

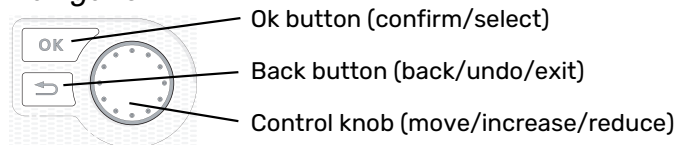
Exhaust air heat pump

NIBE F470 1x230V



Quick guide

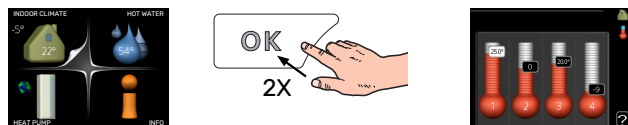
Navigation



A detailed explanation of the button functions can be found on page 42.

How to scroll through menus and make different settings is described on page 44.

Set the indoor climate



The mode for setting the indoor temperature is accessed by pressing the OK button twice, when in the start mode in the main menu.

Increase hot water volume



To temporarily increase the amount of hot water, first turn the control knob to mark menu 2 (water droplet) and then press the OK button twice.

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Important information

Safety information

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

The manual must be left with the customer.

For the latest version of the product's documentation, see nibe.co.uk.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

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Water may drip from the safety valve. A factory-fitted overflow pipe runs from the safety valve to an overflow cup. An overflow pipe has to be routed from the overflow cup to a suitable drain. The overflow pipe must be inclined along its entire length to prevent pockets where water can accumulate, and must be frost-proof.

F470 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

Symbols

Explanation of symbols that may be present in this manual.



WARNING!

This symbol indicates serious danger to person or machine.



NOTE

This symbol indicates danger to person or machine.



Caution

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



TIP

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

Marking

Explanation of symbols that may be present on the product's label(s).



Fire hazard!



Read the User Manual.



Read the Installer Manual.

Handling

The heat pump contains a highly flammable refrigerant. For this reason, take special care during handling, installation, service, cleaning and scrapping to prevent damage to the refrigerant system and thus reduce the risk of leakage.



NOTE

Work on refrigerant systems must be carried out by personnel who have knowledge and experience of working with flammable refrigerants.

Safety precautions



WARNING!

Do not use agents to speed up the defrosting process or for cleaning, other than those recommended by the manufacturer.

The apparatus must be stored in a room with no continuous ignition sources (e.g. naked flame, an active gas installation or an active electric heater).

Must not be punctured or burned.

Be aware that the refrigerant may be odourless

GENERAL

Pipe installation should be kept to a minimum.

AREA CHECKS

Before work is started on systems that contains combustible refrigerants, safety checks must be performed to ensure that the ignition risk is kept to a minimum.

WORKING METHOD

The work must be carried out in a controlled way to minimise the risk of contact with combustible gas or liquid during the work.

GENERAL FOR THE WORKING RANGE

All maintenance staff and those who work in close proximity to the product must be instructed which type of work is to be carried out. Avoid carrying out work in enclosed spaces. The area surrounding the worksite must be cordoned off. Ensure that the area is made safe by removing combustible material.

CHECK FOR THE PRESENCE OF REFRIGERANT

Check whether there is refrigerant in the area using a suitable refrigerant detector prior to and during work, to notify the service technician whether there is a possible flammable atmosphere or not. Ensure that the refrigerant detector is suitable for

combustible refrigerant, i.e. does not generate sparks or cause ignition in any other way.

PRESENCE OF FIRE EXTINGUISHERS

If hot work is carried out on the heat pump, a powder or carbon dioxide fire extinguisher must be to hand.

ABSENCE OF IGNITION SOURCES

Pipes connected to the unit must not contain potential sources of ignition.

Those who carry out work with refrigerant system connections, including exposing pipes that contain or have contained combustible refrigerant, may not use potential ignition sources in such a way that that can lead to risks of fire or explosions.

All potential ignition sources, including cigarette smoking, should be kept at a safe distance from the service work area where combustible refrigerant can leak out. Before carrying out work, the area surrounding the equipment must be checked to ensure that there are no ignition risks. "No smoking" signs must be displayed.

VENTILATED AREA

Ensure that the work is carried out outdoors or that the work area is ventilated before the system is opened and before any hot work is carried out. The area must be ventilated whilst the work is being carried out. There must be ventilation around any refrigerant that comes out, which should be routed outdoors.

CHECKING COOLING EQUIPMENT

If electrical components are replaced, the replacement parts must be fit for purpose and have the correct technical specifications. Always follow the manufacturer's guidelines regarding maintenance and servicing. Contact the manufacturer's technical department in the event of any doubts. The following checks must be carried out for installations that use combustible refrigerants.

- The actual filling quantity is appropriate for the magnitude of the space where the parts containing refrigerant are installed.
- Ventilation equipment and outlet work correctly and without obstructions.
- If an indirect refrigerant circuit is used, check whether the secondary circuit contains refrigerant.
- All markings of equipment are visible and clear. Markings, signs and similar that are not clear must be replaced.
- Refrigerant pipes and components are positioned in such a way that it is not likely that they be subjected to substances that can corrode components containing refrigerant, if these components are not made of material that is resistant against corrosion, or not appropriately protected against such corrosion.

CHECKING ELECTRICAL EQUIPMENT

Repair and maintenance of electrical components must include initial safety checks and procedures for component inspection. In the event of a fault, which can cause a safety risk, do not supply any power to the circuit until the fault has been rectified. If the fault cannot be rectified immediately, and operation must continue, an adequate temporary solution must be implemented. This must be reported to the equipment owner, so that all parties have been informed.

The following checks must be carried out at the initial safety checks.

- That the capacitors are discharged. Discharging must be done safely, to prevent the risk of sparking.
- That no powered electrical components or live cables are exposed when filling or collecting refrigerant or when the system is flushed.
- That the system is continually earthed.

REPAIRING SEALED COMPONENTS

When repairing sealed components, all electrical supply must be disconnected from the equipment that is being repaired

before any sealed covers or similar are removed. If it is absolutely necessary to have an electricity supply to the equipment during the service, continuously activated leak tracing must be performed at the most critical points in order to warn of any dangerous situations.

Pay particular attention to the following so that the sheath is not changed in a way that affects the protection level when working with electrical components. This means damage to cables, unnecessary amounts of connections, terminals that do not follow the original specifications, damaged gas-kets, incorrect grommets etc.

Ensure that the apparatus is secured properly.

Check that seals or sealing materials have not deteriorated to a degree that they can no longer prevent combustible gases from entering. Replacement parts must meet the manufacturer's specifications.



NOTE

Use of silicone seals can hamper the efficiency of certain types of leak-tracing equipment. Components with built in safety do not need to be isolated before starting work.

WIRING

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

LEAK TESTING

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak tracers must be used to detect combustible refrigerant; but the leak tracer may not be sufficiently sensitive or may need to be recalibrated (the leak tracing equipment must be calibrated in an area completely free from refrigerant). The

leak tracer must not be a potential source of ignition and must be suitable for the relevant refrigerant. The leak tracing equipment must be set and calibrated for the relevant refrigerant, to ensure that the gas concentration is a maximum of 25% of the lowest combustible concentration (Lower Flammability Limit, LFL) of the relevant refrigerant.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leak that requires brazing is detected, all refrigerant must be removed from the system and stored in a separate container. Alternatively, the refrigerant can be stored separated from the brazing area in a part of the system at a safe distance from the leak, if this part of the system can be disconnected safely with shut-off valves. The system must be emptied in accordance with the section "Removal and draining".

REMOVAL AND DRAINING

When a cooling circuit is opened for repairs – or for another reason – work must be carried out in a conventional manner. Due to the risk of fire it is important that best practice is applied. Follow the procedure below.

1. Remove the refrigerant
2. Flush the circuit with inert gas.
3. Drain the circuit.
4. Flush through with inert gas.
5. Open the circuit by cutting or brazing.

Collect the refrigerant in the intended cylinders. Clean the system with oxygen-free nitrogen to make the unit safe. This process may need to be repeated several times. Compressed air and oxygen must not be used.

Clean the system by breaking the vacuum with oxygen-free nitrogen, and filling the system to working pressure, relieving the pressure to atmospheric pressure and finally pumping to vacuum. Repeat the process until no refrigerant remains in the system. After the final filling with oxygen-free nitrogen, relieve the pressure in the system to atmospheric pressure, so that work can be carried out. This type of flushing must always be carried out if hot work is to be performed on the pipe system.

Ensure that the vacuum pump's outlet is not near to any potential ignition sources and that there is satisfactory ventilation by the outlet.

FILLING

In addition to the conventional filling procedures, the following actions must be taken.

- Ensure that different refrigerants are not mixed when filling equipment is used. Hoses and lines must be as short as possible to minimise the enclosed refrigerant volume.
- Containers must be stored in a suitable position in accordance with the instructions.
- Ensure that the cooling system is grounded before the system is filled with refrigerant.
- Mark the system once filling is complete (if not already marked). If the amount differs from the pre-installed amount, the marking must include the pre-installed amount, the added extra amount and the total amount.
- Take extra care not to overfill the cooling system.

Before refilling the system, pressure test it with oxygen-free nitrogen. Leak test the system after filling but before using the system. Perform an additional leak test before leaving the installation.

DECOMMISSIONING

Before the device is taken out of operation, the technician must without exception be very familiar with the equipment and all its component parts. Good practice prescribes that all refrigerant is collected safely. Before the collected refrigerant can be reused, oil and refrigerant samples must be taken, if analysis is required. There must be a power supply when this task is started.

1. Familiarise yourself with the equipment and its use.
2. Isolate the system electrically.
3. Before starting the procedure, ensure that:
 - necessary equipment for mechanical handling of the refrigerant container is available
 - all necessary personal safety equipment is available and used correctly
 - the collection process is continuously supervised by an authorised person
 - the collection equipment and containers meet appropriate standards.
4. Pump the refrigerant system to vacuum, if possible.
5. If it is not possible to pump to vacuum, manufacture a branch, so that the refrigerant can be retrieved from different parts of the system.
6. Check that the refrigerant container is on the scales before starting to collect.
7. Start the collection device and collect according to the manufacturer's instructions.
8. Do not overfill the containers (max. 80 % (volume) liquid content).
9. Do not exceed the containers' maximum permitted working pressure – not even temporarily.
10. When the containers have been filled correctly and the process is complete, close all shut-off valves in the equip-

ment and remove and containers and equipment from the installation immediately.

11. The collected refrigerant must not be filled in any other system before being cleaned and checked.

Marking

The equipment must be marked stating that it has been taken out of operation and drained of refrigerant. The marking must be dated and signed. Check that the equipment is marked indicating that it contains combustible refrigerant.

Collection

Best practice prescribes that all refrigerant is collected safely when the refrigerant is drained from a system, either for servicing or for decommissioning.

The refrigerant must only be collected in suitable refrigerant containers. Ensure that the required number of containers, which can hold the entire volume of the system, are available. All containers that are to be used must be intended for the collection of the refrigerant and marked for this refrigerant (specifically designed for the collection of refrigerant). The containers have to be equipped with correctly functioning pressure relief valves and shut-off valves. Empty collection containers must be drained and, if possible, chilled before collection.

The collection equipment must function correctly and instructions for the equipment must be to hand. The equipment must be suitable for the collection of combustible refrigerant.

Fully functioning and calibrated scales must also be to hand.

Hoses must be in good condition and be equipped with leak-proof quick couplings. Before using the collecting machine, check that it is working correctly and has been properly maintained. Associated electrical components must be sealed, to prevent ig-

dition if any refrigerant should leak out. Contact the manufacturer if you are in any doubt.

Return the collected refrigerant to the refrigerant supplier in the correct collection container and with the relevant Waste Transfer Note. Do not mix refrigerants in collection devices or containers.

If compressors/compressor oil are/is to be removed ensure that the affected device is drained to an acceptable level to ensure that no combustible refrigerant remains in the lubricant. Compressors must be drained before being returned to the supplier. Only electrical heating of the compressor housing may be used to quicken draining. Drain oil from the system in a safe manner.

MISCELLANEOUS

Maximum amount of refrigerant: See Technical Specifications in the Installer Manual.

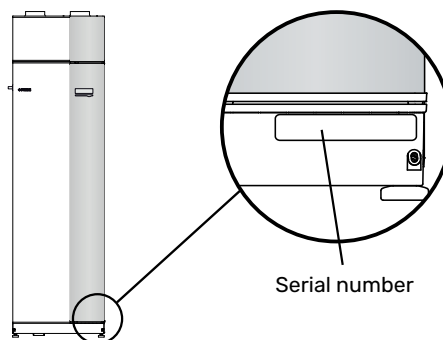
- Everyone who works with or opens a refrigerant circuit must have a current, valid certificate from an accredited industry issuing body, which states that, according to the industry's recognised assessment standard, they have the authority to safely handle refrigerants.
- Servicing must only be performed according to the equipment manufacturer's recommendations.

Maintenance and repairs that require the assistance of another trained person must be carried out under the supervision of person with the authority to handle combustible refrigerants.

Maintenance and repair that requires the skill of another person must be carried out under the supervision of someone with the above expertise.

Serial number

The serial number can be found at the bottom right of the front cover, in the info menu (menu 3.1) and on the type plate (PZ1).



Caution

You need the product's (14 digit) serial number for servicing and support.

Recovery



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

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

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

Country specific information

UNITED KINGDOM

This installation is subject to building regulation approval, notify the local Authority of intention to install.

Use only manufacturer's recommended replacement parts.

For more information see nibe.co.uk.



Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit centralheating.co.uk for information.

Warranty and insurance information

Thank you for installing a new NIBE heat pump in your home.

NIBE heat pumps are manufactured in Sweden to the very highest standard so we are pleased to offer our customers a comprehensive guarantee.

The product is guaranteed for 24 months for parts and labour from the date of installation or 33 months from the date of manufacture, whichever is the shorter.

The NIBE guarantee is based on the unit being installed and commissioned by a NIBE accredited installer, serviced every year and the Benchmark documents completed. Where this condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

We recommend the installer completes and returns as soon as possible, your guarantee registration card or completes the guarantee form on the NIBE website, www.nibe.co.uk

Electrical Supply

The heat pump must be permanently connected to a 230 V ~ 50 Hz supply.

All system components shall be of an approved type and all wiring to current I.E.E wiring regulations.

External wiring must be correctly earthed, polarised and in accordance with the relevant standards: Currently this is BS 7671.

Domestic Hot Water

All domestic hot water circuits, connections and fittings must be in accordance with the relevant standards and water supply regulations. It should also be in accordance with the relevant requirements of the Local Authority and the Building Regulations relevant to the location of installation.

BS 8558:2015 Services supplying water for domestic use within buildings and their cartilages.

Water Supply (Water Fitting) Regulations 1999 or The Water Bylaws 2000 (Scotland).

Heating System

The installation of the heat pump should follow best practice as covered in the following:

BS 5449 Forced circulation hot water central heating systems for domestic premises.

BS 15450 Heating systems in buildings – Design of heat pump heating systems.

Ventilation System

Any ventilation system should be designed and installed in accordance with Building Regulations, England & Wales Approved Document F1 and Scotland Technical Standard Section 3.14 Ventilation. Only this will ensure hygienic room air and prevent any dampness to the building structure.

To be able to ensure a high degree of efficiency and an extremely comfortable living environment, we recommend that the installation of any ventilation system should be planned and this plan be strictly followed by the ventilation engineer.

We recommend that the exhaust and supply air is extracted and supplied via metal spiral seam pipes with fitting seals approved to sealing class D, or suitable equivalent UPVC plastic duct work and sealed with acrylic duct sealant. The exhaust air is extracted from the bathroom, toilet, kitchen and utility room. This will also apply to duct work carrying fresh air from the outside that is preheated in the heat pump and supplied the living quarters. Factors such as street noise, exhaust fumes, wind, general noise, cold and pollen can be taken into account choosing the right outside air vent. This ensures a controlled ventilation system with heat recovery and offers a high degree of comfort.

The discharge air duct work to outside must be insulated to ensure condensation does not form in the duct work.

Inspection of the installation

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

✓	Description	Notes	Signature	Date
	Ventilation (page 23)			
	Setting ventilation flow exhaust air			
	Setting ventilation flow supply air			
	Connecting ground cables			
	Heating medium (page 21)			
	System flushed			
	System vented			
	Circulation pump setting			
	Pressure in the climate system			
	Setting trim valve, number of turns from closed position			
	Hot water (page 21)			
	Mixing valve			
	Expansion vessel			
	T&P valve			
	Tundish			
	Electricity (page 25)			
	Connections			
	Main voltage			
	Phase voltage			
	Fuses heat pump			
	Fuses property			
	Outside sensor			
	Room sensor			
	Safety breaker			
	Earth circuit-breaker			
	Miscellaneous			
	Benchmark checklist			

Delivery and handling

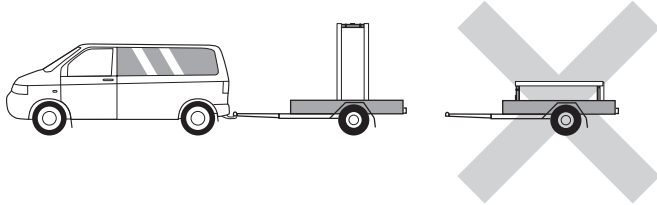
Transport

F470 should be transported and stored vertically in a dry place.

Ensure that the heat pump cannot fall over during transport.

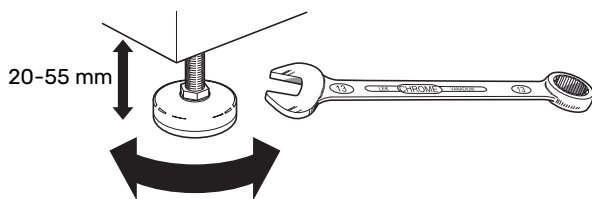
Check that F470 has not been damaged during transport.

However, the F470 can be carefully laid on its back when being moved into the building.



Assembly

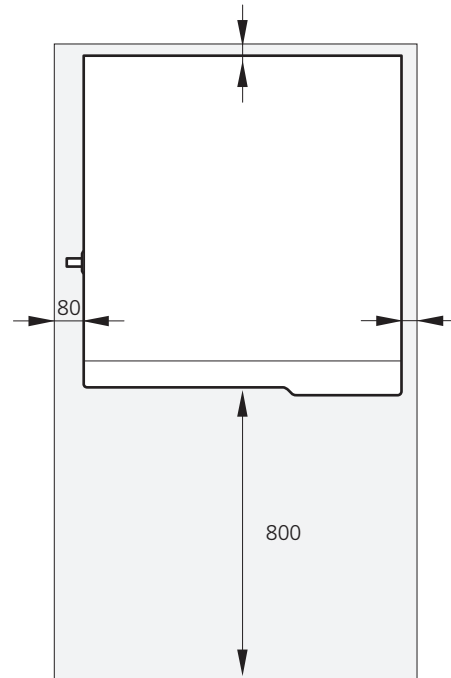
- Position F470 on a solid foundation indoors that withstands water and the weight of the product.
- Use the product's adjustable feet to attain a horizontal and stable set-up.



- Since water comes from F470, the area where F470 is located must be equipped with floor drainage.
- Because water comes from F470, the floor coating is important. A waterproof floor or floor membrane is recommended.
- 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.
- The installation area always has to have a temperature of at least 10 °C and max. 30 °C.

INSTALLATION AREA

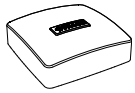
Leave a free space of 800 mm in front of the product. Leave free space between F470 and wall/other machinery/fittings/cables/pipes etc. It is recommended that a space of at least 10 mm is left to reduce the risk of noise and of any vibrations being propagated.



NOTE

Ensure that there is sufficient space (300 mm) above F470 for connecting ventilation ducts.

Supplied components



Outdoor temperature sensor (BT1)



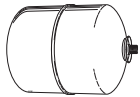
Room sensor (BT50)



Earth cabling (4 pcs)



2 x tundish (WM3)



Expansion vessel (CM4) with holder (enclosed separately)

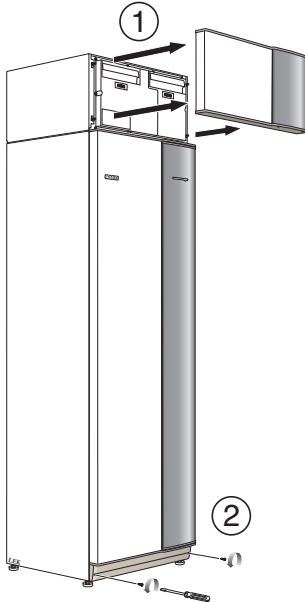
LOCATION

The kit of supplied items is placed on top of the product.

Removing the covers

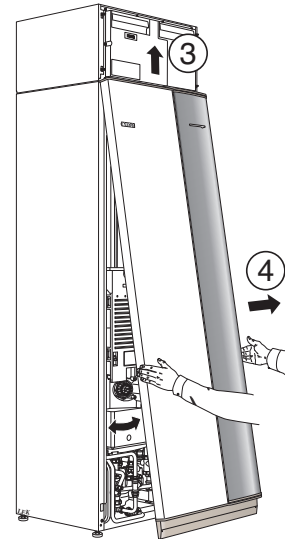
FRONT COVER

1. Remove the upper panel by pulling it straight out.
2. Remove the screws from the lower edge of the front panel.



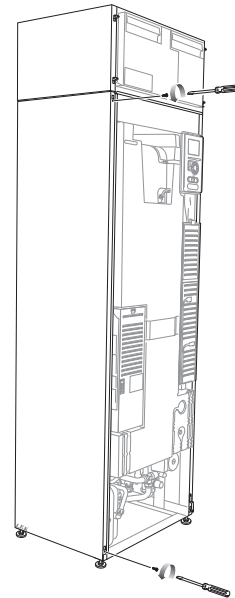
3. Lift the panel out at the bottom edge and up.

4. Pull the panel towards yourself.

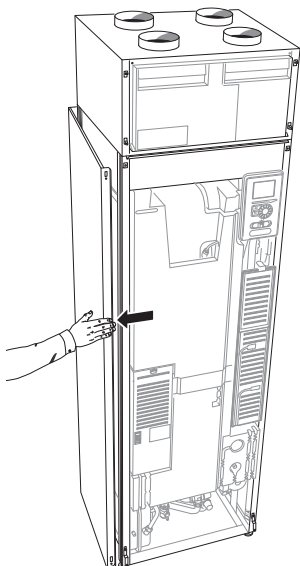


SIDE PANELS

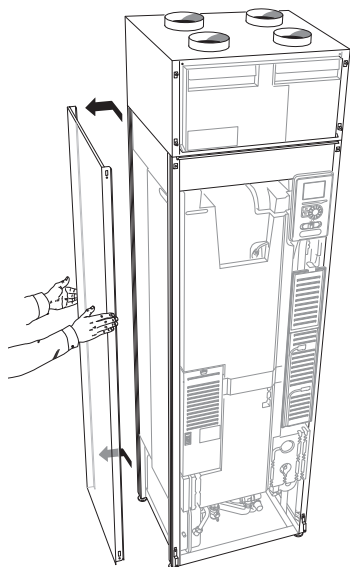
1. Remove the screws from the upper and lower edges.



2. Twist the panel slightly outwards.



3. Move the panel backwards and slightly to the side.



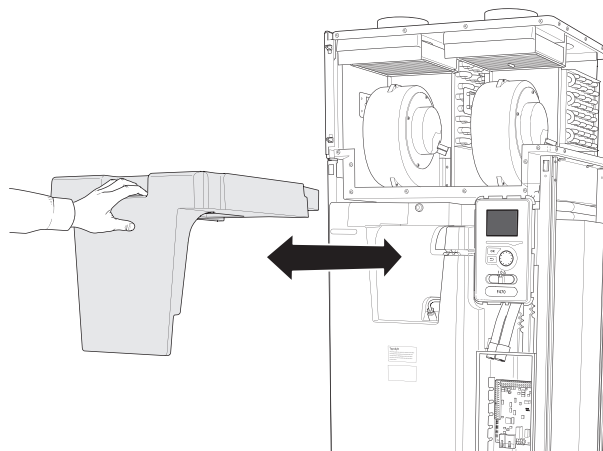
4. Assembly takes place in the reverse order.

Removing parts of the insulation

Parts of the insulation can be removed to facilitate the installation.

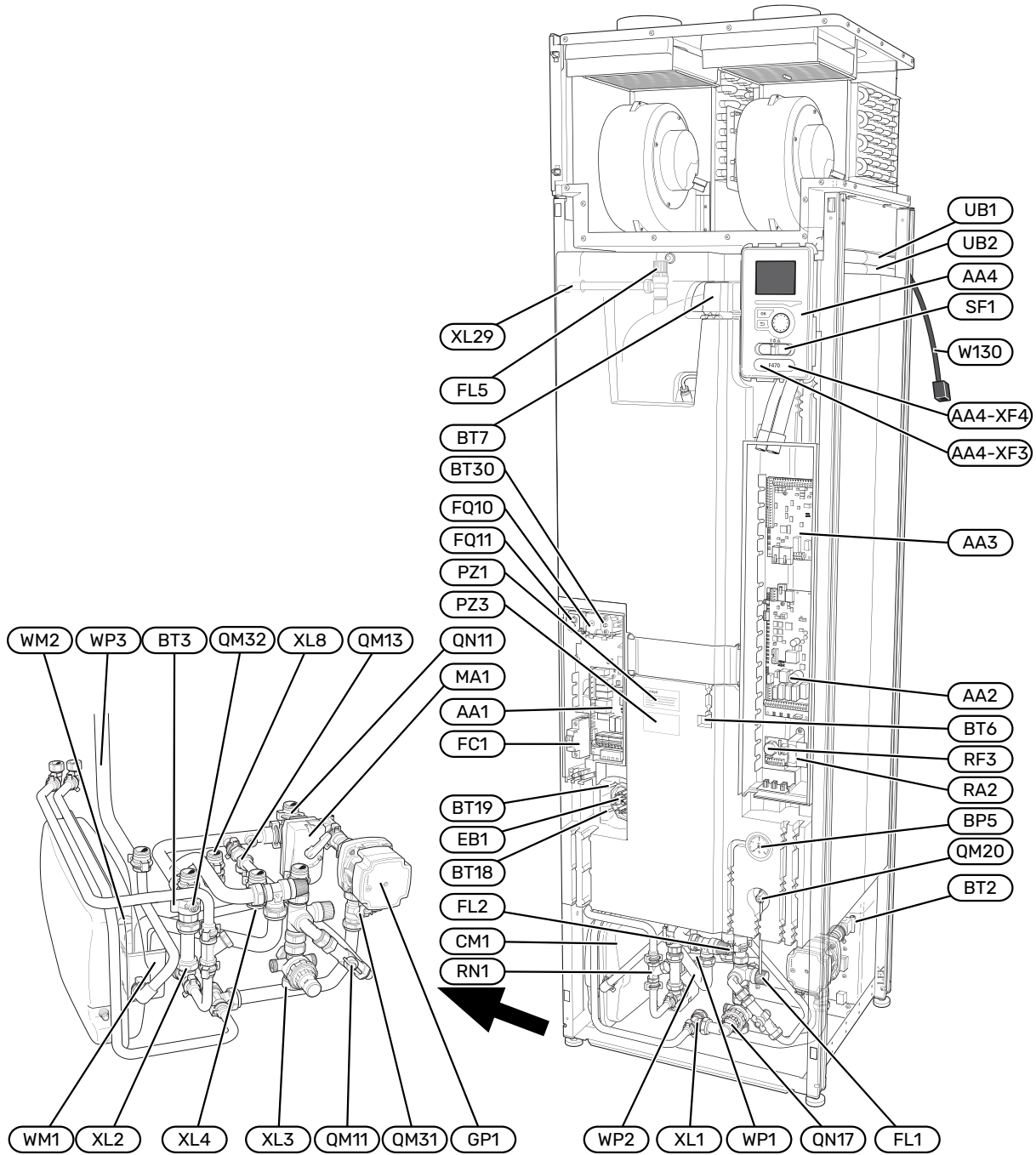
INSULATION, TOP

Grip the handle and pull straight out as illustrated.



The heat pump design

General



PIPE CONNECTIONS

XL1	Connection, heating medium flow line
XL2	Connection, heating medium return line
XL3	Connection, cold water
XL4	Connection, hot water
XL8	Connection, docking in
XL29	Connection, T&P valve

HVAC COMPONENTS

CM1	Expansion vessel
FL1	Expansion relief valve, water heater
FL2	Safety valve, climate system
FL5	T&P valve
GP1	Circulation pump
QM11	Filler valve, climate system
QM13	Filler valve 2, climate system
QM20	Vent valve, heating medium
QM31	Shut-off valve, heating medium flow
QM32	Shut off valve, heating medium return
QN11	Shunt valve
QN17	Pressure reduction valve
RN1	Trim valve
WM1	Overflow cup
WM2	Overflow water discharge
WP1	Overflow pipe, safety valve hot water heater
WP2	Overflow pipe, safety valve climate system
WP3	Overflow pipe, condensation

SENSORS ETC.

BP5	Pressure gauge, heating system
BT2	Temperature sensors, heating medium flow
BT3	Temperature sensors, heating medium return
BT6	Controlling hot water sensor
BT7	Display hot water sensor
BT18	Temperature sensor, compressor operation
BT19	Temperature sensor, immersion heater operation
BT30	Thermostat, backup heating

ELECTRICAL COMPONENTS

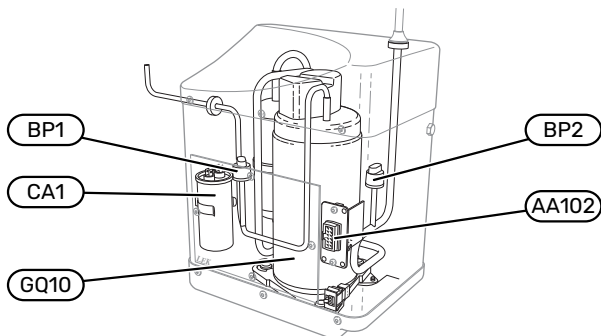
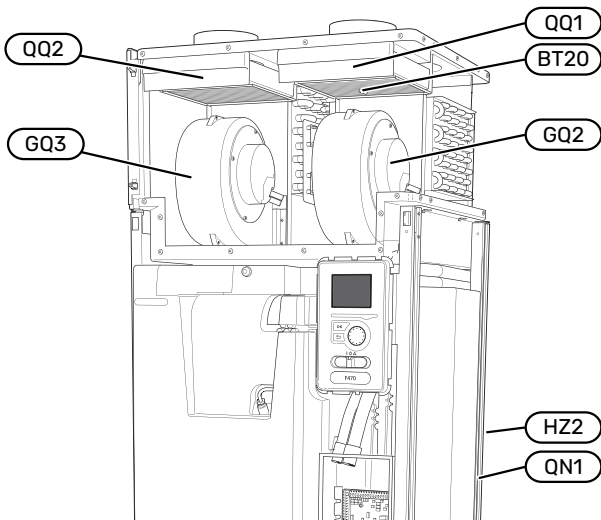
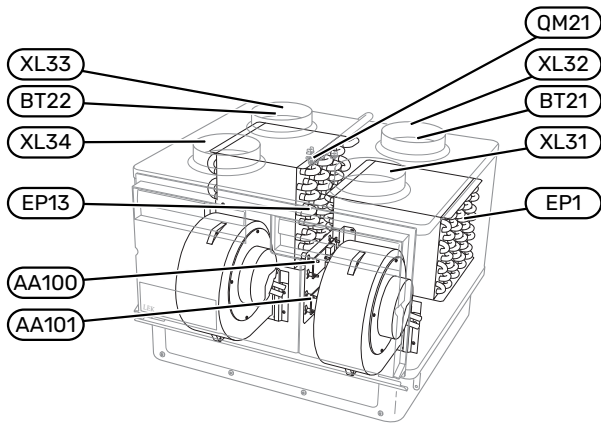
AA1	Immersion heater card
AA2	Base card
AA3	Input circuit board
AA4	Display unit
	AA4-XF3 USB port
	AA4-XF4 Service socket
EB1	Immersion heater
FC1	Miniature circuit-breaker
FQ10	Temperature limiter
FQ11	Temperature limiter for the compressor
MA1	Shunt motor with hand wheel
RA2	Choke
RF3	EMC card
SF1	Switch
W130	Network cable for NIBE Uplink

MISCELLANEOUS

PZ1	Rating plate
PZ3	Serial number plate
UB1-2	Cable gland

Designations according to standard EN 81346-2.

Air treatment unit and compressor module



VENTILATION CONNECTIONS

- XL31 Ventilation connection, exhaust air
- XL32 Ventilation connection, extract air
- XL33 Ventilation connection, supply air
- XL34 Ventilation connection, outdoor air

HVAC COMPONENTS

- EP13 Supply air battery
- QM21 Vent valve, supply air coil

SENSORS ETC.

- BP1 High pressure pressostat
- BP2 Low pressure pressostat
- BT16 Temperature sensor, evaporator¹
- BT20 Temperature sensor, exhaust air
- BT21 Temperature sensor, extract air
- BT22 Temperature sensor, supply air

¹ Not visible in the image

ELECTRICAL COMPONENTS

- AA100 Connection card air treatment section, exhaust air
- AA101 Connection card air treatment section, supply air
- AA102 Connection card compressor card
- CA1 Capacitor

COOLING COMPONENTS

- EP1 Evaporator
- GQ10 Compressor
- HZ2 Drying filter¹
- QN1 Expansion valve¹

¹ Located on the back of the product

VENTILATION

- GQ2 Exhaust air fan
- GQ3 Supply air fan
- HQ10 Exhaust air filter¹
- HQ11 Supply air filter¹
- QQ1 Filter cover, exhaust air
- QQ2 Filter cover, supply air

¹ Not visible in the image

Pipe and ventilation connections

General pipe connections

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

The system requires the radiator circuit to be designed for a low temperature heating medium. At the lowest dimensioned outdoor temperature (DOT) the highest recommended temperatures are 55 °C on the supply line and 45 °C on the return line.



Caution

Ensure that incoming water is clean. When using a private well, it may be necessary to supplement with an extra water filter.



NOTE

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



NOTE

Water may drip from the safety valve. A factory-fitted overflow pipe runs from the safety valve to an overflow cup. An overflow pipe has to be routed from the overflow cup to a suitable drain. The overflow pipe must be inclined along its entire length to prevent pockets where water can accumulate, and must be frost-proof.



NOTE

This installation is subject to building regulation approval, notify the local Authority of intention to install.



NOTE

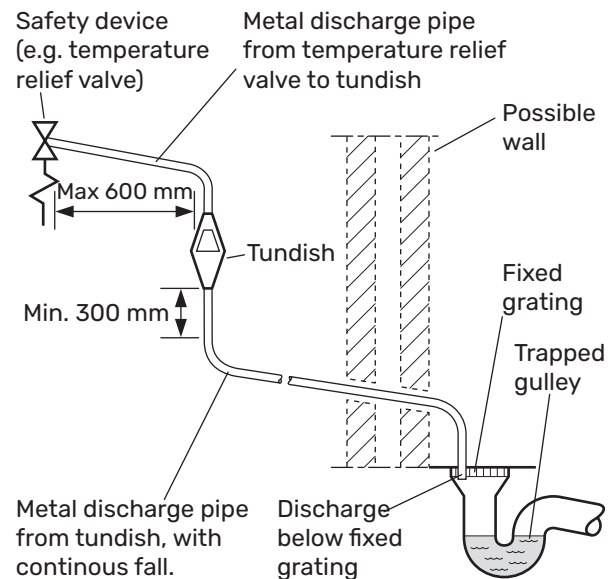
Use only manufacturer's recommended replacement parts.

Waste water from the evaporator's collection tray and from safety valves is led via an unpressurised overflow pipe to the drain, so that hot water splashes cannot cause damage.

The mouth of the overflow pipe must be visible and not placed close to electrical components. In addition, the mouth of the overflow pipe (tundish), drain valves and motorised valves should also be positioned well away from all electrical components. This is the only permitted use of unpressurised overflow pipes. Overflow pipes from tundish (WM3) connected to the expansion relief valve (FL1) must also be connected to the drain in the same way.

The connection for the T&P valve (XL29) must not be used for any other purpose. Valves may not be positioned between the T&P valve (FL5) and the water heater.

Overflow pipes from tundish must be routed with a fall and be at least 300 mm long, before bends or angles in the pipework (see image) and must also be frost-proof.



Valve outlet size	Minimum size of discharge pipe	Minimum size of discharge pipe from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15 mm	22 mm	up to 9 m	0.8 mm
G1/2	15 mm	28 mm	up to 18 m	1.0 mm
G1/2	15 mm	35 mm	up to 27 m	1.4 mm
G3/4	22 mm	28 mm	up to 9 m	1.0 mm
G3/4	22 mm	35 mm	up to 18 m	1.4 mm
G3/4	22 mm	42 mm	up to 27 m	1.7 mm
G1	28 mm	35 mm	up to 9 m	1.4 mm
G1	28 mm	42 mm	up to 18 m	1.7 mm

Valve outlet size	Minimum size of discharge pipe	Minimum size of discharge pipe from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1	28 mm	54 mm	up to 27 m	2.3 mm

Table sizing of copper discharge pipe for common temperature relief valve outlet sizes.

HARD WATER AREAS

Normally, there should not normally be any problem installing F470 in hard water areas, as the operating temperature is 50–60°C.

CLEANING THE CLIMATE SYSTEM

When the water heater and the climate system have been filled with water, F470 must operate at maximum normal temperature for at least one hour. Thereafter the system must be drained of water and refilled.

Before installing the heat pump in an existing system, it is important that the system is properly flushed through.

Even if the heat pump is to be installed in a new system, the heat pump and system should be flushed.



NOTE

Ensure that cleaning agent has been removed from the entire system before adding inhibitor.

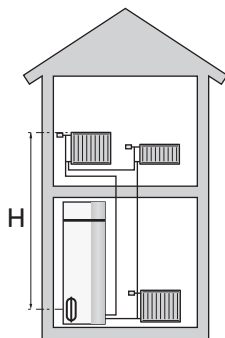
After flushing an inhibitor should be used for long-term anti-corrosion protection.

NIBE Energy Systems Limited recommends water treatments, supplied by Fernox, specifically designed for heat pumps.

SYSTEM VOLUME

F470 is equipped with an expansion vessel (CM1).

The volume of the expansion vessel is 10 litres and it is pre-pressurised as standard to 0.5 bar. As a result, the maximum permitted height "H" between the expansion vessel and the highest installed radiator is 5 m, see figure.



If the pre-pressure is not high enough, it can be increased by filling with air via the valve in the expansion vessel. Any change in the pre-pressure affects the ability of the expansion vessel to handle the expansion of the water.

The maximum system volume, excluding F470, is 219 litres at the above-mentioned pre-pressure.

SYSTEM DIAGRAM

F470 consists of a heat pump, water heater, immersion heater, fans, circulation pump and control system. F470 is connected to the ventilation system and heating medium circuit.

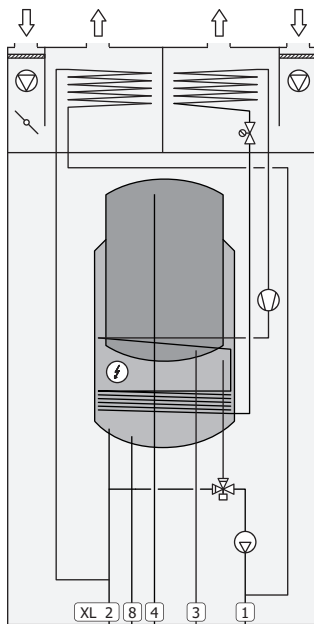
When the exhaust air at room temperature passes through the evaporator, the refrigerant evaporates because of its low boiling point. As a result, the air releases energy to the refrigerant.

The refrigerant is then compressed in a compressor, causing the temperature to rise considerably.

The warm refrigerant is led to the condenser. Here the refrigerant gives off its energy to the heating system water, whereupon the refrigerant changes state from gas to liquid.

The refrigerant then goes via filters to the expansion valve, where the pressure and temperature are reduced.

The refrigerant has now completed its circulation and returns to the evaporator.



Pipe connections

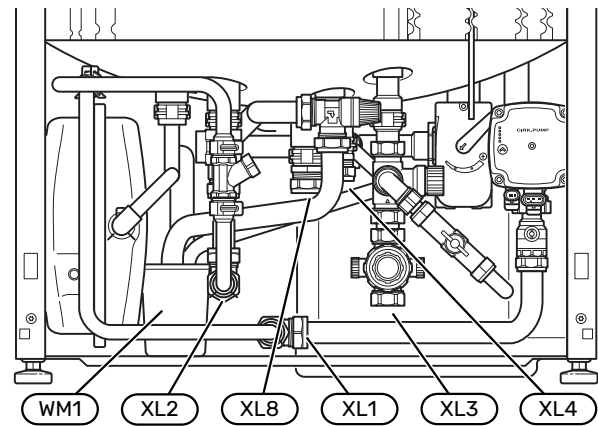
XL1	Connection, heating medium flow line
XL2	Connection, heating medium return line
XL3	Connection, cold water
XL4	Connection, hot water
XL8	Connection, docking in
XL29	Connection, T&P valve



Caution

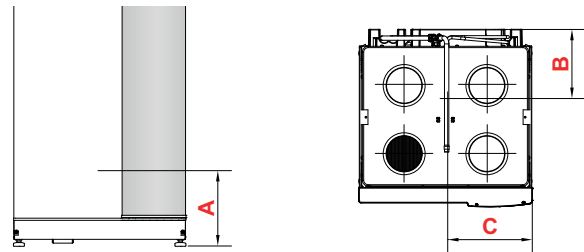
This is a principle of operation. For more detailed information about F470, see section "The heat pump design".

Dimensions and pipe connections



The overflow cup (WM1) can be turned, allowing the pipe to be pointed forwards or backwards to simplify connection to the drain.

SETTING OUT DIMENSIONS



Connection		A	B	C
XL1 Heating medium supply	(mm)	30	465	320
XL2 Heating medium return	(mm)	45	420	365
XL3 Cold water	(mm)	80	455	210
XL4 Hot water	(mm)	170	400	260
XL8 Docking	(mm)	175	290	295
WM1 Overflow cup	(mm)	60	200	420

PIPE DIMENSIONS

Connection		
XL1-XL2 Heating medium ext θ	(mm)	22
XL3 Cold water ext θ	(mm)	22
XL4 Hot water ext θ	(mm)	22
XL8 Docking ext. θ	(mm)	22
XL29 Connection, T&P valve	(mm)	15
WM2 Overflow water discharge	(mm)	32

Symbol key

Symbol	Meaning
	Unit box
	Shut-off valve
	Non-return valve
	Mixing valve
	Circulation pump
	Immersion heater
	Expansion vessel
	Expansion valve
	Fan
	Compressor
	Temperature sensor
	Trim valve
	Reversing valve/shunt
	Overflow valve
	Domestic hot water
	Hot water circulation
	Heat pump
	Heating system
	Heating system with lower temperature

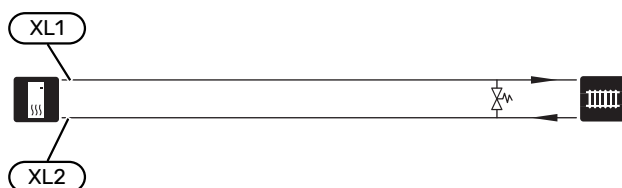
Climate system

A climate system is a system that regulates the indoor temperature with the help of the control system in F470 and, for example, radiators, underfloor heating, fan coils, etc.

CONNECTING THE CLIMATE SYSTEM

Install as follows:

- When connecting to a system with thermostats, either a bypass valve must be fitted or, alternatively, some of the thermostats must be removed to ensure there is sufficient flow and heat emission.



Cold and hot water

The settings for hot water are made in menu 5.1.1.

Stop temperature for hot water must be at least 60°C.

CONNECTING COLD AND HOT WATER

Install as follows:

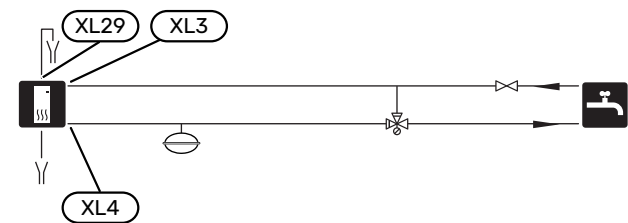
- shut-off valve
- mixing valve

A mixing valve must be installed when the factory setting for hot water is changed. National regulations must be observed.

- enclosed expansion vessel (CM4)

The expansion vessel (CM4) accommodates expansion that results from heating the water inside the unit. The expansion vessel must be connected between the expansion relief valve (FL1) and the water heater. The location of the expansion vessel should allow access to recharge the pressure when necessary.

- enclosed tundish (WM3)



Supply air battery

The supply air battery (EP13) is connected in parallel with the radiator circuit and heats the house's supply air. The water flow through the supply air battery is set using a trim valve (RN1). The supply air temperature has to be roughly the same as the indoor temperature, preferably a degree or so lower.



TIP

If possible, choose a cold day to adjust the trim valve.

Installation alternative

F470 can be installed in several different ways, some of which are shown here.

Further option information is available at www.nibe.co.uk and in the respective assembly instruction for the accessory used. See page 59 for a list of accessories that can be used with F470.

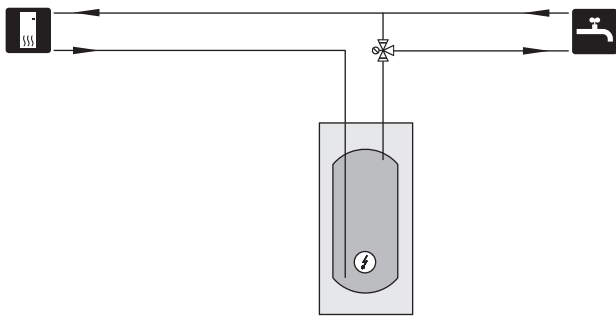
EXTRA HOT WATER HEATERS

The system should be supplemented with an extra water heater, if a large bath tub or other significant consumer of hot water is installed.

Water heater with immersion heater

In a water heater with an immersion heater, the water is initially heated by the heat pump. The immersion heater in the water heater is used for keeping warm and when the heat pump does not have sufficient power.

The water heater's flow is connected after F470.



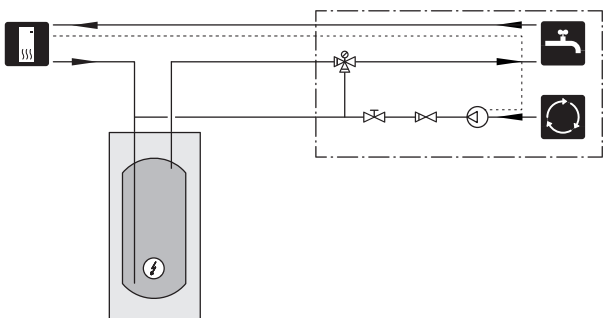
HOT WATER CIRCULATION

A circulation pump can be controlled by F470 to circulate the hot water. The circulating water must have a temperature that prevents bacterial growth and scalding, and national standards must be satisfied.

The HWC return is connected to a freestanding water heater.

The expansion vessel (CM4) that is enclosed F470 may need to be replaced with a larger one.

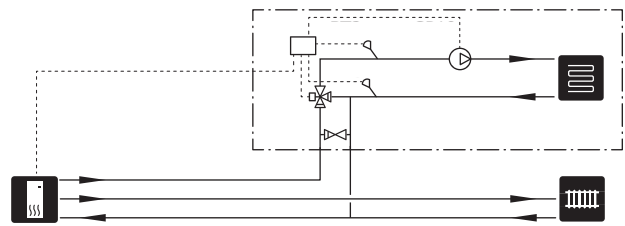
The circulation pump is activated via the AUX output in menu 5.4 - "soft in/outputs".



EXTRA CLIMATE SYSTEM

In buildings with several climate systems that require different supply temperatures, the accessory ECS 40/ECS 41 can be connected.

ECS 40/ECS 41 is connected to connection, docking in (XL8).



General ventilation connection

- Ventilation installation must be carried out in accordance with current norms and directives.
- Connections must be made via flexible hoses, which should be installed so that they are easy to replace.
- Provision must be made for inspection and cleaning of the duct.
- Make sure that there are no reductions of cross-sectional area in the form of creases, tight bends, etc., since this will reduce the ventilation capacity.
- The air duct system must be a minimum of air tightness class B.
- To prevent fan noise being transferred to the ventilation devices, install silencers in suitable locations in the duct system.
- The extract air and outdoor air ducts are insulated using diffusion-proof material along their entire lengths.
- Ensure that the condensation insulation is fully sealed at any joints and/or at lead-in nipples, silencers, roof cowls or similar.
- The air must be routed to the outdoor air duct through an outer wall grille in the facade. The outer wall grille must be installed so that it is protected from the weather and must be designed so that no rainwater and/or snow can penetrate the facade or follow the air into the duct.
- When positioning the outdoor air and extract air hood/grille, bear in mind that the two air flows must not short circuit to prevent the extract air from being drawn into F470 again.
- The extract air duct must be a maximum of 20 m long with a maximum of six bends.
- Because the heat pump contains a flammable refrigerant, the air ducting system must be earthed. This is done by making a good electrical connection to the air ducts using the enclosed earth cables (4). The cables must then be connected to the earth pins on top of the top cover.
- A duct in a masonry chimney stack must not be used for extract air or outdoor air.
- When external devices that affect the ventilation are used, for example kitchen fans and stoves, the heat pump must be in operation. There is a risk of freezing at low outdoor temperatures.

EXHAUST AIR DUCT /KITCHEN FAN

Exhaust air duct (kitchen fan) must not be connected to F470.

To prevent cooking odours from being led to the F470, the distance between the kitchen fan and the exhaust air valve must be observed. The distance should not be less than 1.5 m.

Always use a kitchen fan when cooking.

Ventilation flow

Connect F470 so that all the exhaust air, except kitchen duct air (kitchen fan), passes through the evaporator (EP1) in the heat pump.

The ventilation flow must comply with the applicable national standards.

For optimum heat pump performance, the ventilation flow must not be less than 28 l/s (100 m³/h) at an exhaust air temperature of at least 20 °C. When the exhaust air temperature is lower than 20 °C (for example at start-up and when there is nobody at home), the minimum value is 31 l/s (110 m³/h).

The supply air flow must be lower than the exhaust air flow to prevent over pressure in the house.

The heat pump's installation area must be ventilated to at least 5 l/s (18 m³/h)

Set the ventilation capacity in the heat pump's menu system (menu 5.1.5 - "fan sp. exhaust air").

If the exhaust air temperature falls below 16 °C, the compressor is blocked and electric additional heat is permitted. No energy is recovered from the exhaust air when the compressor is blocked.

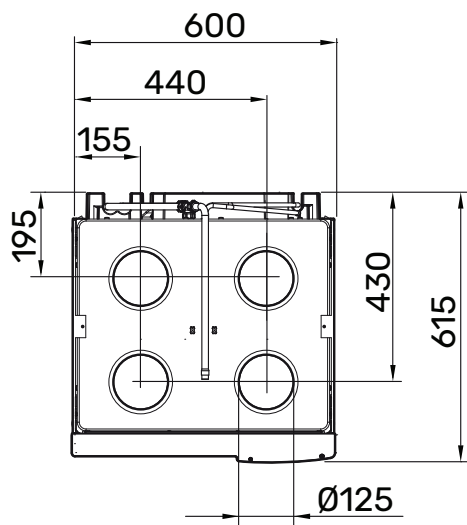
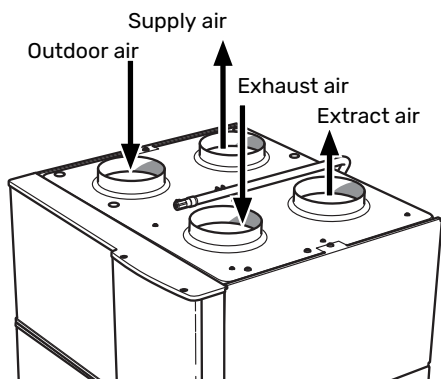
Adjusting ventilation

To obtain the necessary air exchange in every room of the house, the exhaust air device and the supply air device must be correctly positioned and adjusted and the fans in the heat pump adjusted.

Immediately after installation adjust the ventilation so that it is set according to the projected value of the house.

Incorrect adjustment of the ventilation may lead to reduced installation efficiency and thus poorer operating economy, a poorer indoor climate and moisture damage in the building.

Dimensions and ventilation connections

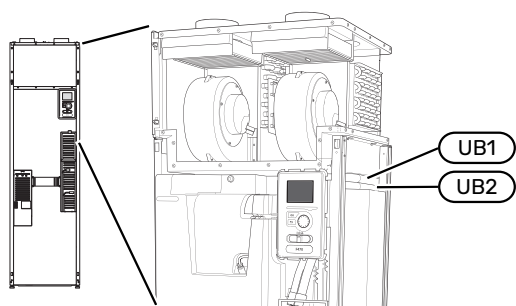


Electrical connections

General

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

- Electrical installation and wiring must be carried out in accordance with national provisions.
- Disconnect F470 before insulation testing the house wiring.
- F470 must be fitted with a residual current device. If the property is equipped with a residual current device, F470 must be equipped with a separate one.
- F470 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- If a miniature circuit breaker is used, this must have at least triggering characteristic "C". See section "Technical specifications" for fuse size.
- To prevent interference, communication cables to external connections must not be laid in the vicinity of high voltage cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX, LiYY or equivalent.
- For an electrical wiring diagram for F470, see the "Technical specifications" section.
- When routing a cable into F470, the cable grommets (UB1) and (UB2) must be used.



NOTE

Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Disconnect the current using the circuit breaker before carrying out any servicing.



NOTE

If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.



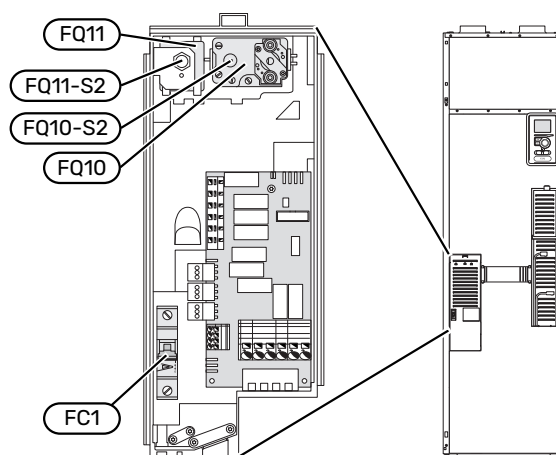
NOTE

Check the connections, main voltage and phase voltage before the product is started, to prevent damage to the heat pump electronics.



NOTE

Do not start the system before filling up with water. Components in the system could be damaged.



MINIATURE CIRCUIT-BREAKER (FC1)

Operation (230 V), fans, compressor, circulation pump, etc., are internally fused by a miniature circuit breaker (FC1).



Caution

Check the miniature circuit-breaker (FC1). It may have tripped during transport.

TEMPERATURE LIMITER (FQ10)

The temperature limiter (FQ10) cuts the current supply to the electric additional heat if the temperature rises between 90 and 100°C and can be manually reset.

Resetting

The temperature limiter (FQ10) is accessible behind the front cover. Reset the temperature limiter by carefully pressing the button (FQ10-SF2) using a small screwdriver.

TEMPERATURE LIMITER, COMPRESSOR (FQ11)

Temperature limiter (FQ11) cuts the current supply to the soft starter if the temperature rises above 88 °C and is manually reset.

Resetting

Temperature limiter (FQ11) is accessible behind the front cover. The temperature limiter is reset by firmly pressing in its button (FQ11-SF2) using a small screwdriver.

ACCESSIBILITY, ELECTRICAL CONNECTION

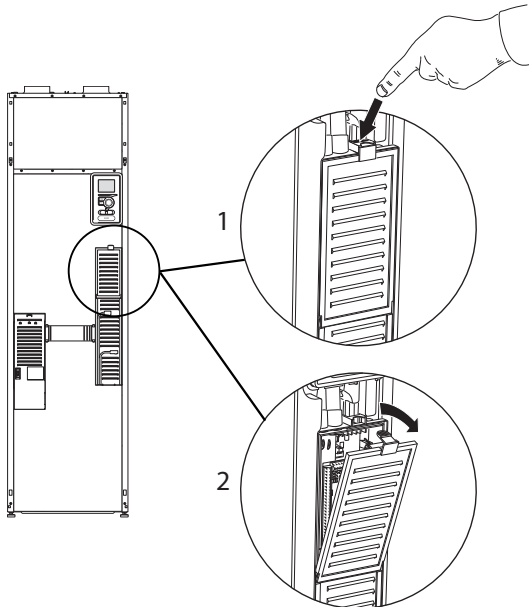
The plastic cap of the electrical boxes is opened using a screwdriver.



NOTE

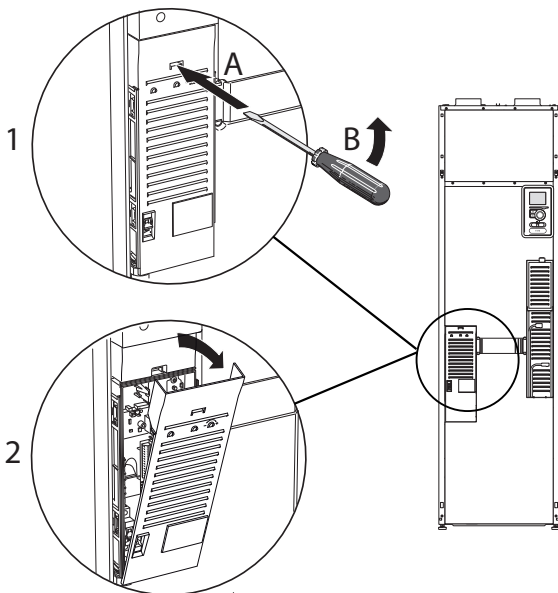
The cover for the input card is opened without a tool.

Removing the cover, input board



1. Push the catch down.
2. Angle out the cover and remove it.

Removing the cover, immersion heater board



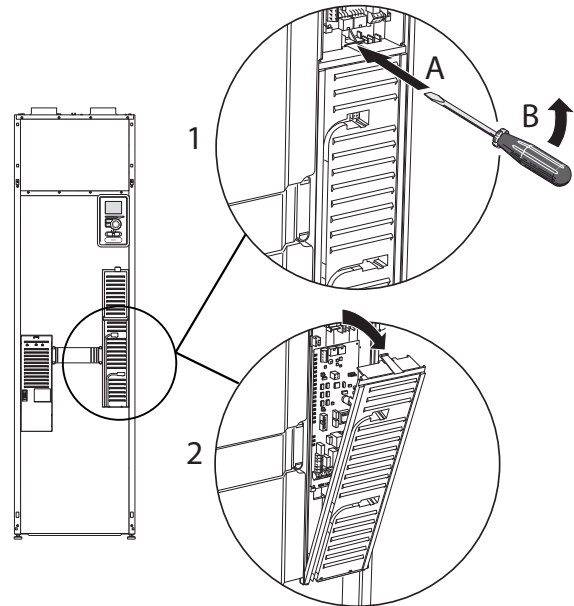
1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.

Removing the cover, base circuit board



Caution

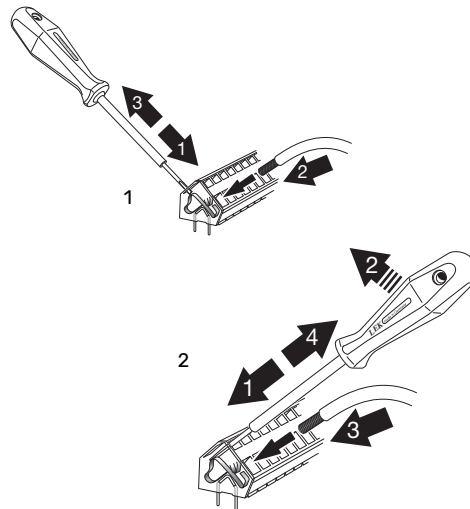
To remove the cover for the base board, the cover for the input circuit board must first be removed.



1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.

CABLE LOCK

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



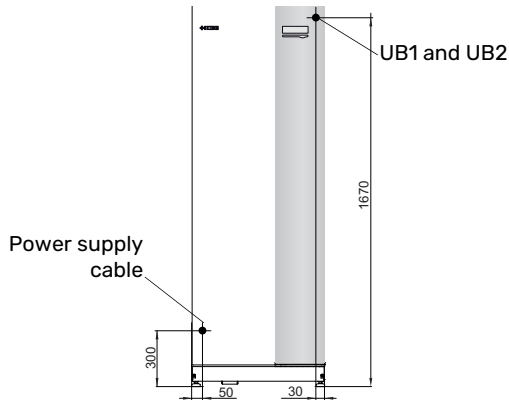
Connections

POWER CONNECTION

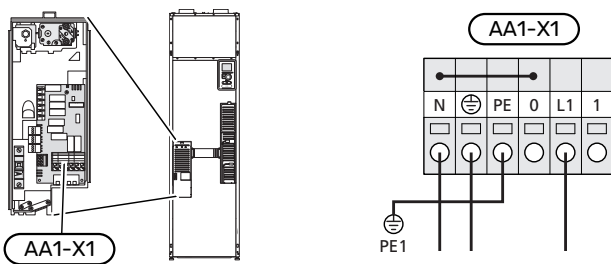
F470 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

The enclosed cable (length approx. 2 m) for the incoming supply electricity is connected to terminal block X1 on the electric addition PCB (AA1).

The connection cable can be found on the reverse of F470 (see dimensions diagram below).



Connection 1x230V



TARIFF CONTROL

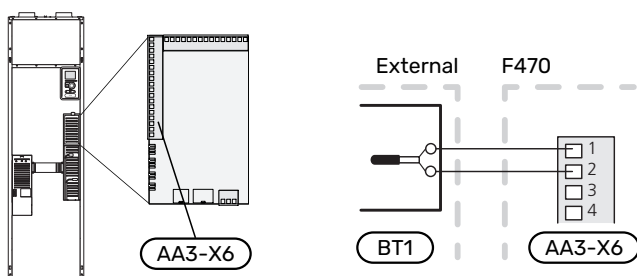
If the voltage to the immersion heater and/or the compressor disappears for a certain period, there must also be blocking via the AUX-input at the same time, see "Possible selection for AUX inputs".

OUTSIDE SENSOR

The outdoor temperature sensor (BT1) is placed in the shade on a wall facing north or north-west, so it is unaffected, for example, by the morning sun.

Connect the outdoor temperature sensor to terminal block X6:1 and X6:2 on the input board (AA3).

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



ROOM SENSOR

F470 is supplied with an enclosed room sensor (BT50). The room sensor has a number of functions:

1. Shows current room temperature in the display on F470.
2. Option of changing the room temperature in °C.
3. Provides the option of fine-tuning the room temperature.

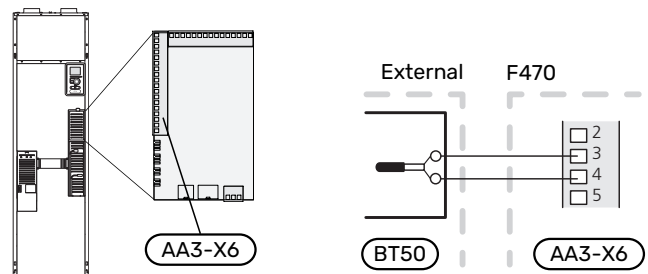
Install the sensor in a neutral position where the set temperature is wanted.

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

F470 operates without the room sensor, but if you want to read the home's indoor temperature from the display on F470, the sensor must be fitted. Connect the room sensor to X6:3 and X6:4 on the input board (AA3).

If the room temperature sensor will have a controlling function, it is activated in menu 1.9.4 - "room sensor settings".

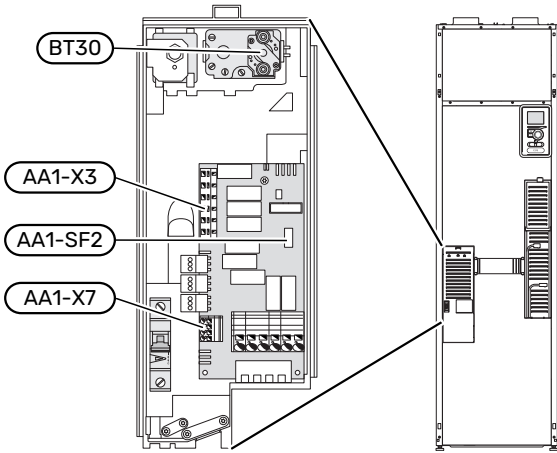
If the room sensor is used in a room with underfloor heating, it should only have an indicative function, not control of the room temperature.



Caution

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

Settings



The image shows the dip-switch (AA1-S2) in the factory setting.

ELECTRICAL ADDITION - MAXIMUM OUTPUT

The immersion heater output is divided into steps, according to the table.

Setting maximum output in the electric additional heat is done in menu 5.1.12.

Power steps of the immersion heater

Electrical addition (kW)	Max (A)
0.0	6.3
2.7	17.9
5.3 ¹	29.3
8.0	41

¹ Factory setting

The table displays the maximum phase current for the relevant power step for the heat pump.

EMERGENCY MODE

When the heat pump is set to emergency mode (SF1 is set to Δ), only the most necessary functions are activated.

- The compressor and fans are off and heating is managed by the immersion heater.

Power in emergency mode

The immersion heater's output in emergency mode is set with the dipswitch (S2) on the immersion heater circuit board (AA1) according to the table below.

kW	1	2	3	4	5	6
2.7	on	off	off	off	off	off
5.3 ¹	on	off	on	off	off	off
8.0	on	off	on	off	on	off

¹ Factory setting

Optional connections

LOAD MONITOR

Integrated load monitor

F470 is equipped with a simple form of integrated load monitor, which limits the power steps for the electric additional heat by calculating whether future power steps can be connected to the relevant phase without exceeding the current for the specified main fuse.

If the current would exceed the specified main fuse, the power step is not permitted. The size of the property's main fuse is specified in menu 5.1.12 - "internal electrical addition".

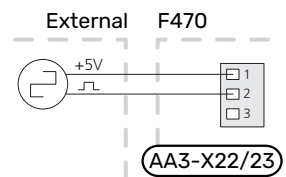
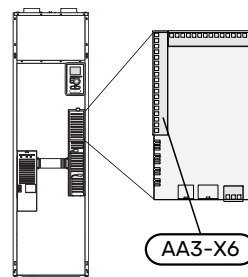
CONNECTING EXTERNAL ENERGY METER



NOTE

Connection of external energy meter requires version 35 or later on the input board (AA3) as well as "display version" 8816 or later.

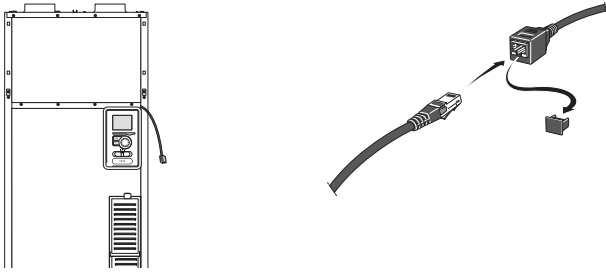
One or two energy meters (BE6, BE7) are connected to terminal block X22 and/or X23 on input board (AA3).



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

NIBE UPLINK

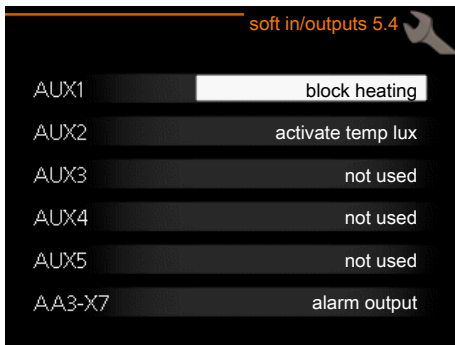
Connect the network connected cable (straight, Cat.5e UTP) with RJ45-contact (male) to RJ45 contact (female) on the rear of the heat pump.



EXTERNAL CONNECTION OPTIONS

F470 has software-controlled AUX inputs and outputs for connecting the external switch function (contact has to be potential-free) or sensor.

In menu 5.4 - "soft in/outputs", you select the AUX connection to which each function has been connected.



For certain functions, accessories may be required.



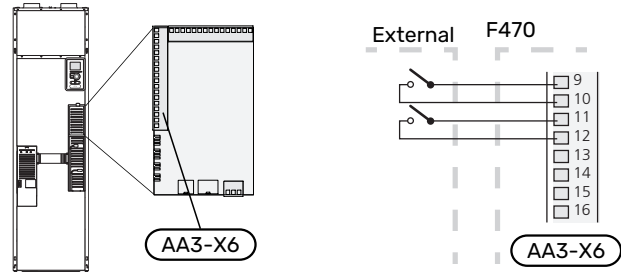
TIP

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

Selectable inputs

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

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



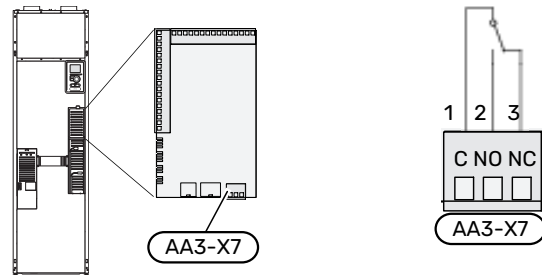
The example above uses the inputs AUX1 (X6:9-10) and AUX2 (X6:11-12) on the input board (AA3).

Selectable outputs

A selectable output is AA3-X7.

The output is a potential-free switching relay.

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



Caution

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



TIP

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

Possible selection for AUX inputs

Monitor

Available options are:

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

External activation of functions

An external switch function can be connected to F470 to activate various functions. The function is activated during the time the switch is closed.

Possible functions that can be activated:

- hot water comfort mode "temporary lux"
- hot water comfort mode "economy"
- "external adjustment"

When the switch is closed, the temperature changes in °C (if the room sensor is connected and activated). If a room sensor is not connected or not activated, the desired change of "temperature" (heating curve offset) is set with the number of steps selected. The value is adjustable between -10 and +10. External adjustment of climate systems 2 to 8 requires accessories.

- climate system 1 to 8

Setting the value for the change is performed in menu 1.9.2 - "external adjustment".

- activation of one of four fan speeds.

The following options are available:

- "activate fan speed 1 (NO)" - "activate fan speed 4 (NO)"
- "activate fan speed 1 (NC)"

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

- SG ready



Caution

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

"SG Ready" requires two AUX inputs.

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

Closed or open switch means one of the following:

- Blocking (A: Closed, B: Open)

"SG Ready" is active. The compressor in the heat pump and additional heat is blocked.

- Normal mode (A: Open, B: Open)

"SG Ready" is not active. No effect on the system.

- Low price mode (A: Open, B: Closed)

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

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

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

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

- +Adjust

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

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

*Support for +Adjust required



Caution

This accessory may require a software update in your F470. The version can be checked in the "Service info" menu 3.1. Visit nibeuplink.com and click on the "Software" tab to download the latest software to your installation.



Caution

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

External blocking of functions

An external switch function can be connected to F470 for blocking various functions. The switch must be potential-free and a closed switch results in blocking.



NOTE

Blocking entails a risk of freezing.

Functions that can be blocked:

- hot water (hot water production). Any hot water circulation (HWC) remains in operation.
- heating (blocking of heating demand)

- internally controlled additional heat
- compressor
- tariff blocking (additional heat, compressor, heating and hot water are disconnected)

Possible selections for AUX output

Indication

- alarm
- holiday
- away mode for "smart home" (complement to the functions in menu 4.1.7 - "smart home")

Control

- circulation pump for hot water circulation
- external heating medium pump
- external frost protection damper (QN42)

Blocking

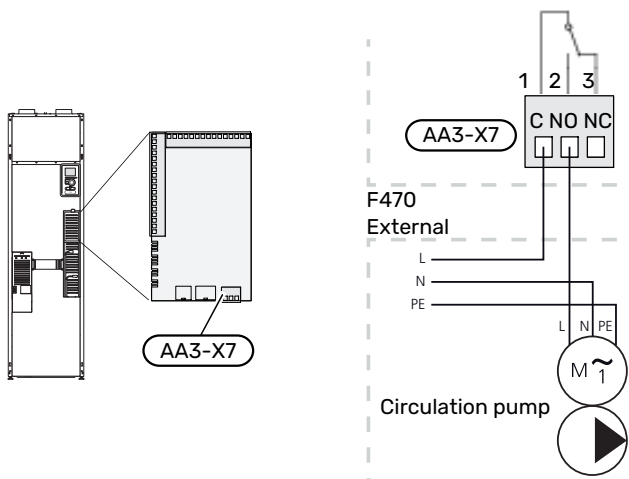
- supply air heating (accessory BSA 10 is required)



NOTE

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

An external circulation pump is connected to the AUX output, as illustrated below.



Connecting accessories

Instructions for connecting accessories are provided in the manual accompanying the accessory. See page 59 for the list of the accessories that can be used with F470.

Commissioning and adjusting

Preparations

1. Check that the switch (SF1) is in position "⏻".
2. Check that the filling valve (QM11) is fully closed.



Caution

Check the miniature circuit-breaker (FC1). It could have tripped during transport.



NOTE

Do not start F470 if there is a risk that the water in the system has frozen.



NOTE

At the time of commissioning, complete all relevant sections of the Benchmark Checklist located at the back of this document.

Completion of the Benchmark Checklist is a condition of warranty. For full terms and conditions of warranty, please see our website nibe.co.uk.

Filling and venting

FILLING THE HOT WATER HEATER

1. Open a hot water tap in the house.
2. Open the externally mounted filler valve. This valve should then be fully open during operations.
3. When the water that comes out of the hot water tap is no longer mixed with air, the water heater is full and the tap can be closed.

FILLING THE CLIMATE SYSTEM

1. Check that the shut-off valves for the heating system (QM31) and (QM32) are open.
2. Open the vent valves (QM20) and (QM21).
3. Check that the enclosed flexible hose is connected between the filling valves (QM11) and (QM13). Connect the hose, if this has not been done already.
4. Open the filling valves (QM11), (QM13). The heating unit and the rest of the climate system fill with water.
5. When the water exiting the vent valves (QM20) and (QM21) is no longer mixed with air, close the valves.
6. After a while, the pressure begins to rise on the pressure gauge (BP5). When the pressure reaches 2.5 bar (0.25 MPa), the safety valve (FL2) starts to release water. Now, close one filling valve (QM11).

7. Reduce the boiler pressure to the normal working range (approx. 1 bar) by opening the vent valves (QM20) and (QM21) or the safety valve (FL2).
8. Check that there is water in the overflow cup (WM1).

If the overflow cup requires topping up:

1. Carefully turn the safety valve for hot water (FL1) anti-clockwise.

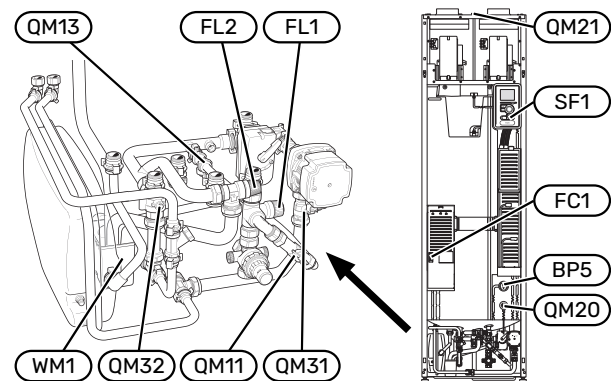
VENTING THE CLIMATE SYSTEM

1. Turn the power switch (SF1) to ⏻.
2. Vent the heat pump via the vent valve (QM20) and the rest of the climate system via its respective vent valves.
3. Vent the supply air coil via its vent valve (QM21).
4. Keep topping up and venting until all air has been removed and the pressure is correct.



NOTE

The vent pipe from the container must be drained of water before air can be released. This means that the system is not necessarily bled despite the flow of water when the bleed valve (QM20) is opened.



Start-up and inspection

START GUIDE



NOTE

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

1. Set switch (SF1) on F470 to position "I".
2. Follow the instructions in the display's start guide. If the start guide does not start when you start the F470, you can start it manually in menu 5.7.



TIP

See page 42 for a more in-depth introduction to the heat pump's control system (operation, menus etc.).

Commissioning

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

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



Caution

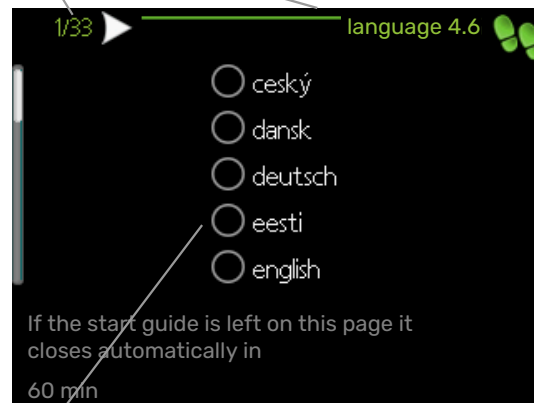
As long as the start guide is active, no function in the installation will start automatically.

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

Operation in the start guide

A. Page

B. Name and menu number



C. Option / setting

A. Page

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

Scroll between the pages of the start guide as follows:

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

B. Name and menu number

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

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

C. Option / setting

Make settings for the system here.

SETTING THE VENTILATION

The ventilation must be set according to applicable standards. The supply air flow is adjusted so that it is 80% of the exhaust air flow. The settings are made in menus 5.1.5 - "fan speed" and 5.1.6 - "fan sp. supply air".

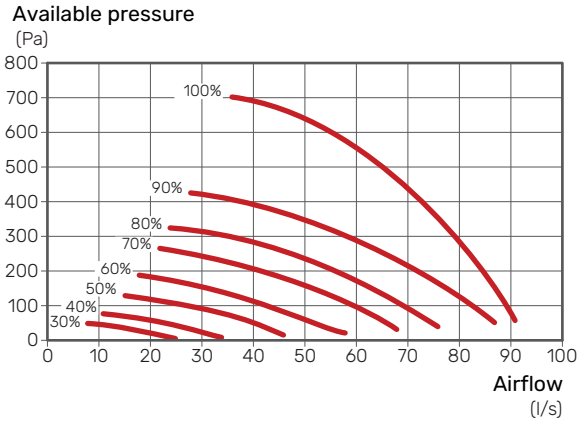
Even if ventilation is roughly set at installation it is important that a ventilation adjustment is ordered and permitted.



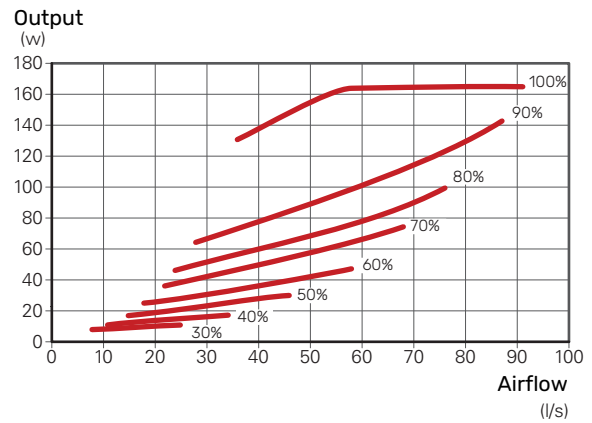
NOTE

Order a ventilation adjustment to complete the setting.

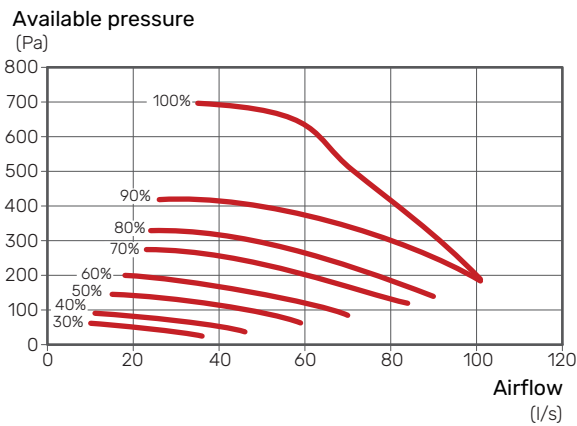
Ventilation capacity, supply air



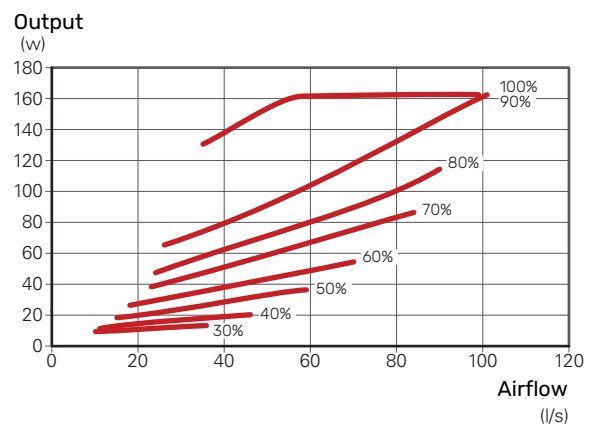
Fan output, supply air



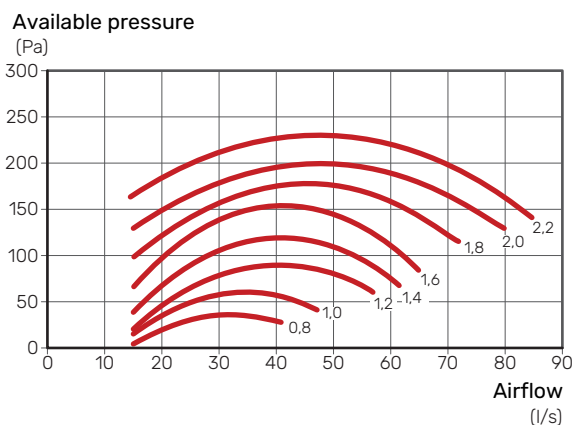
Ventilation capacity, exhaust air



Fan output, exhaust air



Specific fan power



The diagram shows the SFP rating with both the fans' power consumption ($W/(l/s)$).

SUPPLY AIR BATTERY

Water flow through the supply air coil

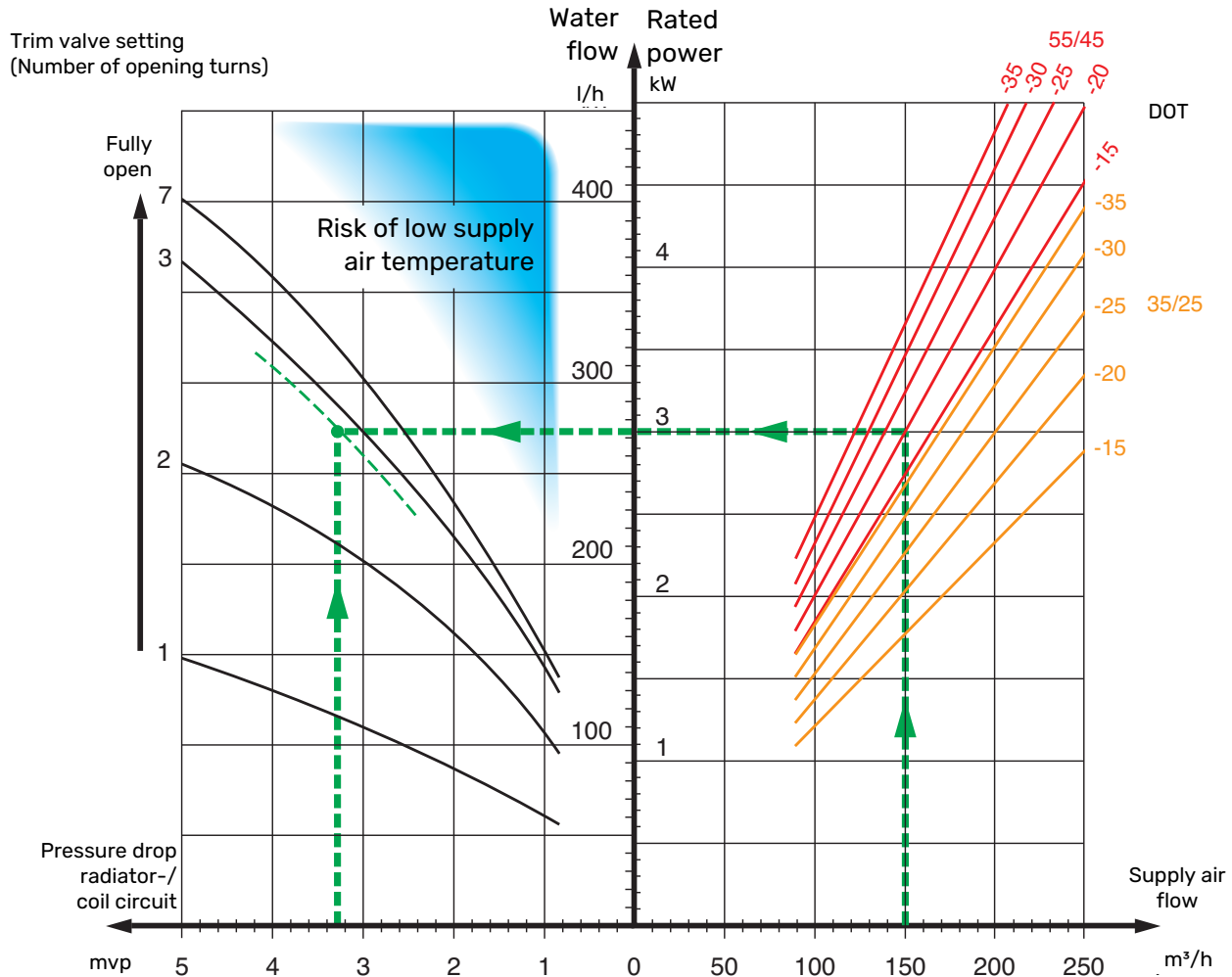
The water flow through the supply air coil is set by means of a trim valve (RN1). This valve must be adjusted to prevent unnecessary energy consumption in the accommodation. The additional output is determined according to the diagram

below. The supply air temperature must be approximately the same as the indoor temperature, preferably a few degrees lower.



TIP

Post-adjust the trim valve on a cold day.



The delivered output in the diagram is calculated when dimensioning the heating system 55/45°C respective 35/25°C (underfloor heating).

Example: If the supply flow is regulated to 150 m³/h and DOT is -20 °C at a pump pressure (= pressure drop coil circuit) of 3.3 mvp (33 kPa), gives the setting 2.8 on the trim valve.

This means the trim valve must be opened 2.8 turns from the closed position. At the same time it can be read that the coil is supplying the supply air with approximately 3 kW of additional output at -20°C.



NOTE

Vent the coil using the venting screw (QM21) repeatedly in order to ensure the circulation through the coil.

COMMISSIONING WITHOUT FANS

The heat pump can be run without recovery, as only an electric boiler, to produce heat and hot water, for example before the ventilation installation is complete.

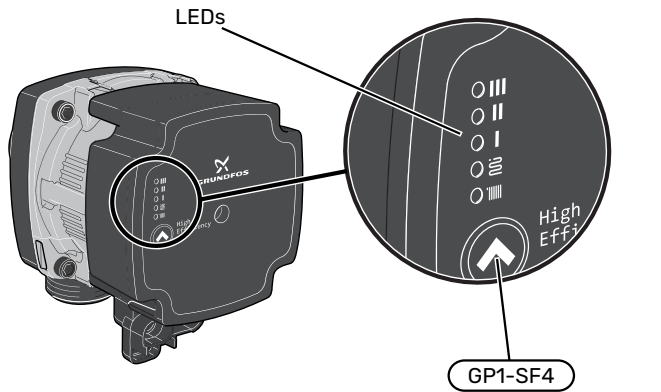
1. Enter menu 4.2 - "op. mode" and select "add. heat only"
2. Enter menu 5.1.5 - "fan sp. exhaust air" and reduce the fan speed to 0%.
3. In addition, go to menu 5.1.6 - "fan sp. supply air" and reduce the fan speed on the supply air fan to 0%.



NOTE

Select operating mode "auto" or "manual" when the heat pump is to run on recovery again.

SETTING CIRCULATION PUMP



The circulation pump (GP1) is equipped with five LEDs. In normal mode, the LEDs show the pump's setting by lighting up in green and/or yellow. The LEDs can also indicate an alarm, in which case they light up in red and yellow.



The circulation pump's (GP1) various settings are selected by pressing the switch (GP1-SF4).

Choose between 5 different settings on the circulation pump.

- proportional pressure auto adapt (PPAA)
- constant pressure auto adapt (CPAA)
- proportional pressure (PP)
- constant pressure (CP)
- constant curve (CC).

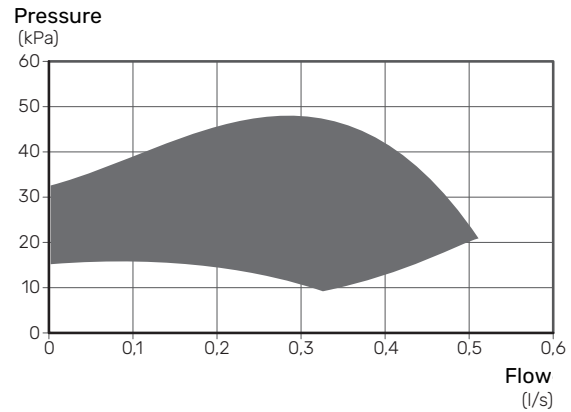
The circulation pump's factory setting is CP, speed 3.

Proportional pressure auto adapt (PPAA)

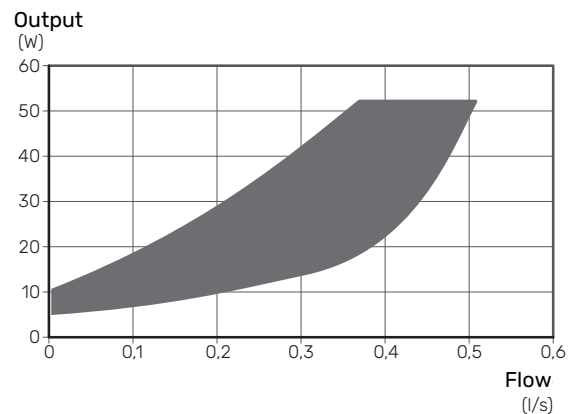
The circulation pump continually regulates the flow through the system with a great deal of freedom, to ensure minimum pump power consumption.

The setting is intended for radiator systems. Due to optimisation to low pumping capacity, the flow may be insufficient in certain systems.

Capacity, circulation pump (PPAA)



Power, circulation pump (PPAA)



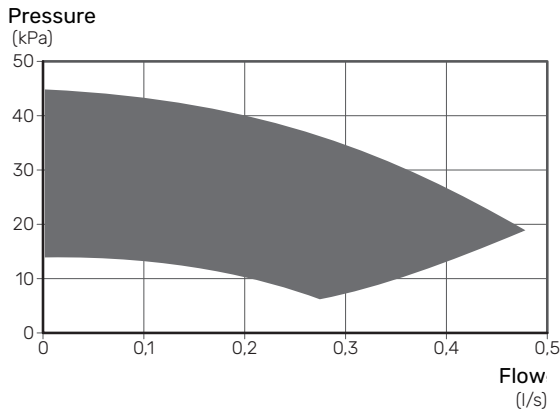
Setting PPAA	
LED indication	

Constant pressure auto adapt (CPAA)

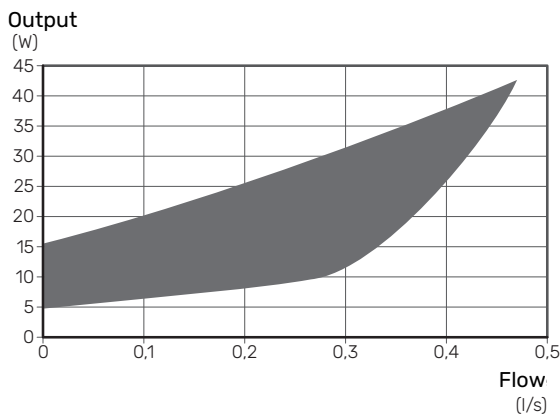
The circulation pump continually regulates the flow through the system with a great deal of freedom, to ensure minimum pump power consumption.

The setting is intended for underfloor heating systems. Due to optimisation to low pumping capacity, the flow may be insufficient in certain systems.

Capacity, circulation pump (CPAA)



Power, circulation pump (CPAA)



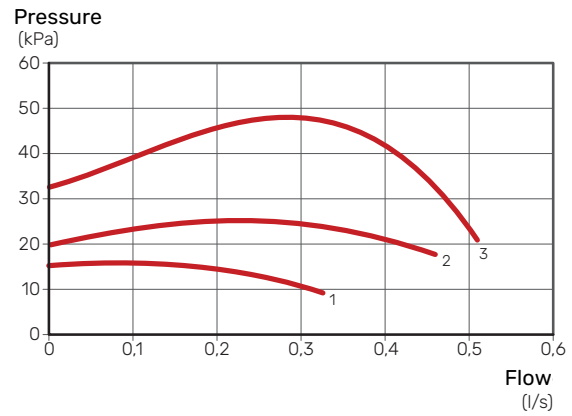
Setting CPAA	
LED indication	

Proportional pressure (PP)

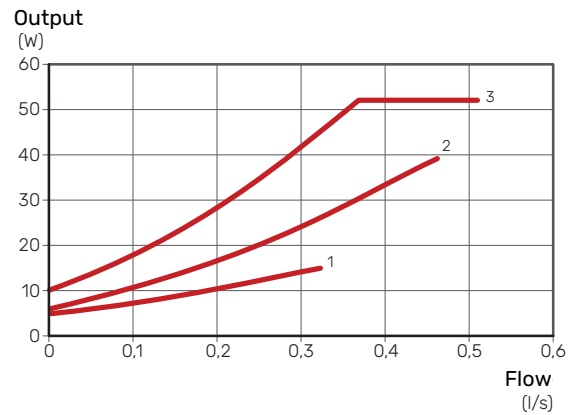
Within a limited range, the circulation pump is permitted to regulate its speed to an optimum system pressure. Speed 1, 2 or 3 is selected based on maximum flow requirement.

The setting is intended for radiator systems.

Capacity, circulation pump (PP)



Output, circulation pump (PP)



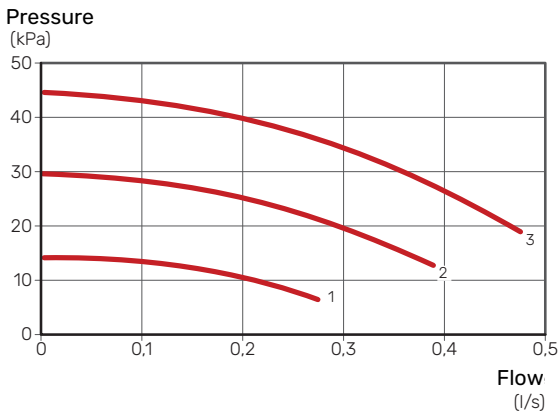
Pump speed PP	1	2	3
LED indication			

Constant pressure (CP)

Within a limited range, the circulation pump is permitted to regulate its speed to a constant system pressure. Speed 1, 2 or 3 is selected based on maximum flow requirement.

The setting is intended for underfloor heating systems.

Capacity, circulation pump (CP)

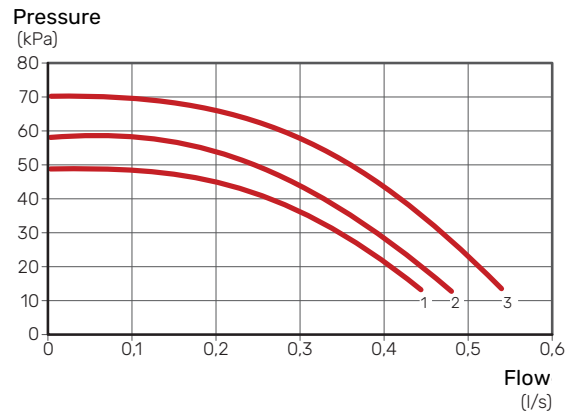


Constant curve (CC)

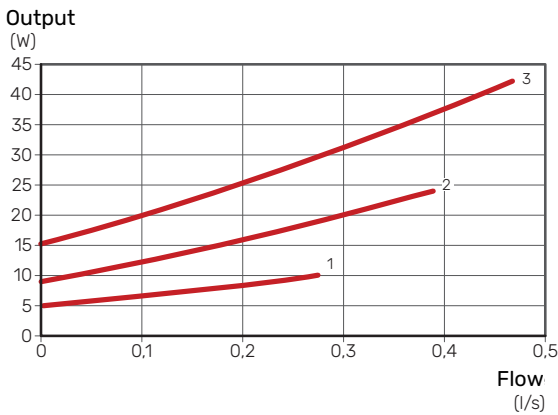
The circulation pump's speed is fixed and no regulation takes place. Speed is selected based on maximum flow requirement.

The setting can be used when very high flows are required.

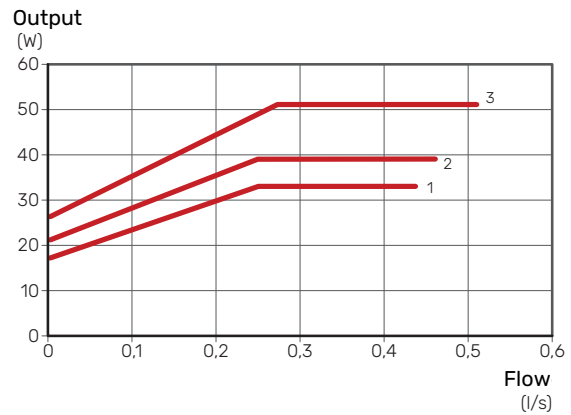
Capacity, circulation pump (CC)



Output, circulation pump (CP)



Output, circulation pump (CC)




Pump speed CP	1	2	3 1
LED indication			




Pump speed CC	1	2	3
LED indication			

1 The circulation pump's factory setting

Alarm

If an alarm occurs, LED  shines red.

When one or more alarms are active, this is indicated according to the following table. If more than one alarm is active, the one with the highest priority is displayed.

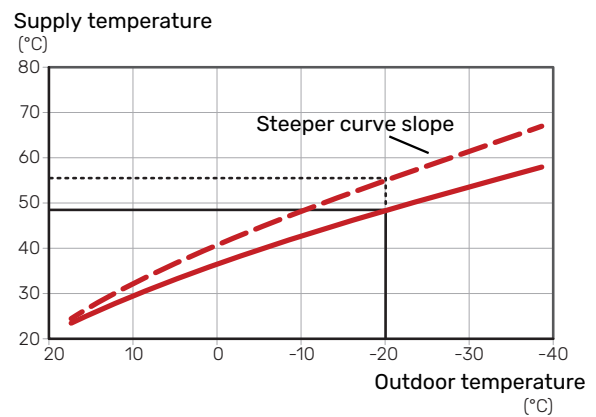
Cause / Action	
The rotor is blocked. Wait or release the rotor shaft.	
Supply voltage too low. Check the supply voltage.	
Electrical fault. Check the supply voltage or replace the circulation pump.	

Setting the heating curve

In the menu "heating curve", you can see the heating curve for your house. The task of the curve is to provide an uniform indoor temperature, regardless of the outdoor temperature, and thereby energy-efficient operation. Based on this curve, the F470 determines the temperature of the water to the climate system (the supply temperature) and thus the indoor temperature.

CURVE COEFFICIENT

The slope of the heating curve indicates how many degrees the supply temperature is to be increased/reduced when the outdoor temperature drops/increases. A steeper slope means a higher supply temperature at a certain outdoor temperature.

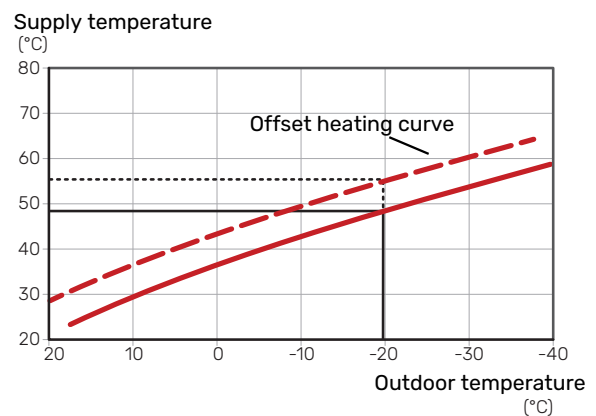


The optimum curve slope depends on the climate conditions in your location, whether the house has radiators, fan coils or underfloor heating and how well insulated the house is.

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

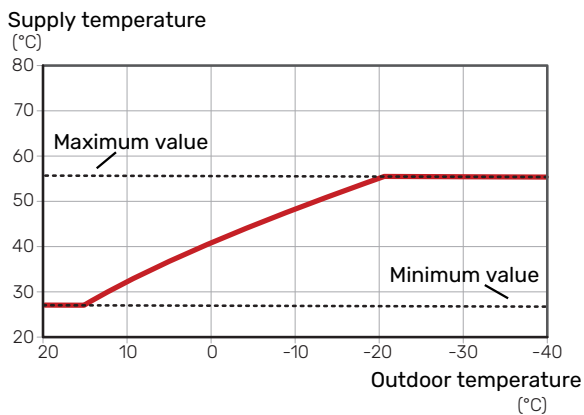
CURVE OFFSET

An offset of the heating curve means that the supply temperature changes by the same amount for all outdoor temperatures, e.g. a curve offset of +2 steps increases the supply temperature by 5 °C at all outdoor temperatures.



SUPPLY TEMPERATURE – MAXIMUM AND MINIMUM VALUES

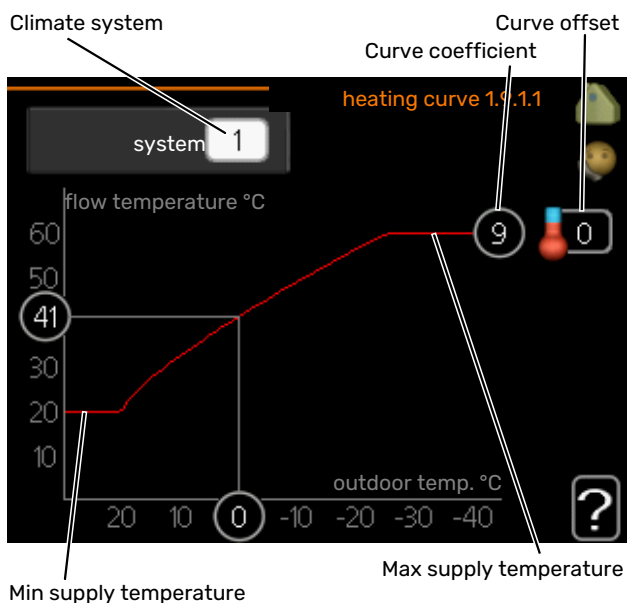
Because the flow line temperature cannot be calculated higher than the set maximum value or lower than the set minimum value the heating curve flattens out at these temperatures.



Caution

With underfloor heating systems, the maximum supply temperature is normally set between 35 and 45 °C.

ADJUSTMENT OF CURVE



1. Select the climate system (if more than one) for which the curve is to be changed.
2. Select curve slope and curve offset.



Caution

If you need to adjust "min. flow line temp." and/or "max flow line temperature", you do this in other menus.

Settings for "min. flow line temp." in menu 1.9.3.

Settings for "max flow line temperature" in menu 5.1.2.



Caution

Curve 0 means that "own curve" is used.

Settings for "own curve" are made in menu 1.9.7.

TO READ OFF A HEATING CURVE

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

BASIC VALUES FOR THE AUTOMATIC HEATING CONTROL

The values stated on the map apply to "heating curve" in menu 1.9.1.

- The first value applies to low temperature radiator systems¹. "temperature" (offset heating curve) in menu 1.1 must be set to -2.
- The value in brackets refers to underfloor heating systems² installed in concrete floor structures.
- When the system is installed in a timber floor structure you can use the number before the brackets, but this value must be reduced by two units. "temperature" (offset heating curve) in menu 1.1, set in these cases to -1.



Caution

The map's values are usually a good starting point and are intended to produce a room temperature of approximately 20 °C. The values can be adjusted later, if necessary.

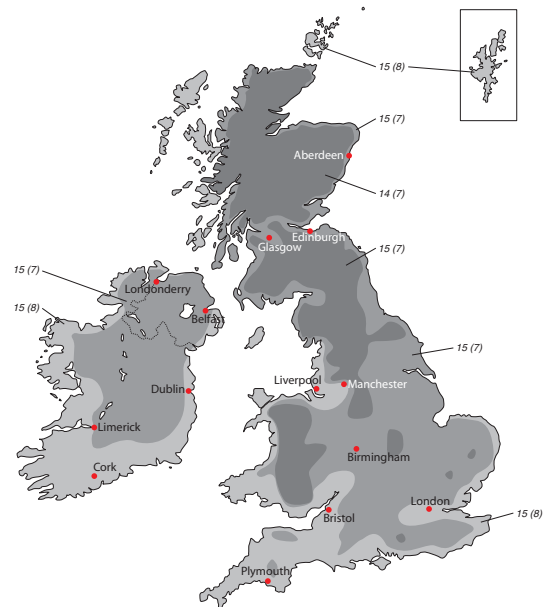
Examples of basic values selection:

- House with low temperature radiator system
London = Area 15 (8).
Set 15 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (offset of heating curve).
- House with underfloor heating installed in a concrete floor structure
London = Area 15 (8).
Set 8 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (offset of heating curve).
- House with underfloor heating installed in a timber floor structure
London = Area 15 (8).
Set 13 (see point three in the list above) in menu 1.9.1, "heating curve" and -1 in menu 1.1 "temperature" (offset of heating curve).



Caution

An increase in the room temperature can be slowed by the thermostats for the radiators or under floor heating. Therefore, open the thermostat valves fully, except in those rooms where a cooler temperature is required, e.g. bedrooms.

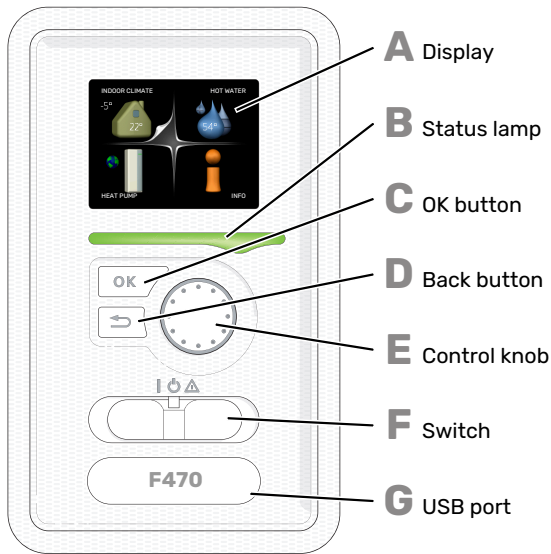


¹ A low-temperature radiator system refers to a system where the supply temperature needs to be 55 °C on the coldest day.

² Underfloor heating may be dimensioned very differently. The above example refers to a system where the supply temperature needs to be approximately 35 – 40 °C or 45 – 50 °C on the coldest day.

Control - Introduction

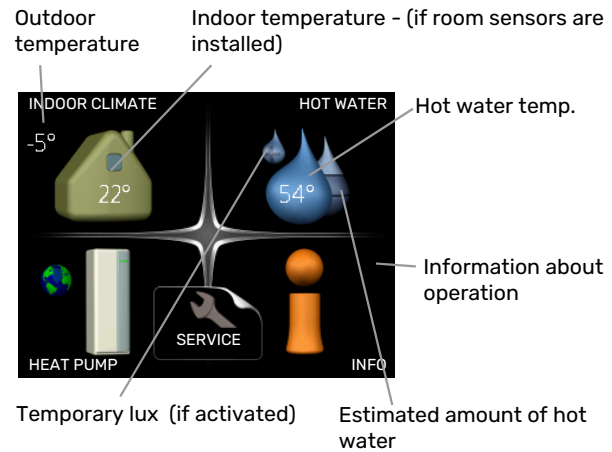
Display unit



- A DISPLAY**
Instructions, settings and operational information are shown on the display. You can easily navigate between the different menus and options to set the comfort or obtain the information you require.
- B STATUS LAMP**
The status lamp indicates the status of the heat pump. It:
- lights green during normal operation.
 - lights yellow in emergency mode.
 - lights red in the event of a deployed alarm.
- C OK BUTTON**
The OK button is used to:
- confirm selections of sub menus/options/set values/page in the start guide.
- D BACK BUTTON**
The back button is used to:
- go back to the previous menu.
 - change a setting that has not been confirmed.
- E CONTROL KNOB**
The control knob can be turned to the right or left. You can:
- scroll in menus and between options.
 - increase and decrease the values.
 - change page in multiple page instructions (for example help text and service info).
- F SWITCH (SF1)**
The switch assumes three positions:
- On (I)
 - Standby (U)
 - Emergency mode (Δ) (see page 53)
- Emergency mode must only be used in the event of a fault on the heat pump. In this mode, the compressor and fans switch off and the immersion heater engages. The heat pump display is not illuminated and the status lamp illuminates yellow.
- G USB PORT**
The USB port is hidden beneath the plastic badge with the product name on it.
The USB port is used to update the software.
Visit nibeuplink.com and click the "Software" tab to download the latest software for your installation.

Menu system










When the door to the heat pump is opened, the menu system's four main menus are shown in the display as well as certain basic information.

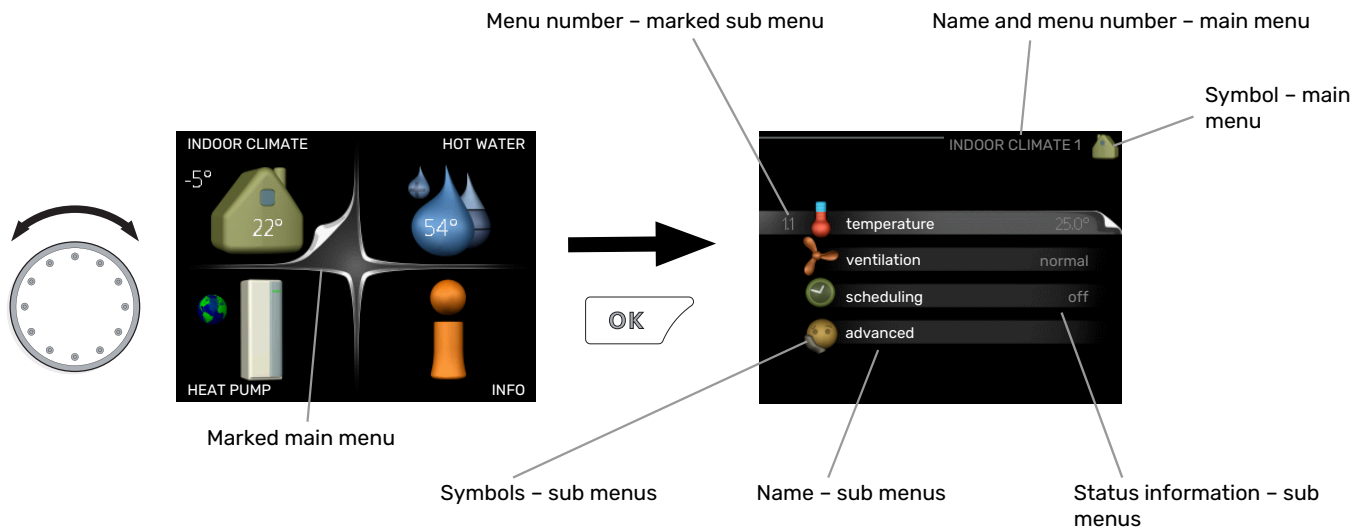


- MENU 1 - INDOOR CLIMATE**
Setting and scheduling the indoor climate. See information in the help menu or user manual.
- MENU 2 - HOT WATER**
Setting and scheduling hot water production. See information in the help menu or user manual.
- MENU 3 - INFO**
Display of temperature and other operating information and access to the alarm log. See information in the help menu or user manual.
- MENU 4 - HEAT PUMP**
Setting time, date, language, display, operating mode etc. See information in the help menu or user manual.
- MENU 5 - SERVICE**
Advanced settings. These settings are not available to the end user. The menu is visible when the Back button is pressed for 7 seconds when you are in the start menu. See page 48.

SYMBOLS IN THE DISPLAY

The following symbols may appear on the display during operation.

Symbol	Description
	This symbol appears by the information sign if there is information in menu 3.1 that you should note.
	<p>These two symbols indicate whether the compressor or addition is blocked in F470.</p> <p>These can, for example, be blocked depending on which operating mode is selected in menu 4.2, if blocking is scheduled in menu 4.9.5 or if an alarm has occurred that blocks one of them.</p> <p> Blocking the compressor.</p> <p> Blocking additional heat.</p>
	This symbol appears if periodic increase or lux mode for the hot water is activated.
	This symbol indicates whether "holiday setting" is active in 4.7.
	This symbol indicates whether F470 has contact with NIBE Uplink.
	This symbol indicates the actual speed of the fan if the speed has changed from the normal setting.
	This symbol is visible in installations with active solar accessories.



OPERATION

To move the cursor, turn the control knob to the left or the right. The marked position is white and/or has a turned up tab.



SELECTING MENU

To advance in the menu system select a main menu by marking it and then pressing the OK button. A new window then opens with sub menus.

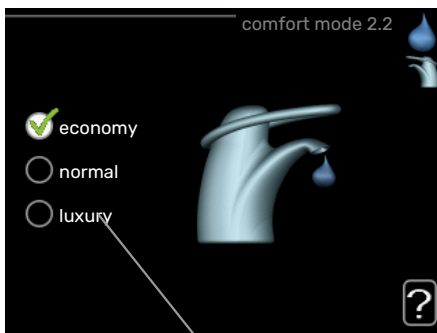
Select one of the sub menus by marking it and then pressing the OK button.

SETTING A VALUE




Values to be changed



SELECTING OPTIONS



Alternative

In an options menu the current selected option is indicated by a green tick. 

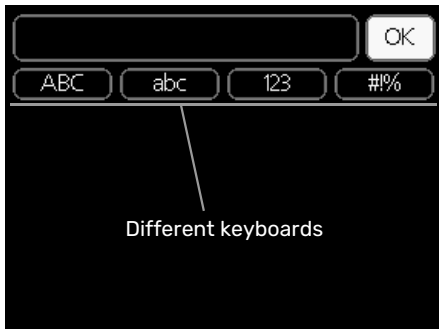
To select another option:

1. Mark the applicable option. One of the options is pre-selected (white). 
2. Press the OK button to confirm the selected option. The selected option has a green tick. 

To set a value:

1. Mark the value you want to set using the control knob. 01
2. Press the OK button. The background of the value becomes green, which means that you have accessed the setting mode. 01
3. Turn the control knob to the right to increase the value and to the left to reduce the value. 04
4. Press the OK button to confirm the value you have set. To change and return to the original value, press the Back button. 04

USE THE VIRTUAL KEYBOARD



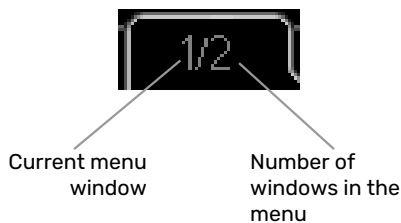
In some menus where text may require entering, a virtual keyboard is available.



Depending on the menu, you can gain access to different character sets which you can select using the control knob. To change character table, press the Back button. If a menu only has one character set the keyboard is displayed directly. When you have finished writing, mark "OK" and press the OK button.

SCROLL THROUGH THE WINDOWS

A menu can consist of several windows. Turn the control knob to scroll between the windows.




Scroll through the windows in the start guide



Arrows to scroll through window in start guide

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

HELP MENU

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

To access the help text:

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

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

Control - Menus

Menu 1 - INDOOR CLIMATE

OVERVIEW

1 - INDOOR CLIMATE	1.1 - temperature	
	1.2 - ventilation	
	1.3 - scheduling	1.3.1 - heating
		1.3.3 - ventilation
	1.9 - advanced	1.9.1.1 - heating curve
		1.9.2 - external adjustment
		1.9.3 - min. flow line temp.
		1.9.4 - room sensor settings
		1.9.6 - fan return time
		1.9.7 - own curve
	1.9.8 - point offset	
	1.9.9 - night cooling	

Menu 2 - HOT WATER

OVERVIEW

2 - HOT WATER	2.1 - temporary lux	
	2.2 - comfort mode	
	2.3 - scheduling	
	2.9 - advanced	2.9.1 - periodic increase
		2.9.2 - hot water recirc. *

* Accessory needed.

Menu 3 - INFO

OVERVIEW

3 - INFO	3.1 - service info
	3.2 - compressor info
	3.3 - add. heat info
	3.4 - alarm log
	3.5 - indoor temp. log

Menu 4 - HEAT PUMP

OVERVIEW

4 - HEAT PUMP	4.1 - plus functions *	4.1.3 - internet	4.1.3.1 - NIBE Uplink
			4.1.3.8 - tcp/ip settings
			4.1.3.9 - proxy settings
		4.1.5 - SG Ready	
		4.1.6 - smart price adaption™	
		4.1.7 - smart home	
	4.2 - op. mode		
	4.3 - my icons		
	4.4 - time & date		
	4.6 - language		
	4.7 - holiday setting		
	4.9 - advanced	4.9.2 - auto mode setting	
		4.9.4 - factory setting user	
		4.9.5 - schedule blocking	

* Accessory needed.

Menu 5 - SERVICE

OVERVIEW

5 - SERVICE	5.1 - operating settings	5.1.1 - hot water settings
		5.1.2 - max flow line temperature
		5.1.4 - alarm actions
		5.1.5 - fan sp. exhaust air
		5.1.6 - fan sp. supply air
		5.1.12 - internal electrical addition
		5.1.99 - other settings
	5.2 - system settings	5.2.4 - accessories
	5.3 - accessory settings	5.3.3 - extra climate system *
		5.3.21 - flow sensor / energy meter*
	5.4 - soft in/outputs	
	5.5 - factory setting service	
	5.6 - forced control	
	5.7 - start guide	
	5.8 - quick start	
	5.9 - floor drying function	
	5.10 - change log	
	5.12 - country	

* Accessory needed.

Go to the main menu and hold the Back button in for 7 seconds to access the Service menu.

Sub-menus

Menu **SERVICE** has orange text and is intended for the advanced user. This menu has several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

operating settings Operating settings for the heat pump.

system settings System settings for the heat pump, activating accessories etc.

accessory settings Operational settings for different accessories.


soft in/outputs Setting software-controlled inputs and outputs on input board (AA3).

factory setting service Total reset of all settings (including settings available to the user) to default values.

forced control Forced control of the different components in the heat pump.

start guide Manual start of the start guide which is run the first time the heat pump is started.

quick start Quick starting the compressor.



NOTE
Incorrect settings in the service menus can damage the heat pump.

MENU 5.1 - OPERATING SETTINGS

Operating settings can be made for the heat pump in the sub menus.

MENU 5.1.1 - HOT WATER SETTINGS



NOTE

The factory set tap water temperatures specified in the manual can vary due to the directives in force in different countries. From this menu, you can check the relevant settings for the system.

economy

Setting range start temp. economy: 15 - 52 °C

Factory setting start temp. economy: 45 °C

Setting range stop temp. economy: 15 - 55 °C

Factory setting stop temp. economy: 51 °C

normal

Setting range start temp. normal: 15 - 52 °C

Factory setting start temp. normal: 49 °C

Setting range stop temp. normal: 15 - 55 °C

Factory setting stop temp. normal: 55 °C

luxury

Setting range start temp. lux: 15 - 62 °C

Factory setting start temp. lux: 52 °C

Setting range stop temp. lux: 15 - 65 °C

Factory setting stop temp. lux: 58 °C

stop temp. per. increase

Setting range: 55 - 70 °C

Factory setting: 60 °C

Here you set the start and stop temperature of the hot water for the different comfort options in menu 2.2 as well as the stop temperature for periodic increase in menu 2.9.1.

MENU 5.1.2 - MAX FLOW LINE TEMPERATURE

climate system

Setting range: 20–70 °C

Default value: 60 °C

Here, you set the maximum supply temperature for the climate system. If the installation has more than one climate system, individual maximum supply temperatures can be set for each system. Climate system 2 - 8 cannot be set to a higher max supply temperature than climate system 1.



Caution

For underfloor heating systems, max flow line temperature should normally be set to between 35 and 45°C.

Check the max floor temperature with your floor supplier.

MENU 5.1.4 - ALARM ACTIONS

Select if you want the heat pump to alert you that there is an alarm in the display here.



Caution

If no alarm action is selected, it can result in higher energy consumption in the event of an alarm.

MENU 5.1.5 - FAN SP. EXHAUST AIR

normal and speed 1-4

Setting range: 0 – 100 %

Set the speed for the five different selectable speeds for the fan here.



Caution

An incorrectly set ventilation flow can damage the house and may also increase energy consumption.

MENU 5.1.6 - FAN SP. SUPPLY AIR

normal and speed 1-4

Setting range: 0 – 100 %

Set the speed for the five different selectable speeds for the fan here.



Caution

An incorrectly set value may damage the house in the long term and possibly increase energy consumption.

MENU 5.1.12 - INTERNAL ELECTRICAL ADDITION

set max electrical add.

Setting range 0 – 8 kW

Default values: 5.3 kW

fuse size

Setting range: 1 – 200 A

Factory setting: 16 A

Here you set the max. electrical output of the internal electrical addition in F470 and the fuse size for the installation.

MENU 5.1.99 - OTHER SETTINGS

trend calculation limit

Setting range: 0 – 20 °C

Default value: 7 °C

transfer time

Setting range: 1 – 60 min

Factory setting: 45 min

months btwn filter alarms

Setting range: 1 – 12

Default value: 3

Here you can set trend calculation limit, transfer time, months btwn filter alarms and fan synch. operation .

trend calculation limit

Here you set at what outdoor temperature the trend calculation is to be active. Above this limit, connection of the immersion heater is delayed and the immersion heater is not connected if the compressor is able to increase the temperature in the vessel.

transfer time

Here you can set transfer time between heating and hot water production in F470. During the transfer time the compressor maintains the stop temperature that applied during hot water production.

months btwn filter alarms

Here you set the number of months between alarms for a reminder to clean the filters in F470.

fan synch. operation

Select whether the fan is to maintain the same speed, regardless of whether the compressor is operating or not, or alternatively run at different speeds. If the function is activ-

ated, fan speed 2 applies when the compressor is not in operation, and normal fan speed applies when the compressor is in operation.

MENU 5.2 - SYSTEM SETTINGS

Make different system settings for the heat pump here, e.g. which accessories are installed.

MENU 5.2.4 - ACCESSORIES

Inform the heat pump which accessories are installed here.

There are two ways of activating connected accessories. You can either mark the alternative in the list or use the automatic function "search installed acc."

search installed acc.

Mark "search installed acc." and press the OK button to automatically find connected accessories for F470.

MENU 5.3 - ACCESSORY SETTINGS

The operating settings for accessories that are installed and activated are made in the sub-menus for this.

MENU 5.3.3 - EXTRA CLIMATE SYSTEM

mixing valve amplifier

Setting range: 0.1 – 10.0

Default value: 1.0

mixing valve step delay

Setting range: 10 – 300 s

Default values: 30 s

Contr. pump GP10

Setting range: on/off

Factory setting: off

Here, you select which climate system (2 - 8) you wish to set.

mixing valve amplifier, mixing valve step delay: Here, you set the shunt amplification and shunt waiting time for the various extra climate systems that are installed.

Contr. pump GP10: Here, you can set the speed of the circulation pump manually.

See the accessory installation instructions for function description.

MENU 5.3.21 - FLOW SENSOR / ENERGY METER

Energy meter

set mode

Setting range: energy per pulse / pulses per kWh

Default value: energy per pulse

energy per pulse

Setting range: 0 – 10000 Wh

Factory setting: 1000 Wh

pulses per kWh

Setting range: 1 – 10000

Factory setting: 500

Energy meter (Electricity meter)

The energy meter(s) is used to send pulse signals every time a certain amount of energy has been consumed.

energy per pulse: Here you set the amount of energy to which each pulse will correspond.

pulses per kWh: Here you set the number of pulses per kWh that are sent to F470.

MENU 5.4 - SOFT IN/OUTPUTS

Here, you can select which input/output on the input board (AA3) the external switch function (page 29) will be connected to.

Selectable inputs on terminal block AUX 1-5 (AA3-X6:9-18) and output AA3-X7 on the input board.

MENU 5.5 - FACTORY SETTING SERVICE

All settings can be reset (including settings available to the user) to default values here.



Caution

When resetting, the start guide is displayed the next time the heat pump is restarted.

MENU 5.6 - FORCED CONTROL

You can force control the different components in the heat pump and any connected accessories here.

MENU 5.7 - START GUIDE

When the heat pump is started for the first time the start guide starts automatically. Start it manually here.

See page 33 for more information about the start guide.

MENU 5.8 - QUICK START

It is possible to start the compressor from here.



Caution

There must be a heating or hot water demand to start the compressor.



NOTE

Do not quick start the compressor too many times over a short period of time, as this could damage the compressor and its surrounding equipment.

MENU 5.9 - FLOOR DRYING FUNCTION

length of period 1 - 7

Setting range: 0 - 30 days

Factory setting, period 1 - 3, 5 - 7: 2 days

Factory setting, period 4: 3 days

temp. period 1 - 7

Setting range: 15 - 70 °C

Default value:

temp. period 1	20 °C
temp. period 2	30 °C
temp. period 3	40 °C
temp. period 4	45 °C
temp. period 5	40 °C
temp. period 6	30 °C
temp. period 7	20 °C

Set the function for under floor drying here.

You can set up to seven time periods with different calculated supply temperatures. If fewer than seven periods are to be used, set the remaining periods to 0 days.

Mark the active window to activate the underfloor drying function. A counter at the bottom shows the number of days the function has been active.



TIP

If operating mode "add. heat only" is to be used, select it in menu 4.2.



TIP

It is possible to save a floor drying log that shows when the concrete slab has reached the correct temperature. See section "Logging floor drying" on page 56.

MENU 5.10 - CHANGE LOG

Read off any previous changes to the control system here.

The date, time, ID no. (unique to particular setting) and the new set value are shown for every change.



Caution

The change log is saved at restart and remains unchanged after factory setting.

5.12 - COUNTRY

Select here the country in which the product was installed. This allows access to country-specific settings in your product.

Language settings can be made regardless of this selection.



Caution

This option locks after 24 hours, after restarting the display and during program updating.

Service



NOTE

F470 must be serviced once a year by competent and qualified personnel, such as a NIBE a service engineer or other qualified professional.

When replacing components on F470 only replacement parts from NIBE may be used.



NOTE

Take the necessary safety precautions. Ensure that the heat pump is not connected to the power prior to servicing or maintenance work.



NOTE

If an electrical connection has been disconnected and is connected, ground must be checked using a suitable multimeter.



NOTE

An immersion heater without a temperature limiter is not allowed to be installed.



NOTE

Inspect and clean the water heater via the inspection hatch (QQ1) by using a suitable instrument such as, an endoscope.



NOTE

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located at the back of this document.

Completion of the Service Interval Record is a condition of warranty. For full terms and conditions of warranty, please see our website nibe.co.uk.

Maintenance

CLEANING THE OVERFLOW CUP/FLOOR DRAIN

Condensation forms when the heat pump is working. This condensation is routed via an overflow cup (WM1) to a drain, e.g. a floor drain.

The condensation water contains a certain amount of dust and particles.

Regularly check that the overflow cup (WM1) and any floor drain are not blocked; water must be able to run through freely. Clean, if necessary.



NOTE

If the overflow cup or floor drain is blocked, water can flow over onto the floor in the installation area. To prevent damage to the building, a waterproof floor or floor membrane is recommended.

GENERAL INSPECTION

Check the following:

1. Condition of casing.
2. Electrical connections.
3. Pipe connections.
4. Alarm log.

Correct any fault before continuing.

WATER HEATER

Check the following:

1. Hot water start and stop temperature.
2. Pressure controlled bypass valve.
3. T&P valve.
4. Overflow pipe.
5. Pressure expansion vessel.
6. Expansion relief valve.

Correct any fault before continuing.

HOT WATER SETTINGS

Check the following:

1. Hot water start and stop temperature.
2. Hot water mode.

Correct any fault before continuing.

CLIMATE SYSTEM

Check the following:

1. Climate system start and stop temperature.
2. Heating curve settings.
3. Function of the room sensor (if installed).
4. Limiting valve settings.
5. System pressure.
6. Flow and return temperature. The difference must be 5 - 10 °C

Correct any fault before continuing.

VENTILATION SYSTEM

Check the following:

1. The air filter. Clean or replace if necessary.
2. Any dirt on the fan. Clean if necessary.
3. Ensure that the ventilation openings are not blocked.
4. The airflow. Adjust if necessary.
5. Ensure that the damper motor is not blocked.

Correct any fault before continuing.

SAFETY VALVES

F470 has three safety valves, two for the hot water and one for the climate system.

The function of the safety valves must be checked regularly. The valves are accessed via the service hatch. Perform checks as follows:

1. Open the valve by turning the knob anti-clockwise carefully.
2. Check that water flows through the valve.
3. Close the valve by releasing it. If it does not close automatically when released, turn it anti-clockwise slightly.
4. The climate system may need to be refilled, after checking the safety valve, see section "Filling the climate system".

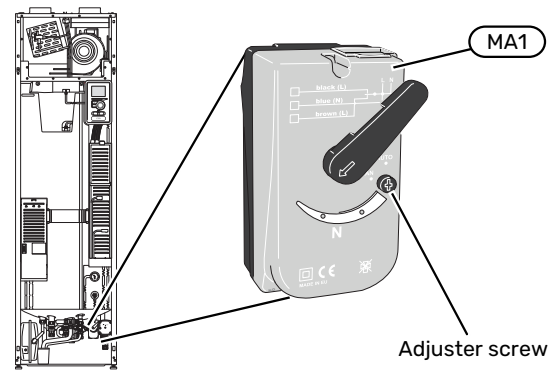
Service actions

EMERGENCY MODE

Emergency mode is used in event of operational interference and in conjunction with service.

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

- The status lamp illuminates yellow.
- The display is not lit and the control computer is not connected.
- The temperature in the heating section is controlled by a fixed thermostat (BT30) at 63 °C.
- The compressor and the fans are off and only the heating medium pump and the electric additional heat are active. The electric additional heat power in emergency mode is set on the electric addition PCB (AA1). See page 28 for instructions.
- The automatic heating control system is not operational, so manual mixing is required. This is done by turning the adjustment screw on the shunt motor (MA1) to "manual mode" and then turning the shunt knob to the desired position.



DRAINING THE HOT WATER HEATER

The water heater can be drained through the safety valve (FL1) or via the overflow cup (WM1).



NOTE

There may be some hot water, risk of scalding.

1. Disconnect the overflow pipe from the safety valve (FL1) and connect a hose to a draining pump instead. If a draining pump is not available, the water can be released directly into the overflow cup instead (WM1).
2. Open the safety valve (FL1).
3. Open a hot water tap to let air into the system. If this is not sufficient, detach the pipe connection (XL4) on the hot water side and ensure that air is entering.

CLEANING THE WATER HEATER

To clean the water heater, remove the upper panel and the insulation. Then open the flange for easy access.

DRAINING THE CLIMATE SYSTEM

In order to carry out service on the climate system, it may be easier to drain the system first.



NOTE

There may be some hot water, risk of scalding.

The hot water can be drained as follows:

- through the safety valve (FL2) via the overflow cup (WM1)
- through a hose that is connected to the safety valve's (FL2) outlet

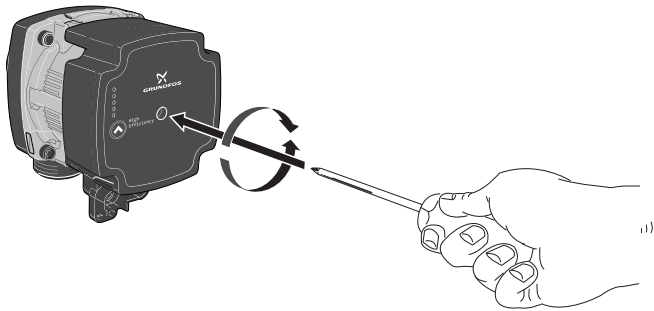
1. Open the safety valve.
2. Set the vent valve for the climate system (QM20) in the open position for air supply.

HELPING THE CIRCULATION PUMP TO START

The circulation pump in F470 has an automatic start help function. If necessary the pump can be started manually.

In such cases, take the following action:

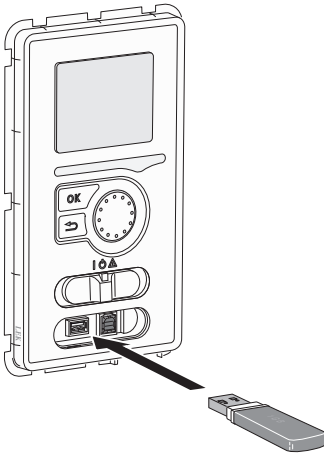
1. Turn off F470 by setting the switch (SF1) to "0".
2. Remove the front cover
3. Press in the screw for start help using a screwdriver as illustrated.
4. With the screw pressed in, turn the screwdriver in any direction.
5. Start F470 by setting the switch (SF1) to "I", and check that the circulation pump is working.



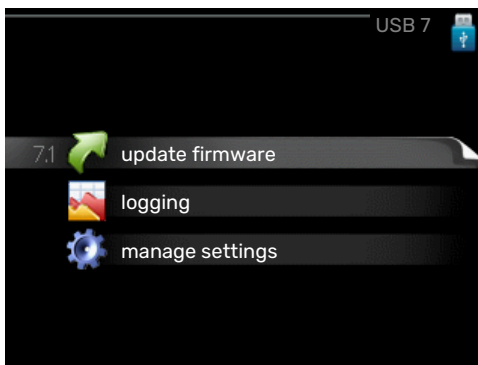
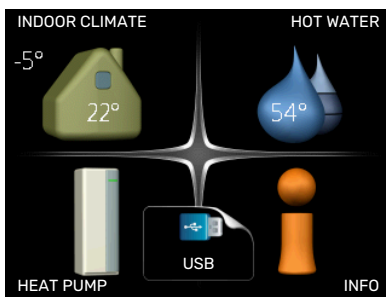
TEMPERATURE SENSOR DATA

Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-10	56.20	3.047
0	33.02	2.889
10	20.02	2.673
20	12.51	2.399
30	8.045	2.083
40	5.306	1.752
50	3.583	1.426
60	2.467	1.136
70	1.739	0.891
80	1.246	0.691

USB SERVICE OUTLET

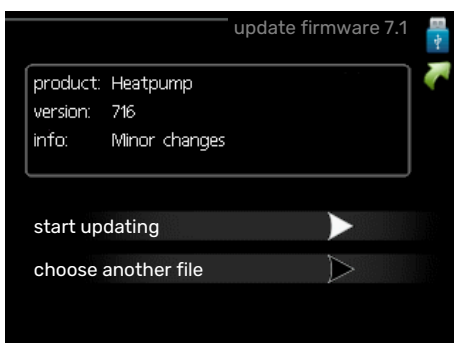


The display unit is equipped with a USB socket that can be used to update the software and save logged information in F470.



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

Menu 7.1 - "update firmware"



Here, you can update the software in F470.



NOTE

For the following functions to work the USB memory must contain files with software for F470 from NIBE.

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

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

start updating

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

If you responded "yes" to the previous question the update starts and you can now follow the progress of the update on the display. When the update is complete F470 restarts.



TIP

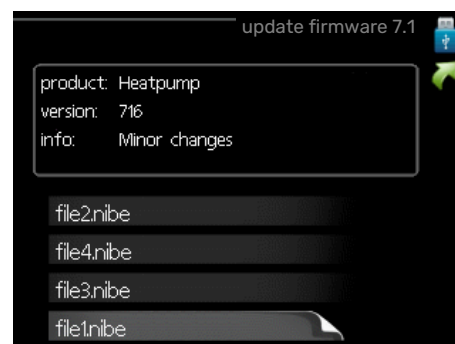
A software update does not reset the menu settings in F470.



Caution

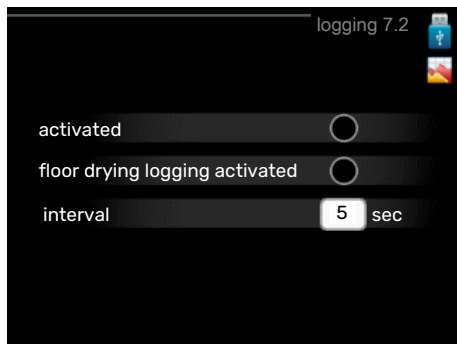
If the update is interrupted before it is complete (for example, by a power cut), the software can be reset to the previous version if the OK button is held in during start-up until the green lamp comes on (takes about 10 seconds).

choose another file



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

Menu 7.2 - logging



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

Here you can choose how current measurement values from F470 should be saved onto a log file on the USB memory.

1. Set the desired interval between loggings.
2. Tick "activated".
3. The present values from F470 are saved in a file in the USB memory at the set interval until "activated" is unticked.



Caution

Untick "activated" before removing the USB memory.

Logging floor drying

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

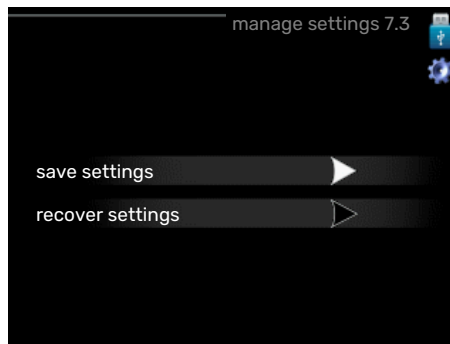
- Make sure that "floor drying function" is activated in menu 5.9.
- Select "logging floor drying activated".
- A log file is now created, where the temperature and the immersion heater output can be read off. Logging continues until "logging floor drying activated" is deselected or until "floor drying function" is stopped.



Caution

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

Menu 7.3 - manage settings



save settings

Setting option: on/off

recover settings

Setting option: on/off

In this menu, you save/upload menu settings to/from a USB memory stick.

save settings: Here, you save menu settings in order to restore them later or to copy the settings to another F470.



Caution

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

recover settings: Here, you upload all menu settings from the USB memory stick.



Caution

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

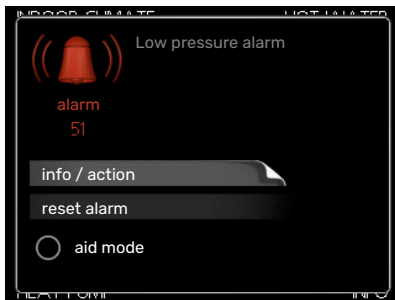
Disturbances in comfort

In most cases, F470 notes a malfunction (a malfunction can lead to disruption in comfort) and indicates this with alarms, and instructions for action, in the display.

Info menu

All the heat pump measurement values are gathered under menu 3.1 in the heat pump menu system. Looking through the values in this menu can often simplify finding the source of the fault. See help menu or user manual for more information about menu 3.1.

Manage alarm



In the event of an alarm, some kind of malfunction has occurred, which is indicated by the status lamp changing from green continuously to red continuously. In addition, an alarm bell appears in the information window.

ALARM

In the event of an alarm with a red status lamp, a malfunction has occurred that the heat pump cannot remedy itself. By turning the control knob and pressing the OK button, you can see in the display what type of alarm it is and reset it. You can also choose to set the heat pump to aid mode.

info / action Here you can read what the alarm means and receive tips on what you can do to correct the problem that caused the alarm.

reset alarm In many cases, it is sufficient to select "reset alarm" for the product to revert to normal operation. If a green light comes on after selecting "reset alarm", the alarm has been remedied. If the red light is still on, and a menu called "alarm" is visible in the display, the problem causing the alarm still remains.

aid mode "aid mode" is a type of emergency mode. This means that the heat pump produces heat and/or hot water even though there is some kind of problem. This could mean that the heat pump's compressor is not running. In this case, the immersion heater produces heat and/or hot water.



Caution

To select aid mode an alarm action must be selected in the menu 5.1.4.



Caution

Selecting "aid mode" is not the same as correcting the problem that caused the alarm. The status lamp will therefore continue to be red.

Troubleshooting

If the operational interference is not shown in the display the following tips can be used:

BASIC ACTIONS

Start by checking the following items:

- The switch's (SF1) position.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The heat pump's RCD.
- Miniature circuit breaker for F470 (FC1).
- Temperature limiter for F470 (FQ10).
- Correctly set load monitor.

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

- Closed or throttled externally mounted filling valve for the hot water.
 - Open the valve.
- F470 in incorrect operating mode.
 - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop additional heat" in menu 4.9.2.
 - If mode "manual" is selected, select "addition".
- Large hot water consumption.
 - Wait until the hot water has heated up. Temporarily increased hot water capacity (temporary lux) can be activated in menu 2.1.
- Too low hot water setting.
 - Enter menu 2.2 and select a higher comfort mode.

LOW ROOM TEMPERATURE

- Closed thermostats in several rooms.
 - Set the thermostats to max, in as many rooms as possible. Adjust the room temperature via menu 1.1, instead of choking the thermostats.
See the "Saving tips" section in the User manual for more detailed information about how to best set the thermostats.
- F470 in incorrect operating mode.
 - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop heating" in menu 4.9.2.

- If mode "manual" is selected, select "heating". If this is not enough, select "addition".
- Too low set value on the automatic heating control.
 - Enter menu 1.1 "temperature" and adjust the offset heating curve up. If the room temperature is only low in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting up.
- "Holiday mode" activated in menu 4.7.
 - Enter menu 4.7 and select "Off".
- External switch for changing room temperature activated.
 - Check any external switches.
- The heating medium pump (GP1) has stopped.
 - See section "Helping the circulation pump to start" on page 54.
- Air in the climate system.
 - Vent the climate system (see page 32).
- Closed valves (QM31), (QM32) to the climate system.
 - Open the valves.

HIGH ROOM TEMPERATURE

- Too high set value on the automatic heating control.
 - Enter menu 1.1 (temperature) and reduce the offset heating curve. If the room temperature is only high in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting down.
- External switch for changing room temperature activated.
 - Check any external switches.
- Trim valve to supply air coil (RN1) is not adjusted.
 - Adjust the valve (see diagram on page 35).

LOW SYSTEM PRESSURE

- Not enough water in the climate system.
 - Top up the water in the climate system (see page 32).

LOW OR A LACK OF VENTILATION

- The exhaust air filter (HQ10) and/or the supply air filter (HQ11) is clogged.
 - Clean or replace the filters.
- The ventilation is not adjusted.
 - Order/implement ventilation adjustment.
- Exhaust air device blocked or throttled down too much.
 - Check and clean the exhaust air devices.
- Fan speed in reduced mode.
 - Enter menu 1.2 and select "normal".
- External switch for changing the fan speed activated.
 - Check any external switches.

HIGH OR DISTRACTING VENTILATION

- The exhaust air filter (HQ10) and/or the supply air filter (HQ11) is clogged.
 - Clean or replace the filters.
- The ventilation is not adjusted.
 - Order/implement ventilation adjustment.
- Fan speed in forced mode.
 - Enter menu 1.2 and select "normal".
- External switch for changing the fan speed activated.
 - Check any external switches.

LOW SUPPLY AIR TEMPERATURE

- Air in the supply air battery
 - Bleed the supply air battery.
- Trim valve too restricted (RN1)
 - Adjust the trim valve (see diagram on page 35).

HIGH SUPPLY AIR TEMPERATURE

- Trim valve (RN1) not sufficiently restricted.
 - Adjust the trim valve (see diagram on page 35).

THE COMPRESSOR DOES NOT START

- There is no heating or hot water demand.
 - F470 does not call on heating or hot water.
- The heat pump defrosts.
 - The compressor starts, when defrosting is complete.
- Compressor blocked due to the temperature conditions.
 - Wait until the temperature is within the product's working range.
- Minimum time between compressor starts has not been reached.
 - Wait for at least 30 minutes and then check if the compressor has started.
- Alarm tripped.
 - Follow the display instructions.

Accessories

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

Not all accessories are available on all markets.

BLOCKING OF SUPPLY AIR HEATING BSA 10

BSA 10 used to block supply air heating in F470 at the same time as some heat production is required in all or parts of the waterborne heating system.

Part no. 067 601

DOCKING KIT DEH

There are separate docking kits available for connecting other heat sources to the heat pump.

Docking kit wood/oil/pellets DEH 40

Part no. 066 101

Docking kit gas DEH 41

Part no. 066 102

EXTRA SHUNT GROUP ECS

This accessory is used when F470 is installed in houses with two or more different heating systems that require different supply temperatures.

ECS 40 (Max 80 m²)

Part no 067 287

ECS 41 (approx. 80-250 m²)

Part no 067 288

ROOM UNIT RMU 40

The room unit is an accessory with a built-in room sensor, which allows the control and monitoring of F470 to be carried out in a different part of your home to where it is located.

Part no 067 064

SOLAR PACKAGE NIBE PV

NIBE PV is a modular system comprising solar panels, assembly parts and inverters, which is used to produce your own electricity.

TEMPERATURE SENSOR DISTRIBUTOR TSS 20

Temperature sensor distributor.

Basic kit, part no. 067 635

Extension kit, part no. 067 636

ACCESSORY BOARD AXC 20

Accessory board for hot water circulation, BSA 10, damper for anti-freeze and/or external heating medium pump.

Part no. 067 609

TOP CABINET TOC 30

Top cabinet, which conceals any pipes/ventilation ducts.

Height 245 mm

Part no. 067 517

Height 345 mm

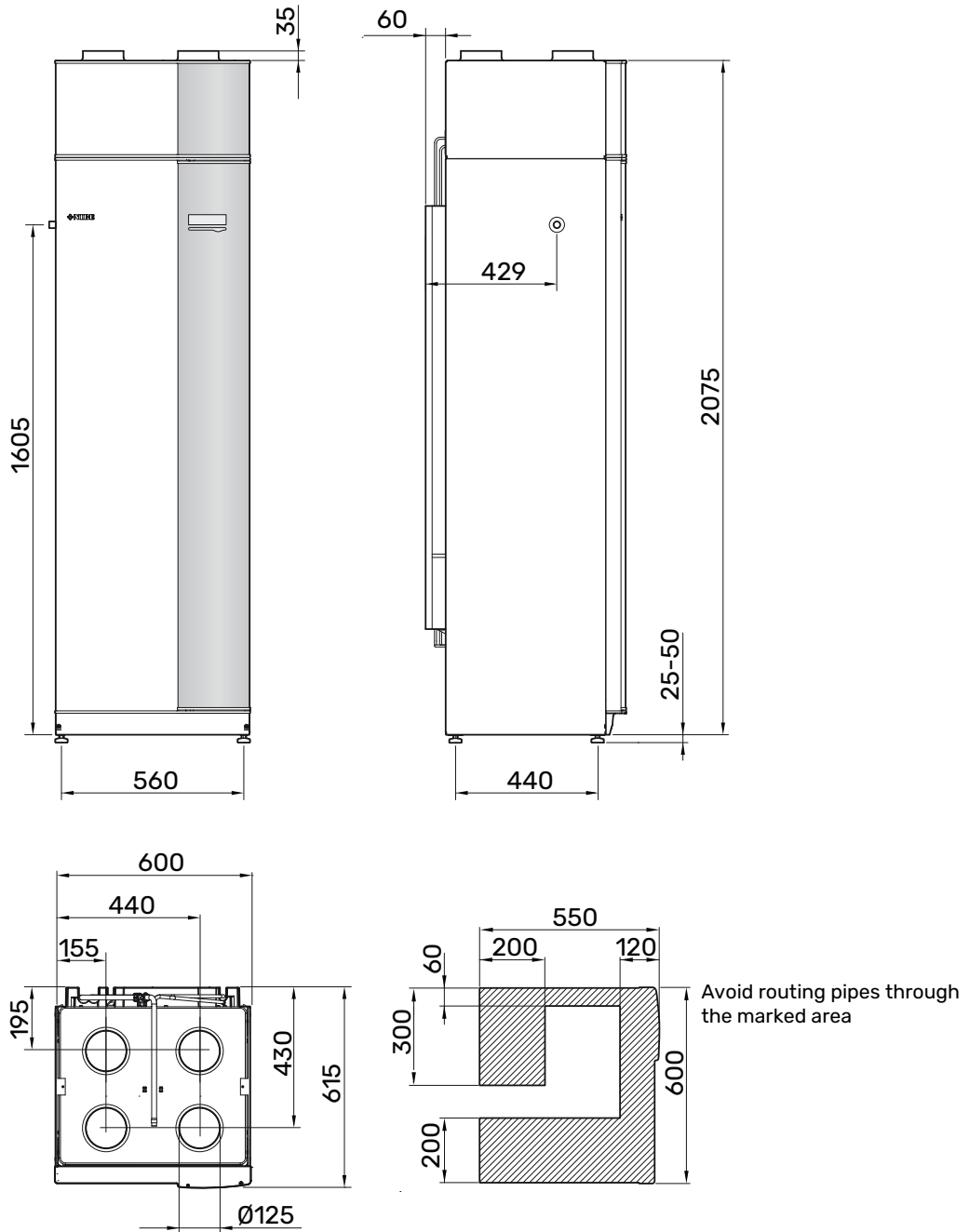
Part no. 067 518

Height 385-635 mm

Part no. 067 519

Technical data

Dimensions



Technical specifications

1x230 V		Stainless
Output data according to EN 14 511		
Heating capacity (P _H)/COP ¹	kW/-	2.18 / 3.93
Heating capacity (P _H)/COP ²	kW/-	2.03 / 3.24
Heating capacity (P _H)/COP ³	kW/-	1.88 / 2.74
Output data according to EN 14 825		
Rated heating output (P _{designh})	kW	3
SCOP cold climate, 35°C / 55 °C		3.70 / 3.08
SCOP average climate, 35 °C / 55 °C		3.58 / 2.98
SCOP warm climate, 35°C / 55°C		3.58 / 2.98
Additional power		
Max power, immersion heater (factory setting)	kW	8.0 (5.3)
Energy rating, average climate		
The product's efficiency class room heating, average climate 35 / 55 °C ⁴		A+ / A+
The system's efficiency class room heating, average climate 35 / 55 °C ⁵		A+ / A+
Declared tap profile/efficiency class hot water heating ⁶		L / A
Electrical data		
Rated voltage	V	230 V - 50 Hz
Max operating current	A	41
Min. fuse rating	A	10
Drive output heating medium pump	W	4-34
Driving power exhaust air fan	W	10-165
Driving power supply air fan	W	10-165
Enclosure class		IP 21
Equipment Compliant with IEC 61000-3-12		
For Connection Design Purposes, Compliant with Class A limits of IEC 61000-3-2		
For Connection Design Purposes, Compliant with IEC 61000-3-3 technical requirements		
Refrigerant circuit		
Type of refrigerant		R290
Volume	kg	0.44
Cut-out value pressostat HP	MPa/bar	2.45 / 24.5
Cut-out value pressostat LP	MPa/bar	0.15 / 1.5
Heating medium circuit		
Opening pressure, safety valve	MPa/bar	0.25 / 2.5
Operating pressure (supply line)	MPa/bar	0.2 / 2.0
Max temperature, supply line (factory setting)	°C	70 (60)
Ventilation		
Min. air flow at exhaust air temperature at least 20°C	l/s	28
Min. air flow at exhaust air temperature below 20°C	l/s	31
Noise		
Sound effect level according to EN 12 102 (L _{W(A)}) ⁷	dB(A)	51.5-54.5
Sound pressure level in the installation room (L _{P(A)}) ⁸	dB(A)	47.5-50.5
Pipe connections		
Heating medium ext Ø	mm	22
Hot water ext Ø	mm	22
Cold water ext Ø	mm	22
Docking ext Ø	mm	22
Ventilation Ø	mm	125

¹ A20(12)W35, exhaust air flow 56 l/s (200 m³/h)

² A20(12)W45, exhaust air flow 42 l/s (150 m³/h)

³ A20(12)W55, exhaust air flow 31 l/s (110 m³/h)

⁴ Scale for the product's efficiency class room heating: A+++ to D.

⁵ Scale for the system's efficiency class room heating: A+++ to G. Reported efficiency for the system takes the product's temperature regulator into account.

⁶ Scale for efficiency class hot water: A+ to F.

⁷ The value varies with the selected fan curve. For more detailed sound data, including sound to channels, visit nibe.co.uk.

⁸ The value can vary with the room's damping capacity. These values apply at a damping of 4 dB.

Other 1x230 V		Stainless
Water heater and heating section		
Volume heating section	litre	70
Volume, hot water heater	litre	170
Max pressure in hot water heater	MPa/bar	1.0 / 10.0
Capacity, hot water		
Tap volume 40°C according to EN 16 147($V_{max.}$) ¹	litre	281
COP at Normal comfort (COP_p)		1.97
Idle loss at Normal comfort (P_{es})	W	54
Maximum water supply pressure	MPa/bar	1.6 / 16
Operating pressure, tap water	MPa/bar	0.6 / 6.0
Expansion vessel, tap water, precharge pressure	MPa/bar	0.35 / 3.5
Volume expansion vessel (external)	litre	18
Pressure reduction valve, setting	MPa/bar	0.3 / 3.0
Max operating pressure of T&P-valve	MPa/bar	0.7 / 7.0
Max operating temperature T&P-valve	°C	95
Discharge capacity of T&P-valve	kW	25
Set opening pressure expansion valve tap water	MPa/bar	0.6 / 6.0
Cut out, temperature limiter	°C	80
Heating time 15 °C to 60 °C	h min	1:26
Reheating time to 60°C, 70% of total volume	min.	57
Dimensions and weight		
Width	mm	600
Depth	mm	616
Height incl. feet		2,100 - 2,125
Required ceiling height	mm	2,170
Net weight	kg	207
Mass unit, filled with water	kg	447
Part No.		066 067

¹ A20(12) exhaust air flow 42 l/s (150 m³/h). Comfort mode, normal

Energy labelling

INFORMATION SHEET

Supplier		NIBE
Model		F470
Temperature application	°C	35 / 55
Declared load profile for water heating		L
Seasonal space heating energy efficiency class, average climate		A+ / A+
Water heating energy efficiency class, average climate		A
Rated heat output ($P_{designh}$), average climate	kW	3 / 3
Annual energy consumption space heating, average climate	kWh	1505 / 1806
Annual energy consumption water heating, average climate	kWh	1299
Seasonal space heating energy efficiency, average climate	%	140 / 116
Water heating energy efficiency, average climate	%	79
Sound power level L_{WA} indoors	dB	52
Rated heat output ($P_{designh}$), cold climate	kW	3 / 3
Rated heat output ($P_{designh}$), warm climate	kW	3 / 3
Annual energy consumption space heating, cold climate	kWh	1737 / 2091
Annual energy consumption water heating, cold climate	kWh	1299
Annual energy consumption space heating, warm climate	kWh	973 / 1168
Annual energy consumption water heating, warm climate	kWh	1299
Seasonal space heating energy efficiency, cold climate	%	145 / 120
Water heating energy efficiency, cold climate	%	79
Seasonal space heating energy efficiency, warm climate	%	140 / 116
Water heating energy efficiency, warm climate	%	79
Sound power level L_{WA} outdoors	dB	-

Compressor motor is exempted from EU 2019/1781 due to that motors completely integrated into compressor and energy performance cannot be tested independently from the product.

DATA FOR ENERGY EFFICIENCY OF THE PACKAGE

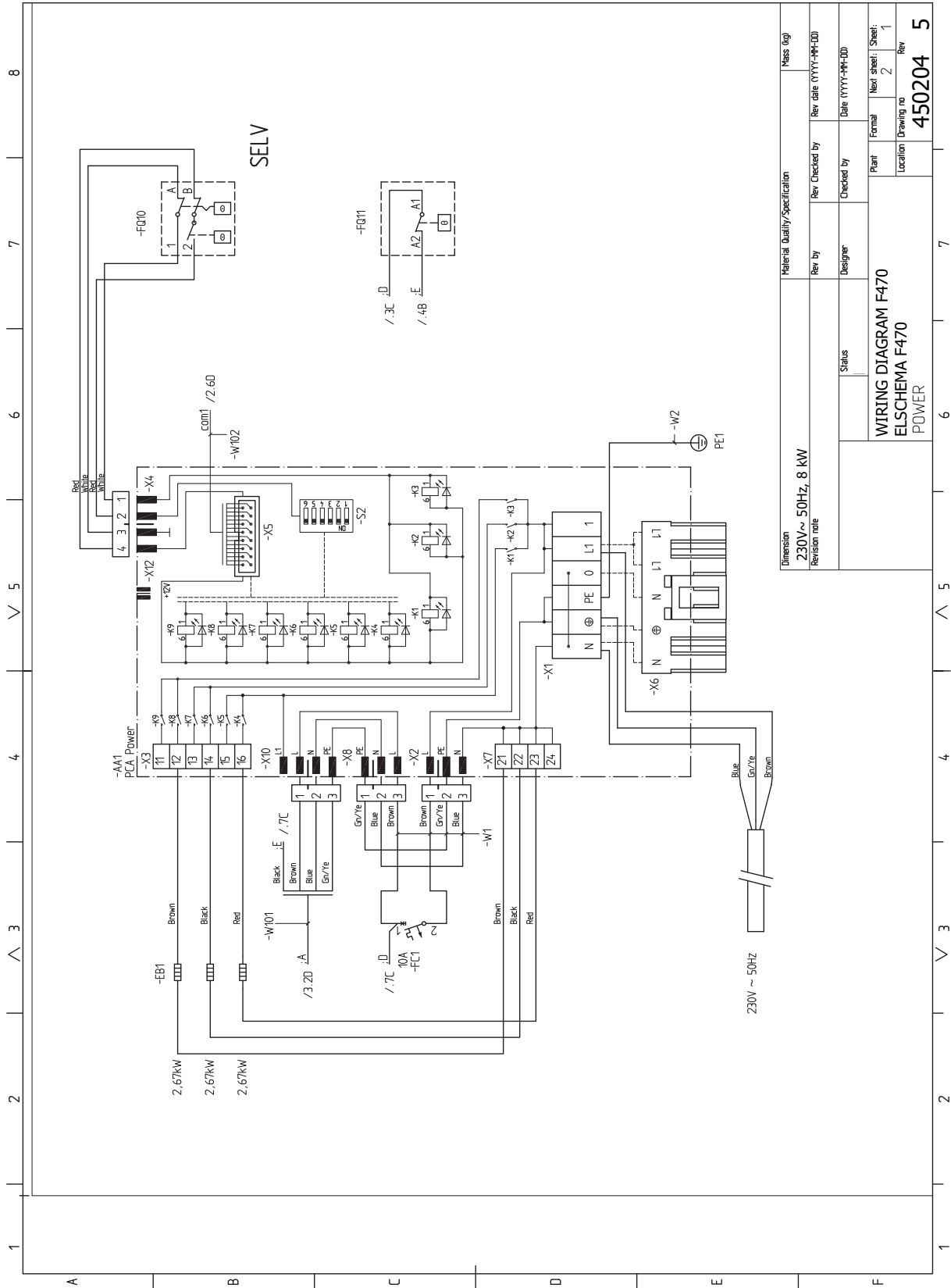
Model		F470
Temperature application	°C	35 / 55
Controller, class		VII
Controller, contribution to efficiency	%	3.5
Seasonal space heating energy efficiency of the package, average climate	%	143 / 119
Seasonal space heating energy efficiency class of the package, average climate		A+ / A+
Seasonal space heating energy efficiency of the package, cold climate	%	148 / 123
Seasonal space heating energy efficiency of the package, warm climate	%	143 / 119

Reported efficiency for the system also takes the temperature regulator into account. If the system is supplemented with external additional heat or solar heating, the total efficiency of the system must be recalculated.

TECHNICAL DOCUMENTATION

Model				F470			
Type of heat pump	<input type="checkbox"/> Air-water <input checked="" type="checkbox"/> Exhaust-water <input type="checkbox"/> Brine-water <input type="checkbox"/> Water-water						
Low-temperature heat pump	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
Integrated immersion heater for additional heat	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Heat pump combination heater	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Climate	<input checked="" type="checkbox"/> Average <input type="checkbox"/> Cold <input type="checkbox"/> Warm						
Temperature application	<input checked="" type="checkbox"/> Medium (55°C) <input type="checkbox"/> Low (35°C)						
Applied standards	EN14825, EN16147						
Rated heat output	Prated	2,6	kW	Seasonal space heating energy efficiency	η_s	116	%
Declared capacity for space heating at part load and at outdoor temperature T_j				Declared coefficient of performance for space heating at part load and at outdoor temperature T_j			
$T_j = -7\text{ °C}$	Pdh	1.7	kW	$T_j = -7\text{ °C}$	COPd	2.72	-
$T_j = +2\text{ °C}$	Pdh	1.7	kW	$T_j = +2\text{ °C}$	COPd	3.22	-
$T_j = +7\text{ °C}$	Pdh	1.7	kW	$T_j = +7\text{ °C}$	COPd	3.37	-
$T_j = +12\text{ °C}$	Pdh	1.7	kW	$T_j = +12\text{ °C}$	COPd	3.28	-
$T_j = \text{biv}$	Pdh	1.7	kW	$T_j = \text{biv}$	COPd	3.04	-
$T_j = \text{TOL}$	Pdh	1.7	kW	$T_j = \text{TOL}$	COPd	2.56	-
$T_j = -15\text{ °C}$ (if TOL < -20 °C)	Pdh		kW	$T_j = -15\text{ °C}$ (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-1.6	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	P _{cy}		kW	Cycling interval efficiency	COP _{cy}		-
Degradation coefficient	Cdh	0.96	-	Max supply temperature	WTOL	58	°C
<i>Power consumption in modes other than active mode</i>				<i>Additional heat</i>			
Off mode	P _{OFF}	0.002	kW	Rated heat output	P _{sup}	0.9	kW
Thermostat-off mode	P _{TO}	0.02	kW				
Standby mode	P _{SB}	0.015	kW	Type of energy input	Electric		
Crankcase heater mode	P _{CK}	0	kW				
<i>Other items</i>							
Capacity control	Fixed			Rated airflow (air-water)		150	m ³ /h
Sound power level, indoors/outdoors	L _{WA}	52 / -	dB	Nominal heating medium flow		0.18	m ³ /h
Annual energy consumption	Q _{HE}	1.806	kWh	Brine flow brine-water or water-water heat pumps			m ³ /h
<i>For heat pump combination heater</i>							
Declared load profile for water heating	L			Water heating energy efficiency	η_{wh}	79	%
Daily energy consumption	Q _{elec}	5.92	kWh	Daily fuel consumption	Q _{fuel}		kWh
Annual energy consumption	AEC	1,299	kWh	Annual fuel consumption	AFC		GJ
Contact information	NIBE Energy Systems - Box 14 - Hannabadsvägen 5 - 285 21 Markaryd - Sweden						

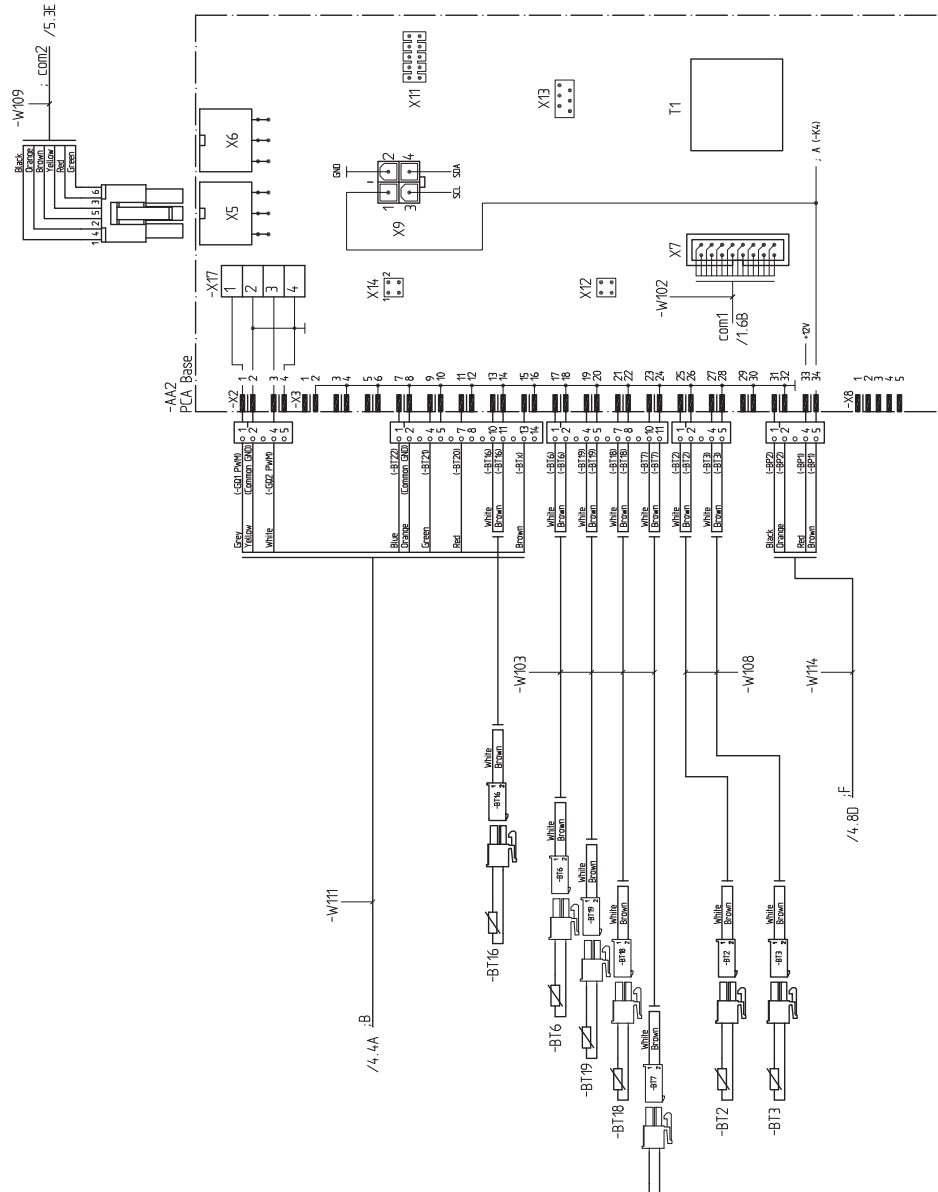
Electrical circuit diagram



Material Quality/Specification		Revision		Mass (kg)	
Rev by	Rev checked by	Rev date (YYYY-MM-DD)	Checked by	Date (YYYY-MM-DD)	Mass (kg)
Status			Designer		
WIRING DIAGRAM F470			Plant		
ELSCHEMA F470			Format		
POWER			Next sheet: 1		
			Drawing no		
			450204		
			Rev		
			5		

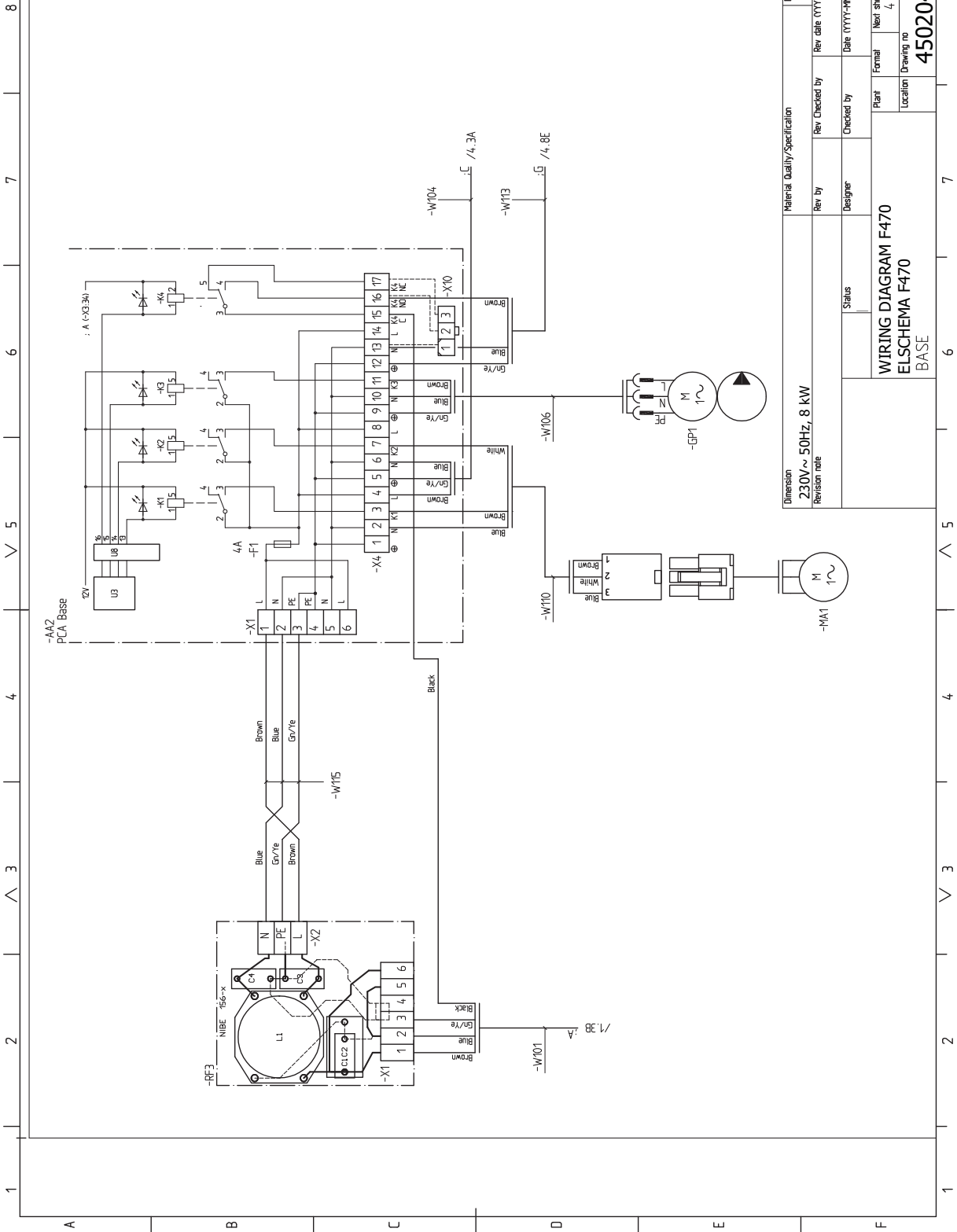
1 2 3 4 5 6 7 8

COLOR CODE	
UL/CSA DIN 47700	
Black	White
Brown	Brown
Red	Green
Orange	Yellow
Yellow	Grey
Green	Pink
Blue	Blue
Violet	Red
Grey	Black
White	Violet



SELV

Material Quality/Specification		Mass (kg)	
Dimension	230V~ 50Hz, 8 kW	Rev by	Rev date (YYYY-MM-DD)
Revision note		Checked by	Date (YYYY-MM-DD)
		Status	Designer
		WIRING DIAGRAM F470	
		ELSCHEMA F470	
		BASE	
Plant	Formal	Next sheet	Sheet
Location	Drawing no	Rev	Rev
	450204	5	2



Material Quality/Specification		Mass (kg)	
Dimension	230V~ 50Hz, 8 kW	Rev by	Rev Checked by
Revision note		Designer	Checked by
		Status	Date (YYYY-MM-DD)
		Plant	Formal
		Location	Next sheet: Sheet: 3
		Drawing no	Rev
			4
			5

WIRING DIAGRAM F470
ELSCHEMA F470
BASE

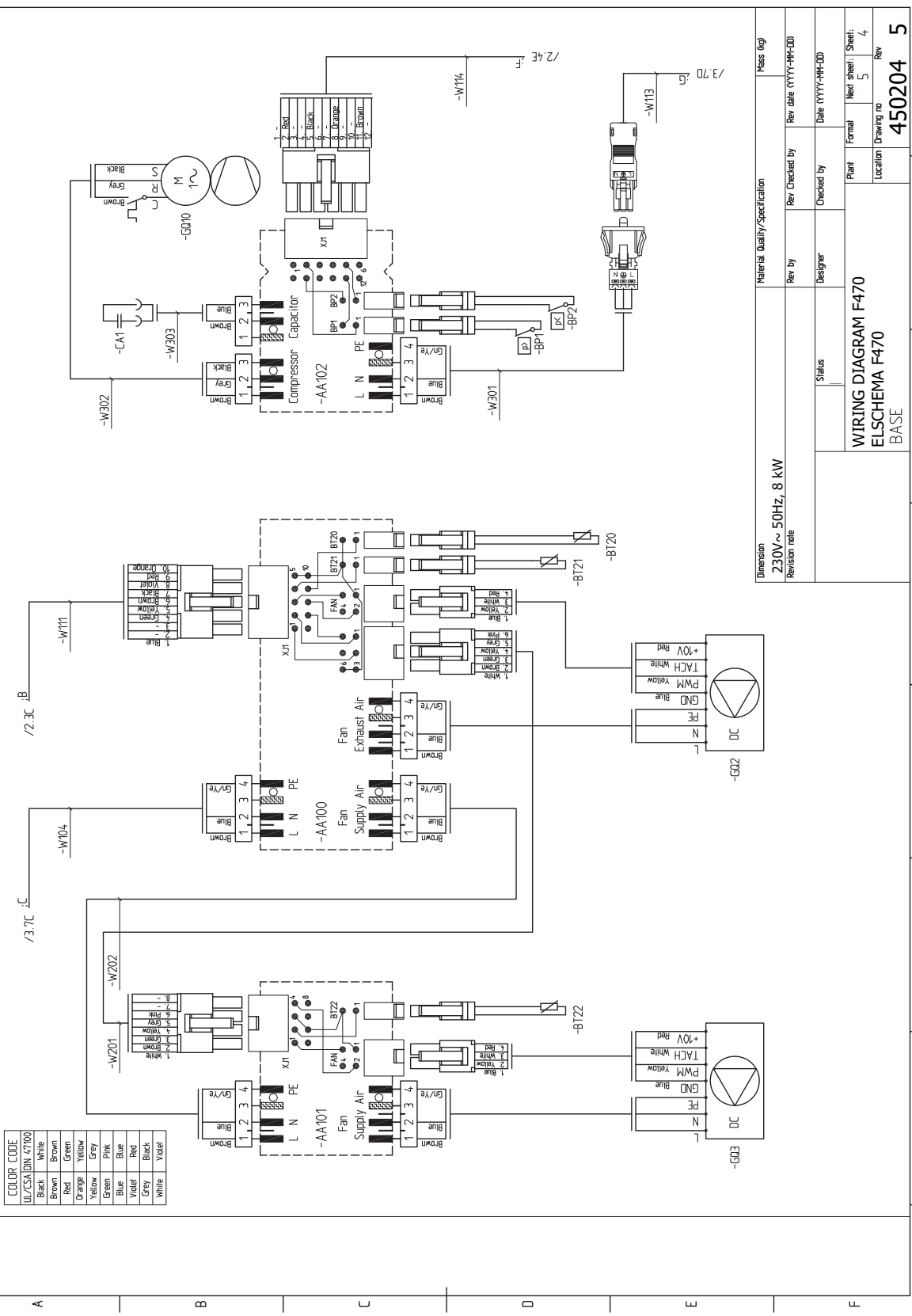
1 2 3 4 5 6 7 8

A B C D E F

1 2 3 4 5 6 7 8

COLOR CODE
UL/CSA (IN & 7100)

Black	White
Brown	Green
Red	Brown
Orange	Yellow
Yellow	Grey
Green	Pink
Blue	Blue
Violet	Red
Grey	Black
White	Violet



Dimension	Material Quality/Specification		Mass (kg)
230V~50Hz, 8 kW	Rev by	Rev Checked by	Rev date (YYYY-MM-DD)
Revision note	Status	Designer	Date (YYYY-MM-DD)
	WIRING DIAGRAM F470		Plant
	ELSCHHEMA F470		Formal
	BASE		Next sheet: Sheet: 5
			Drawing no
			450204
			Rev
			5
			4
			5

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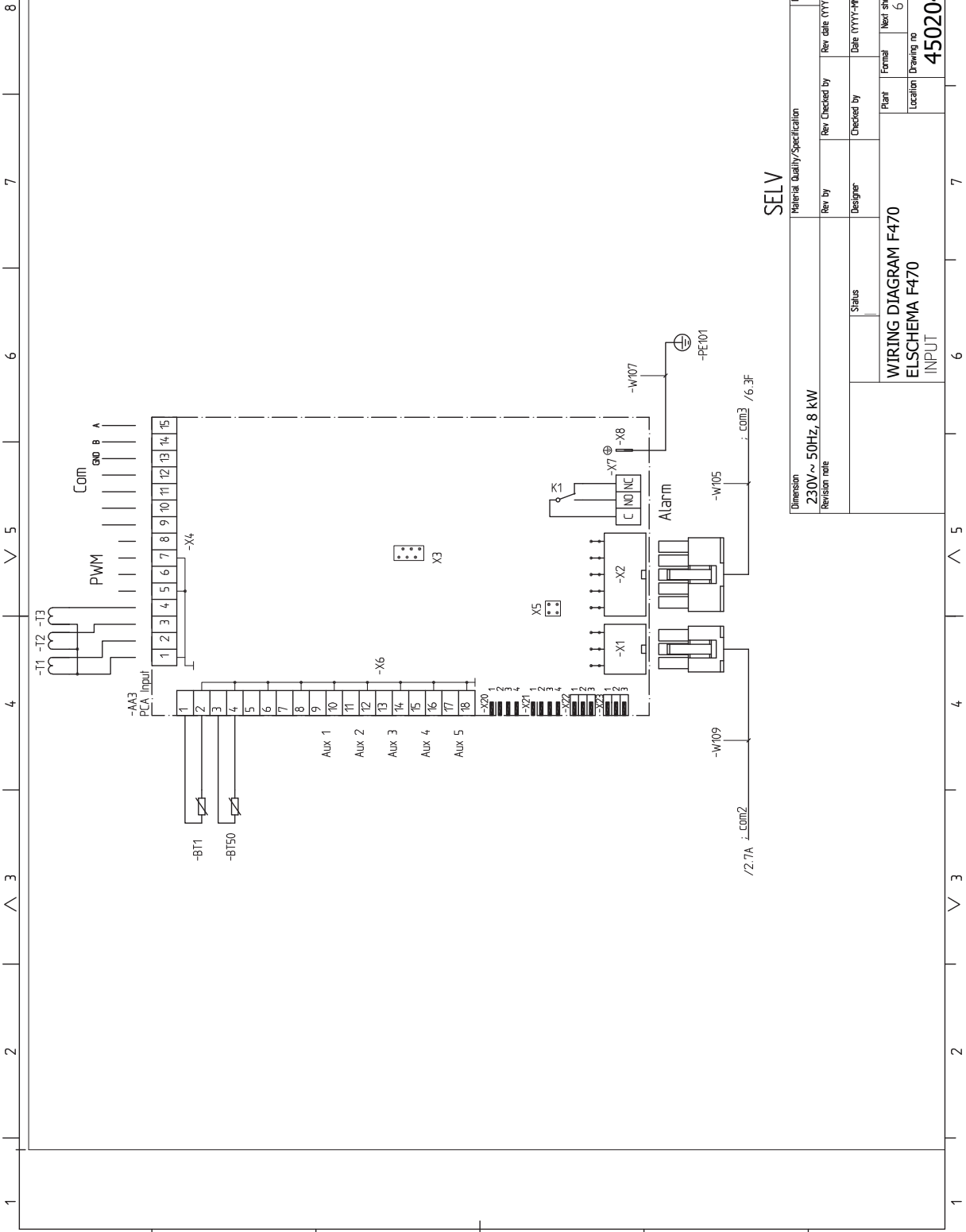
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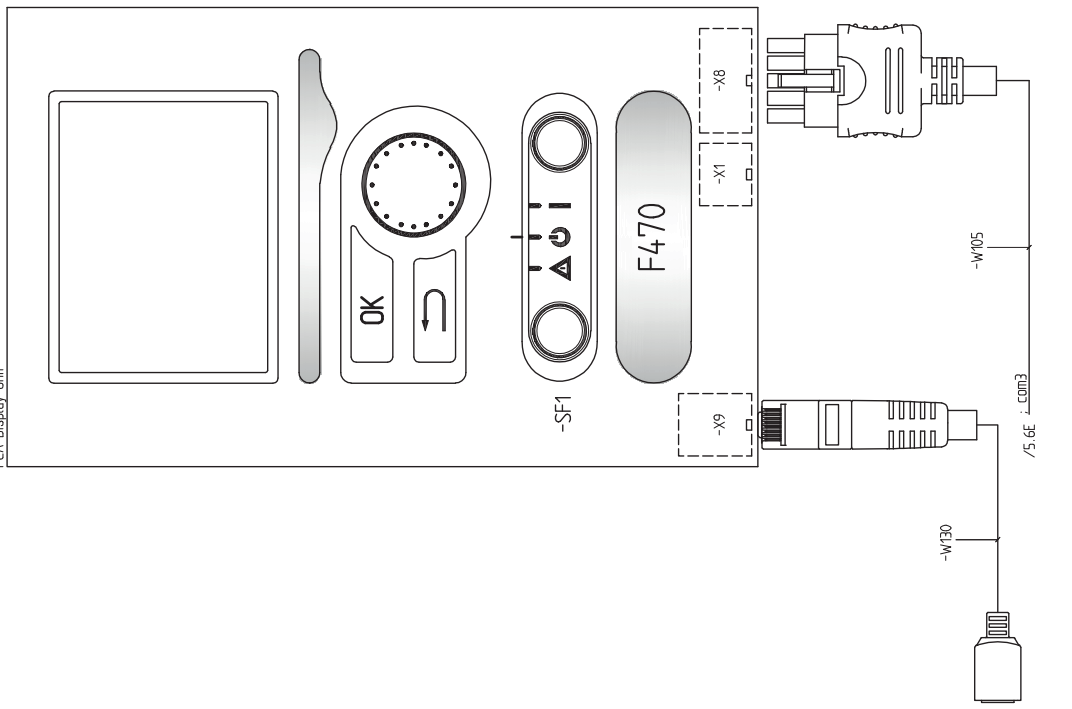
SELV

Material Quality/Specification		Mass (kg)	
Rev by	Rev Checked by	Rev date (YYYY-MM-DD)	
Designer	Checked by	Date (YYYY-MM-DD)	
Status	Plant	Formal	Next sheet: 5
	Location	Drawing no	Rev
		450204	5

Dimension	230V~ 50Hz, 8 kW
Revision note	
WIRING DIAGRAM F470	
ELSICHEMA F470	
INPUT	

1 2 3 4 5 6 7 8

-AA4
PCA Display Unit



SELV

Material Quality/Specification		Mass (kg)	
Dimension	230V~ 50Hz, 8 kW	Rev. Checked by	Rev. date (YYYY-MM-DD)
Revision note		Checked by	Date (YYYY-MM-DD)
Status	Designer	Plant	Formal
WIRING DIAGRAM F470		Location	Next sheet: Sheet: 6
ELSICHEMA F470		Drawing no	Rev
DISPLAY		450204	5

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EXHAUST AIR HEAT PUMP COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____

Address _____

Telephone Number _____

Heat Pump Make and Model _____

Heat Pump Serial Number _____

Commissioned by *(print name)* _____ Certified Operative Reg. No. [1] _____

Company Name & Address _____ Commissioning Date _____

Telephone No. _____

Building Regulations Notification Number *(if applicable)* [2] _____

CONTROLS - SYSTEM AND HEAT PUMP Tick the appropriate boxes if applicable

1. Time & Temperature Control to Heating	Room Thermostat & Programmer/Timer <input type="checkbox"/>	Programmable Roomstat <input type="checkbox"/>	Load/Weather Compensation <input type="checkbox"/>	Optimum Start Control <input type="checkbox"/>
2. Time & Temperature Control to Hot Water			Cylinder Thermostat & Programmer/Timer <input type="checkbox"/>	Combined with Heat pump main controls <input type="checkbox"/>
3. Heating Zone Valves			Fitted <input type="checkbox"/>	Not Required <input type="checkbox"/>
4. Hot Water Zone Valves			Fitted <input type="checkbox"/>	Not Required <input type="checkbox"/>
5. Thermostatic Radiator Valves			Fitted <input type="checkbox"/>	Not Required <input type="checkbox"/>
6. Heat Pump Safety Interlock [3]				Provided <input type="checkbox"/>
7. Outdoor Sensor			Fitted <input type="checkbox"/>	Not Required <input type="checkbox"/>
8. Automatic Bypass System			Fitted <input type="checkbox"/>	Not Required <input type="checkbox"/>
9. Buffer Vessel Fitted			Yes <input type="checkbox"/> No <input type="checkbox"/>	If YES, Volume <input type="text"/> Litres

ALL SYSTEMS

The heating system has been filled and pressure tested Yes

Expansion vessel for heating is sized, fitted & charged in accordance with manufacturer's instructions Yes

The heat pump is fitted on a solid/stable surface capable of taking its weight Yes

The system has been flushed and cleaned in accordance with BS7593 and heat pump manufacturer's instructions Yes

What system cleaner was used? _____

What inhibitor was used? _____ Qty litres

Are all external pipeworks insulated? Yes

Is the system adequately frost protected? Yes

VENTILATION SYSTEM

Duct work fitted and pressure tested in accordance with manufacturer's instructions Yes No

Air Vents fitted Yes N/A

Ventilation air flow measured/recorded in accordance with building regulations & manufacturers instructions Yes I/s

Air filter cleaned & correctly fitted Yes

CENTRAL HEATING MODE

Heating Flow Temperature °C Heating Return Temperature °C

DOMESTIC HOT WATER MODE

Is the heat pump connected to a hot water cylinder? Unvented Vented Thermal Store Not Connected Yes

Hot water has been checked at all outlets Yes

ADDITIONAL SYSTEM INFORMATION

Additional heat sources connected

Gas Boiler Oil Boiler Electric Heater Other _____

ALL INSTALLATIONS

The heating, hot water and ventilation systems complies with the appropriate Building Regulations Yes

All electrical work complies with the appropriate Regulations Yes

The heat pump and associated products have been installed and commissioned in accordance with the manufacturer's instructions Yes

The operation of the heat pump and system controls have been demonstrated to the customer Yes

The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes

Commissioning Engineer's Signature _____

Customer's Signature _____

(To confirm demonstration of equipment and receipt of appliance instructions)

Notes: [1] Installers should be members of an appropriate Competent Persons Scheme. [2] All installations in England and Wales must be notified to Local Area Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer. [3] May be required for systems covered by G3 Regulations



Service Record

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

Service 1

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 2

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 3

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 4

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 5

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 6

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 7

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 8

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 9

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 10

Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

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