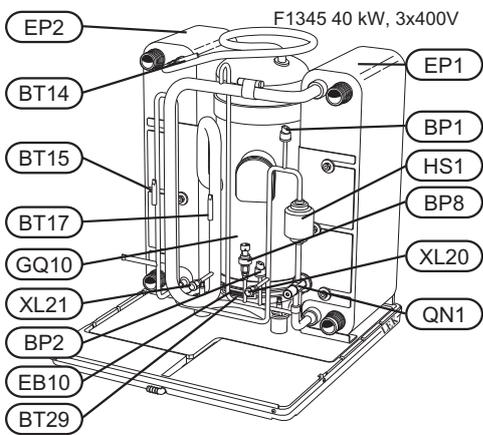
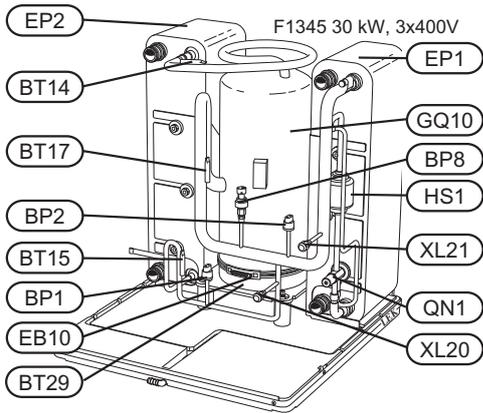
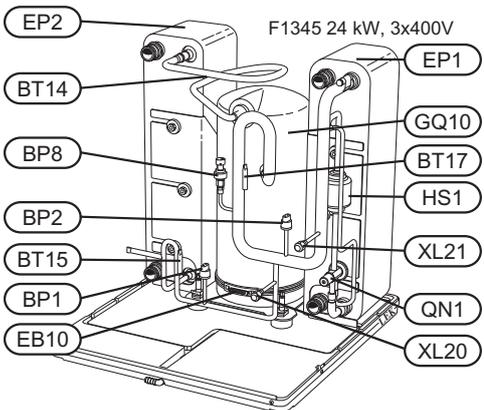
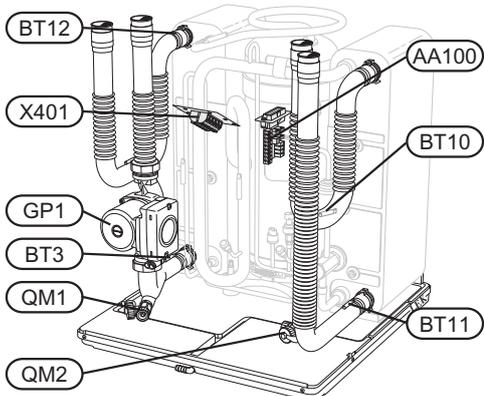
Designations in component locations according to standard IEC 81346-1 and 81346-2.

# Cooling section

F1345 24 and 30 kW, 3x400 V



F1345 40 and 60 kW, 3x400 V



### **Pipe connections**

- XL 20 Service connection, high pressure
- XL 21 Service connection, low pressure

### **HVAC components**

- GP 1 Circulation pump
- GP 2 Brine pump
- QM 1 Drainage, climate system
- QM 2 Draining, brine side

### **Sensors etc.**

- BP 1 High pressure pressostat
- BP 2 Low pressure pressostat
- BP 8 Sensor, low pressure
- BT 3 Temperature sensors, heating medium return
- BT 10 Temperature sensor, brine in
- BT 11 Temperature sensor, brine out
- BT 12 Temperature sensor, condenser supply line
- BT 14 Temperature sensor, hot gas
- BT 15 Temperature sensor, fluid pipe
- BT 17 Temperature sensor, suction gas
- BT 29 Temperature sensor, compressor

### **Electrical components**

- AA 100 Joint card
- EB 10 Compressor heater
- X 401 Joint connector, compressor and motor module

### **Cooling components**

- EP 1 Evaporator
- EP 2 Condenser
- GQ 10 Compressor
- HS 1 Drying filter
- QN 1 Expansion valve

Designations in component locations according to standard IEC 81346-1 and 81346-2.

# 4 Pipe connections

## General

Pipe installation must be carried out in accordance with current norms and directives. F1345 can operate with a return temperature of up to 58 °C and an outgoing temperature from the heat pump of 65 °C.

F1345 is not equipped with internal shut off valves; these must be installed to facilitate any future servicing.



**NOTE**

The pipe system needs to be flushed out before the heat pump is connected so that debris cannot damage component parts.



**NOTE**

Do not solder directly on the heat pump pipes, because of internal sensors.

Compression ring coupling alternatively pressure connection should be used.

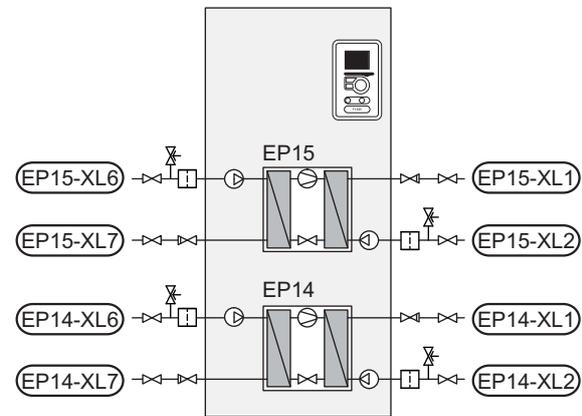
### Symbol key

Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Shunt / shuttle valve
	Safety valve
	Temperature sensor
	Expansion vessel
	Pressure gauge
	Circulation pump
	Particle filter
	Auxiliary relay
	Compressor
	Heat exchanger

## System diagram

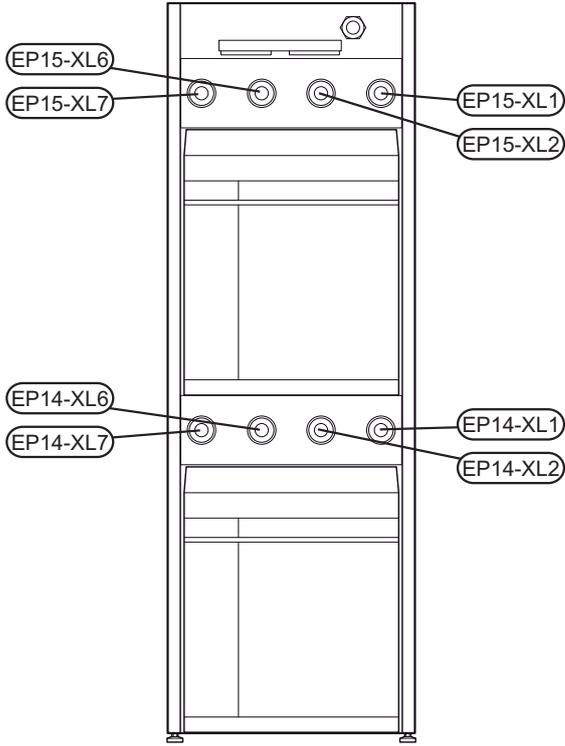
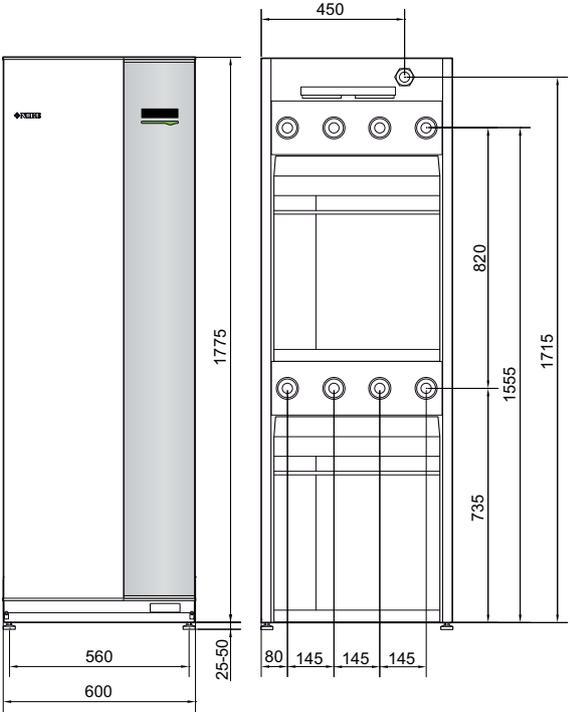
F1345 consists of two heat pump modules, circulation pumps and control system with possibility of additional heat. F1345 is connected to the brine and heating medium circuits.

In the heat pump evaporator, the brine (water mixed with anti-freeze, glycol or ethanol) releases its energy to the refrigerant, which is vaporised in order to be compressed in the compressor. The refrigerant, of which the temperature has now been raised, is passed to the condenser where it gives off its energy to the heating medium circuit and, if necessary, to any docked water heater. If there is a greater need for heating/hot water than the compressors can provide it is possible to connect an external immersion heater.



- EP 14 Cooling module
- EP 15 Cooling module
- XL 1 Connection, heating medium flow
- XL 2 Connection, heating medium return
- XL 6 Connection, brine in
- XL 7 Connection, brine out

# Dimensions and pipe connections



## Pipe dimensions

Connection	
(XL1) Heating medium supply, external thread	G2"
(XL2) Heating medium return, external thread	G2"
(XL6) Brine in, external thread	G2"
(XL7) Brine out, external thread	G2"

## Brine side

### Collector

Type	Surface soil heat, recommended collector length (m)	Rock heat, recommended active drilling depth (m)
24 kW	3x350-4x400	2x180-3x180
30 kW	3x450-4x450	3x150-5x150
40 kW	4x500-6x500	4x170-5x200
60 kW	6x450-8x450	6x150-8x180

Applies to PEM hose 40x2.4 PN 6.3.

These are rough example values. At installation the correct calculations must be made according to local conditions.



#### Caution

The length of the collector hose varies depending on the rock/soil conditions, climate zone and on the climate system (radiators or under-floor heating).

Max length per coil for the collector should not exceed 500 m.

The collectors must always be connected in parallel with the possibility of adjusting the flow for the relevant coil.

For surface soil heat, the hose should be buried at a depth determined by local conditions and the distance between the hoses should be at least 1 metre.

For several bore holes, the distance between the holes must be determined according to local conditions.

Ensure the collector hose rises constantly towards the heat pump to avoid air pockets. If this is not possible, airvents should be used.

As the temperature of brine system can fall below 0 °C it must be protected against freezing down to -15 °C. 1 litre of ready mixed brine per meter of collector hose (applies when using PEM-hose 40x 2.4 PN 6.3) is used as a guide value when making the volume calculation.



#### Caution

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

### Connecting the brine side

- The pipe connections are on the rear of the heat pump.
- Insulate all indoor brine pipes against condensation.



#### NOTE

Condensation may drip from the expansion vessel. Position the vessel so that this does not harm other equipment.

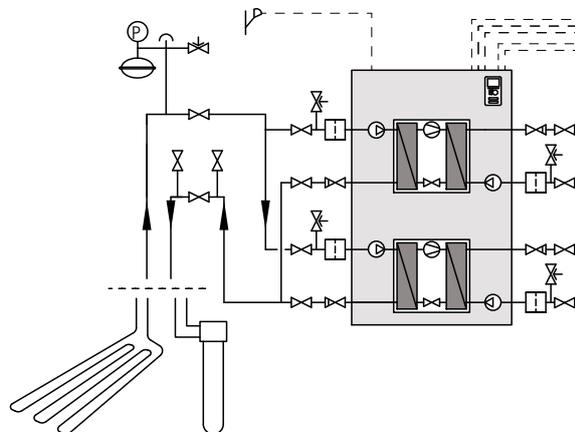


#### Caution

When necessary you should install venting valves in the brine system.

- Mark the brine system with the antifreeze that is used.
- Install the supplied safety valve at the expansion vessel as illustrated in the outline diagram. The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost-free.
- Install shut off valves as close to the heat pump as possible so that the flow to individual cooling modules can be shut off. Extra safety valves (according the outline diagram) are required.
- Fit the supplied particle filter on the incoming pipe.
- Fit the supplied non-return valves on the outgoing pipe.

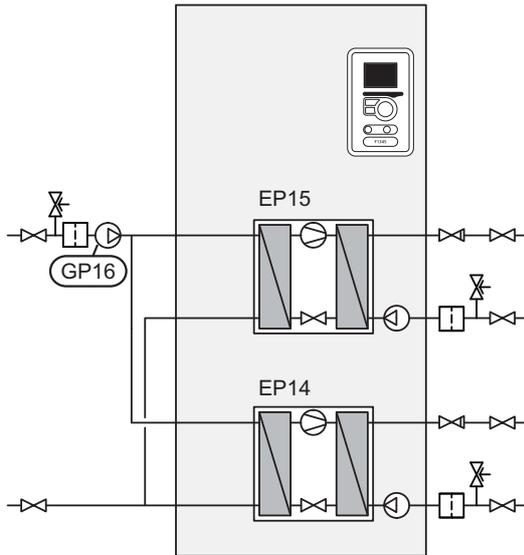
In the case of connection to an open groundwater system, an intermediate frost-protected circuit must be provided, because of the risk of dirt and freezing in the evaporator. This requires an extra heat exchanger.



## Connecting external brine pump (40 and 60kW only)

Install the brine pump (GP16) according to the circulation pump manual for connection of incoming brine (EP14-XL6) and (EP15-XL6) between the heat pump and shut off valve (see image).

In some countries the brine pump is not supplied, see list of supplied items.



**NOTE**  
 Insulate the brine pump against condensation (do not cover the drainage hole).

## Expansion vessel

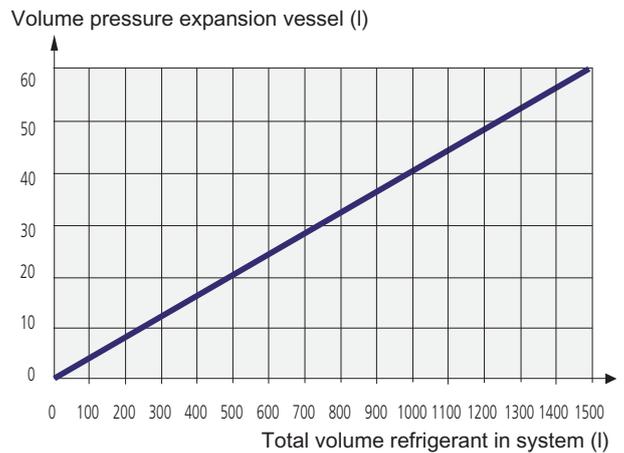
The brine circuit must be supplied with a pressure expansion vessel.

The brine side must be pressurised to at least 0.05 MPa (0.5 bar).

The pressure expansion vessel should be dimensioned as set out in the following diagram, to prevent operating disturbances. The diagrams cover the temperature range from 10 °C to +20 °C at a pre-pressure of 0.05 MPa (0.5 bar) and the safety valve's opening pressure of 0.3 MPa (3.0 bar).

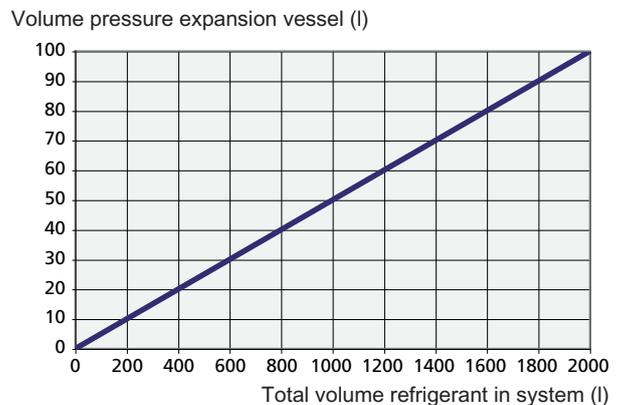
### Ethanol 28% (volume percent)

In installations with ethanol (28% volume percent) as the brine the pressure expansion vessel must be dimensioned according to the following diagram.



### Ethylene glycol 40% (volume percent)

In installations with ethylene glycol (40% volume percent) as the brine the pressure expansion vessel must be dimensioned according to the following diagram.



## Heating medium side

### Connecting the climate system

A climate system is a system that regulates indoor comfort with the help of the control system in F1345 and for example radiators, underfloor heating/cooling, fan convectors etc.

- The pipe connections are on the rear of the heat pump.
- Install the necessary safety equipment and shut off valves (installed as close to the heat pump as possible so that the flow to individual cooling modules can be shut off).
- Fit the supplied particle filter on the incoming pipe.
- The safety valve must have a maximum 0.6 MPa (6.0 bar) opening pressure and be installed on the heating medium return. The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost-free.
- 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.
- Fit the supplied non-return valves on the outgoing pipe.



#### Caution

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



#### Caution

The heat pump is designed so that heating production can occur with one or two cooling modules. This however entails different pipe or electrical installations.

## Hot water heater

### Connecting the hot water heater

- Any docked hot water heater must be fitted with necessary set of valves.
- The mixing valve must be installed if the setting is changed so that the temperature can exceed 60 °C.
- The setting for hot water is made in menu 5.1.1.
- The safety valve must have a maximum opening pressure in accordance with the water heater manual and be installed on the incoming domestic water line. The entire length of the overflow water pipe from the safety valves must be inclined to prevent water pockets and must also be frost-free.



#### Caution

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



#### Caution

The heat pump/system is designed so that hot water production can occur with one or several cooling modules. This however entails different pipe or electrical installations.

### Fixed condensing

If F1345 is to work with fixed condensing you must connect an external flow sensor (BT25) according to the description on page 24. In addition, you must do the following menu settings.

Menu	Menu setting (local variations may be required)
1.9.3 - min. flow line temp.	Desired temperature in the tank.
5.1.2 - max flow line temperature	Desired temperature in the tank.
5.1.10 - op. mod heat med pump	intermittent
4.2 - op. mode	manual

## Docking alternatives

F1345 can be connected in several different ways, some of which are shown below.

Further option information is available at [www.nibe.eu](http://www.nibe.eu) and in the respective assembly instructions for the accessories used. See page 38 for a list of the accessories that can be used with F1345.

### Explanation

#### CL11 Pool system

AA5	Accessory card
BT51	Temperature sensor, pool
EP5	Exchanger, pool
GP9	Circulation pump, pool
HQ41	Particle filter, pool
QN19	Three way valve, pool
RN42	Trim valve

#### EB1 External additional heat

CM5	Expansion vessel, closed
EB1	External electrical additional heat
FL10	Safety valve, heating medium side
QM42 - QM43	Shut-off valve, heating medium side
RN11	Trim valve

#### EB100 Heat pump system (Master)

BT1	Temperature sensor, outdoor
BT6	Temperature sensor, hot water charging
BT25	Temperature sensor, heating medium flow, External
BT71	Temperature sensor, heating medium return, External
EB100	Heat pump, F1345
EP14	Cooling module A
EP15	Cooling module B
FL11 - FL12	Safety valve, collector side
FL13 - FL14	Safety valve, heating medium side
HQ12 - HQ15	Particle filter
QM50 - QM53	Shut-off valve, brine side
QM54 - QM57	Shut-off valve, heating medium side
QN10	Reversing valve, heating/hot water
RM10 - RM13	Non-return valve

CM5 Expansion vessel, closed

EM1 Gas boiler

FL10 Safety valve, heating medium side

KA1 Auxiliary relay, external additional heat

QN11 Mixing valve, addition

#### EP21 Climate system 2

AA5 Accessory card

BT2 Temperature sensors, heating medium flow

BT3 Temperature sensors, heating medium return

GP20 Circulation pump

QN25 Shunt valve

#### Miscellaneous

AA5 Accessory card

BP6 Manometer, brine side

BT70 Temperature sensor, hot water flow

CP10, CP11 Accumulator tank with hot water coil

CM1 Expansion vessel, closed, heating medium side

CM3 Expansion vessel, closed, brine side

EB2 Immersion heater

EB10 Hot water heater

EP12 Collector, brine side

FL2 Safety valve, heating medium side

FL3 Safety valve, brine

FQ1 Mixer valve, hot water

GP10 Circulation pump, heating medium external

GP11 Circulation pump, domestic hot water circulation

KA1 Auxiliary relay, immersion heater

QM11 Filler valve, heating medium side

QM20 Venting valve, heating medium side

QM21 Venting valve, brine side

QM33 Shut off valve, brine flow

QM34 Shut off valve, brine return

RM42 - RM43 Non-return valve

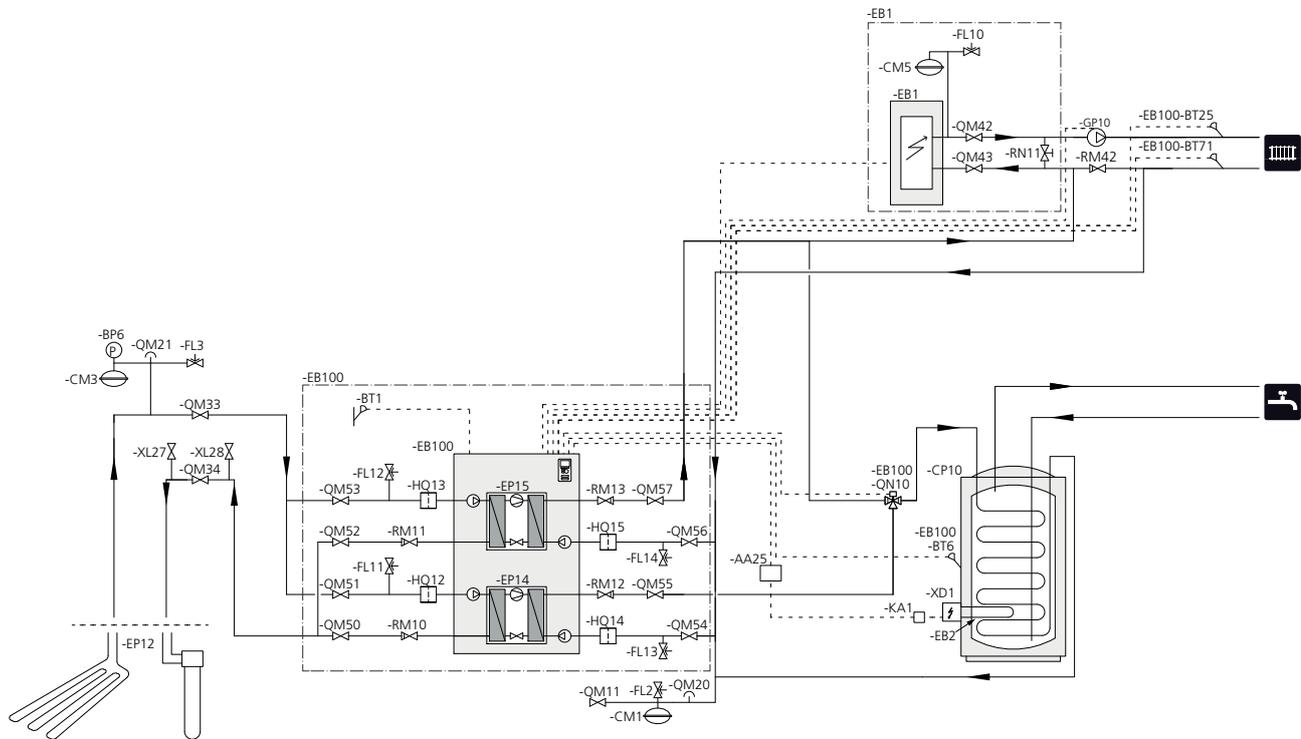
RN41, RN60 - Trim valve

RN63

XD1 Connection box

XL27 - XL28 Connection, filling brine

## Example - F1345 docked with electric additional heat and hot water heater (floating condensing)

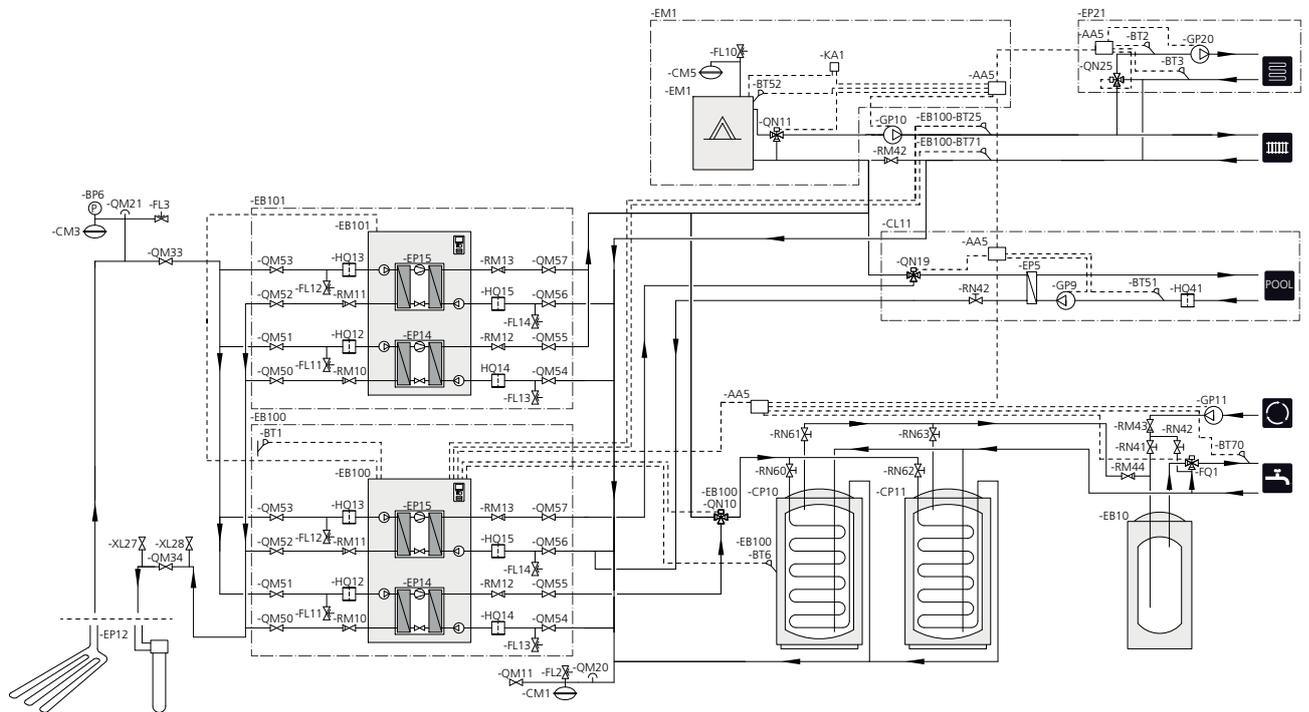


The heat pump (EB100) prioritises charging of hot water with half the power (cooling module EP14) via a reversing valve (QN10). When the water heater/accumulator tank (CP10) is fully charged (EB100-QN10) switches to the heating circuit. When there is a demand for heating, cooling module (EP15) starts first. For greater demands, cooling module (EP14) also starts for heating operation.

Additional heat (EB1) is connected automatically when the energy requirement exceeds the heat pump capacity.

If the water heater/accumulator tank (CP10) is fitted with an immersion heater (EB2) and a junction box (XD1) the functions "temporary lux" and "periodic increases" can be used. A by-pass contactor is recommended.

## Example 2 - 2x F1345 docked with oil addition, pool and water heater (floating condensing)



The heat pump (EB100) prioritises charging of hot water with half the power (cooling module EP14) via a reversing valve (EB100-QN10). When the water heater/accumulator tank (CP10 and CP11) are fully charged (EB100-QN10) switches to the heating circuit. The other half of the output (cooling module (EP14) prioritises pool heating via a reversing valve (CL11-QN19). When the pool is heated (CL11-QN19) switches to the heating circuit. When there is a demand for heating, cooling module (EP15) starts in heat pump (EB101) first. For greater demands, cooling module (EP14) also starts in (EB101) for heating operation.

Additional heat (EM1) is connected automatically when the energy requirement exceeds the heat pump capacity.

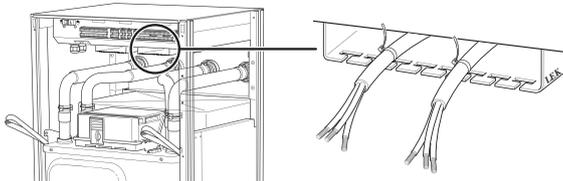
If the water heater/accumulator tank (CP10) is fitted with an immersion heater and a junction box the function "temporary lux" can be used. A by-pass contactor is recommended.

# 5 Electrical connections

## General

All electrical equipment, except the outdoor sensors, room sensors and the current sensors are already connected at the factory. For 40 and 60 kW the brine pump is supplied (does not apply to all countries, see list of supplied items) and must be installed outside the heat pump.

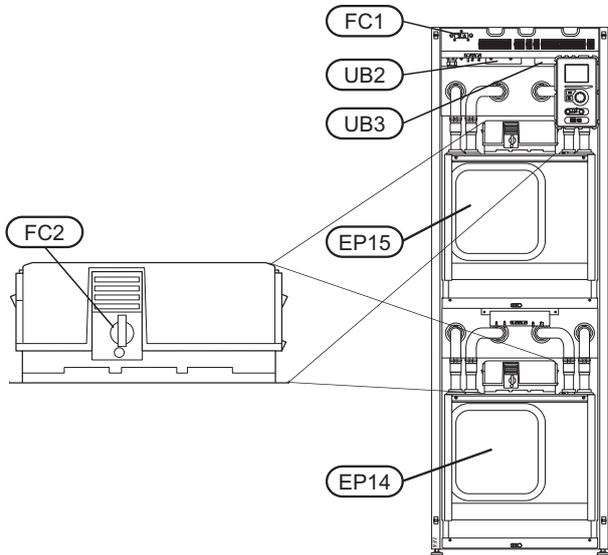
- Disconnect the heat pump before insulation testing the house wiring.
- If the building is equipped with an earth-fault breaker, each F1345 should be equipped with a separate one.
- If a miniature circuit breaker is used this should have at least motor characteristic "C". See page 41 for fuse size.
- For the heat pump wiring diagram, see page 44.
- 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 F1345, cable grommets (e.g. UB2, power cables and UB3, signal cables, marked in image) must be used. Secure the cables in the grooves in the panel using cable ties (see image).



**NOTE**  
 The switch (SF1) must not be moved to "I" or "Δ" until the boiler has been filled with water. Otherwise the compressor can 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**  
 Refer to the outline diagram of your system for positioning of the temperature sensor.



### Miniature circuit-breaker

The heat pump operating circuit and a large proportion of its internal components are internally fused by a miniature circuit breaker (FC1).

### Motor cut-out

Motor protection breakers (EP14-FC2) and (EP15-FC2) cut the power to the relevant compressor if the current is too high.

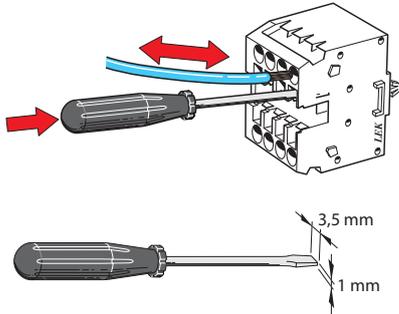
### Resetting

The motor protection breakers (EP14-FC2) and (EP15-FC2) are accessible behind the front cover. The affected breaker is reset by twisting the control knob to horizontal position.

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

## Cable lock

Use a suitable tool to release/lock cables in the heat pump terminal blocks.



## Connections

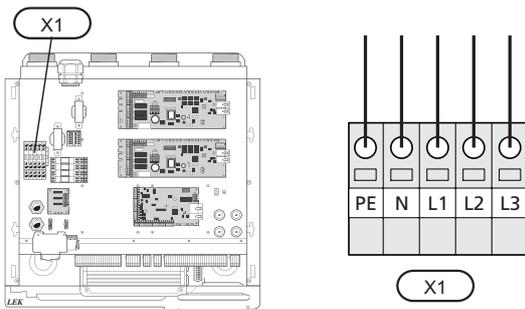


### NOTE

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

## Power connection

F1345 must be installed via an isolator switch with a minimum breaking gap of 3mm. Minimum cable area must be dimensioned according to the fuse rating used. Supplied cable for incoming electricity is connected to terminal block X1.



### NOTE

F1345 contains scroll compressor, which means that it is important that electrical connections are 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 certain period, simultaneous blocking of these must take place via software controlled input (AUX input) to avoid alarm, see page 29.

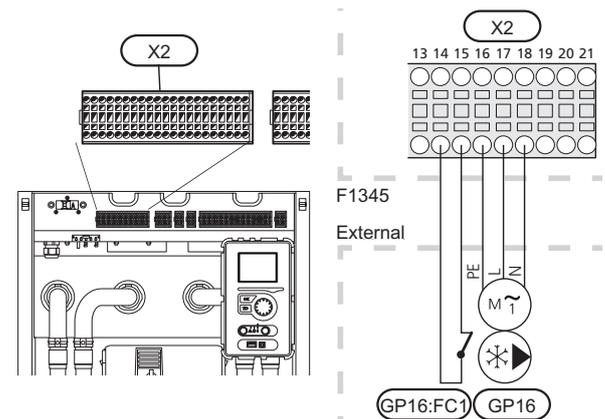
At the same time external operating voltage for the control system must be connected to the heat pump, see page 23.

## Connecting external brine pump (40 and 60kW only)

Connect the external circulation pump (GP16) as illustrated to the terminal block X2:16 (PE), X2:17 (230 V) and X2:18 (N).

Connect the external circulation pump motor cut-out (GP16:FC1) as illustrated to the terminal block X2:14 and X2:15.

In some countries the brine pump is not supplied, see list of supplied items.



### NOTE

If the brine pumps is not correctly connected at start up the heat pump receives an alarm.

## Connecting external operating voltage for the control system

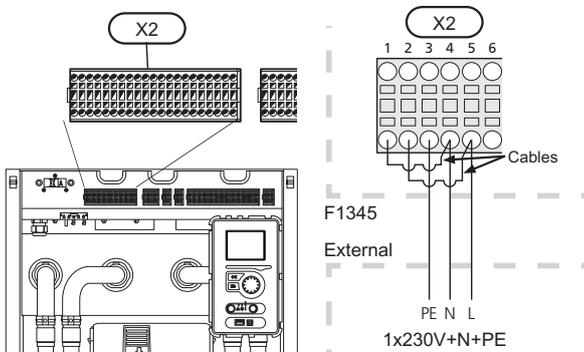


### NOTE

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 X2:1 and X2:4 and between terminal block X2:2 and X2:5 (see image).

Operating voltage (1x230V+N+PE) is connected to X2:3 (PE), X2:4 (N) and X2:5 (L) (as illustrated).

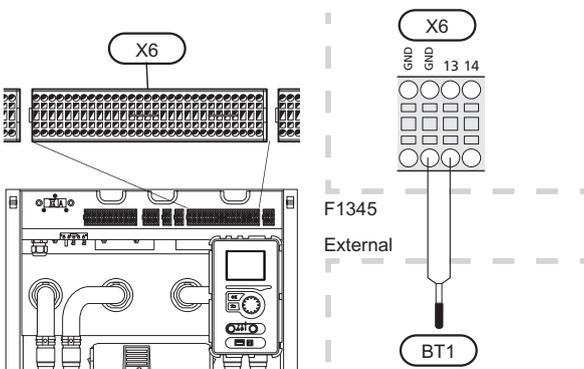


## Outside sensor

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 X6:13 and X6:GND. Use a twin core cable of at least 0.5 mm<sup>2</sup> cable area.

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

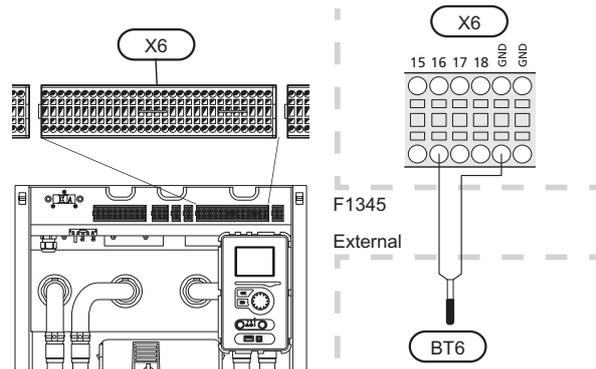


## Temperature sensor, hot water charging

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

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

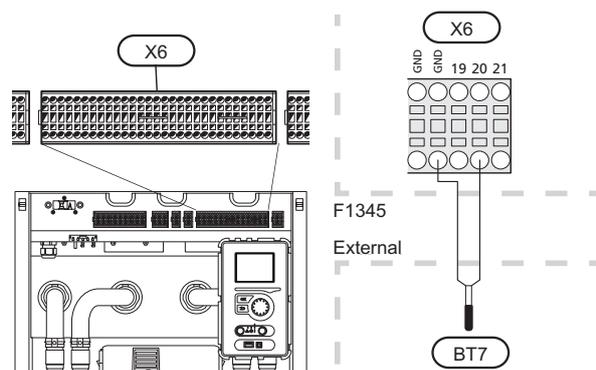
Hot water charging is activated in menu 5.2 or in the start guide.



## Temperature sensor, hot water top

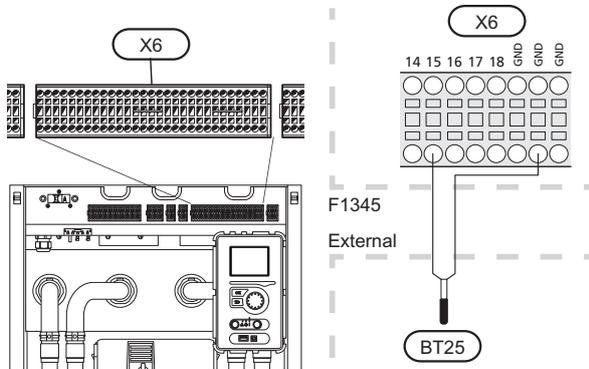
A temperature sensor for hot water top (BT7) can be connected to F1345 for showing the water temperature at the top of the tank (if possible).

Connect the sensor to terminal block X6:20 and X6:GND. Use a twin core cable of at least 0.5 mm<sup>2</sup> cable area.



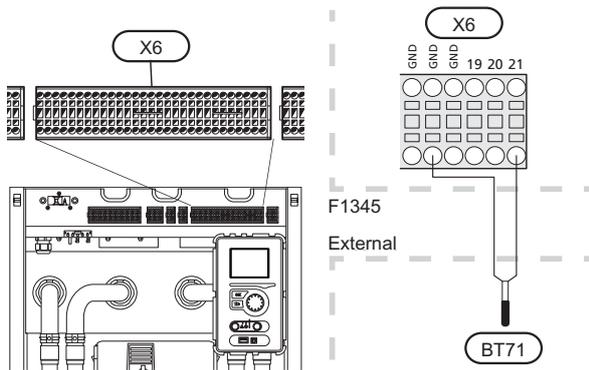
### Temperature sensor, external flow line

Connect temperature sensor, external flow (BT25) to terminal block X6:15 and X6:GND. Use a twin core cable of at least 0.5 mm<sup>2</sup> cable area.



### Temperature sensor, external return line

Connect temperature sensor, external return line (BT71) to terminal block X6:21 and X6:GND. Use a twin core cable of at least 0.5 mm<sup>2</sup> cable area.



# Optional connections

## Master/Slave

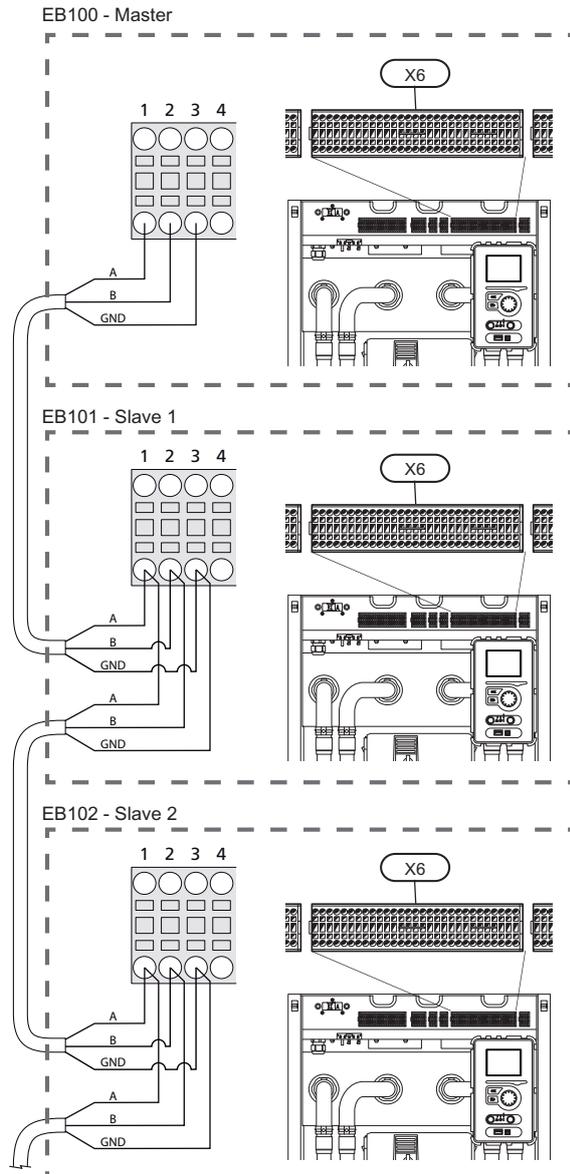
Several heat pumps (F1345) can be interconnected by selecting one heat pump as master and the others as slaves.

The heat pump is always delivered as master and up to till 8 slaves can be connected to it. In systems with several heat pumps each pump must have a unique name, that is only one heat pump can be "Master" and only one can be for example "Slave 5". Set master/slaves in menu 5.2.1.

External temperature sensors and control signals must only be connected to the master, except for external control of the compressor module and reversing valve(s) (QN10) that can be connected one to each heat pump. See page 28 for connecting the reversing valve (QN10).

Connect the communications cables as illustrated in series to the terminal block X6:1 (A), X6:2 (B) and X6:3 (GND) between the heat pumps.

Use cable type LiYY, EKKX or similar.



## Load monitor

When many power consumers 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. The heat pump has integrated load monitors that control the electrical steps for the electrical additional heat by disconnecting step by step in event of overload in a phase. Reconnection occurs when other current consumption is reduced.

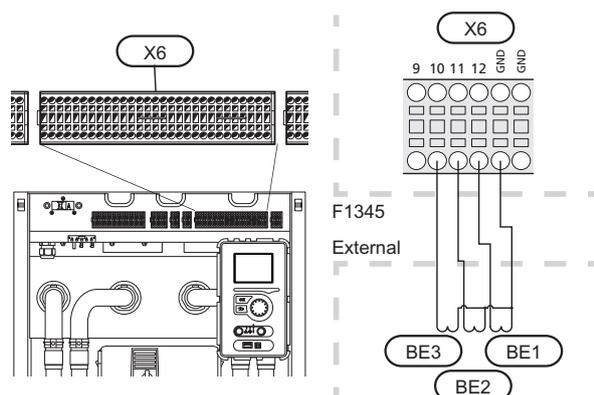
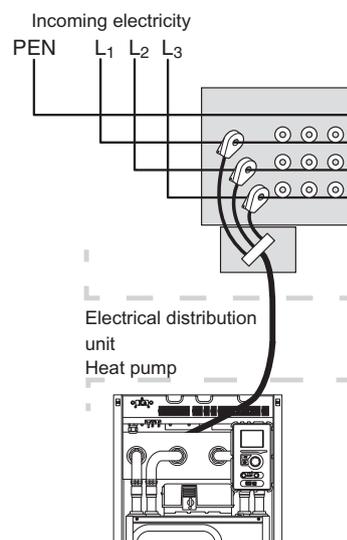
### Connecting current sensors

A current sensor (BE1 - BE3) should be installed on each incoming phase conductor in to the distribution box to measure the current. The distribution box is an appropriate installation point.

Connect the current sensors to a multi-core cable in an enclosure next to the distribution box. Use a multi-core cable of at least 0.5 mm<sup>2</sup> from the enclosure to the heat pump.

Connect the cable to terminal X6:10 to 12 and X6:GND where X6:GND is the common terminal block for the three current sensors.

The size of the property's main fuse is set in menu 5.1.12.



## Room sensor

F1345 can be supplemented with a room sensor (BT50). The room temperature sensor has up to three functions:

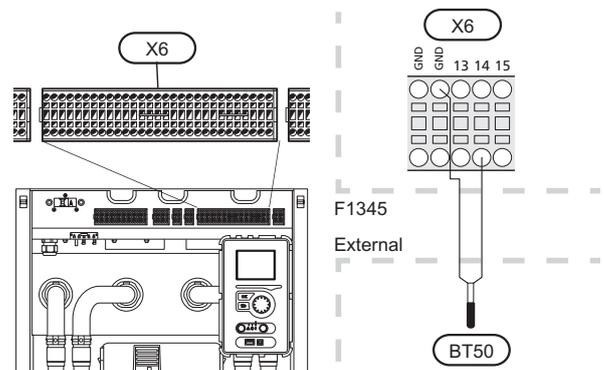
1. Show current room temperature in the heat pump's display.
2. Option of changing the room temperature in °C.
3. Makes it possible to change/stabilise the room temperature.

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

The heat pump operates without the sensor, but if one wishes to read off the accommodation's indoor temperature in F1345's display the sensor must be installed. Connect the room sensor to X6:14 and X6:GND.

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

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



**Caution**

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

## Step controlled additional heat



### NOTE

Mark up any junction boxes with warnings for external voltage.

External step controlled additional heat can be controlled by up to three potential free relays in the heat pump (3 step linear or 7 step binary). With the AXC 50 accessory a further three potential free relays are used for addition control, which then gives max 3+3 linear or 7+7 binary steps.

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

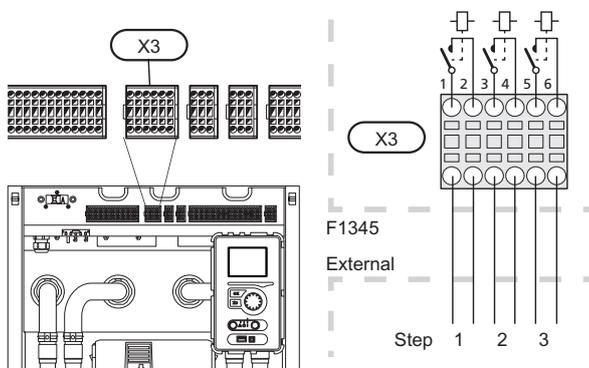
Step 1 is connected to terminal block X3:1 and 2.

Step 2 is connected to terminal block X3:3 and 4.

Step 3 is connected to terminal block X3:5 and 6.

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

All additional heat can be blocked by connecting a potential free switch function to the software controlled input terminal block X6 (see page 29) which is selected in menu 5.4.



If the relays are to be used for operating voltage, bridge the supply from X2:6 to X3:2, X3:4 and X3:6. Connect the neutral from an external addition to X2:8.

## Relay output for emergency mode

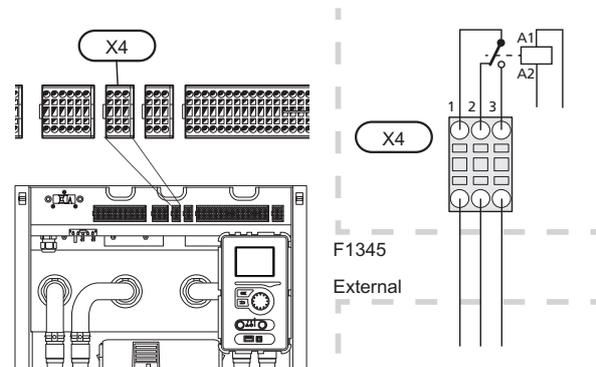


### NOTE

Mark up any junction boxes with warnings for external voltage.

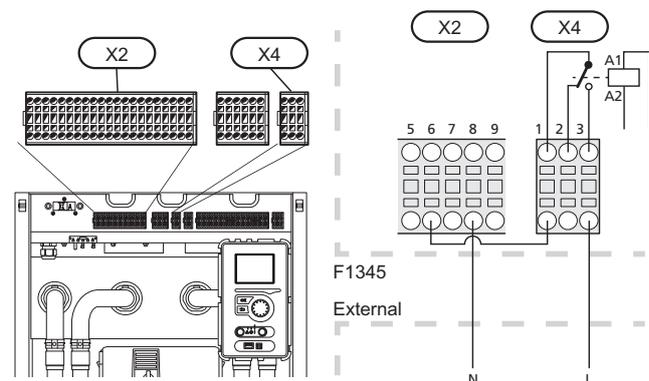
When switch (SF1) is set to "⚠" mode (emergency mode) the internal circulation pumps (EP14-GP1 and EP15-GP1) are activated and the potential free variable emergency mode relay (K1). External accessories are disconnected.

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.



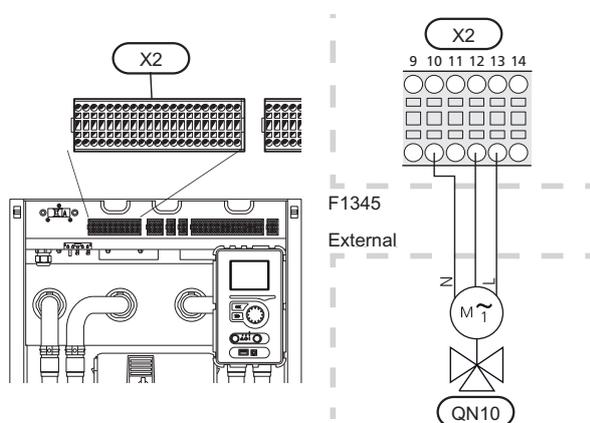
If the relay is to be used for operating voltage, bridge the supply from terminal block X2:6 to X4:1 and connect neutral and operating voltage from the external additional heating to X2:8 (N) and X4:3 (L).

## Reversing valves

F1345 can be supplemented with an external reversing valve (QN10) for hot water control (see page 38 for accessory).

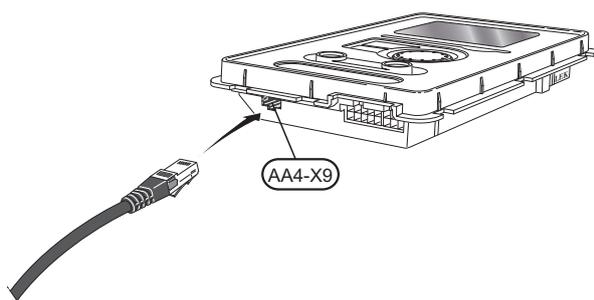
Connect the external reversing valve (QN10) as illustrated to terminal block X2:10 (N), X2:12 (operation) and X2:13 (L).

With several heat pumps connected as master/slave, connect the reversing valve electrically to a suitable heat pump. The reversing valve is controlled by the master heat pump regardless which heat pump it is connected to.



## NIBE Uplink™

Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable gland (UB3) in the heat pump for cable routing.



## External connection options

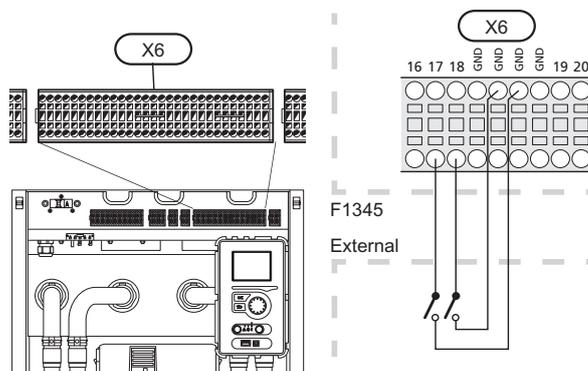
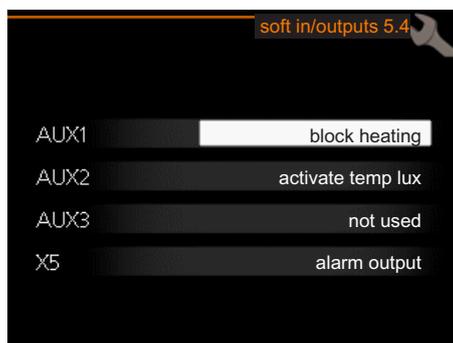
On terminal block (X6), F1345 has software controlled inputs and outputs for connection of external contact function. This means that an external contact function can be connected to one of three special connections where the function for connection must be decided in the heat pump software.



### Caution

If an external contact function is connected to F1345, the function for use input or output must be selected in menu 5.4.

Selectable inputs on the input card for these functions are AUX1 (X6:17), AUX2 (X6:18) and AUX3 (X6:19). Connect ground to terminal block X6:GND. Selectable outputs are terminal block X5.



The example above uses the inputs AUX1 (X6:17) and AUX2 (X6:18) on the terminal block (X6).



### Caution

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

## Possible selection for AUX inputs

The following functions can be connected to the AUX inputs on the terminal block X6 located behind the front cover.

- **Temperature sensor, cooling/heating**

An extra temperature sensor can be connected to F1345 in order to better determine when it is time to switch between heating and cooling operation.

The temperature sensor is connected to the selected input (menu 5.4, is only displayed if cooling accessory is installed) on terminal block X6 which is located behind the front cover and is positioned in a suitable place in the climate system.

Use a 2 core cable of at least 0.5 mm<sup>2</sup> cable area.

- **Switch for external blocking of additional heat**

In those cases external blocking of additional heat is desired, this can be connected to terminal block X6, which is positioned behind the front cover.

The additional heat is disconnected by connecting a potential free switch function to the input selected in menu 5.4.

A closed contact results in the electrical output being disconnected.

- **Contact for external blocking of compressor (EP14) and/or (EP15)**

In those cases external blocking of compressor (EP14) and/or (EP15) is wanted, this can be connected to terminal block X6, which is positioned behind the front cover.

The compressor (EP14) and/or (EP15) are disconnected by connecting a potential free switch function to the input selected in menu 5.4.

External blocking of the compressor (EP14) and (EP15) can be combined.

A closed contact results in the electrical output being disconnected.

- **Contact for external tariff blocking**

In those cases external tariff blocking is desired, this can be connected to terminal block X6, which is positioned behind the front cover.

Tariff blocking means that the additional heat, the compressor and heating are disconnected by connecting a potential free switch function to the input selected in menu 5.4.

A closed contact results in the electrical output being disconnected.

- **Switch for external blocking of heating**

In those cases external blocking of heat is used, this can be connected to terminal block X6, which is positioned behind the front cover.

Heating is disconnected by connecting a potential free switch function to the input selected in menu 5.4.

A closed switch results in blocked heating operation.

- **Switch for external forced control of brine pump**

In those cases external forced control of the brine pump is used, this can be connected to terminal block X6, which is positioned behind the front cover.

The brine pump can be force controlled by connecting a potential free switch function to the input selected in menu 5.4.

A closed switch means that the brine pump is active.

- **Contact for activation of "temporary lux"**

An external contact function can be connected to F1345 for activation of the hot water function "temporary lux". The switch must be potential free and connected to the selected input (menu 5.4) on terminal block X6, which is positioned behind the front cover.

"temporary lux" is activated for the time that the contact is connected.

- **Contact for activation of "external adjustment"**

An external contact function can be connected to F1345 to change the supply temperature and the room temperature.

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 offset of "temperature" (heating curve offset) is set with the number of steps selected. The value is adjustable between -10 and +10.

- *climate system 1*

The switch must be potential free and connected to the selected input (menu 5.4) on terminal block X6.

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

- *climate system 2 to 4*

External adjustment for climate systems 2 to 4 require accessories (ECS 40 or ECS 41).

See the accessory's installer handbook for installation instructions.

- **Contact for activation of fan speed**

**Caution**

The external contact function functions only if the accessory FLM is installed and activated.

An external contact function can be connected to F1345 for activation of one of the four fan speeds. The switch must be potential free and connected to the selected input (menu 5.4) on terminal block X6.

When the switch closes, the selected fan speed is activated. Normal speed is resumed when the contact is opened again.

▪ **Pressure/level/flow monitor brine**

If the pressure/level/flow monitor is desired for the brine installation it can be connected on the selected input (menu 5.4) on terminal block X6 located behind the front cover.

For function the input must be connected during normal operation.

**Possible selection for AUX output (potential free variable relay)**

It is possible to have an external connection through the relay function via a potential free variable relay (max 2 A) on the X5 terminal block.

Optional functions for external connection:

- Indication of buzzer alarm.
- Controlling ground water pump.
- Cooling mode indication (only applies if accessories for cooling are present or if the heat pump has the integrated cooling function).
- Control of circulation pump for hot water circulation.
- External circulation pump (for heating medium).

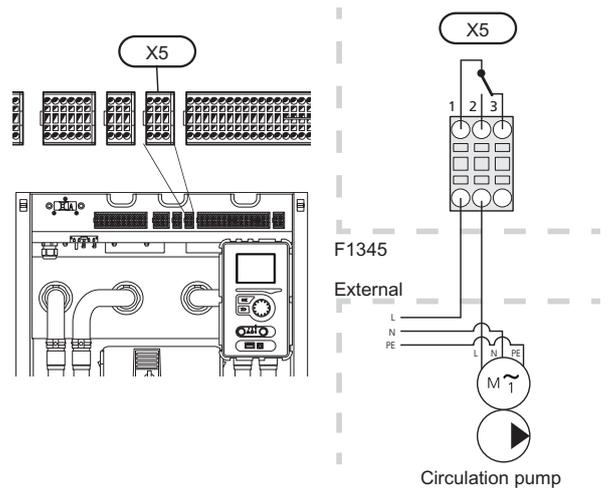
If any of the above is installed to terminal block X5 it must be selected in menu 5.4

The common alarm is preselected at the factory.

**NOTE**  An accessory card is required if several functions are connected to terminal block X5 at the same time that the buzzer alarm is activated (see page 38).

External circulation pump, ground water pump or hot water circulation pump connected to the buzzer alarm relay as illustrated below.

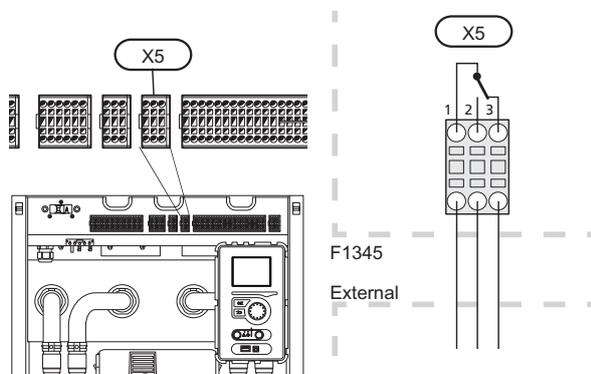
**NOTE**  Mark up any junction boxes with warnings for external voltage.



**Caution**  The relay outputs can have a max load of 2 A (230 V AC) in total.

**Connecting accessories**

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 38 for the list of the accessories that can be used with F1345.



The picture shows the relay in the alarm position.

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

# 6 Commissioning and adjusting

## Preparations

1. Ensure that F1345 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.



### Caution

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

## Filling and venting

### Filling and venting the climate system

#### Filling

1. Open the filling valve (external, not included with the product). Fill the climate system with water.
2. Open the venting valve (external, not included with 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. Bleed the heat pump via a venting valve (external, not included in the product) and the rest of the climate system via their relevant venting valves.
2. Keep topping up and venting until all air has been removed and the pressure is correct.



### TIP

If the heating medium pump (EP14-GP1) and (EP15-GP1) must be run during bleeding, it can be started via the start guide.

### Filling and venting the brine system

When filling the brine system, mix the water with anti-freeze in an open container. The mixture should be protected against freezing down to about -15 °C. The brine is filled by connecting a filling pump.

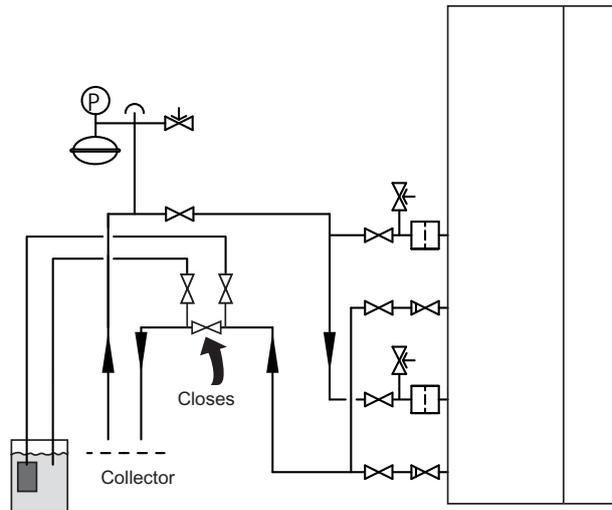
1. Check the brine system for leakage.
2. Connect the filling pump and return line on the brine system's service connections as shown in figure.
3. Close the shut-off valve between the service connections.
4. Open the service connections.

5. Start the filling pump.
6. Fill and bleed the brine system until clear air free liquid enters the return pipe.
7. Close the service connections.
8. Open the shut-off valve between the service connections.



### TIP

If the brine pumps must be run during venting, they can be started via the start guide.



### Symbol key

Symbol	Meaning
	Shut-off valve
	Safety valve
	Expansion vessel
	Pressure gauge
	Particle filter

## Start guide



### NOTE

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



### NOTE

With several heat pumps connected the start guide must first be run in the slave units.

If you set a heat pump to slave you can only make settings for the slave's circulation pumps. Other settings are made and controlled by the master unit.

1. Turn the heat pump's switch (SF1) to "I".
2. Follow the instructions in the start guide in the heat pump display. If the start guide does not start when you start the heat pump, start it manually in menu 5.7.



### TIP

Refer to the operating manual for a more in-depth introduction to the heat pump's control system (operation, menus etc.).

## Commissioning

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

The start guide ensures that the start-up is carried out correctly and cannot be bypassed. The start guide can be started later in menu 5.7.



### Caution

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

The guide will appear at each heat pump re-start until it is deselected on the last page.



### Caution

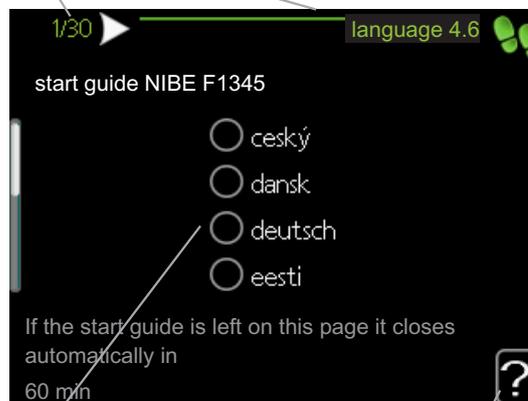
At startup of F1345-30 to 60 kW preheating of the compressors starts. Preheating continues until the temperature sensor BT29 is stable 10 degrees greater than sensor BP8 (for F1345-60 kW this can take up to 12 hours).

See the info menu for more information.

## Operation in the start guide

A. Page

B. Name and menu number



C. Option / setting

D. Help menu

### A. Page

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

Scroll between the pages of the start guide as follows:

1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the pages in the start guide.

### B. Name and menu number

Read what menu in the control system this page of the start guide is based on. The digits in brackets refer to the menu number in the control system.

If you want to read more about affected menus either read off in the sub-menu or in the operating manual under the chapter "Control - Menus"

### C. Option / setting

Make settings for the system here.

### D. Help menu



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

To access the help text:

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

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

## Post adjustment and venting

### Pump capacity diagrams, collector side

To set the correct flow in the brine system the correct speed must be set for the brine pump.

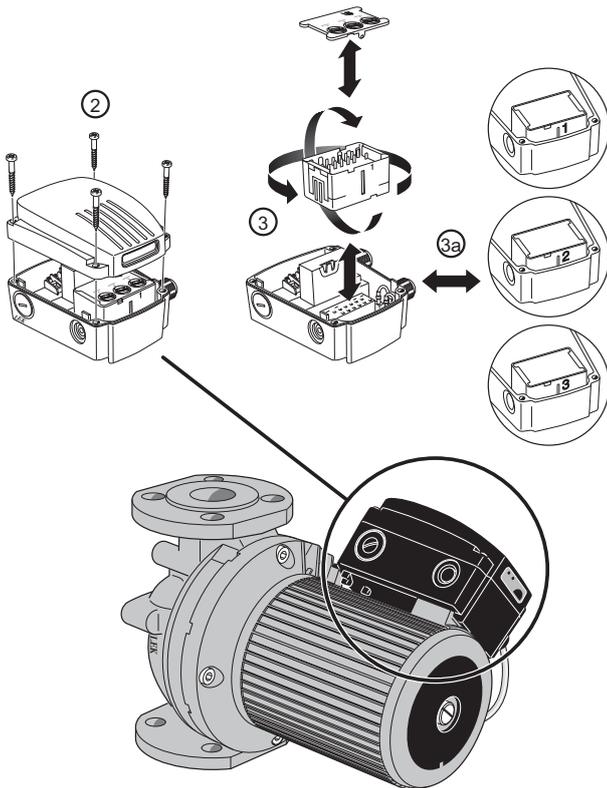
The flow must have a temperature difference between brine out (BT11) and brine in (BT10) of 2 - 5 °C when the system is balanced (suitably 5 minutes after compressor start). Check these temperatures in menu 3.1 "service info" and adjust the brine pump (GP2) speed until the temperature difference is achieved. A high difference indicates a low brine flow and a low difference indicates a high brine flow.

Set the speed of the brine pump in menu 5.1.9, (does not apply to F1345 40 and 60 kW).

### F1345 40 and 60 kW

Set the speed of the brine pump as follows.

In some countries the brine pump is not supplied, see list of supplied items.



1. Use the external safety switch to cut the incoming supply to the circulation pump.
2. Remove the cover for the junction box
3. Pull out the speed switch module and press it back so that the number for the desired speed (3a) is visible through the window in the junction box cover.
4. Reinstall the cover on the junction box.

5. Power the circulation pump and check that the green indicator lamp lights/flashes.



#### Caution

If the speed is changed to or from speed 1 the cover for the speed switch is removed and is installed on the opposite side of the switch.



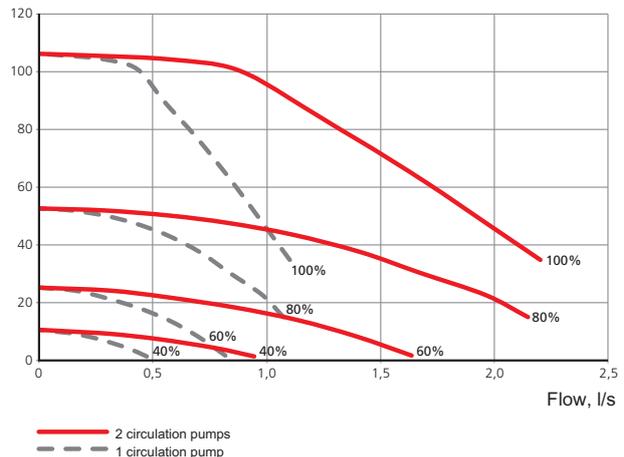
#### NOTE

The speed switch must not be used as a stop /start switch.

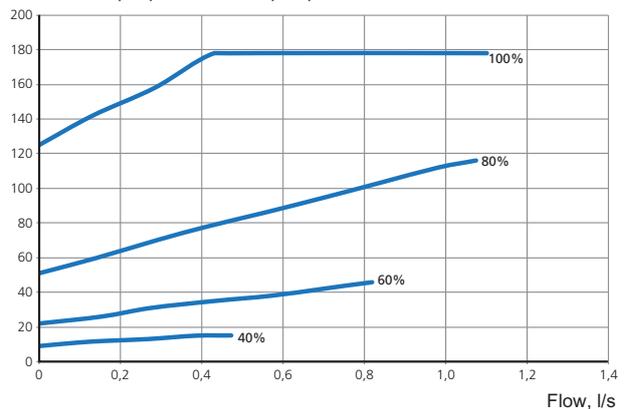
Read off what speed the brine pump should have from the diagrams below.

### F1345 24 kW

External available pressure, kPa

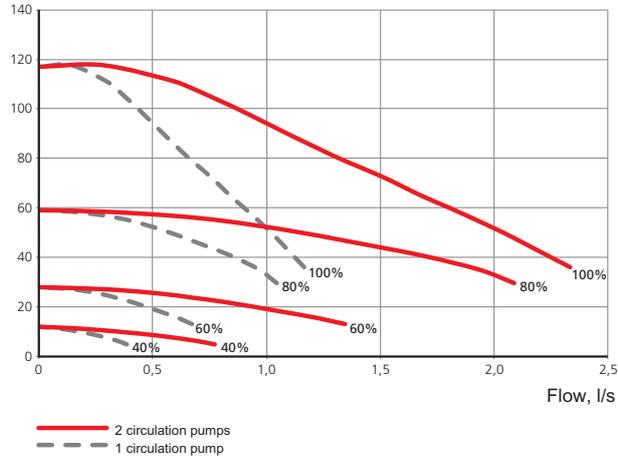


Electrical output per circulation pump, W

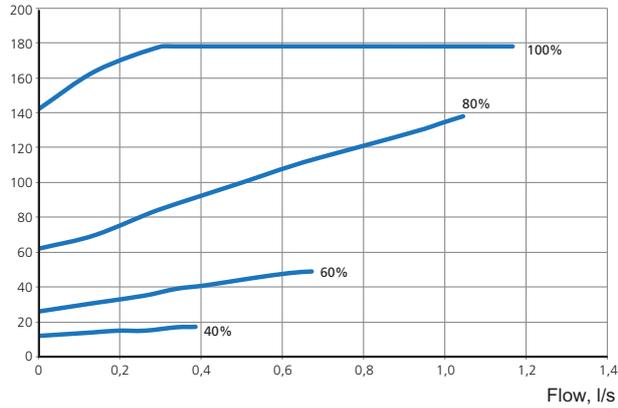


### F1345 30 kW

External available pressure, kPa



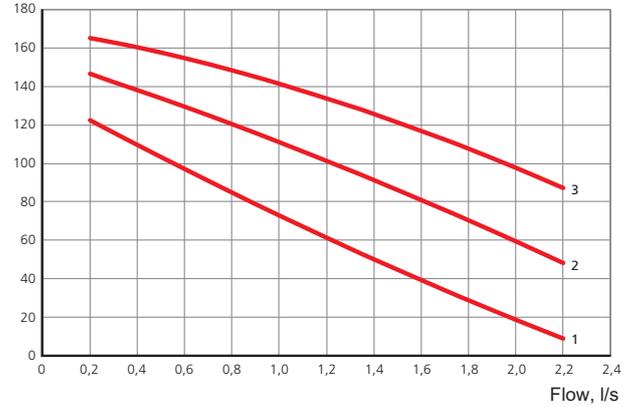
Electrical output per circulation pump, W



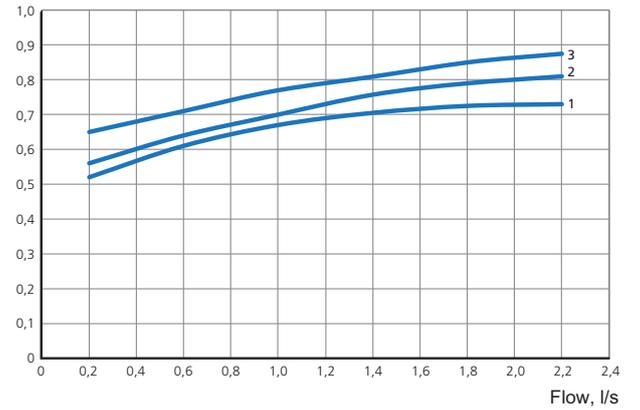
### F1345 40 kW

In some countries the brine pump is not supplied, see list of supplied items.

External available pressure, kPa

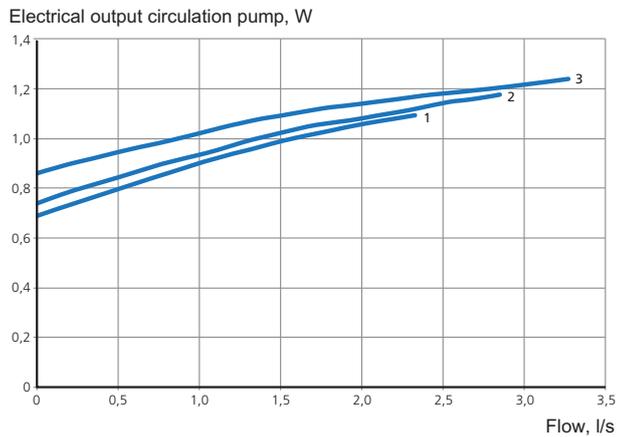
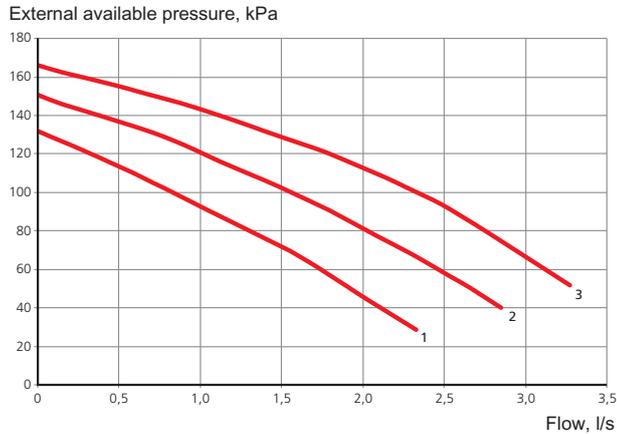


Electrical output circulation pump, W



### F1345 60 kW

In some countries the brine pump is not supplied, see list of supplied items.



### Pump capacity diagrams, heating medium side

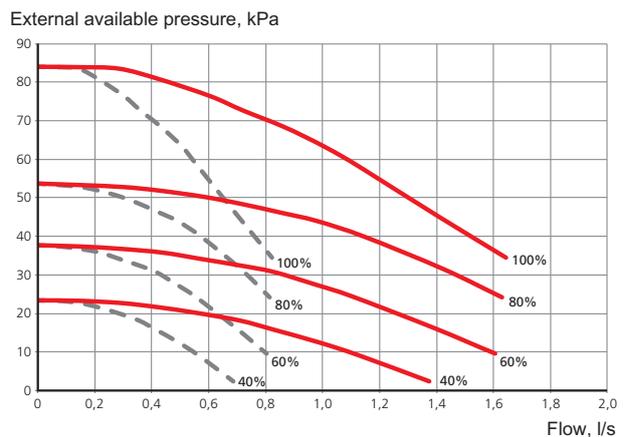
To set the correct flow in the climate system the correct speed must be set for the heating medium pump in the different operating conditions.

The flow must have a suitable temperature difference for the operation (heating operation: 5 - 10 °C, hot water regeneration: 8 - 10 °C, pool heating: approx. 15 °C) between flow temperature (BT2) and the return temperature (BT3). Check these temperatures in menu 3.1 "service info" and adjust the heating medium pump (GP1) speed until the temperature difference is achieved. A high difference indicates a low heating medium flow and a low difference indicates a high heating medium flow.

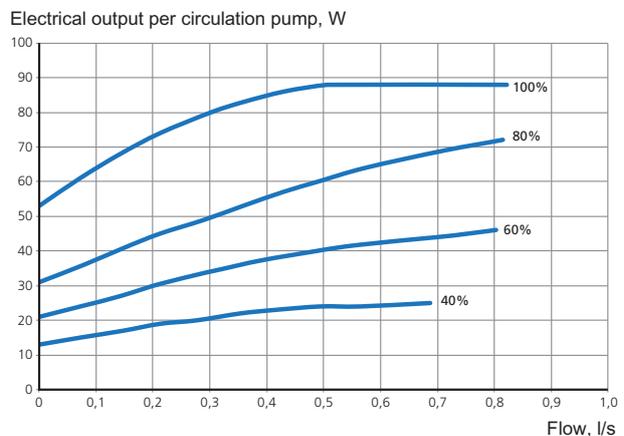
Set the speed of the heating medium pump in menu 5.1.11.

Read off what speed the heating medium pump should be from the diagrams below.

### F1345 24 kW

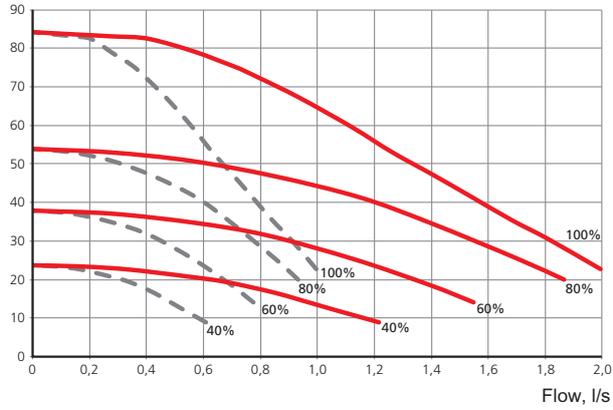


— 2 circulation pumps  
- - - 1 circulation pump



### F1345 30 kW

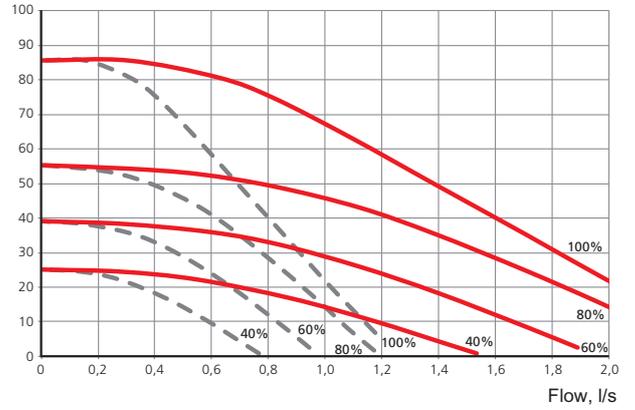
External available pressure, kPa



— 2 circulation pumps  
- - 1 circulation pump

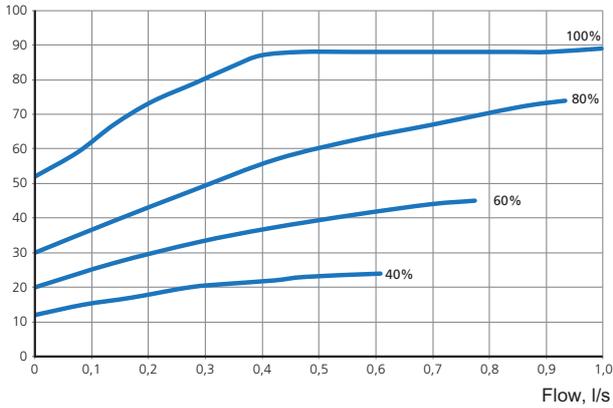
### F1345 40 kW

External available pressure, kPa

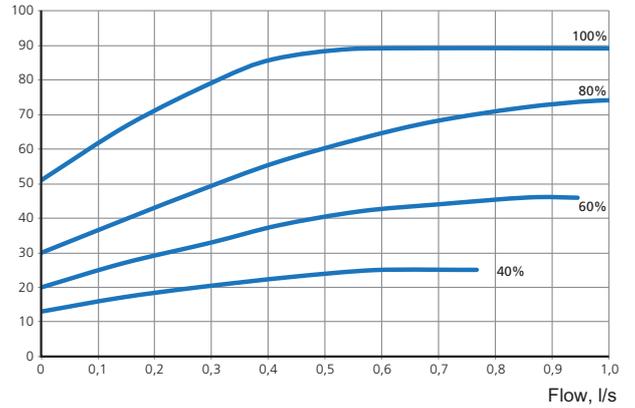


— 2 circulation pumps  
- - 1 circulation pump

Electrical output per circulation pump, W

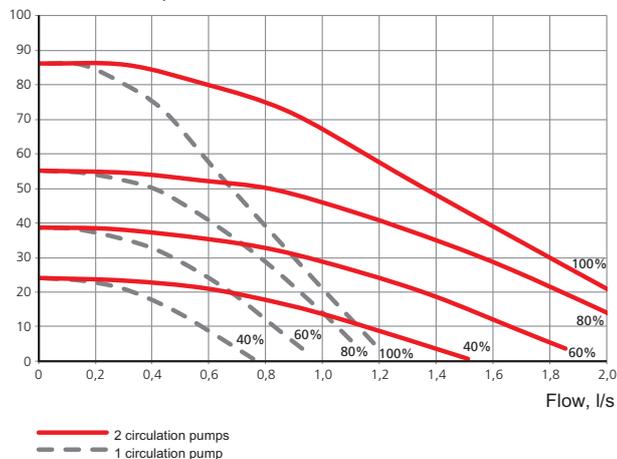


Electrical output per circulation pump, W

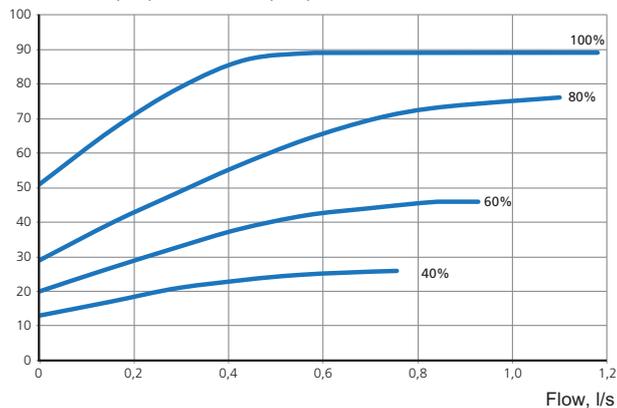


## F1345 60 kW

External available pressure, kPa



Electrical output per circulation pump, W



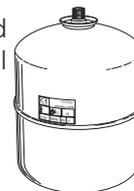
## Readjusting, venting, heat medium side

Air is initially released from the hot water and venting may be necessary. If gurgling sounds can be heard from the heat pump or climate system, the entire system will require additional venting.

## Readjusting, venting, collector side

### Expansion vessel

If a pressure expansion vessel (CM3) is used instead of a level vessel, the pressure level is checked. If the pressure drops, the system should be replenished.



## Post adjusting the room temperature

If the required room temperature is not obtained, re-adjustment may be necessary.

### Cold weather conditions

- If the room temperature is too low, increase "heating curve" in menu 1.9.1, one step.
- If the room temperature is too high, reduce "heating curve" in menu 1.9.1, one step.

### Warm weather conditions

- If the room temperature is too low, increase "temperature" (heating curve offset) in menu 1.1, one step.
- If the room temperature is too high, reduce "temperature" (heating curve offset) in menu 1.1, one step.

# 7 Accessories

## Accessory card AXC 50

An accessory card is required if step controlled additional heat (e.g. external electric boiler) or if shunt controlled additional heat (e.g. wood/oil/gas/pellet boiler), passive/active cooling 2 pipe, passive cooling 2 respectively 4 pipe or if hot water comfort is to be connected to F1345.

An accessory card is also required if the ground water pump or external circulation pump is connected to F1345 at the same time that the buzzer alarm is activated.

Part no. 067 193

## Active/Passive cooling (2-pipe) HPAC 42

Intended for heat pumps with output 24 – 40 kW.

Part no. 067 196

## Active/Passive cooling (4-pipe) ACS 45

Part no. 067 195

## Air module, collector AMB 30

Part no. 065 046

## Auxiliary relay HR 10

Part no. 089 423

## Buffer vessel UKV

### UKV 200

Part no. 080 300

### UKV 300

Part no. 080 301

### UKV 500

Part no. 080 302

## Communications module MODBUS 40

MODBUS 40 enables F1345 to be controlled and monitored using a DUC (computer sub-center) in the building. Communication occurs using MODBUS-RTU.

Part no. 067 144

## Communications module SMS 40

SMS 40 enables operation and monitoring of F1345, via a GSM module, using a mobile phone via SMS messages. If the mobile telephone also has the Android operating system the mobile application "NIBE Mobile App" can be used.

Part no. 067 073

## Connection box K11

Connection box with thermostat and overheating protection.

Part no. 018 893

## Exhaust air module FLM

FLM is an exhaust air module specially designed to combine recovery of mechanical exhaust air with an energy collector in rock.

### FLM

Part no. 067 011

### Bracket pack FLM

Part no. 067 083

## External electrical addition ELK

These accessories may require accessories card AXC 50 (step controlled addition).

### ELK 213

Part no. 069 500

### ELK

ELK 15 Part no. 069 022

### ELK 26

Part no. 067 074

### ELK 26

Part no. 067 074

### ELK 42

Part no. 067 075

## Extra shunt group ECS 40/ECS 41

This accessory is used when F1345 is installed in houses with two or more different climate systems that require different supply temperatures.

ECS 40 (Max. 80 m<sup>2</sup>)

Part no. 067 287

ECS 41 (Min. 80 m<sup>2</sup>)

Part no. 067 288

## Filling valve kit KB 32

Filling valve kit for filling brine in the collector hose for rock heat pumps. Includes dirt filter and insulation.

### KB 32 (max 30 kW)

Part no. 089 971

## Hot water control

### VST 20

Reversing valve, Cu-pipe Ø35

(Max recommended power, 40 kW)

Part no. 089 388

## Hot water heater

### VPA 300/200

Copper Part no. 088 710

Enamel Part no. 088 700

**VPA 450/300**

Copper Part no. 088 660

Enamel Part no. 088 670

**VPB 500**

Hot water heater with charge coil

Copper Part no. 083 220

**VPB 750**

Hot water heater with charge coil

Copper Part no. 083 230

**VPB 1000**

Hot water heater with charge coil

Copper Part no. 083 240

**VPAS 300/450**

Copper Part no. 087 720

Enamel Part no. 087 710

**Immersion heater IU**

3 kW Part no. 018 084

6 kW Part no. 018 088

9 kW Part no. 018 090

**Pool heating POOL 40**

POOL 40 is an accessory that enables pool heating with F1345.

Part no. 067 062

**Room sensor RTS 40**

Part no. 067 065

**Room unit RMU 40**

RMU 40 means that control and monitoring of the heat pump can be carried out in a different part of the accommodation to where F1345 is located.

Part no. 067 064

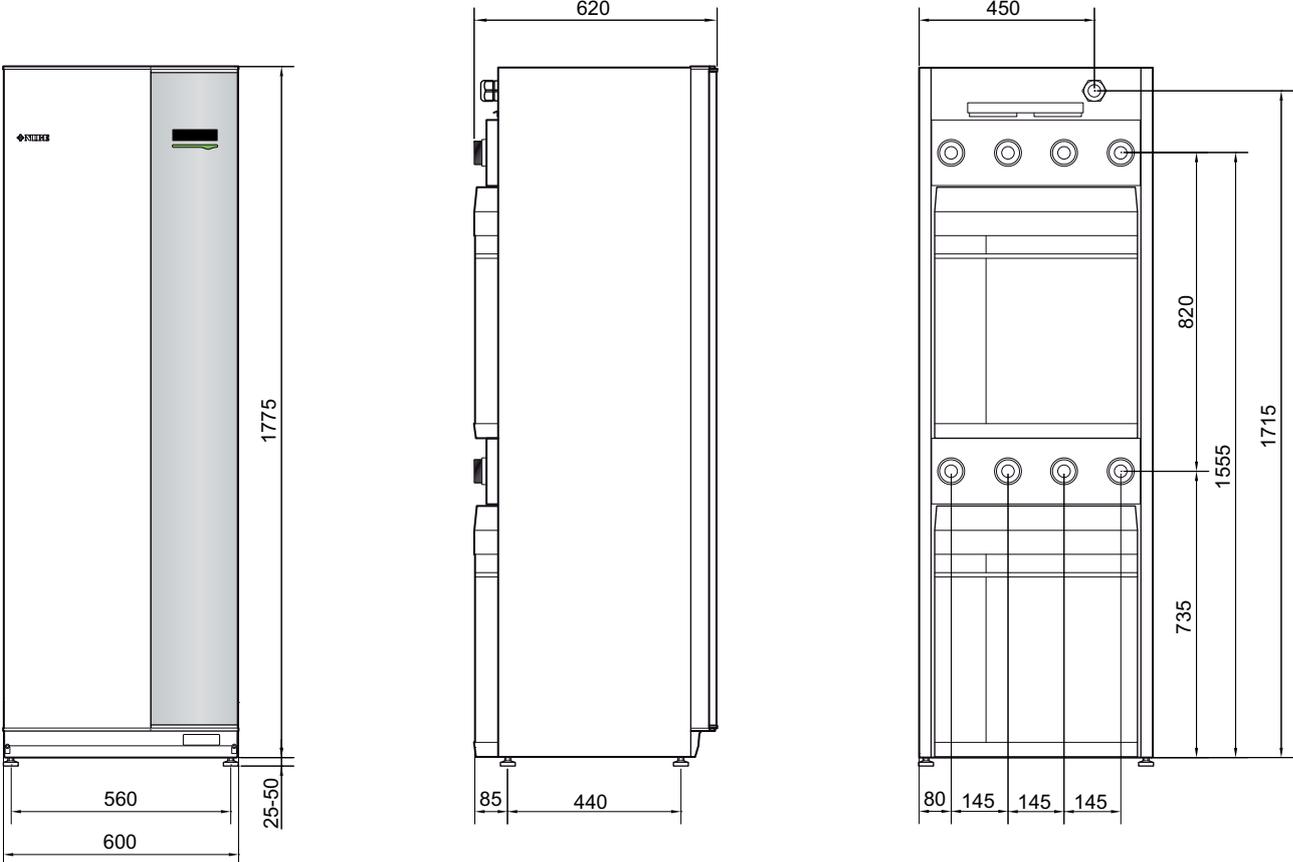
**Solar 42**

Solar 42 means that F1345 (together with VPAS) can be connected to solar heating.

Part no. 067 153

# 8 Technical data

## Dimensions and setting-out coordinates



# Technical specifications



## 3x400V

3x400V		24	30	40	60
<b>Output data at nom flow</b> <small>Refers to performance of heat pump excl. circulation pumps</small>					
<b>0/35</b>					
Rated output	kW	23.2	31.3	40.0	57.8
Cooling output	kW	18.4	24.6	31.8	45.1
Electrical input	kW	4.84	6.67	8.17	12.7
COP	-	4.79	4.69	4.89	4.55
<b>0/50</b>					
Rated output	kW	22.0	30.4	38.7	54.8
Cooling output	kW	15.6	21.6	28.0	38.4
Electrical input	kW	6.41	8.80	10.6	16.4
COP	-	3.43	3.46	3.63	3.34
<b>Output data according to EN 14511</b>					
<b>0/35</b>					
Rated output ( $P_H$ )	kW	22.5	30.8	40.0	57.7
Electrical input ( $P_E$ )	kW	5.05	6.95	8.88	14.1
$COP_{EN14511}$	-	4.46	4.42	4.51	4.09
<b>0/45</b>					
Rated output ( $P_H$ )	kW	21.5	30.1	39.0	55.1
Electrical input ( $P_E$ )	kW	6.08	8.36	10.6	16.5
$COP_{EN14511}$	-	3.54	3.60	3.68	3.35
<b>10/35</b>					
Rated output ( $P_H$ )	kW	30.1	40.3	51.8	78.2
Electrical input ( $P_E$ )	kW	5.39	7.80	9.70	16.1
$COP_{EN14511}$	-	5.54	5.15	5.32	4.84
<b>10/45</b>					
Rated output ( $P_H$ )	kW	28.7	39.5	50.9	72.7
Electrical input ( $P_E$ )	kW	6.44	9.25	11.7	18.4
$COP_{EN14511}$	-	4.43	4.24	4.34	3.95
<b>Electrical data</b>					
Rated voltage		400V 3NAC 50 Hz			
Max operating current, heat pump <sup>3)</sup>	$A_{rms}$	19.4	24.8	30.9	47.1
Max operating current, compressor	$A_{rms}$	7.8	10.5	13.9	19.9
Recommended fuse rating	A	25	30	35	50
Starting current	$A_{rms}$	29	34	42	53
Max permitted impedance at connection point <sup>1)</sup>	ohm	-	-	-	0.4
Total output, Brine pumps <sup>3)</sup>	W	10 – 370	10 – 370	735 – 890	1150 – 1290
Total output, HM pumps	W	5 – 174	5 – 174	5 – 174	5 – 174
IP class		IP 21			
<b>Refrigerant circuit</b>					
Type of refrigerant		R407C			R410A
Volume	kg	2 x 2.2	2 x 2.3	2 x 2.4	2 x 2.4
Cut-out value pressostat HP	MPa	3.2 (32 bar)			4.2 (42 bar)
Difference pressostat HP	MPa	-0.7 (-7 bar)			
Cut-out value pressostat LP	MPa	0.08 (0.8 bar)			0.2 (2 bar)
Difference pressostat LP	MPa	0.07 (0.7 bar)			

3x400V		24	30	40	60
Cut-out value, pressure transmitter LP (without AMB 30)	MPa	0.13 (1.3 bar)			0.35 (3.5 bar)
Cut-out value, pressure transmitter LP (with AMB 30)	MPa	0.08 (0.8 bar)			0.2 (2.0 bar)
Difference, pressure transmitter LP	MPa	0.01 (0.1 bar)			
<b>Brine circuit</b>					
Max system pressure brine	MPa	0.3 (3 bar)			
Min flow	l/s	0.92	1.23	1.59	2.26
Nominal flow	l/s	1.18	1.62	2.09	2.90
Max external avail. press at nom flow <sup>3)</sup>	kPa	92	75	92	72
Max/Min incoming Brine temp	°C	see diagram			
Min. outgoing brine temp without/with AMB 30	°C	-12/-14			
<b>Heating medium circuit</b>					
Max system pressure heating medium	MPa	0.4 (4 bar)			
Min flow	l/s	0.37	0.50	0.64	0.92
Nominal flow	l/s	0.54	0.73	0.93	1.34
Max external avail. press at nom flow	kPa	78	72	70	50
Max/Min heating medium temp	°C	see diagram			
<b>Noise output (L<sub>WA</sub>)</b> according to EN 12102 at 0/35	dB(A)	47	47	47	47
<b>Sound pressure level (L<sub>PA</sub>)</b> calculated values according to EN ISO 11203 at 0/35 and a distance of 1 m	dB(A)	32	32	32	32
<b>Pipe connections</b>					
Brine ext diam. CU pipe		G50 (2" external)			
Heating medium ext diam. CU pipes		G50 (2" external)			

## Miscellaneous

Miscellaneous		24	30	40	60
<b>Compressor oil</b>					
Oil type		POE	POE	POE	POE
Volume	l	2 x 1.89	2 x 1.1	2 x 1.9	2 x 1.9
<b>Dimensions and weight</b>					
Width	mm	600			
Depth	mm	620			
Height	mm	1800			
Required ceiling height <sup>2)</sup>	mm	1950			
Weight complete heat pump	kg	325	335	352	353
Weight only cooling module	kg	130	135	143.5	144
Part no., 3x400V		065 110	065 111	065 112	065 113

<sup>1)</sup>Max. permitted impedance in the mains connected point in accordance with EN 61000-3-11. Start currents can cause short voltage dips that could affect other equipment in unfavourable conditions. If the impedance in the mains connection point is higher than that stated it is possible that interference will occur. If the impedance in the mains connection point is higher than that stated check with the power supplier before purchasing the equipment.

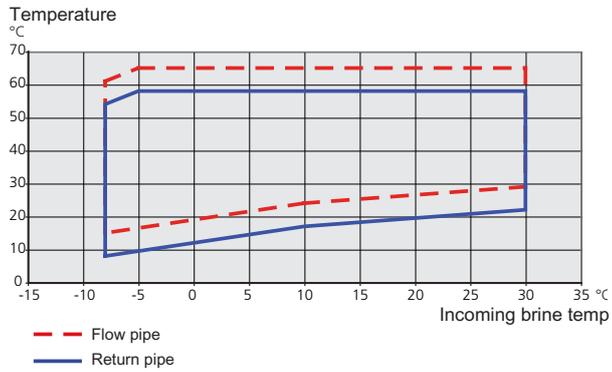
<sup>2)</sup>With feet dismantled the height is approx. 1930 mm.

<sup>3)</sup>This technical data applies to the brine pump supplied for 40 and 60 kW.

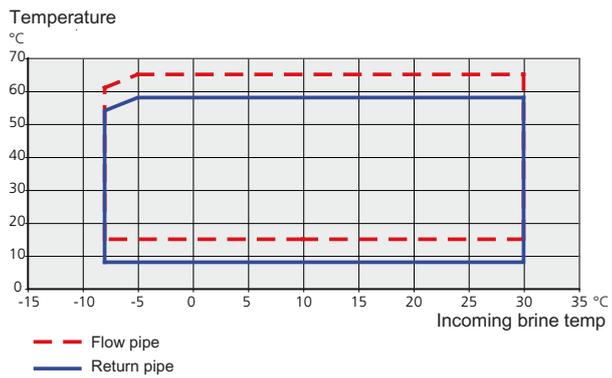
## Working range heat pump, compressor operation

The compressor provides a supply temperature up to 65 °C.

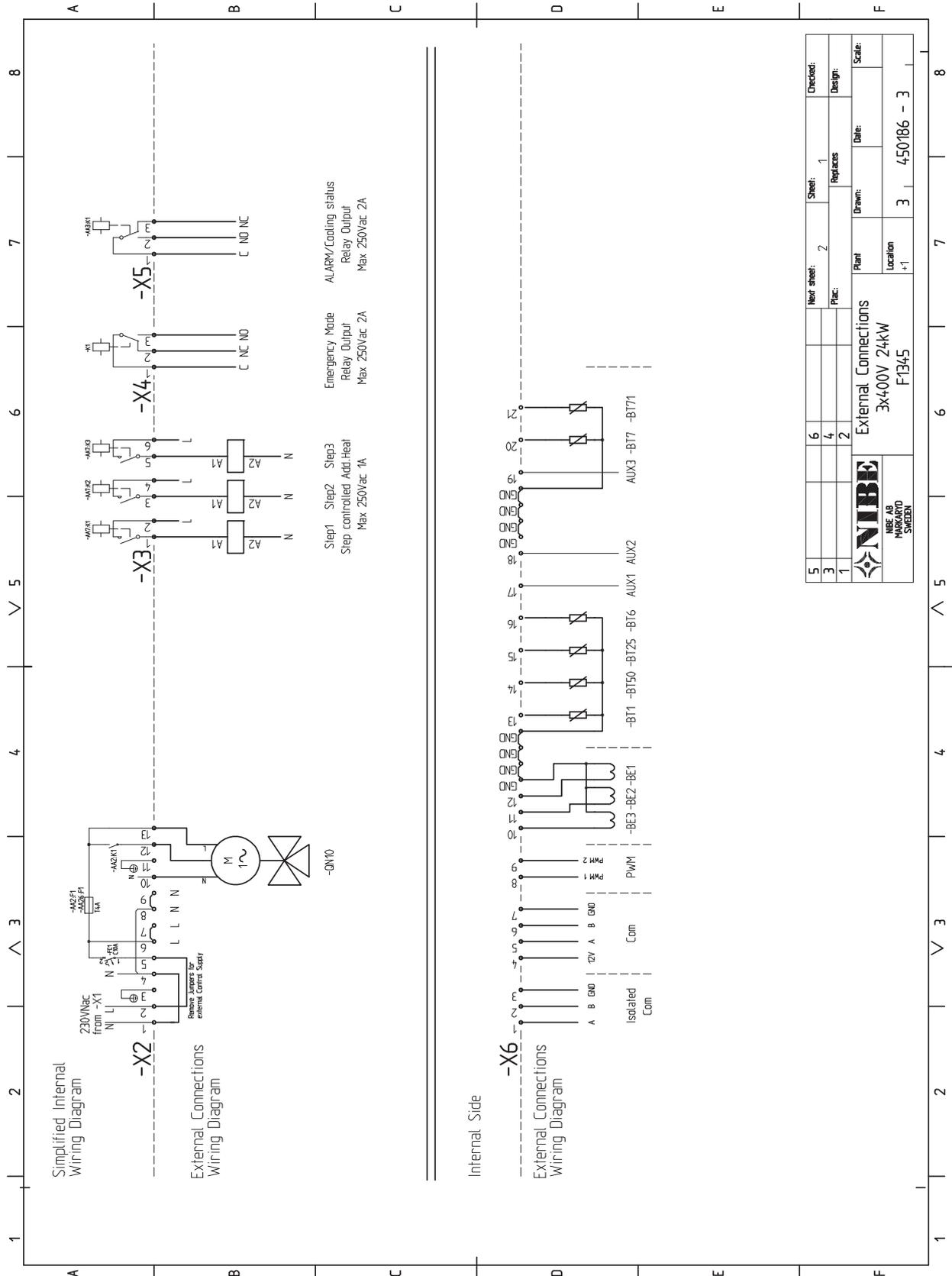
### 3x400V 24 kW



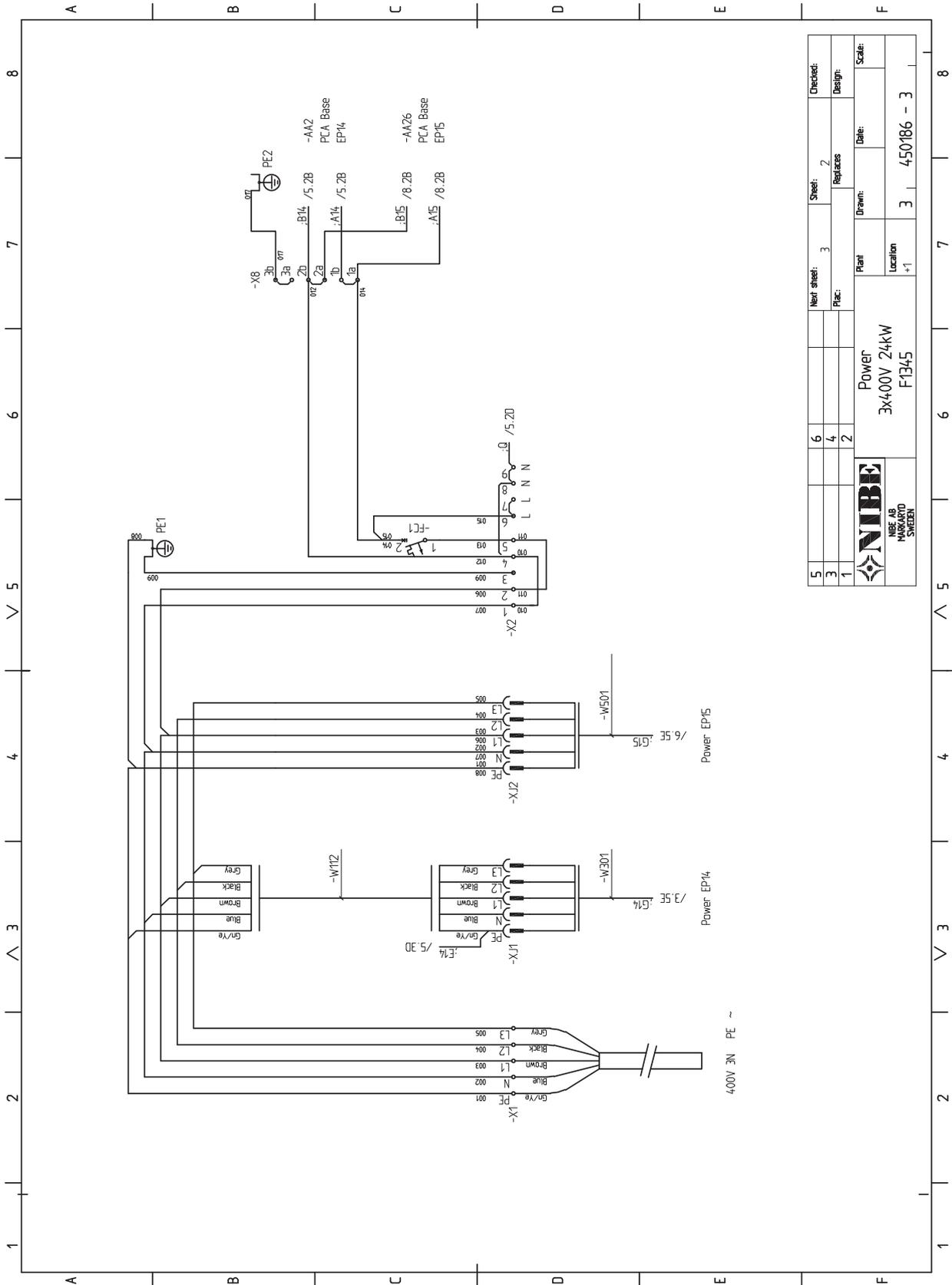
### 3x400V 30 kW, 40 kW and 60 kW



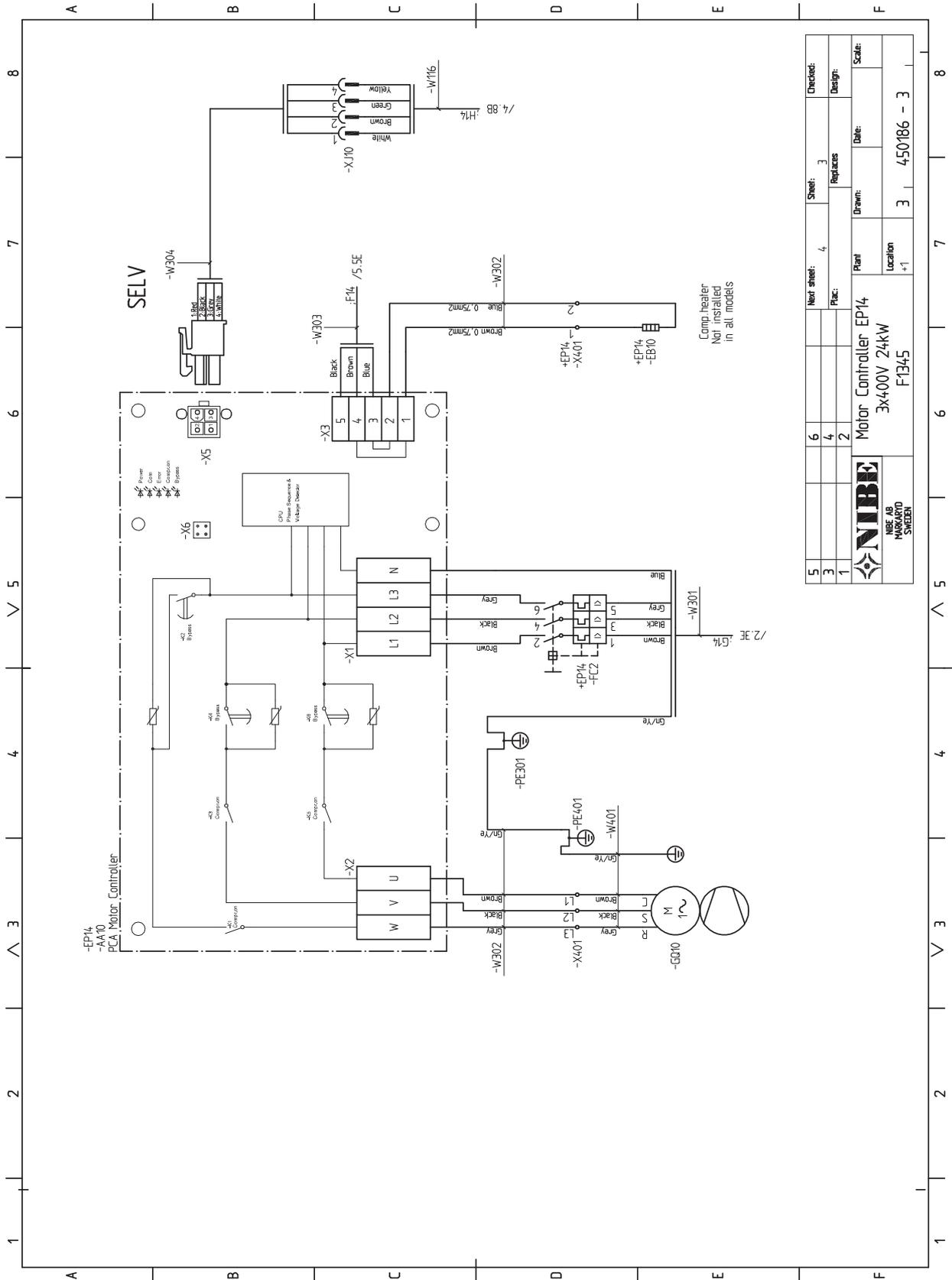
# Wiring diagram, 3x400V 24 kW



5	Next sheet:	2	Sheet:	1	Checked:
3			Replaces		Design:
1			Drawn:		Scale:
			Plant		Date:
			Location	*1	3   450186 - 3
			External Connections 3x400V 24kW F1345		
			 NIBE AB INDUSTRIAL SWEDEN		



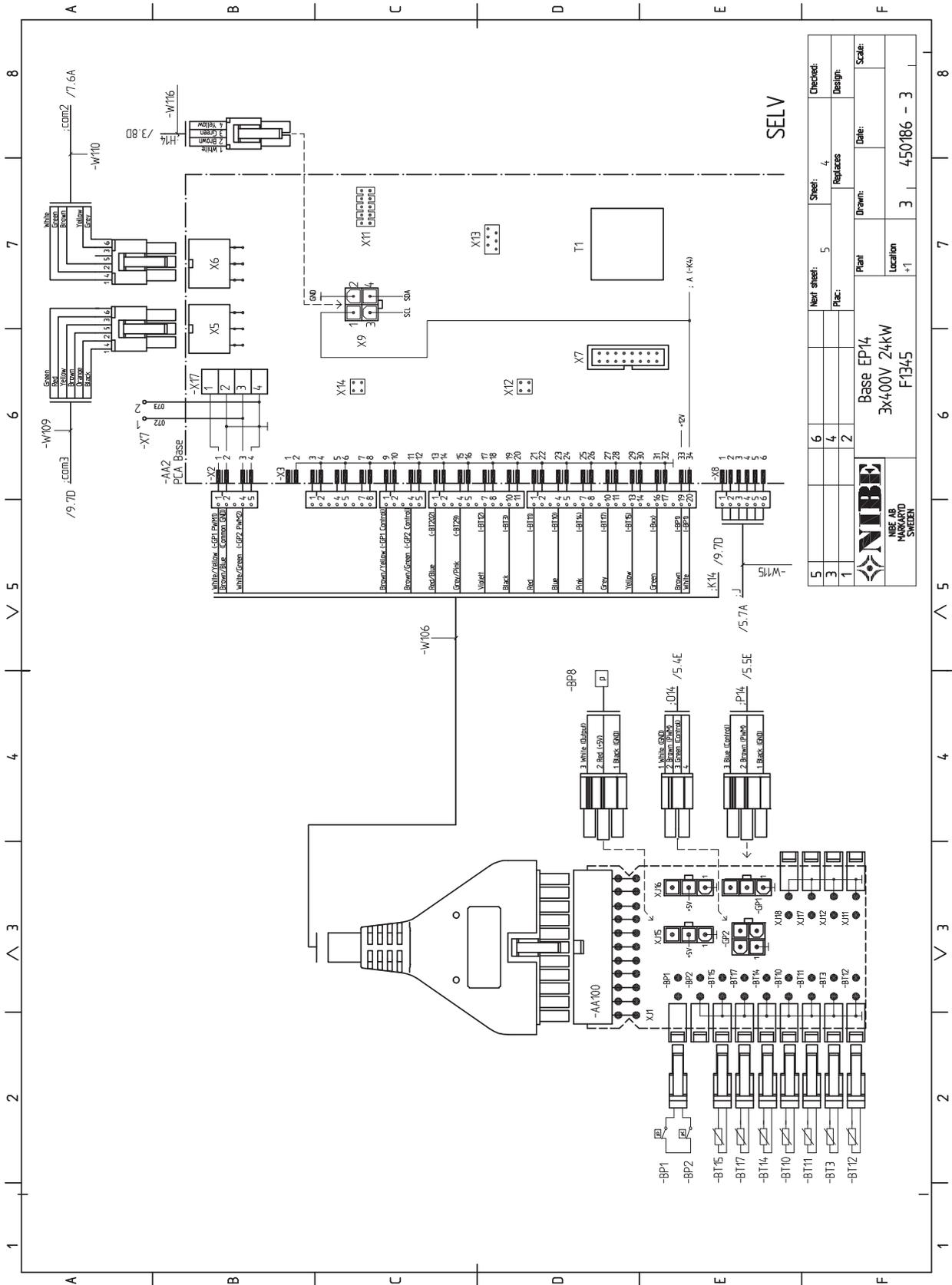
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Sheet: 2		Near sheet: 3		Replaces:		Checked:		Design:		Drawn:		Date:		Scale:		Power		3x400V 24kW		F1345		Part		Location		+1		3		450186 - 3																																																																	
NIBE		NIBE AB		HÄNGÅRDS		SWEDEN		Power		3x400V 24kW		F1345		Part		Location		+1		3		450186 - 3																																																																									



5	6	Next sheet:	4	Sheet:	3	Checked:
3	4	Replaces:		Design:		
1	2	Plant:	Motor Controller EP14	Drawn:	Date:	Scale:
		Location:	+1	3	450186 - 3	

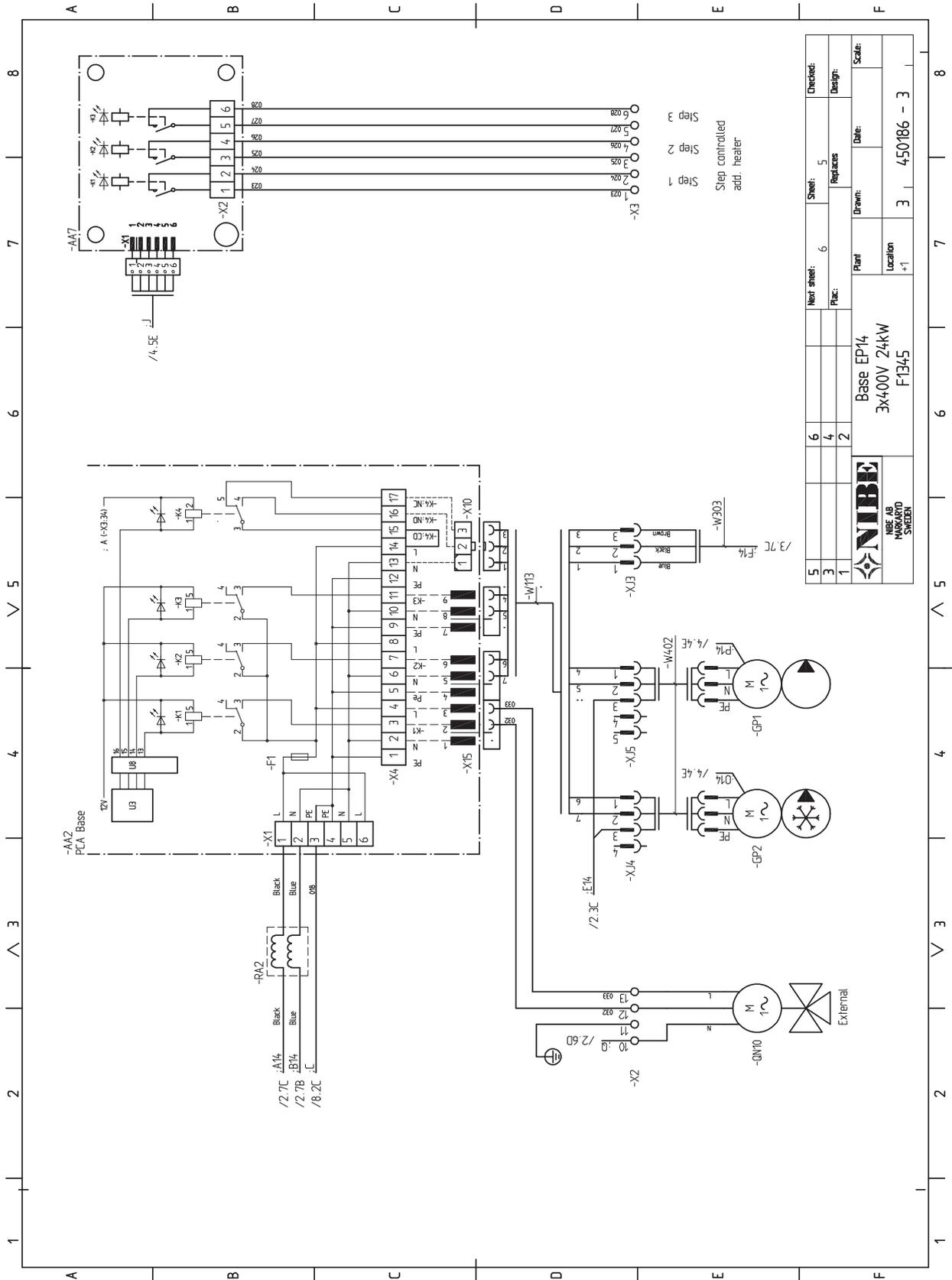


Comp heater  
Not installed  
in all models



SELV

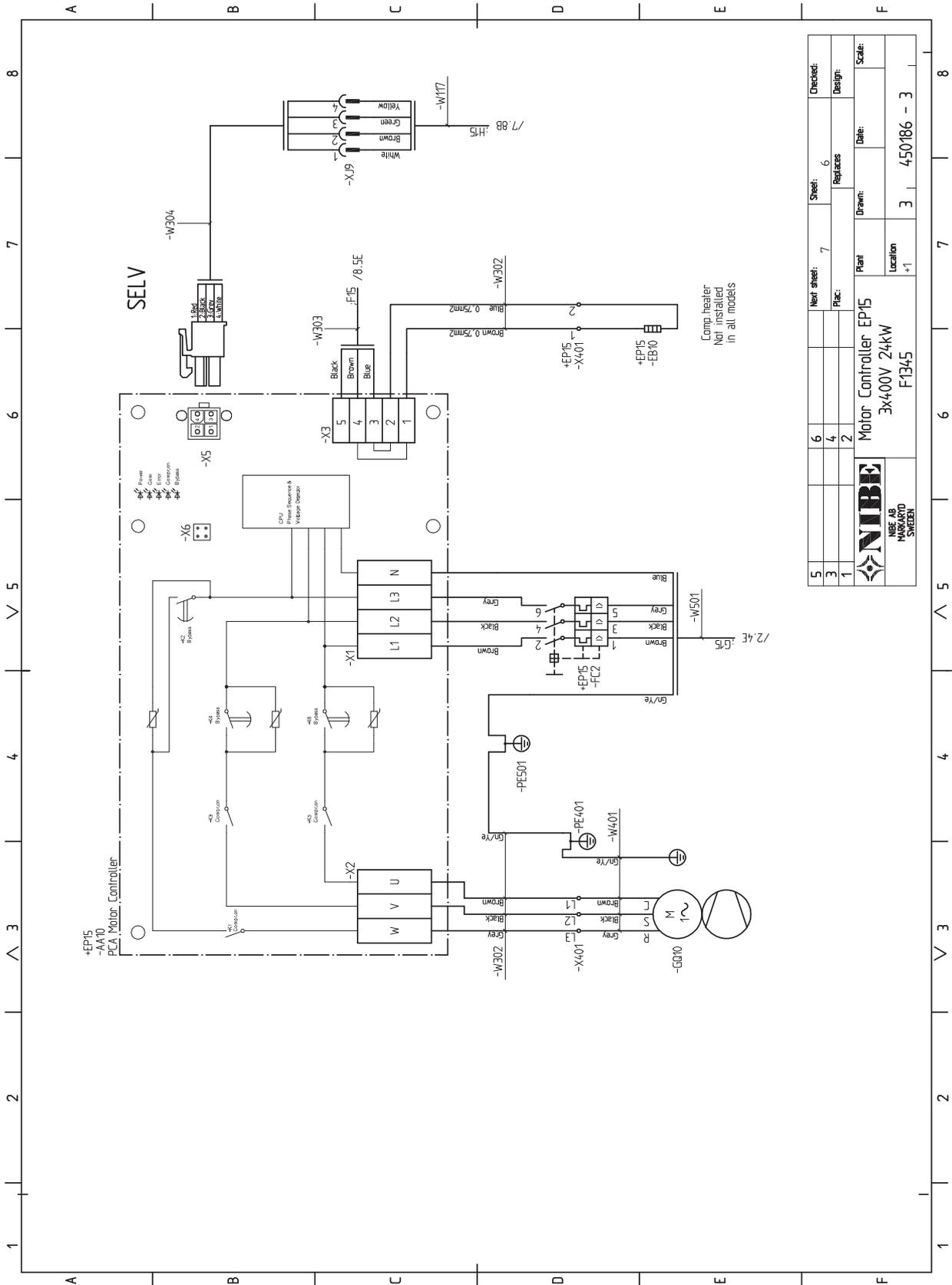
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1	2					Scale:
		<b>Base EP14</b> <b>3x400V 24kW</b> <b>F1345</b>		Part Location *1	Date: 3 450186 - 3	



Step 1  
Step 2  
Step 3

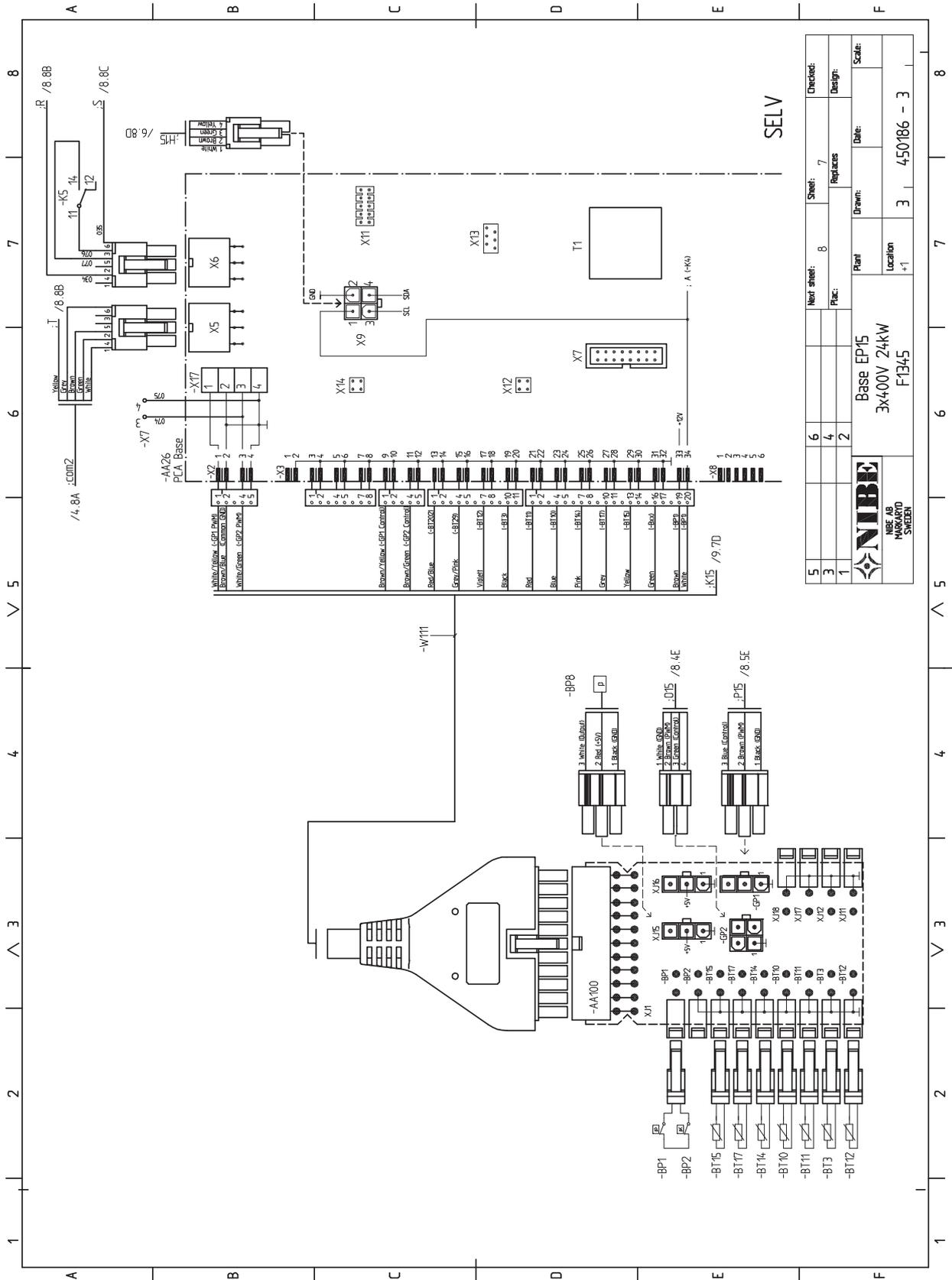
Step controlled  
add. heater

5	6	Next sheet:	6	Sheet:	5	Checked:
3	4	Plac.:	6	Replaces:	5	Design:
1	2					Scale:
 <b>NIBE</b> NIBE AB F1345 TO SWEDEN			Plant	Drawn:	Date:	
			Location	3	450186 - 3	
Base EP14						
3x400V 24kW						
F1345						



5	6	New sheet:	7	Sheet:	6	Checked:
3	4	Part:	2	Replaces:		Design:
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		Motor Controller EP15	3x400V 24kW	Location	+1	Scale:
		F1345				3   450186 - 3



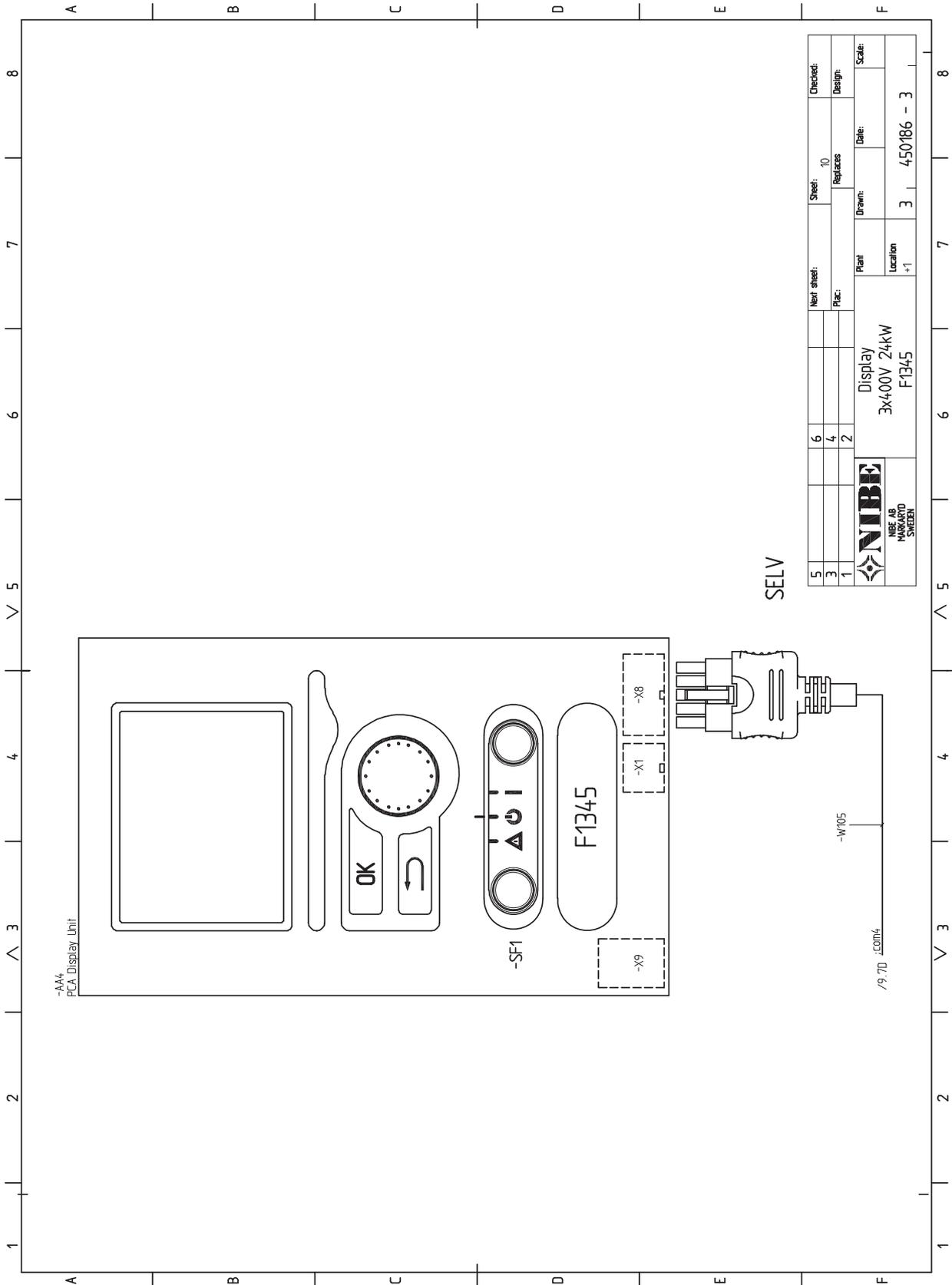


SELV

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		Base EP15 3x400V 24kW F1345	+1	3   450186 - 3





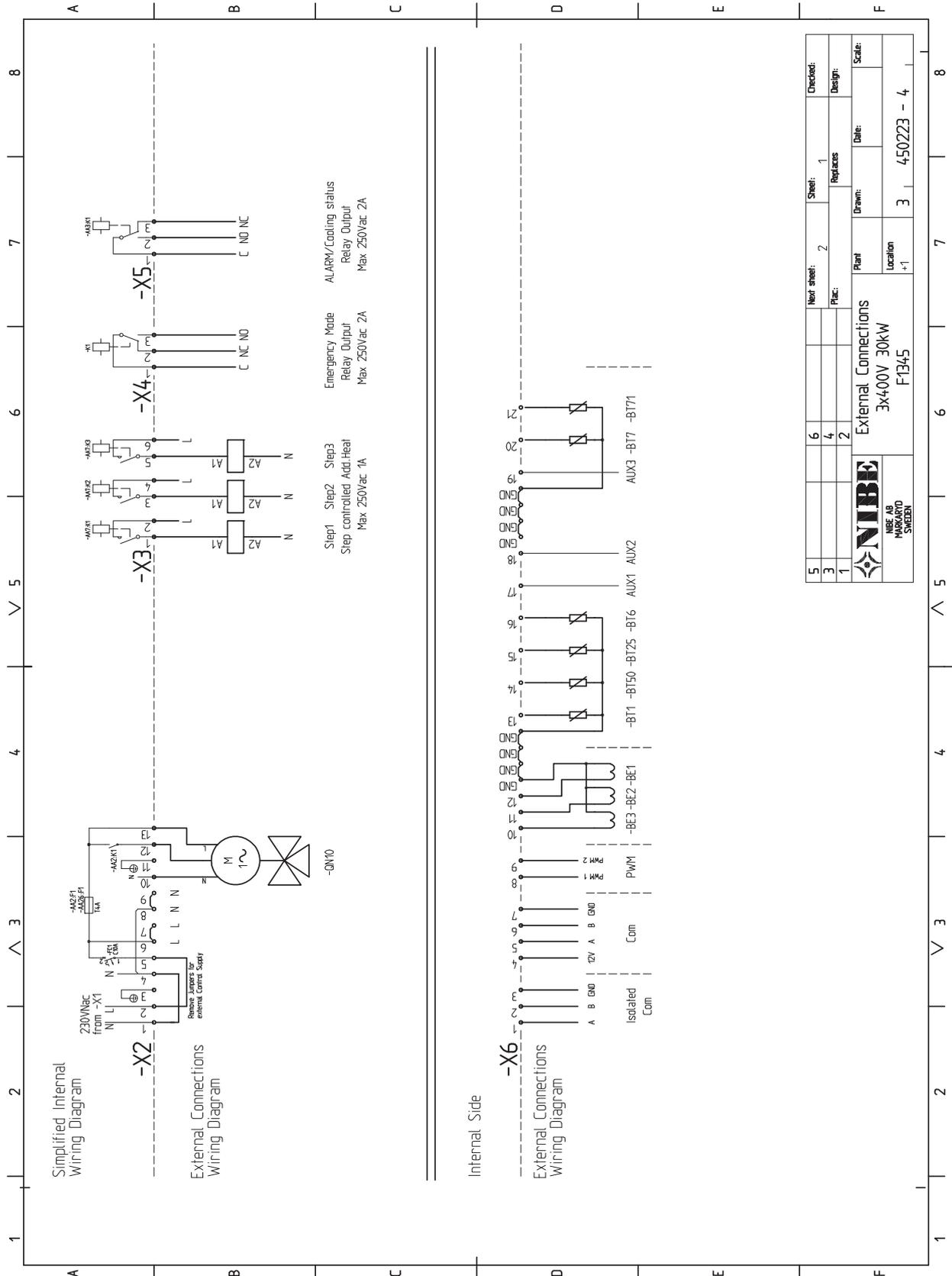


-AA4  
PCA Display Unit

SELV

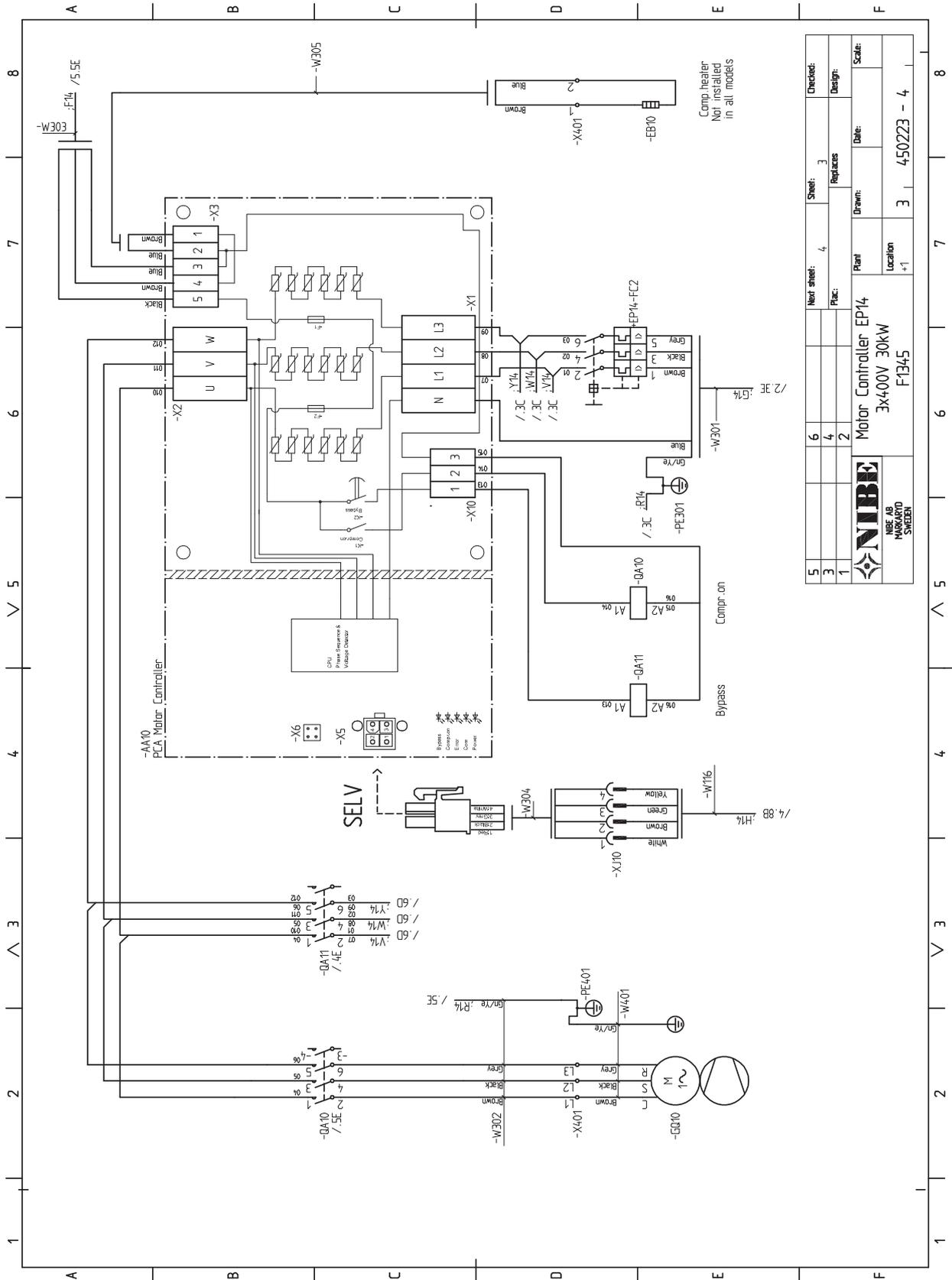
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	2					Part	Scale:
		Display		3x400V 24kW		Location	
		F1345		+1		3   450186 - 3	
		<b>NIBE</b>		NIBE AB		MUNKARÅD	
				SWEDEN			

# Wiring diagram, 3x400V 30 kW



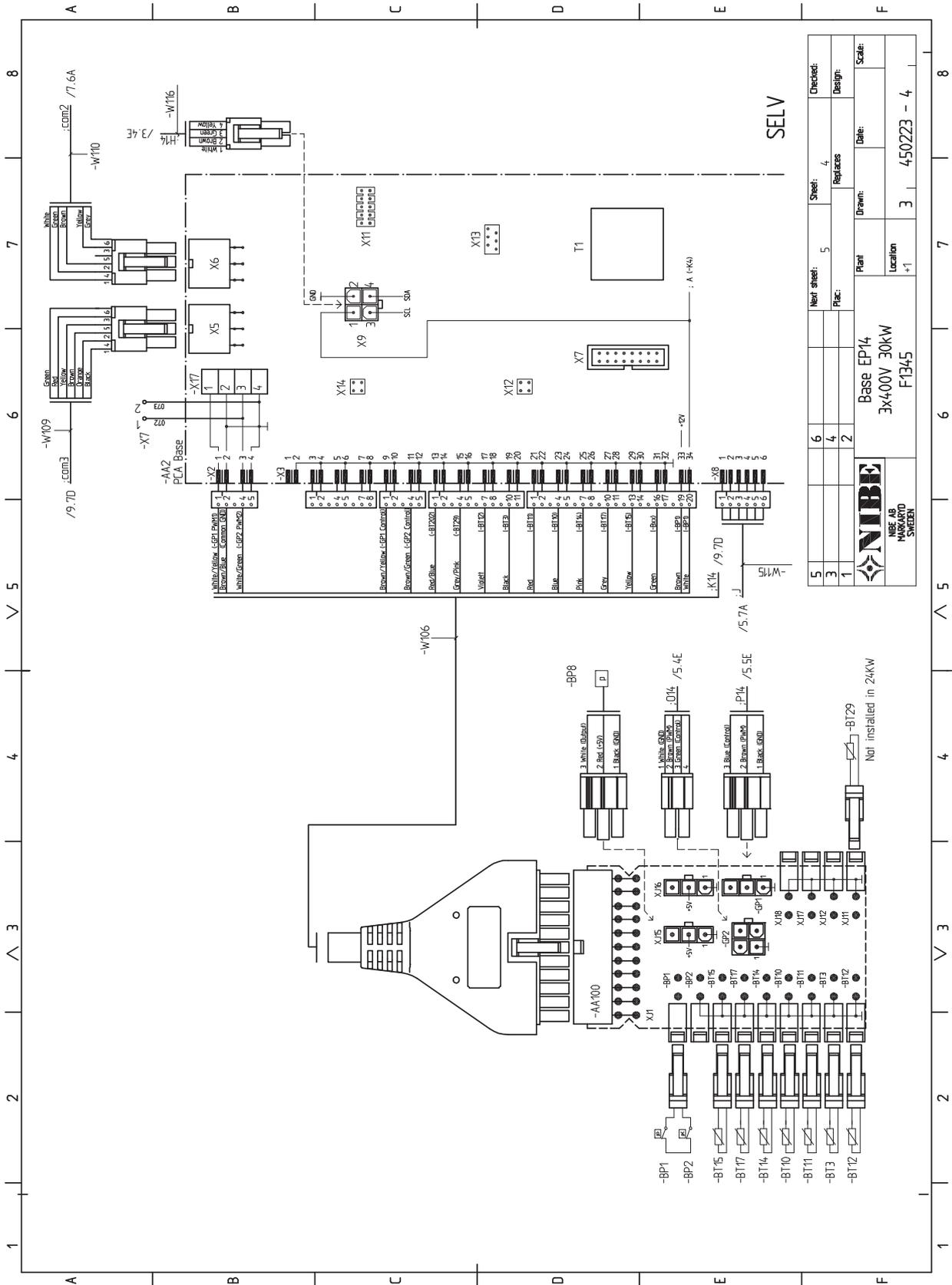
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3			Replaces:		Design:
1			Drawn:		Scale:
			Plant:		Date:
			Location:	*1	3   450223 - 4
			<b>NIBE</b> NIBE AB INDUSTRIAL SWEDEN		
			External Connections 3x400V 30kW F1345		



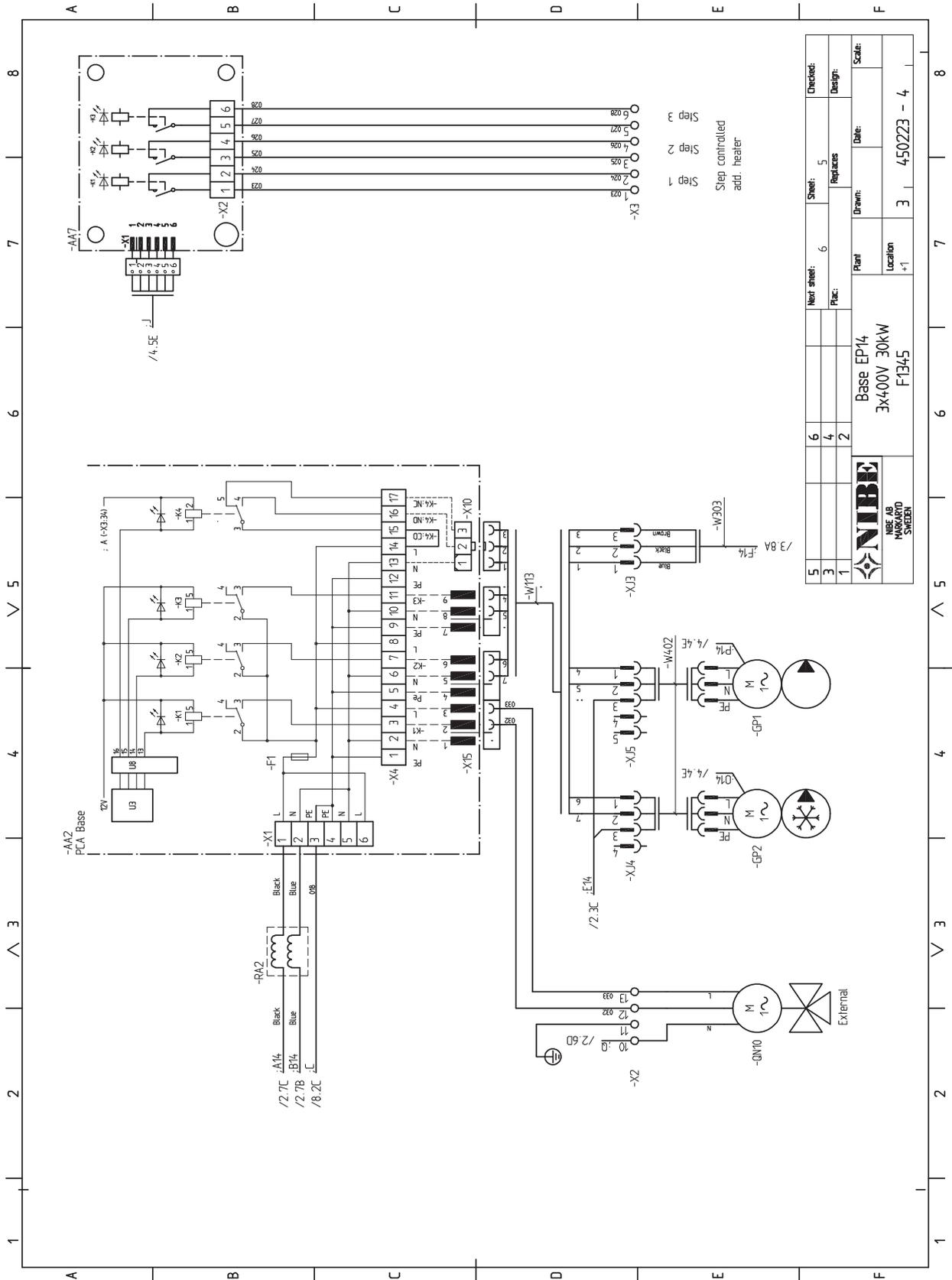


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1	Plant:	2	Drawn:		Scale:
Motor Controller EP14		Plant	Drawn:	Date:	
3x400V 30kW		Location	Drawn:	Date:	
F1345		+1	3	450223 - 4	





5	6	New sheet:	5	Sheet:	4	Checked:
3	4	Replaces:	4	Replaces:	4	Design:
1	2	Part:	3	Drawn:	3	Date:
			<b>Base EP14</b> <b>3x400V 30kW</b> <b>F1345</b>			Scale:
<b>NIBE AB</b> HÅNGBÄRD SVELEN			Location *1			Date: 450223 - 4



Step 1  
Step 2  
Step 3

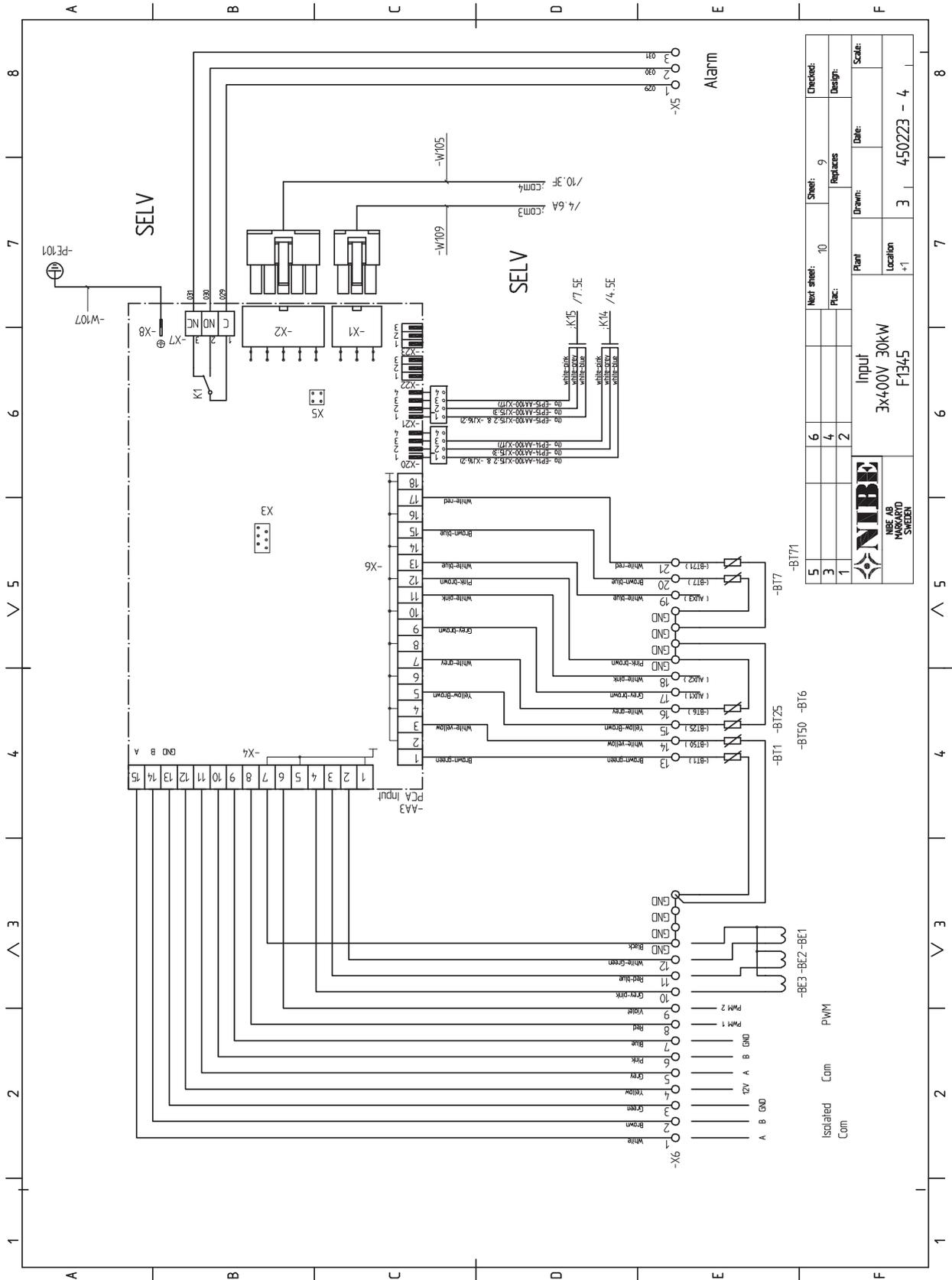
Step controlled  
add: heater

5	6	6	6	5	Checked:
3	4	4	4	Replaces:	Design:
1	2	2	2	Drawn:	Date:
NIBE			Plant	Location	Scale:
NIBE AB FORSKÅRDS STADEN			Base EP14	+1	3   450223 - 4
			3x400V 30kW		
			F1345		



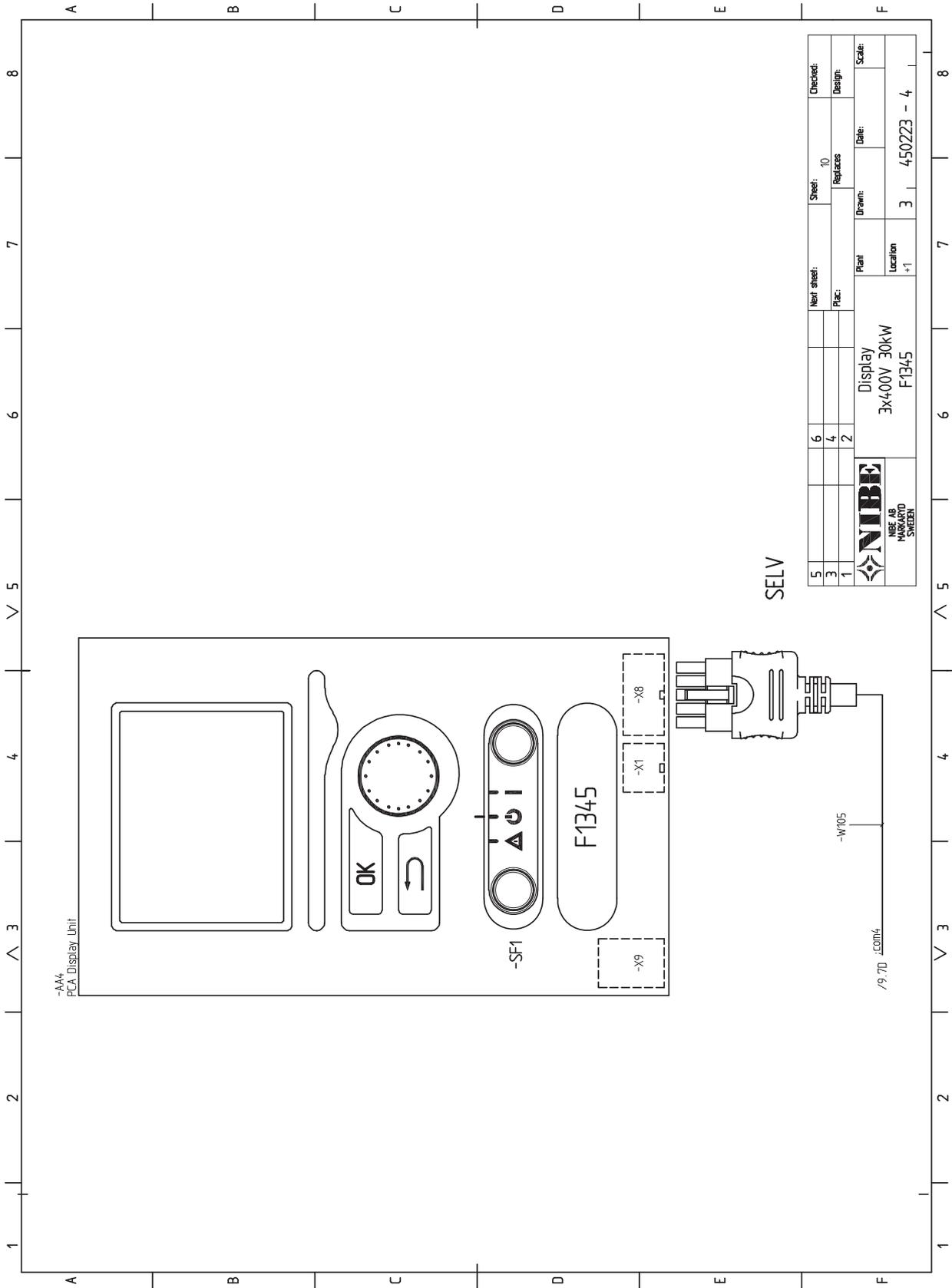






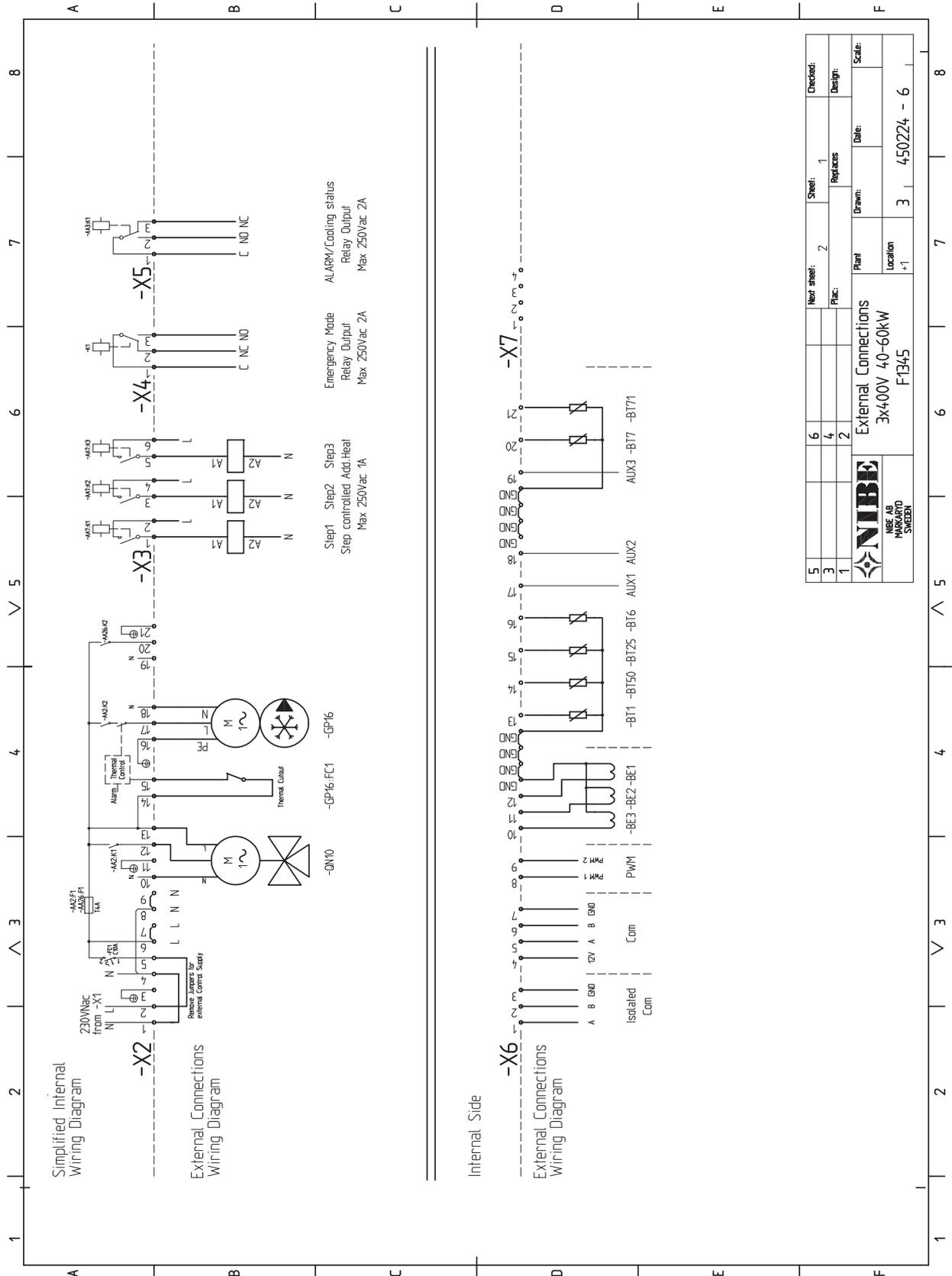
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Plant		Location		Scale:
Input		+1		3   450223 - 4
3x400V 30kW				
F1345				



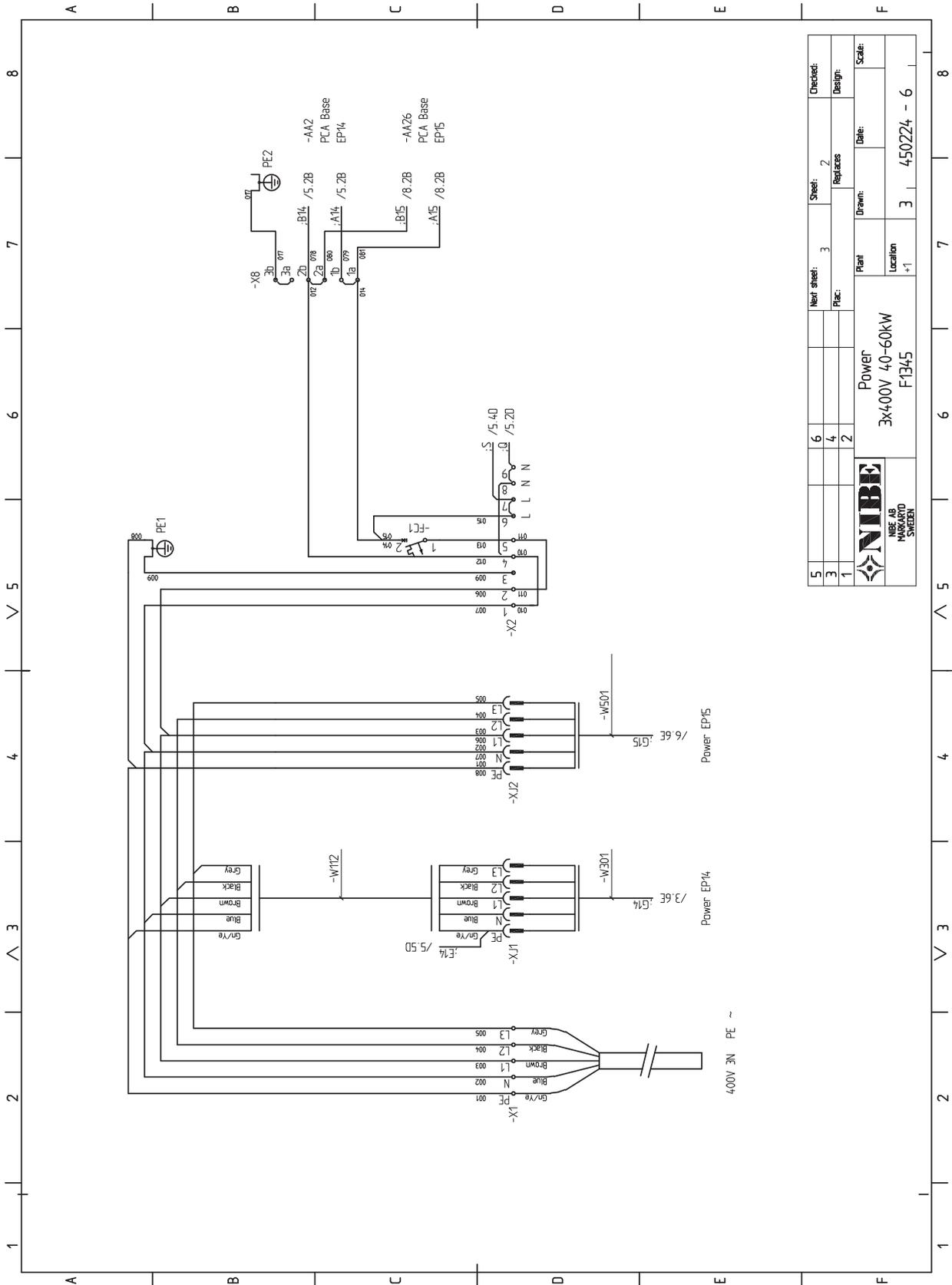


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1	4					Drawn:	Scale:
	2					Date:	
		Part		Location		Date:	
		Display		+1		450223 - 4	
		3x400V 30kW		F1345			
		NIBE		NIBE AB		MUNKARÅD	
		NIBE AB		MUNKARÅD		SWEDEN	

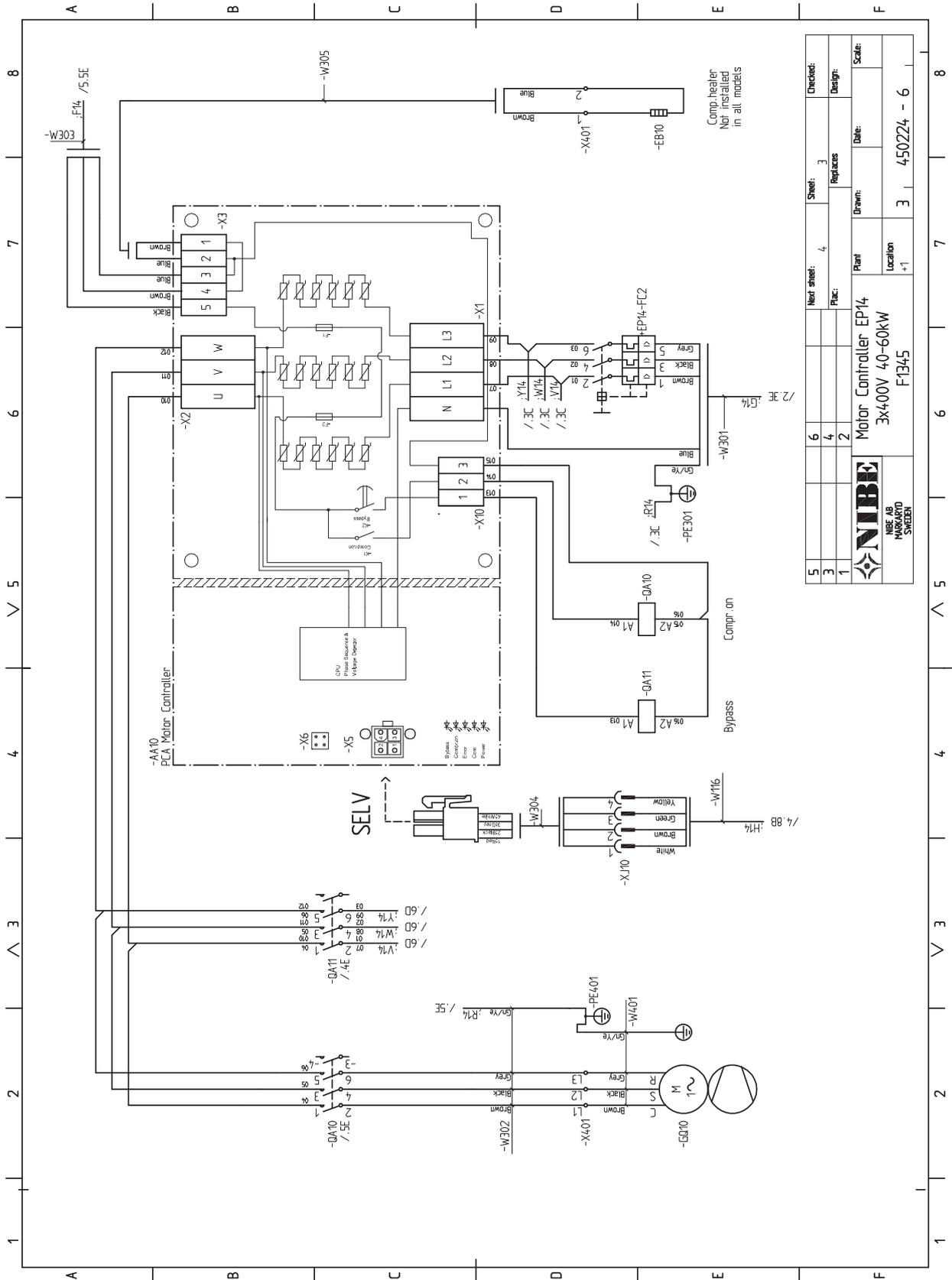
# Wiring diagram, 3x400V 40 and 60 kW



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1			Drawn:		Scale:
			Plant	External Connections	
			Location	3x400V 40-60kW	
				F1345	
				450224 - 6	



5	6	7	8
3	4	5	6
1	2	3	4
Near sheet: 3		Sheet: 2	Checked:
Plac:		Replaces:	Design:
Part:		Drawn:	Date:
Location: +1		Scale:	
Power 3x400V 40-60kW F1345		450224 - 6	
 NIBE AB HANOGARVD SWEDEN			



5	Next sheet:	4	Sheet:	3	Checked:
3			Replaces	3	Design:
1			Plant	Drawn:	Date:
		Motor Controller EP14		Scale:	
		3x400V 40-60kW		3   450224 - 6	
		F1345		Location	
		+1			





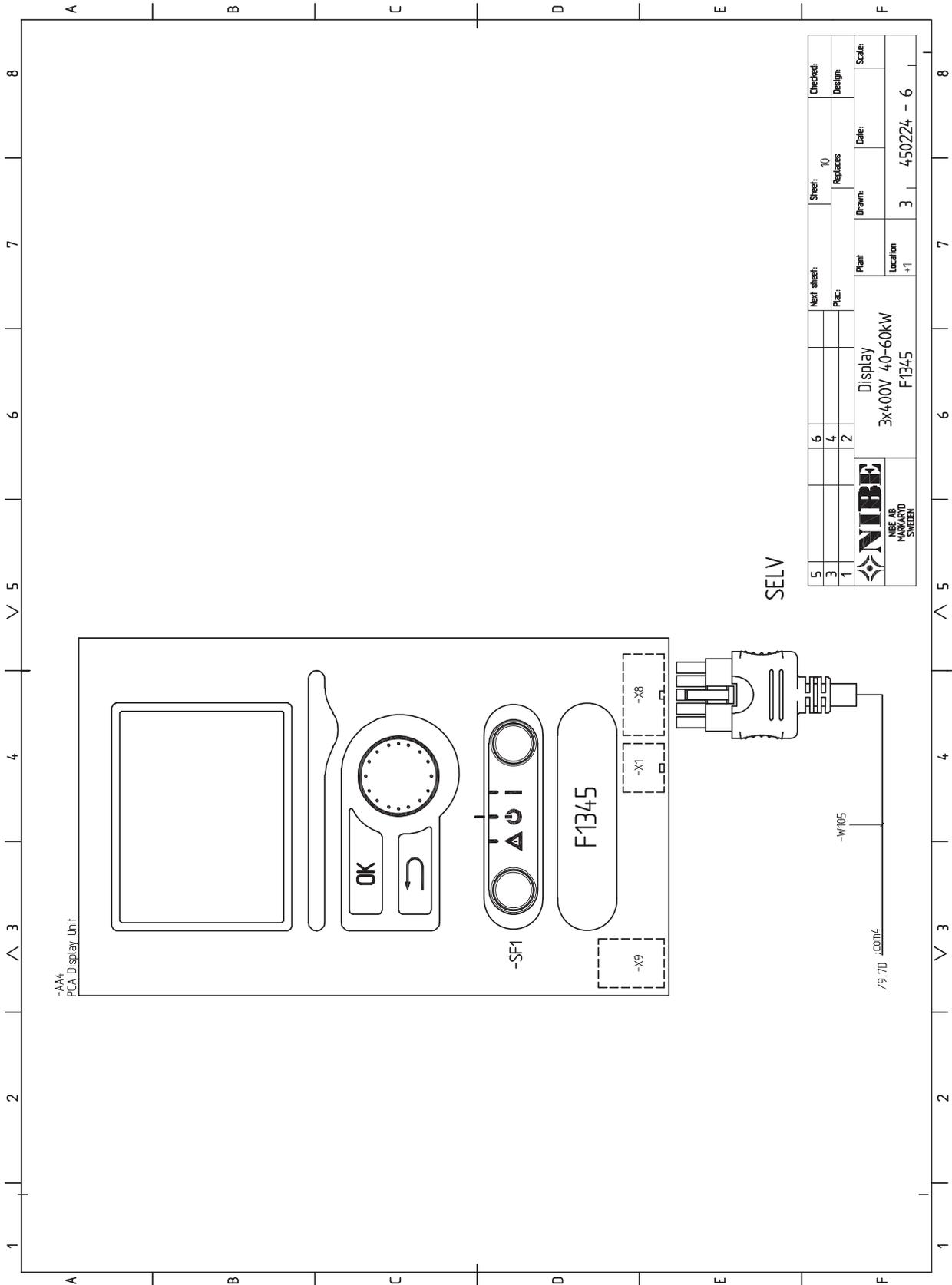












5						Sheet: 10	Checked:
3						Replaces	Design:
1						Drawn:	Date:
							Scale:
Display 3x400V 40-60kW F1345							Part Location +1
							Drawn: 3 Date: 450224 - 6

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