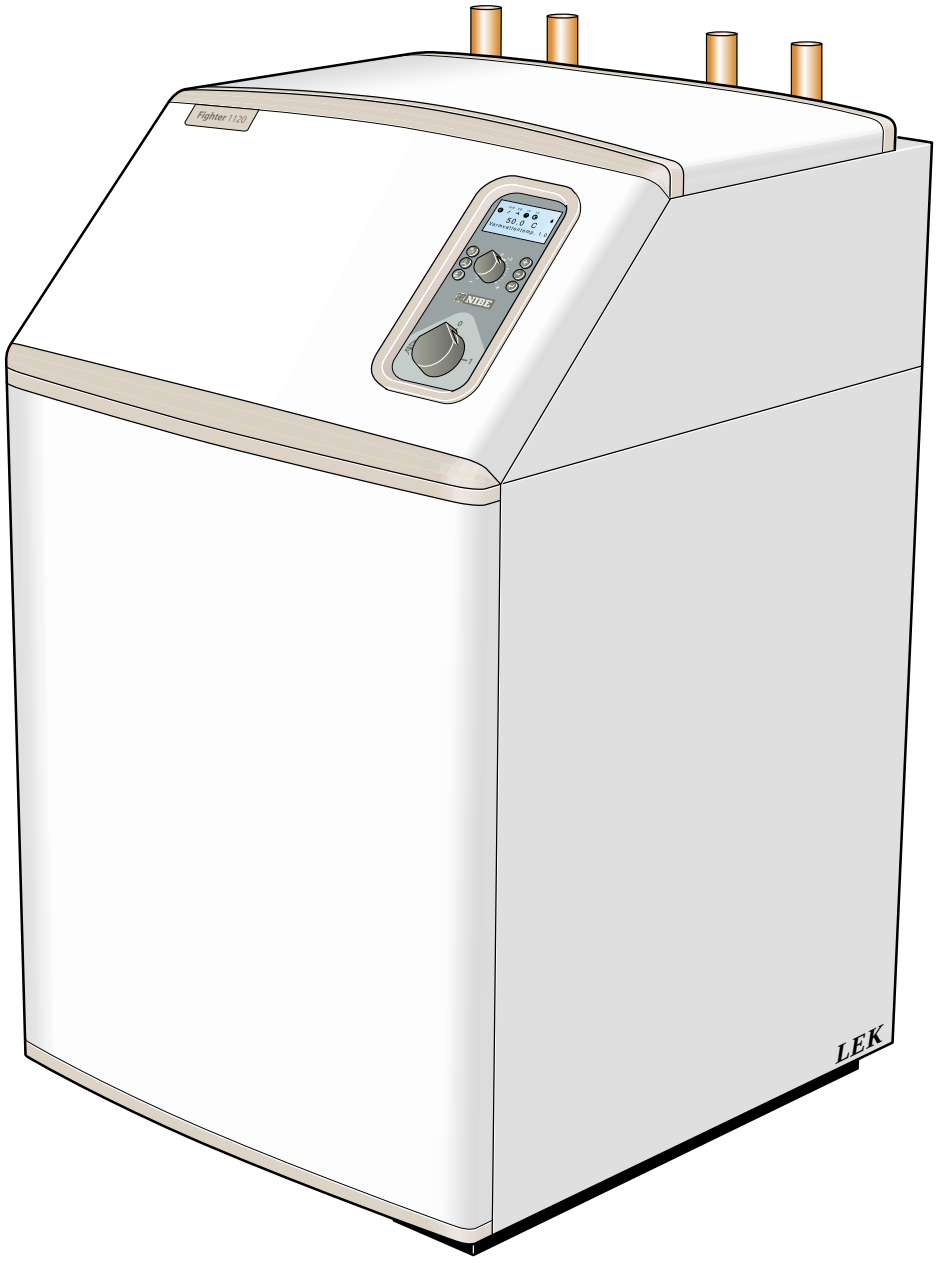
NIBE®

MOS GB 0429-1 611922
FIGHTER 1120

INSTALLATION AND MAINTENANCE INSTRUCTIONS

FIGHTER 1120



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2 General

In order to get the ultimate benefit from your heat pump FIGHTER 1120 you should read through the For Home Owners section in this Installation and Maintenance Instruction.

FIGHTER 1120 is a base heat pump for heating small houses, apartment blocks and industrial premises. The ground, rock or lakes can be used as the heat source.

FIGHTER 1120 is a Swedish made quality product offering a long life span and safe operation.

Completedby the installer when the heat pump is installed

The serial number (95), should always be stated with all correspondence with NIBE.

689 _ _ _ _ _ _ _ _ _ _ _ _ _

(e.g. 68922329454897)

FIGHTER 1120- _ _ kW

Installation date

Accessories:

Electrical supplement ..... ☐ Room control ..... ☐

Hot water control ..... ☐ Other ..... ☐

Oil supplement ..... ☐

Installation engineers

The type of brine Mixing proportion/freezing point

Active drilling depth/collector length

Commissioning checks

Temperature brine (flow/return)__ / __ Pump setting _

(Nominal temperature diff 2 - 5 °C)

Temperature heat medium (in/out) __ / __ Pump setting __

(Nominal temperature diff 5 - 10 °C)

Settings

Menu		Basic setting	Position		Basic setting
1.4	Start temp. HW*.....		100	“Fuse”	20
1.5	Stop temp. HW*.....	54	101	“Max electrical output”	C
1.6	Stop temp. XHW*	60	102	“Max boiler temp”	65
1.8	Interval period XHW*.....	14			
2.1	Curve slope	9			
2.2	Offset. heating curve	0			
2.3	Flow temp/MIN	15			
2.4	Flow temp/MAX	55			

Date _____Signed _____

* Accessories ** Electric boiler mode (see Menu 14).

System description 3

Principle of operation

FIGHTER 1120 consists of a heat pump, circulation pumps and a control system for the heat pump and any additional heat (an immersion heater is not included in the basic design).

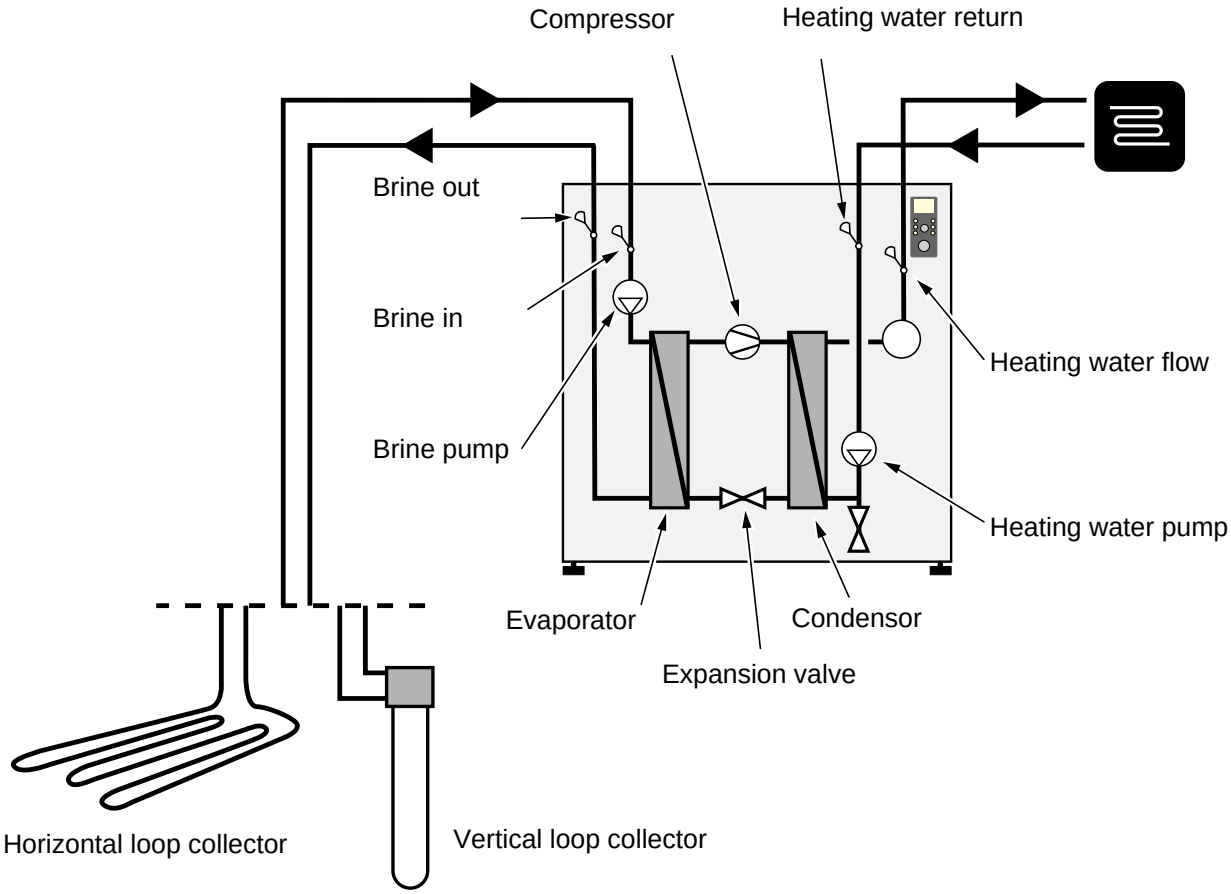
FIGHTER 1120 has built-in circulation pumps, making it easy to connect to the heating medium and collector circuits.

The absorption of heat from the heat source (rock, ground or lake) is through a closed collector system containing water mixed with antifreeze.

Ground water can also be used as a heat source. This requires an intermediate heat exchanger.

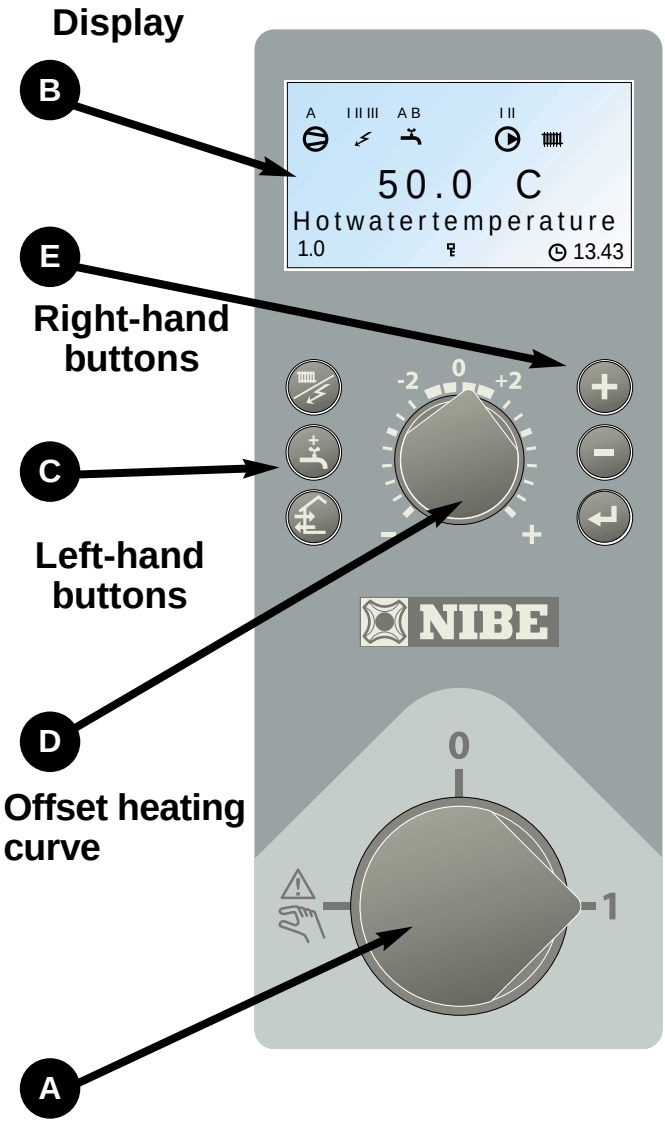
The brine emits its heat to the refrigerant in the heat pump's evaporator. It then vaporises and is compressed in the compressor. The refrigerant, with its increased temperature, is led into the condenser where it emits its energy to the heat medium circuit.

The installation must be fitted with the necessary safety equipment in accordance with the applicable regulations.



4 Front panel

Layout



Explanation

A Switch

with three positions 1 - 0 - ⚠:

1 Normal mode. All control functions connected.

0 Boiler completely switched off.

⚠ Standby. Only circulation pump and electrical supplement. Not connected at the factory

The switch must not be turned to 1 or " ⚠ " before filling the boiler with water.

B Display First row:

A

Compressor symbol.

Indicates when the compressor is operational.

I II

Additional symbol

Indicates when immersion heater is connected. The line indicates which power step/steps are currently connected.

I Additional power, step 1 enabled.

II Additional power, step 2 enabled.

I II Additional power, step 3 enabled.

A B

Extra hot water symbol.

Indicates when the Extra hot water function is active.

A is shown when temperature increase is active.
B is shown when a time based temperature increase is activated, for example. periodic.

I II

Circulation pump symbol.

I Shown when the circulation pump is operational.

II Shown when circulation pump 2 is operational (accessory, extra shunt group required).

Heating system symbols.

Shown when house heating is in progress.

B Display

Second row: Value of the current parameter.
Third row: Description of current display parameter. Hot water temp is normally shown.

Fourth row: Shows menu numbers, key lock, clock symbol and time

A key lock can be activated in the main menus by simultaneously pressing the Plus and the Minus buttons. The key symbol will then be shown on the display. The same procedure is used to deactivate the key lock.

The symbol becomes visible when a timer function is selected, for example, periodic lowering of the supply or time setting for extra hot water.

C Left-hand buttons

Operating mode

This button is used to set the required operating mode with regard to permitting/blocking the circulation pump and additional energy. The change does not need to be confirmed with the Enter button.

The different operating modes are:

Auto mode:

FIGHTER 1120 automatically selects the operating mode by taking the outdoor temperature into account. The circulation pump and the immersion heater are permitted to run as needed.

Summer mode:

Only production of hot water using FIGHTER 1120. The circulation pump and immersion heater are blocked. However, when Extra hot water is activated the immersion heater is connected.

Spring/Autumn mode:

Only production of heating and hot water using FIGHTER 1120. The circulation pump is operational. The immersion heater is disabled. However, when Extra hot water is activated the immersion heater is connected.

The current operating mode is shown on the display when the button is pressed and the mode changes when you continue to press the button. The display returns to the normal display mode once the enter button is pressed.

Winter mode:

Production of heating and hot water.

Extra hot water

The Extra hot water function is activated using this button. The change does not need to be confirmed with the enter button.

A: Means that the hot water temperature is increased to 60 °C (adjustable). The temperature then returns to the normal value.

When **A** comes on the function is activated.

When **A** goes out the function is deactivated.

Press once to give extra hot water for 3 hours.

Press twice to give extra hot water for 6 hours.

Press three times to give extra hot water for 12 hours.

Press four times to give extra hot water for 24 hours.

Press five times to deactivate the function.

No function.

D Offset heating curve

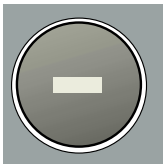
This knob is used to change the heating curve's parallel offset and in doing so the room temperature. Turning clockwise increases the room temperature. When the knob is turned menu 2.0 is shown on the display and the value for the calculated flow temperature changes.

E Right-hand buttons

Plus button

This button is used to scroll through the menu system (forwards) or increase the value of the selected parameter.

See the section Control — General.



Minus button

This button is used to scroll through the menu system (backwards) or lower the value of the selected parameter.

See the section Control — General.

Enter button

This button is used to select a lower menu in the menu system, to activate a parameter change as well as confirm a parameter change.

See the section Control — General".

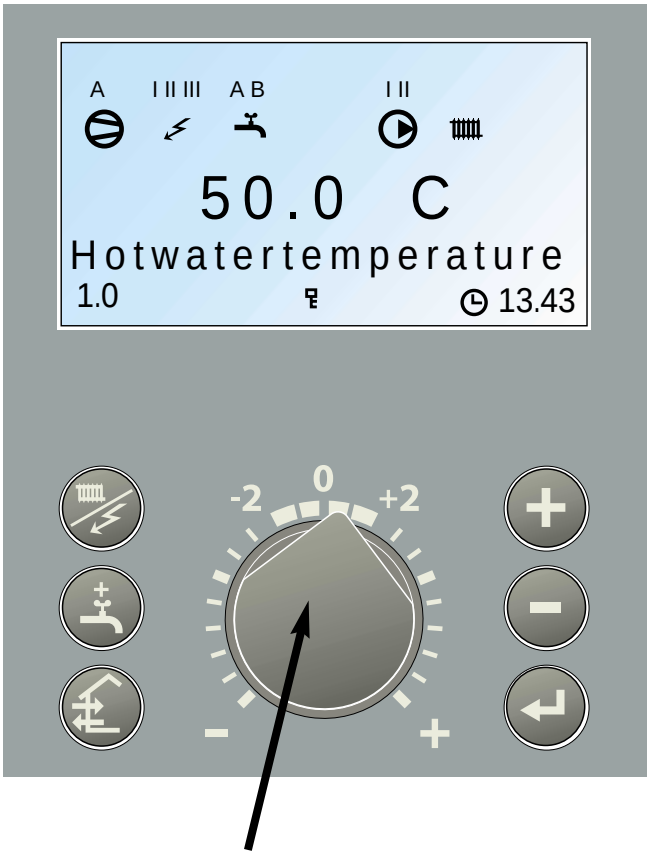
6 Room temperature

Automatic heating control system

The indoor temperature depends on several factors. Sunlight and heat emissions from people and household machines are normally sufficient to keep the house warm during the warmer parts of the year. When it gets colder outside, the heating system must be started. The colder it is outside, the warmer radiators and floor heating system must be. With the FIGHTER 1120, this adjustment is done automatically by a control computer. Before the computer can do this, some basic settings are required.

The heat pump is controlled by built-in sensors for flow and return brine temperatures (collector). Brine return temperatures can, if so required, be limited to a minimum (e.g. for ground water systems).

Heat production is usually controlled using the floating condensing principle. This means that the temperature level needed for heating at a given outside temperature is produced on the basis of values taken from sensors for outside temperature and flow temperature (see docking options 1, 2, 3 and 4). This adjustment is made automatically, however the basic settings must first be made on the boiler, see the section Room temperature - Default setting.



Offset heating curve

Default setting

The basic heating is set using menu 2.1 and with the Offset heating curve knob.

If you do not know the correct settings use the basic data from the map opposite.

If the required room temperature is not obtained, readjustment may be necessary.

NOTE! Wait one day between settings so that the temperatures have time to stabilise.

Readjustment of basic settings.

Cold weather conditions

When the room temperature is too low, the heating curve value is increased in menu 2.1 by one increment.

When the room temperature is too high, the heating curve value is decreased in menu 2.1 by one increment.

Warm weather conditions

If the room temperature is low, increase the offset heating curve setting by one step.

If the room temperature is high, reduce the heating curve offset setting by one step.

Changing the room temperature

Changing the room temperature manually.

If you want to temporarily or permanently lower or raise the indoor temperature relative to the previously set temperature, turn the Heating curve offset knob anticlockwise or clockwise. One to three lines approximately represents a 1 degree change in room temperature.

NOTE! An increase in the room temperature may be inhibited by the radiator or floor heating thermostats, if so these must be turned up.

Room temperature 7

Basic values for the automatic heating control system

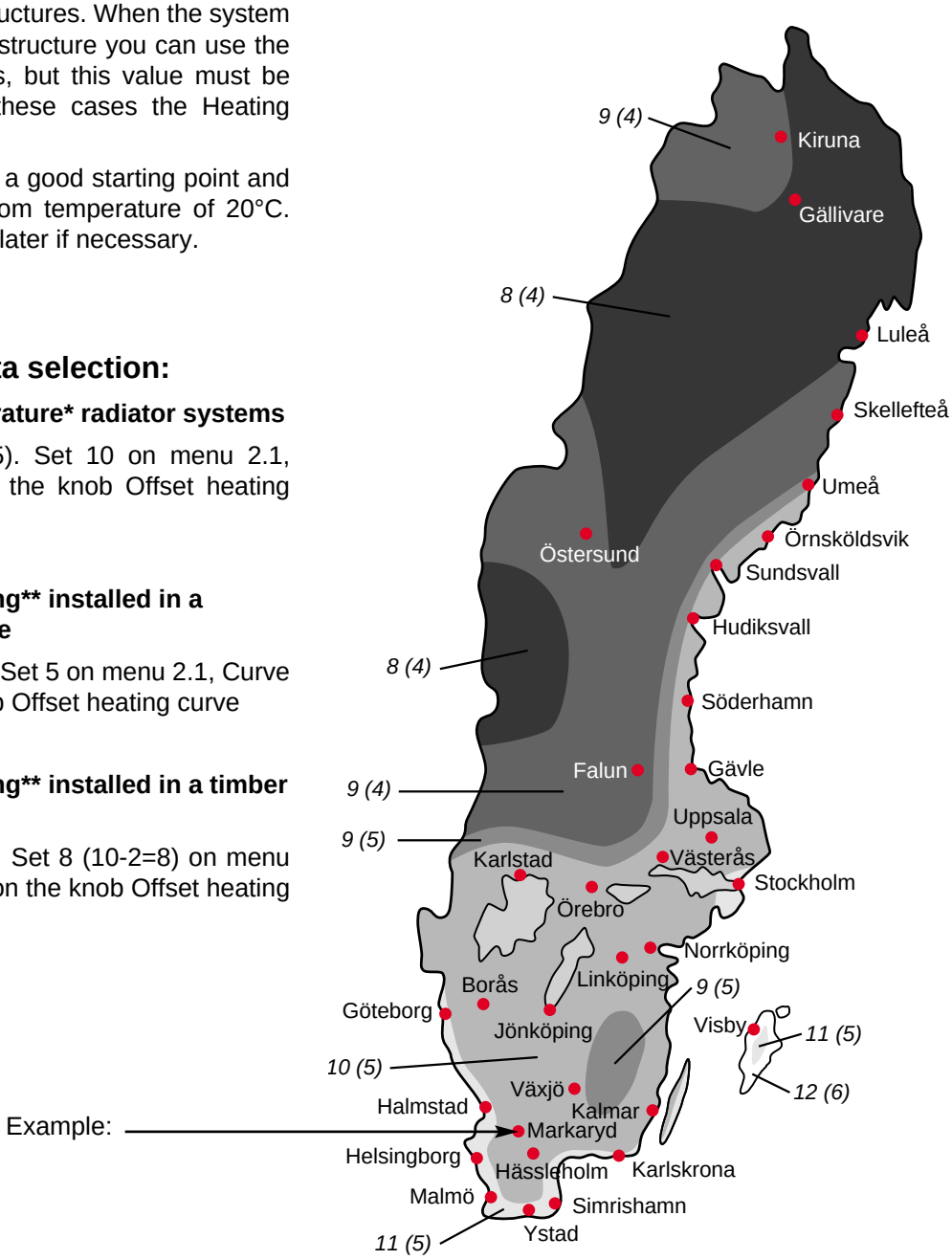
The values stated on the map apply for the Curve slope.

The first value applies for low temperature * radiator systems. Heating curve offset is set to -2.

The value in brackets refers to floor heating systems** 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. In these cases the Heating curve offset is set to -1.

The map values are usually a good starting point and concern an approximate room temperature of 20°C. The values can be adjusted later if necessary.

The lower values in the north of Sweden are due to the lower design outdoor temperature.



Examples of basic data selection:

1. **House with low temperature* radiator systems**

   Markaryd = Area 10 (5). Set 10 on menu 2.1, Curve slope and -2 on the knob Offset heating curve

2. **House with floor heating** installed in a concrete floor structure**

   Markaryd = Area 10 (5). Set 5 on menu 2.1, Curve slope and -1 on the knob Offset heating curve

3. **House with floor heating** installed in a timber floor structure**

   Markaryd = Area 10 (5). Set 8 (10-2=8) on menu 2.1, Curve slop" and -1 on the knob Offset heating curve.

* A low temperature radiator system refers to a system where the flow temperature needs to be 55 °C on the coldest day.

** Floor heating can be dimensioned very differently. Examples 2 and 3 above refer to a system where the flow temperature needs to be approximately 35 - 40 °C resp 45 - 50 °C on the coldest day.

8 Room temperature

Heating

The supply of heat to the building is controlled by the control computer settings (curve slope and offset). After adjustment the correct amount of heat for the current outdoor temperature is supplied. The heat pump flow temperature (HM Flow) will hover around the theoretical required value (the value in brackets on the display). For subnormal temperatures the computer calculates a deficit in the form of degree minutes, which results in the acceleration of heat production. The larger the subnormal temperature, the greater the heat production.

The heat pump computer can control an immersion heater in a maximum of seven output steps if fitted, or an external oil-fired boiler and mixing valve.

Hot water

FIGHTER 1120 can be complemented with Domestic hot water operation and, for example, our VPA hot water accumulator to produce domestic hot water.

Electric boiler mode

If the FIGHTER 1120 is fitted with the Electrical supplement accessory the unit can be used solely as an electric boiler to produce heat and hot water. This is especially useful, for example, before the collector installation is finished.

Changing of Electric boiler mode is done from menu 9.2.4.

Brine pump

The brine pump normally follows the operation of the heat pump. There is a special operating mode for continuous operation for 10 days, followed by return to normal mode (used before stable circulation has been established).

The setting is made on menu 9.2.12, Brine pump 10 days.

Fixed condensing

FIGHTER 1120 can be docked with an external unit with its own automatic heating control system. FIGHTER 1120 then delivers heat up to a fixed temperature level. This is known as fixed condensing. To regulate the room temperature, see the instructions for the external units.

Standby mode

Not connected from the factory, requires the accessory ETS 11.

General information for the installer 9

Transport and storage

The FIGHTER 1120 must be transported and stored upright and dry.

Installation

FIGHTER 1120 is placed on a firm base, preferably a concrete floor or foundation. FIGHTER 1120 should be setup with its rear against an outer wall in a scullery or similar type of room 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. Irrespective of the placement the wall should be sound insulated. Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

Floating condensing

Heat production is usually controlled using the floating condensing principle. This means that the temperature level needed for heating at a given outside temperature is produced on the basis of values taken from sensors for outside temperature and flow temperature (see docking options 1 and 3).

Fixed condensing

If required FIGHTER 1120 can be docked to an external unit with its own heating controls. FIGHTER 1120 then delivers heat up to a fixed temperature level. This is called fixed condensing. See docking option 4. To set the correct parameters for fixed condensing see Docking - option 4. The heat medium pump does not need to be changed.

See the instructions for the external units for how to regulate the room temperature.

The outside sensor has no function with this option, but it should be connected to prevent error messages appearing on the display. There is no need to install the sensor outside.

Guideline values for collectors

Heat pump size	Ground heat recommended collector length	Rock heat recommended active drilling depth
5	250 – 400 m	90 – 110 m
7	325 – 2 x 250 m	120 – 140 m
8,5	400 – 2 x 300 m	140 – 170 m
10	2 x 250 – 2 x 350 m	160 – 190 m
13	2 x 300 – 2 x 400 m	2 x 100 – 2 x 120m
15	2 x 350 – 3 x 300 m	2 x 110 – 2 x 140 m

For use with 40 x 2.4 PN 6.3 PEM hose.

The length of the collector hose varies depending on the rock /ground conditions and on the heating system, i.e. radiators or floor heating.

Max length per collector should not exceed 400m.

Where there is more than one collector, they must be connected in parallel, with a means of adjusting the flow.

The hose should be buried at a depth of about 1 metre and the distance between the hoses should be at least 1 metre.

For several bore holes, the distance between the holes must be at least 15m.

Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and should be documented. The above applies to closed heating systems. If the heat pump is replaced, the installation must be inspected again.

NOTE!

Enter the selected values on page 2 in this Installation instruction. The details are important for service work.

10 Pipe connections

General

Pipe installation must be carried out in accordance with current norms and directives. FIGHTER 1120 can only operate up to a return temperature of about 50 °C and an outgoing temperature from the heat pump of about 60 °C. Since FIGHTER 1120 is not fitted with shutoff valves, these must be fitted outside of the heat pump to facilitate servicing.

NOTE!

The pipe work must be flushed before the heat pump is connected, so that any contaminants do not damage the component parts.

Heating medium pump

Using fixed condensing (Docking opt. 4) the heat medium pump (VBP) runs, in automatic mode, at the same time as the brine pump (KBP).

Pipe connections (collector)

When dimensioning the collector, consideration must be given to the geographical location, type of rock and ground and the degree of coverage provided by the heat pump.

When installing the collector hose ensure it rises constantly towards the heat pump to avoid air pockets. If this is not possible, install high points to vent the air.

All collector pipes in heated rooms must be insulated against condensation. The level vessel (LV) must be installed as the highest point in the collector system and on the incoming pipe before the brine pump. Note that condensation may drip from the level vessel. Position the vessel so that this does not harm other equipment.

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

The level vessel must be marked to show the type of antifreeze used.

Shut-off valves should be installed as close to the heat pump as possible. Fit a particle filter to the incoming pipe.

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

Pipe connections (heating medium)

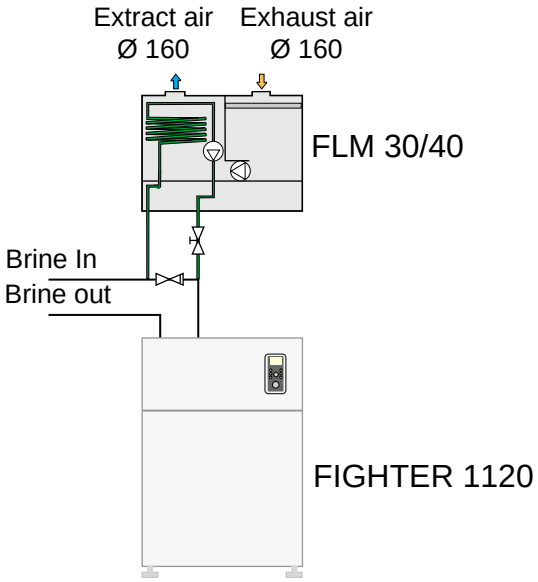
Pipe connections for the heat medium side are made at the top. All required safety devices, shut-off valves (as close to the heat pump as possible), and particle filter (supplied) are fitted.

You should fit either an overflow valve or remove some of the thermostats when connecting to systems with thermostats on all the radiators (coils).

Ventilation recovery

The installation can be supplemented with the exhaust air module FLM 30/40 to provide ventilation recovery.

To avoid condensation, all pipes and other cold surfaces must be isolated with diffusion-proof material.

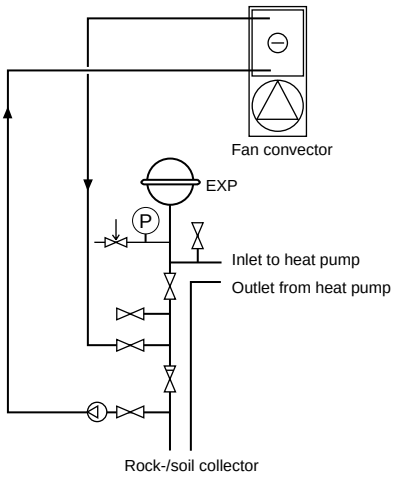


Free cooling

The installation can be supplemented with fan convectors, for example, in order to allow connections for free cooling.

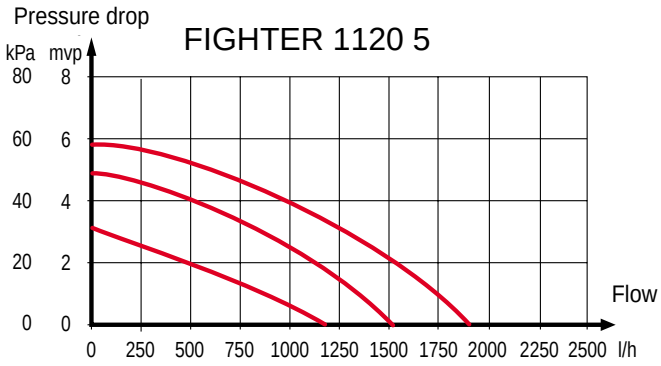
Pipes and other cold surfaces must be insulated with diffusion-proof material to prevent condensation.

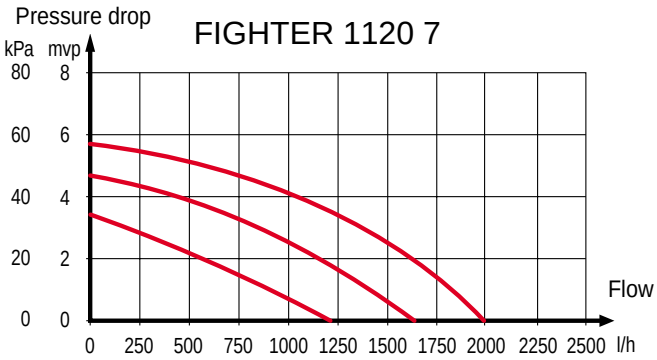
Where the cooling demand is high, fan convectors with drip trays and drain connection are needed.

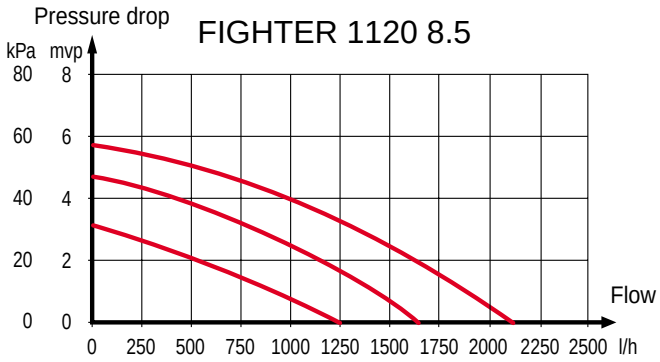


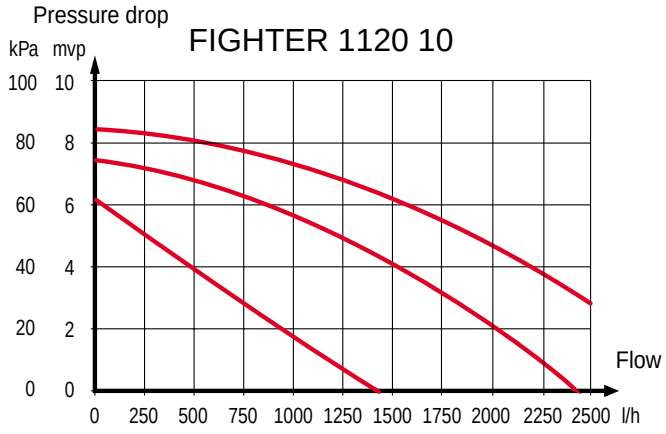
Pump capacity diagrams, heating medium side

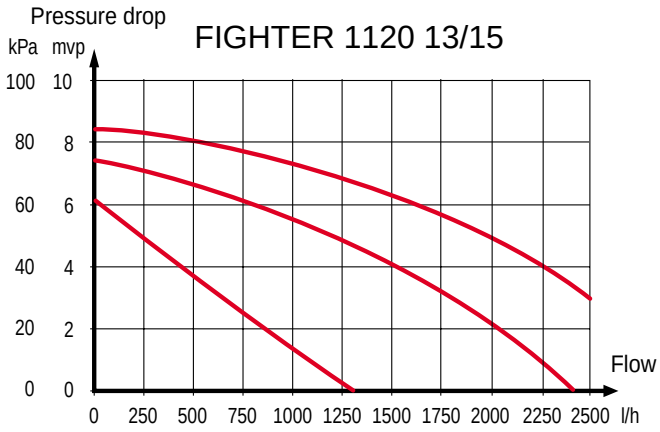
Available pressure equipment







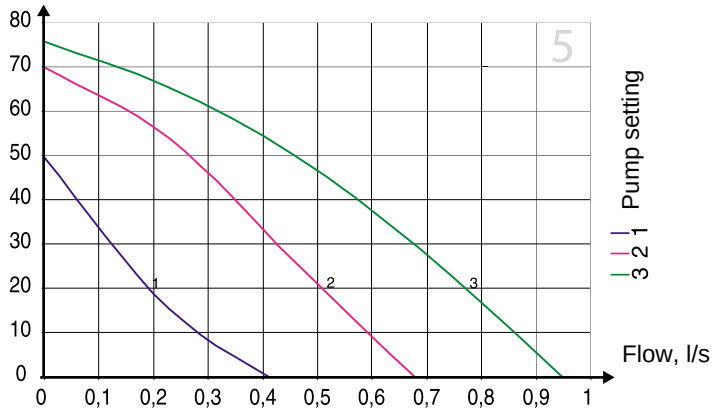




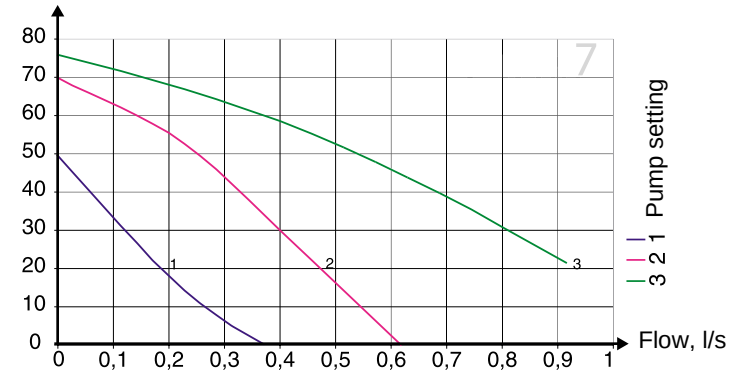
12 Pipe connections

Pump capacity diagrams, brine side

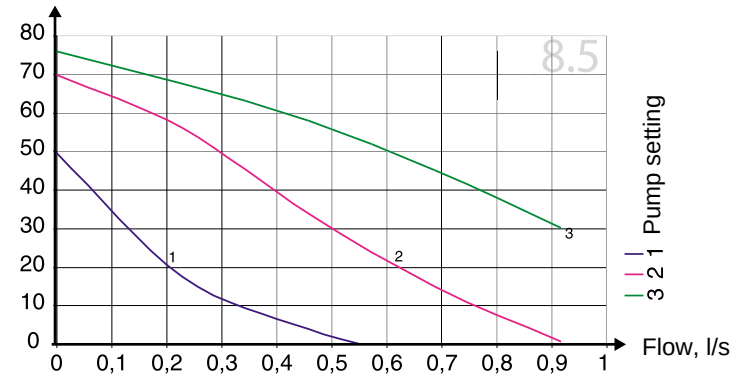
Pressure drop, kPa



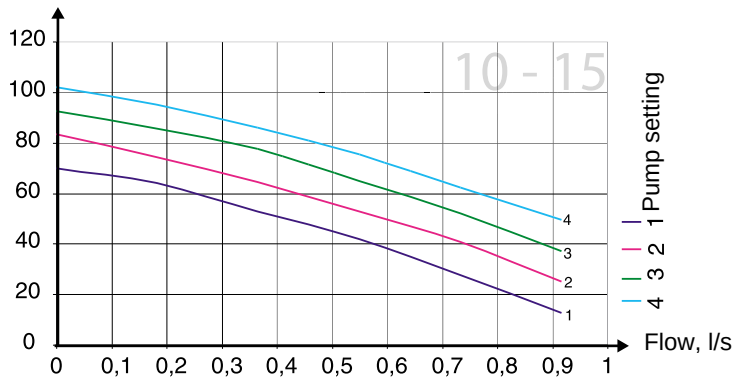
Pressure drop, kPa



Pressure drop, kPa

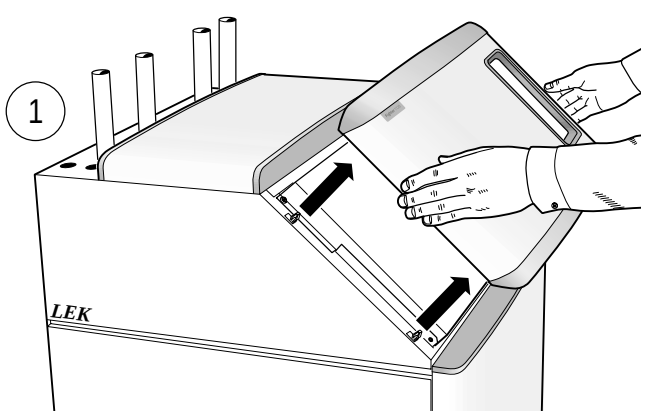


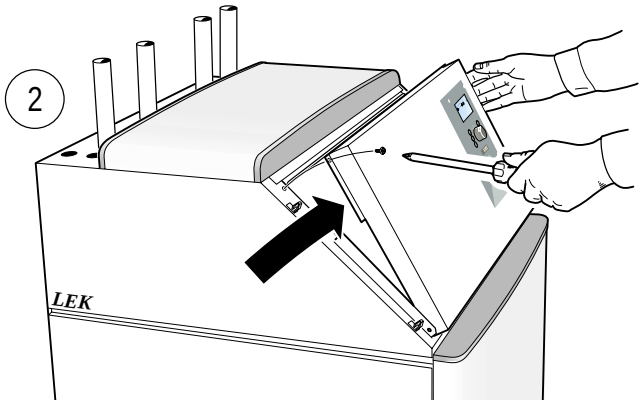
Pressure drop, kPa

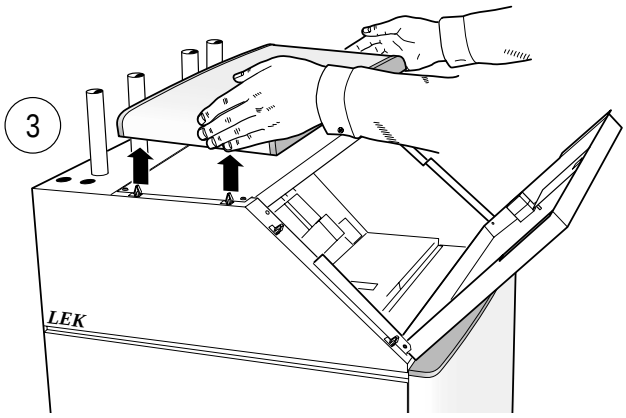


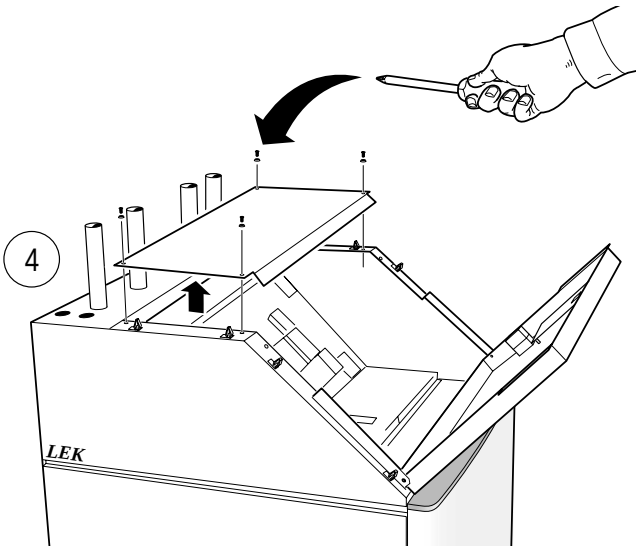
Electrical connection 13

Removing the covers









14 Electrical connection

Connection

FIGHTER 1120 not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician.

FIGHTER 1120 must be installed via an isolator switch with a minimum breaking gap of 3 mm. Other electrical equipment, except the outdoor sensor and the current sensors, are connected at the factory.

Disconnect the heat pump before insulation testing the house wiring.

The heat pump is connected on terminal block (9) to 3 x 400V + N + PE via the junction box with fuses.

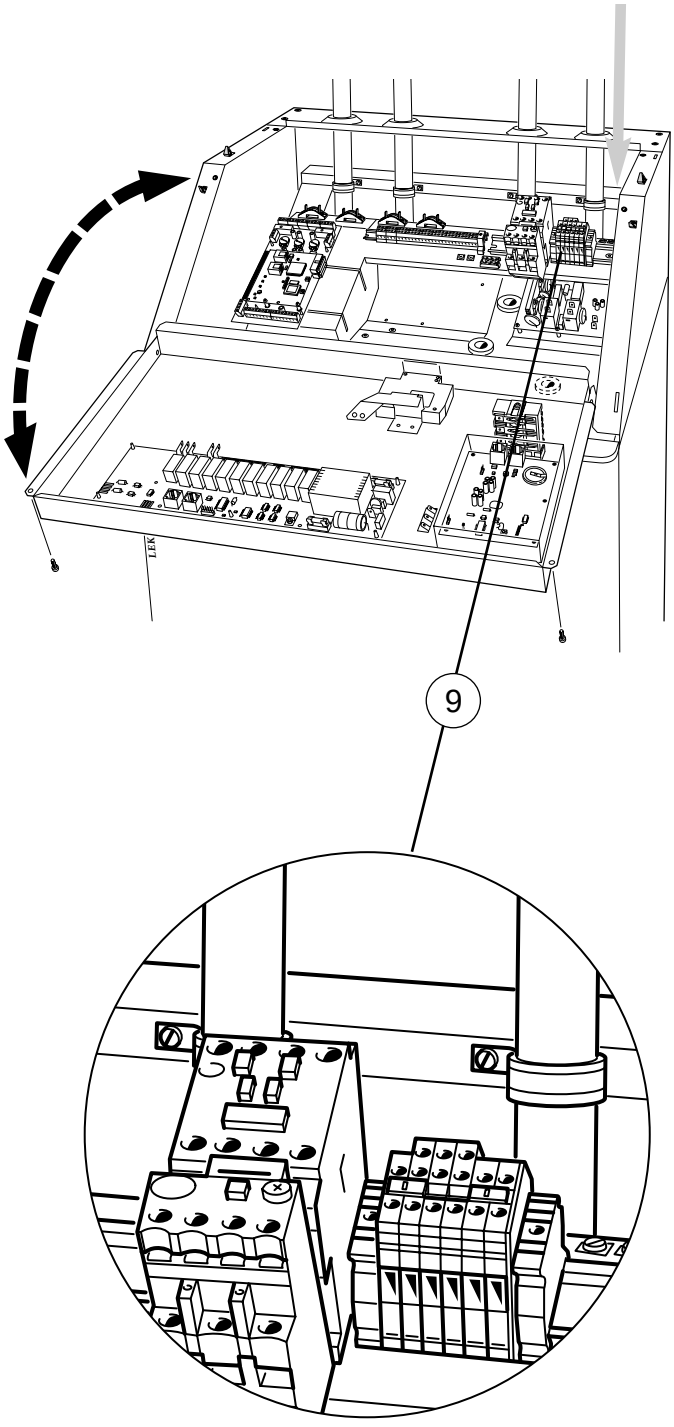
If a miniature circuit breaker is used this should have motor characteristic “D” (compressor operation). For fuse ratings, see Technical data.

The automatic heating control system, circulation pumps and their wiring, are internally fuse protected with a miniature circuit breaker (1).

NOTE!

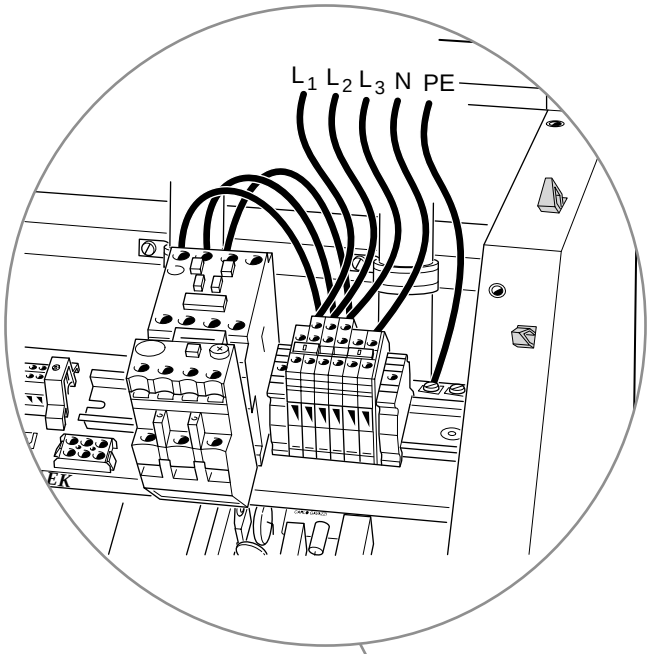
Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the stipulations in force.

Cable entries for the supply and sensors.



Electrical connection 15

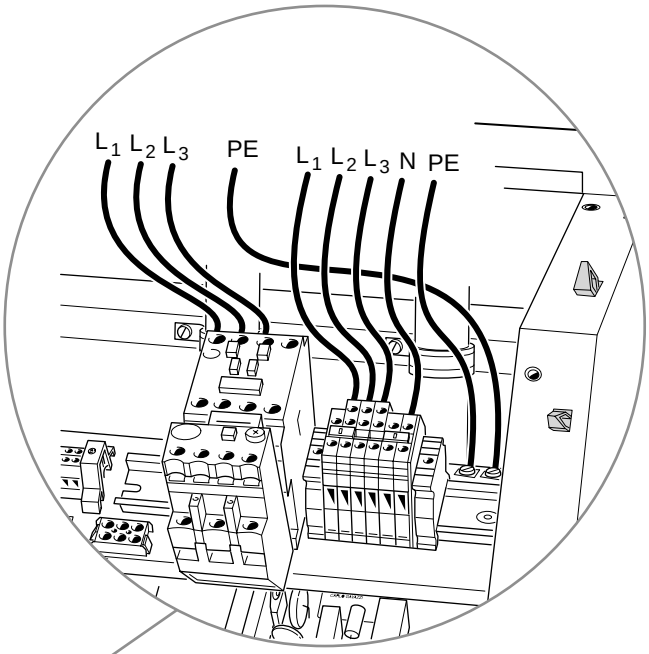
Connection on delivery

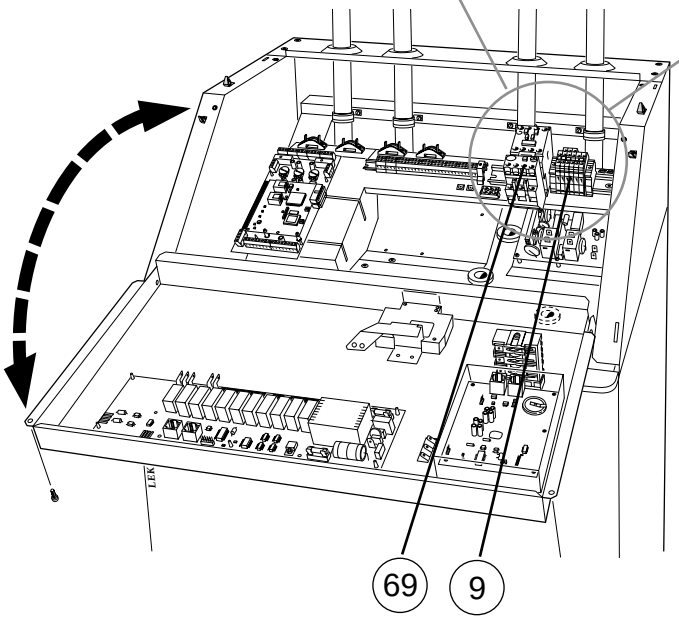


Tariff connection

When a separate compressor and electrical module supply is required to give tariff control do the following:

- Remove the 3 cables between terminal block (9) and the compressor contacts (69). Connect the supply directly to the contactor.
- Remove the 2 orange straps on terminal block (9) and connect the control voltage to the outermost terminals marked L and N on the wiring diagram.



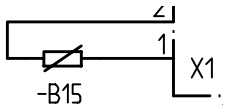


16 Electrical connection

Connecting the outside sensor

- The outside sensor (15) must be installed in a shaded location on a wall facing north or north-west, where it will not be affected by any morning sun. The sensor is connected using a two wire cable to terminals 1 and 2 on the EBV card (2). The minimum cable cross section is 0.4 mm² up to 50 metres. Suitable cable types are EKKX or LiYY.
- If the outside temperature sensor cable runs close to power cables, screened cable should be used. All conduits should be sealed to avoid condensation in the sensor capsule.

Outside temp. sensor



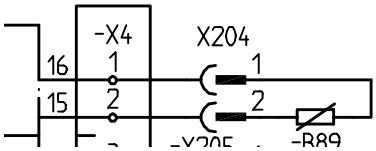
Connecting the temperature sensor included for hot tap water

The supplied sensor is connected using a two-wire cable to terminal positions 11 and 12 on the EBV card (2). The sensor is placed in a submerged tube on the accumulator tank, e.g. VPA.

Connection of the supplied temperature sensor with fixed condensing

Existing sensors are disconnected from the EBV card (2), positions 15 and 16. The sensor supplied is instead connected via a two-wire cable in this position. The sensor is placed in the submerged tube on the electric boiler/accumulator tank.

See docking options 4.

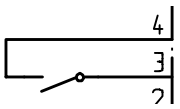


Heating medium flow 1

Connection of the supplied sensors for external compensation

Connecting an external contact, for example, a room thermostat (RT10 accessory) or a timer allows you to temporarily or periodically raise or lower the flow temperature and with that the room temperature. See Menu 2.5 for settings.

Temp set back 1



Max hot water temperature

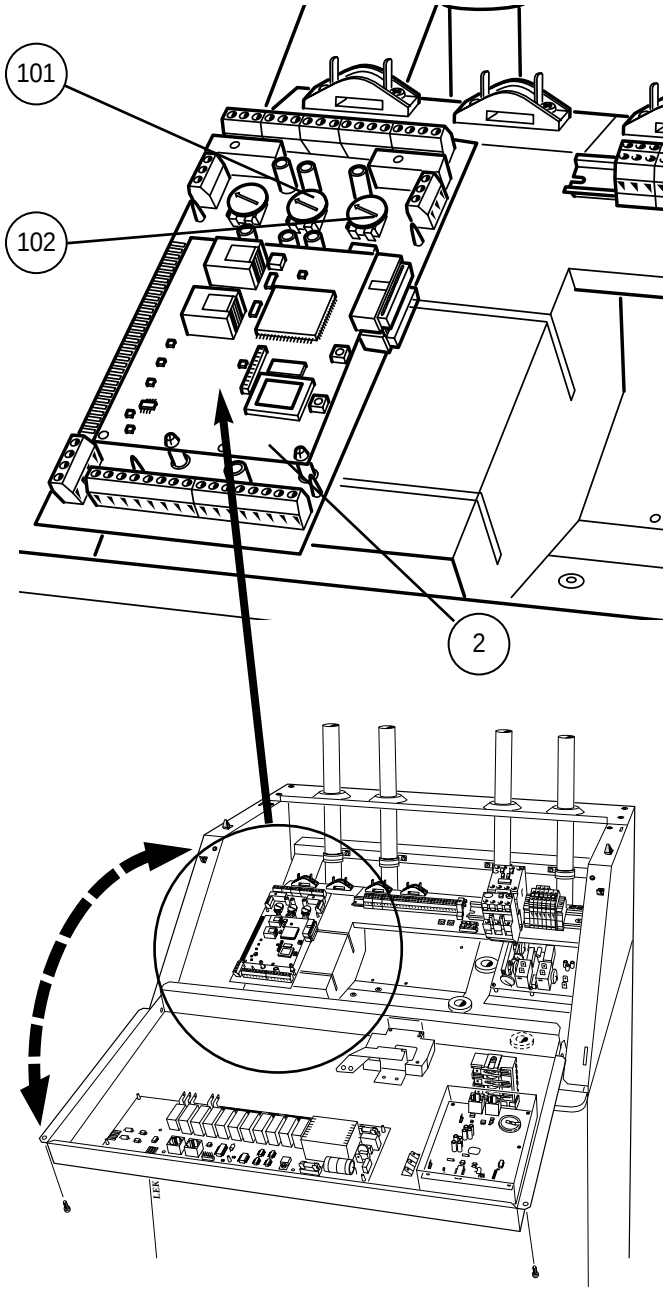
Boiler temperature	Knob position
50	A
55	B
65	C
70	D
75	E
80	F

The setting of the different maximum hot water temperatures is done using the knob (102) on the load monitor card (2).

Max electrical output, three stages binary

Max el. output	Immersion heater, output (kW)	Knob position
6	2	B
6	4	C
6	6	D
9	3	B
9	6	C
9	9	D

The setting of the different max outputs is done using the knob (101) on the load monitor card (2).



18 Electrical connection

Centralised load control and load monitor

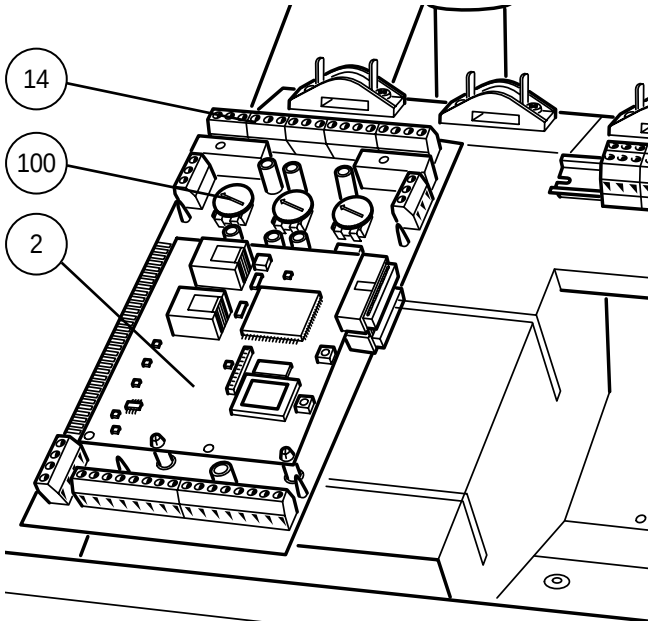
Load monitor

FIGHTER 1120 is equipped with an internal load monitor.

When the load monitor senses an overcurrent on one of the phases, the immersion heater will step down the output until it can be connected again.

The control system must be set for the installation's main fuse so that the load monitor can work correctly. This is done using the knob (100), marked fuse on the load monitor card (2), which is positioned behind the front cover. The supplied current transformers are connected to the terminal block's (14) terminals marked 8 to 11. Terminal 11 is the common conductor for the three current transformers. The current transformers are fitted in the building's distribution box.

Cable type: unscreened LiYY, screened LiYCY. Cable cross section, at least 2 x 0.25 for cable lengths up to 50 m.

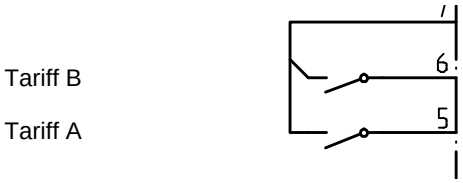


Centralised load control/Tariff

In those cases centralised load control or tariff control is used this can be connected to the terminal block (14) on the load monitor card (2), which is positioned behind the front cover.

When the complete electrical output is to be disconnected, a potential free contact function is connected between 5 and 7 on terminal block (14), tariff A.

When the compressor is to be disconnected, a potential free contact function is connected between 6 and 7 on terminal block (14), tariff B.



Docking 19

General

FIGHTER 1120 can be installed in several different ways, some of which are described below.

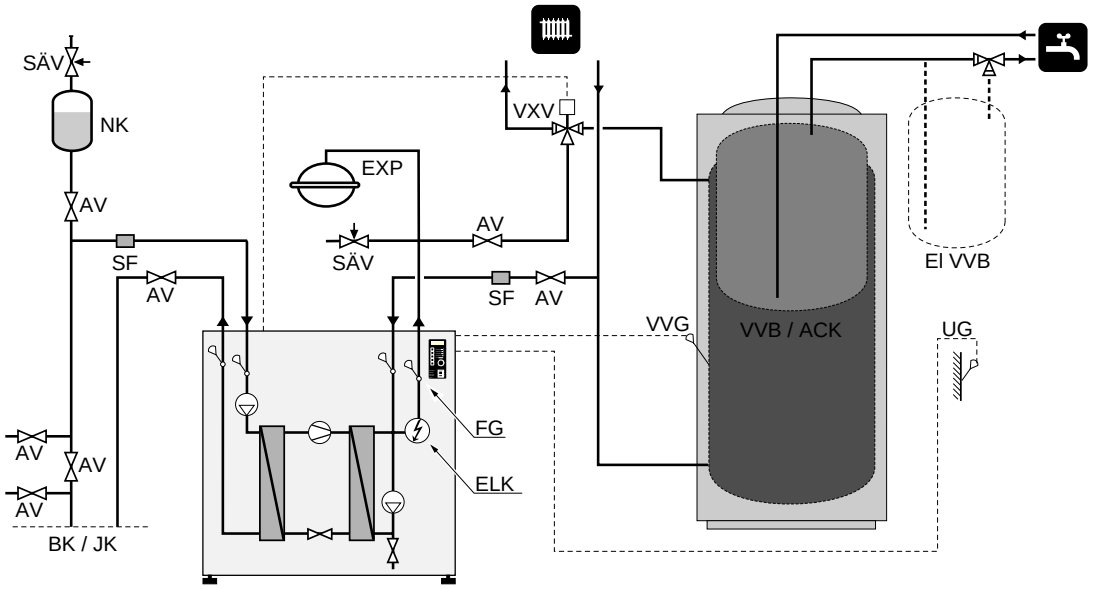
Accessories such as equipment for controlling domestic hot water VST 11, additional heat ETS 11, etc. are ordered separately. The safety equipment must be installed in accordance with current regulations for all docking options.

Abbreviations

AV	Shutoff valve	
BJ/JK	Rock collector/Ground collector	
BV	Check valve	
ELK	Immersion heater	Accessory in ETS 11
El VVB	Electrical hot water heater	
NK	Level vessel	Included with FIGHTER 1120
SF	Particle filter	Included with FIGHTER 1120
SÄV	Safety valve	
PG	Boiler temperature sensor	Included with FIGHTER 1120
FG	Flow sensor	Included with FIGHTER 1120
VVG	Hot water temperature sensor	Included with FIGHTER 1120
UG	Outdoor temperature sensor	Included with FIGHTER 1120
RG	Return temperature sensor	Included with FIGHTER 1120
VVB/ACK	Accumulator with water heater	e.g. VPA
VXV	Reversing valve	Accessory in VST 11
SV	Mixing valve	Motor shunt (230V)

20 Docking - Option 1

Option 1 – FIGHTER 1120 docked with immersion heater and hot water heater (floating condensing)



Principle of operation

FIGHTER 1120 prioritises heating of hot water via a reversing valve (VXV). When the water heater/accumulator tank (VVB/ACK) is fully charged the reversing valve (VXV) switches over to the heating circuit. The heat pump is then controlled by the outdoor sensor (UG) in combination with the built-in flow sensor (FG). The immersion heater (ELK) is connected automatically when the energy requirement exceeds the capacity of the heat pump.

This option requires the accessories ETS 11, and VST 11.

Menu option

This option requires the following selections to be made in:

- Menu 9.2.13.1 Docking type, select opt. ”1”
- Menu 9.2.13.3 Hot water, select On
- Menu 9.2.13.2 Immersion heat type, select the type of immersion heater installation here.

Binary 3 step: Selected when the accessory ETS-11 is connected

Linear 3 step: –

Binary 7 step: –

Off: Preselected

NOTE! These selections are confirmed by switching the heat pump off and on.

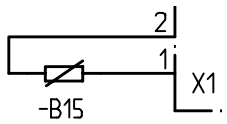
- Check the max. output setting on dial (101), see section Electrical connection — Max electrical output 3-step binary.

Winter operating mode should be selected in order for the electrical supplement to be permitted to start.

Docking - Option 1

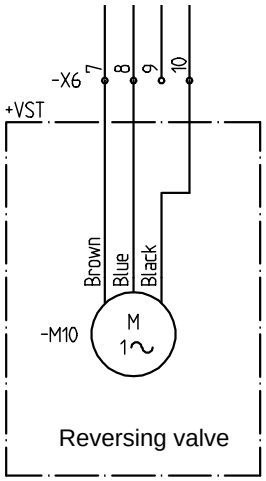
Connection of outside sensor

Outside temp. sensor

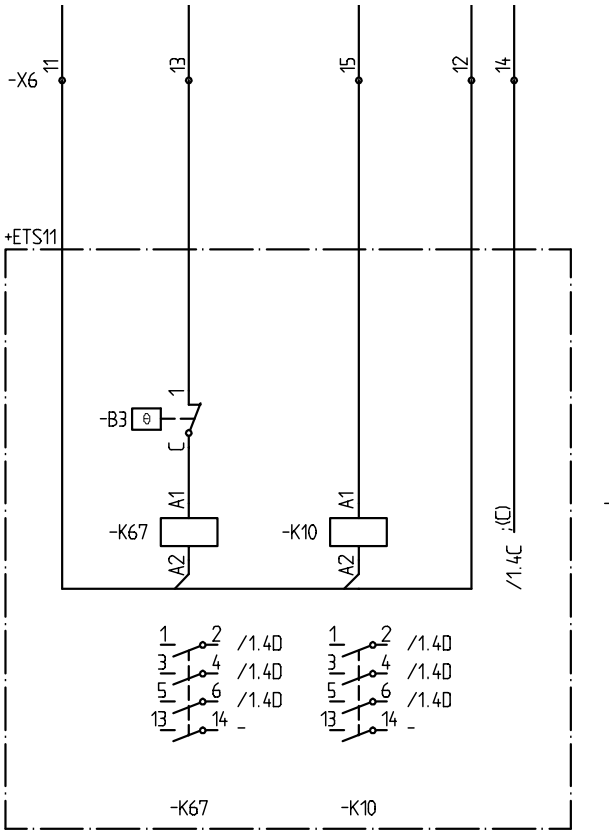


Connection of hot water sensor

Connection VST 11*



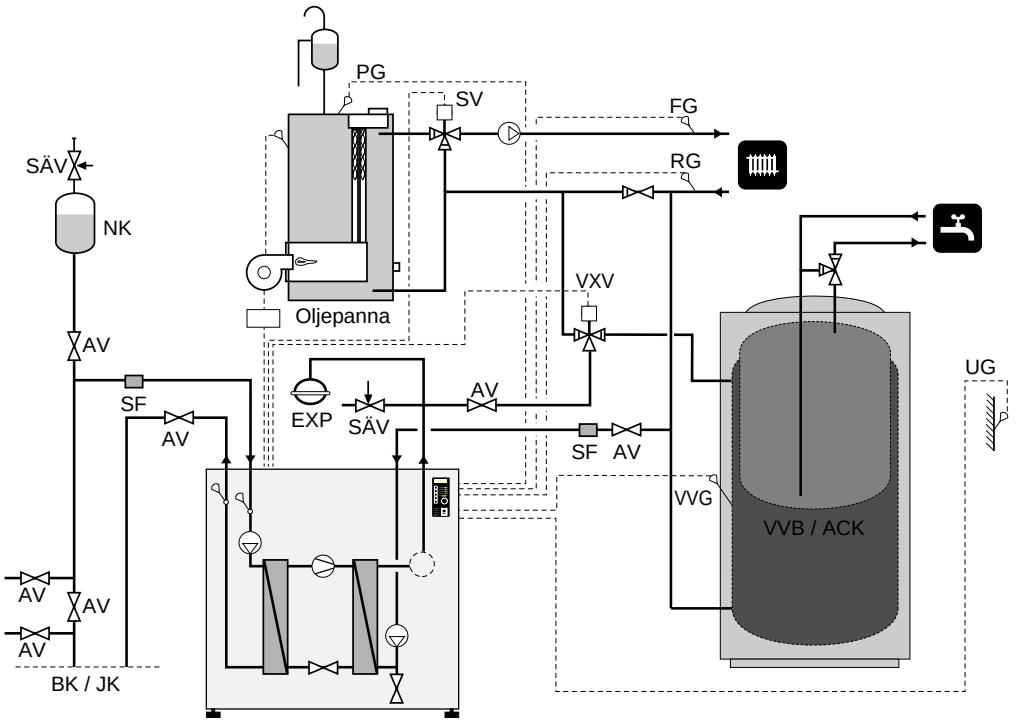
Connection ETS 11*



* Accessories. The figures show how the connection should appear when completed. For full information about the connections see respective Installation instructions.

22 Docking - Option 3

Option 3
FIGHTER 1120 docked to an oil-fired boiler (floating condensing)



Principle of operation

FIGHTER 1120 prioritises charging the hot water heater (VVB/ACK). When the preset hot water temperature is reached, the reversing valve switches to heating. If the heat pump cannot manage to keep the correct flow temperature, the oil-fired boiler starts and the mixing valve (SV) begins to open from the boiler. This option is activated automatically when a boiler sensor (PG) is connected. The flow sensor (FG) and return sensor (RG) should be positioned on the main pipe to the radiators.

This alternative needs the accessory VST 11.

Menu option

This option requires the following selections to be made in:

- Menu 9.2.13.1 Selected docking option select opt. ”3”
- Menu 9.2.13.4 Boiler temp/act mixv, the temperature when the mixing valve should start to work is selected.

When there is also a hot water heater the follow selections should also be made:

- Menu 9.2.13.3 Hot water, select On

NOTE! These selections are confirmed by switching the heat pump off and on.

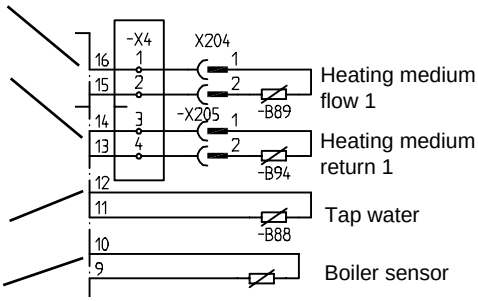
Connection, sensor

Connection of flow sensor, positions 15* and 16* on the EBV-card (2).

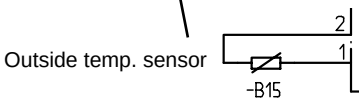
Connection of return temperature senor, positions 13* and 14* on the EBV-card (2).

Connection of hot water sensor, positions 11 and 12 on the EBV-card (2).

Connection boiler temperature sensors, positions 9 and 10 on the EBV-card (2).



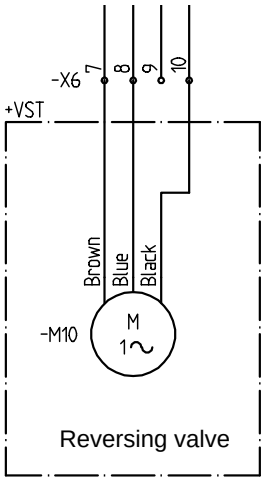
Connection of outside sensor, position 1 and 2 on the EBV-card (2).



* Positions 13 - 16 can ideally be connected directly to the screw terminal.

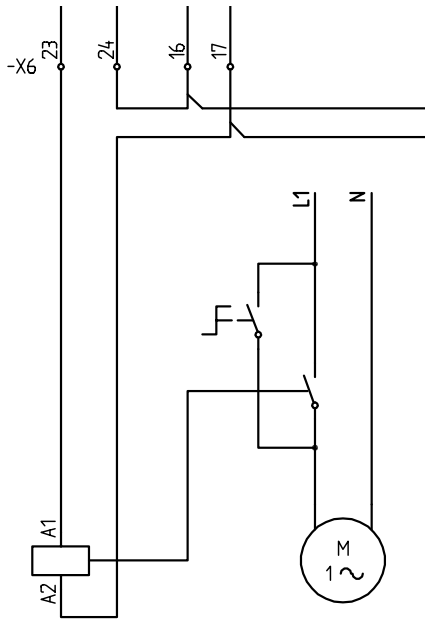
Docking - Option 3

Connection VST 11*



Reversing valve

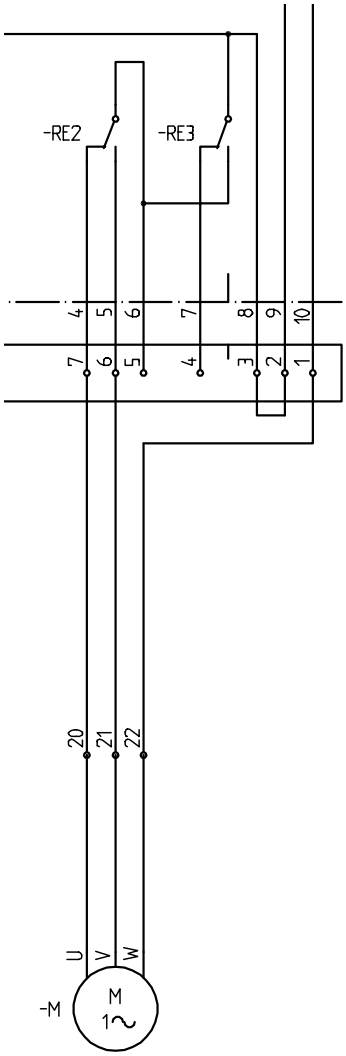
Connection of oil boiler via an external auxiliary relay



Oil boiler

Connection of mixing valve*

Position 20 closes the mixing valve.
Position 21 opens the mixing valve.

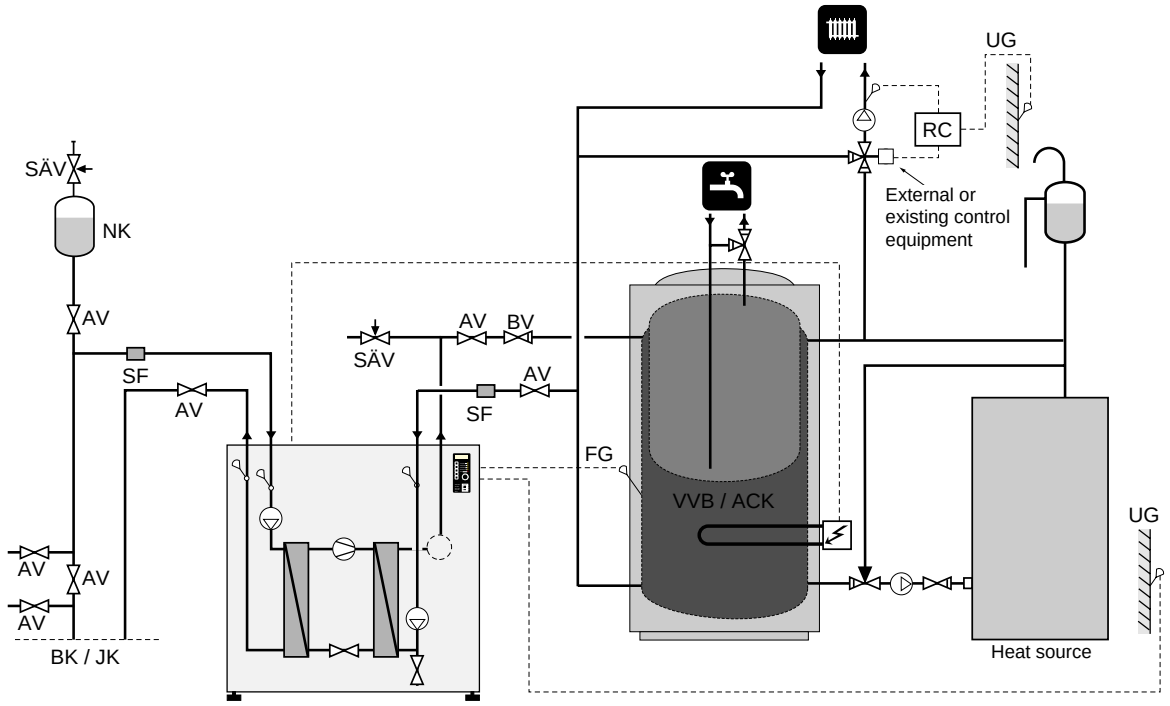


Mixing value

* Accessories. The figures show how the connection should appear when completed. For full information about the connections see respective Installation instructions.

24 Docking - Option 4

Option 4
FIGHTER 1120 docked to another heat source (fixed condensing)



Principle of operation

FIGHTER 1120 prioritises loading the hot water heater/accumulator tank (VVB/ACK). When the wood-fired boiler is used, the heat pump and immersion heater are disconnected with a rising temperature on the flow sensor (FG) and start again when the temperature starts to drop. Self-circulation through the heat pump is prevented by the check valve (BV). The flow sensor (FG) is placed in the submerged tube on the accumulator tank.

Menu option

This option requires the following selections to be made in:

- Menu 9.2.13.1 Docking type, select “4”
- Menu 9.2.13.2 Linear 3 step should be selected
- Menu 9.2.13.3 Hot water, select “Off”

NOTE! These settings must be confirmed by switching the heat pump off and on within 30 minutes.

- Menu 2.3 Flow temp./MIN the value should be set to “50”.
- Menu 2.4 Flow temp./MAX the value should be set to “50”.
- Menu 9.2.2 Flow diff HP select “3”

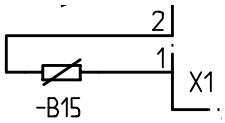
For fixed condensing, 50°C is suitable for both min and max levels. (sensor placement and pump flow observed).

Docking - Option 4

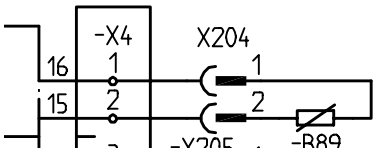
Connection, sensor

Connection of outside sensor

Outside temp. sensor

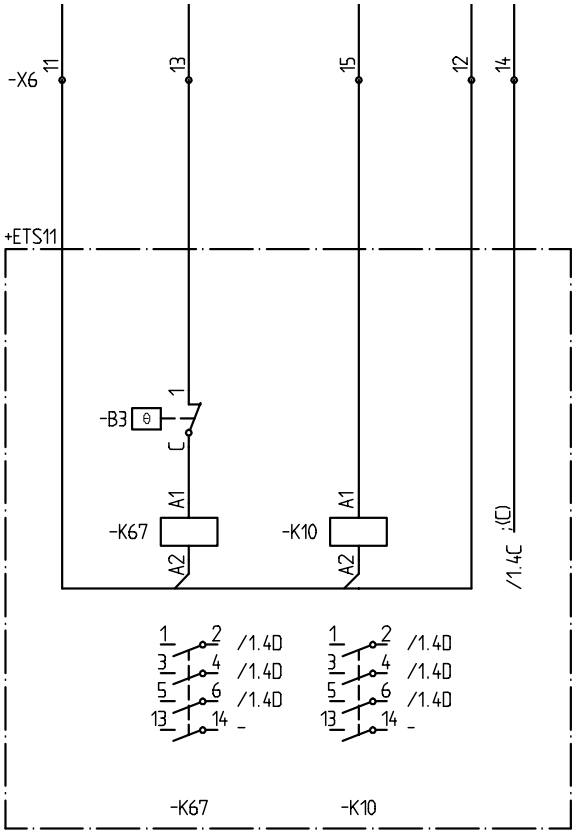


Connection of flow tempera-ture senor



Heating medium flow 1

Connection of external units



26 Commissioning and adjusting

Preparations

Before starting up the system, check that the heating, collector and hot water circuits are full and thoroughly vented. Check the pipe system for leaks.

Filling and venting the cooling medium system

To fill the collector system, mix antifreeze with water, which protects against freezing down to -15 °C, in an open container and connect with filler pump and hoses as illustrated. Close the valve on the main pipe between the service connections and fill through the connection under the level vessel (NK) (which has been removed) until the fluid emerges from the return hose. Then make the following settings on the control panel.

- Set the switch (8) to 1.
- Select Service from menu 8.1.1.
- Switch Electric boiler mode on menu 9.2.4 to On.
- Select On in menu 9.2.12.

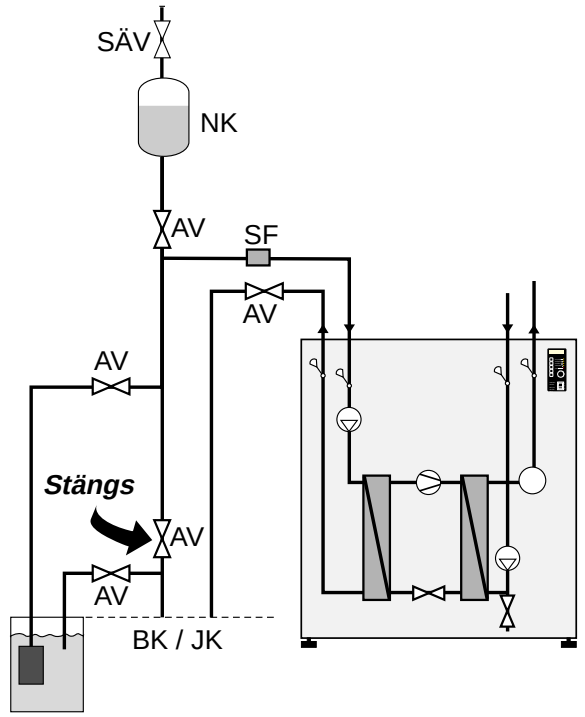
The heat pump cannot start because EP (electric boiler mode only) is selected. The brine pump is now operational together with the filling pump. The fluid can circulate via the mixing vessel until fluid, without air, returns to the return hose.

- Select Off on menu 9.2.12.

Stop the filling pump and clean the particle filter. Then start the filling pump again. Open the valve on the main pipe between the service branches while the filling pump is still operational (to release the air between the branches). Now close the valve by the return hose. Pressurise the system (to max 3 bar) with the filling pump. Close the valve where the level vessel is fitted and stop the filler pump.

Remove the filler hoses and refit the level vessel. Fill the vessel about three-quarters full with the fluid. Now shut the filling plug and open the valve under the vessel.

- Return to normal mode by switching Electric boiler mode on menu 9.2.4. to Off.
- Select the required operating mode with the operating mode selector knob.



SV	Shutoff	BK	Rock collector
SÄV	Safety valve	JK	Ground collector
SF	Particle filter	NK	Level vessel

Filling the heating medium system

The heating medium system is filled with water until the required pressure is reached and then vented.

Soft-start relay

Fighter 1120 is equipped with a soft-starter relay (97) that limits the inrush current on the compressor to max 30A.

NOTE!

The compressor must not be forced to start with periods shorter that 1 start per 15 minutes.

Commissioning and adjusting 27

Starting and checking

- Set the switch (8) to 1.
- Check the settings on the display unit, and adjust so there is a heating requirement.
- Select Service from menu 8.1.1.
- Select brine pump 10 days from menu 9.2.12 to run the brine pump continuously for 10 days. After 10 days the brine pump automatically returns to normal operation.
- Ensure the brine and heating medium pumps are vented and help the pumps to start if necessary.
- Go to menu 5.0 which shows brine supply/return. Ensure that the temperature corresponds with the ground/rock temperature, which indicates the brine flow.
- Select the required operating mode with the operating mode selector knob.

  The compressor will start, and go to menu 5.0. Read the brine temperatures. The difference between these two temperatures should be 2 – 5°C when the system has come into balance. A high difference indicates a high brine flow. A low difference indicates a high brine flow.
- Particular attention should be given to the level in the collector system when using the heat pump at first. Some topping-up may be necessary.
- Check the Flow temperature on menu 2.0 and Return temperature on menu 2.7. The difference between these two temperatures, with floating condensing, should be 5 – 10°C when the heat pump heats the hot water without additional heat. A high difference could depend on a low heat medium flow.
- Fill in the commissioning report on page 2.
- Set the control system to suit the needs of the building.

Readjustment, heating medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the entire system requires further venting. When the system has stabilised (correct pressure and all the air removed) the heating controls can be set at the required value.

Readjustments, brine side

Check the fluid level in the level vessel (85). If the level has dropped, close the valve under the vessel. You can then fill through the connection at the top of the vessel. After filling, open the valve again.

To raise the pressure, close the valve on the incoming main pipe when the brine pump (KBP) is running and the level vessel (NK) is open, so that water is drawn in from the vessel.

28 Setting the heating controls

Setting using diagrams

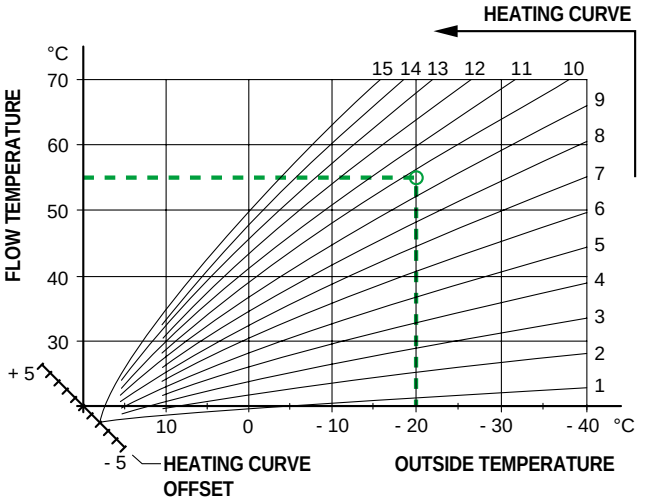
The heating control system of the FIGHTER 1120 is controlled by the outside temperature. This means the supply temperature is regulated in relation to the current outdoor temperature.

The relationship between the outdoor temperature and the flow temperature is set using the computer, see Controls Setting the heating.

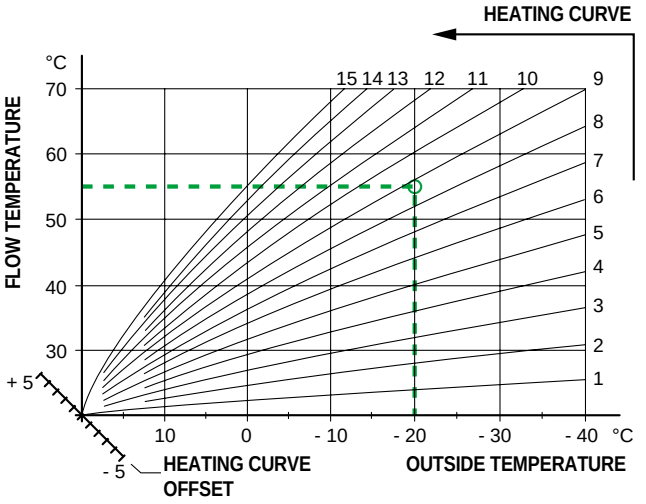
The diagram is based on the dimensioned outdoor temperature in the area and the dimensioned supply temperature of the heating system. When these two values meet, the heating control's curve slope can be read.

The Increase/Reduce heating knob (heating curve offset) can then be set. A suitable value for floor heating is -1 and for radiator systems -2.

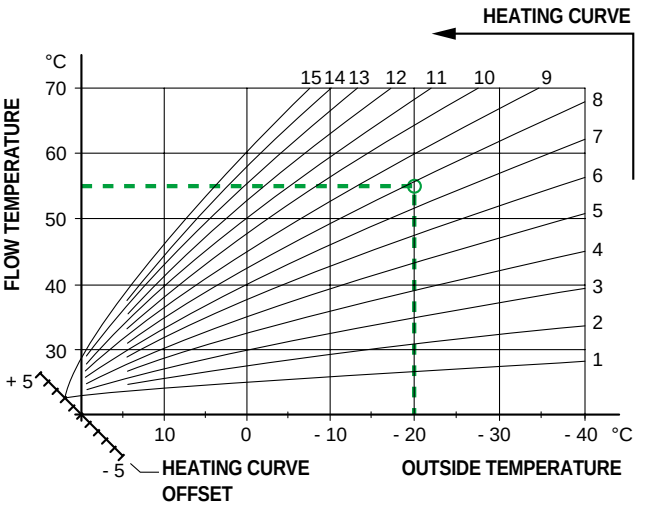
Offset heating curve -2



Offset heating curve 0



Offset heating curve +2



General

The menu tree shows all the menus. Three different menu types can be chosen.

N Normal, covers the normal user's needs.

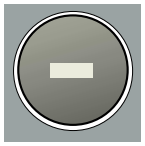
U Extended, shows all menus except the service menus.

S Service, shows all menus, returns to normal 30 minutes after the last button was pressed.

Changing of menu type is done from menu 8.1.1

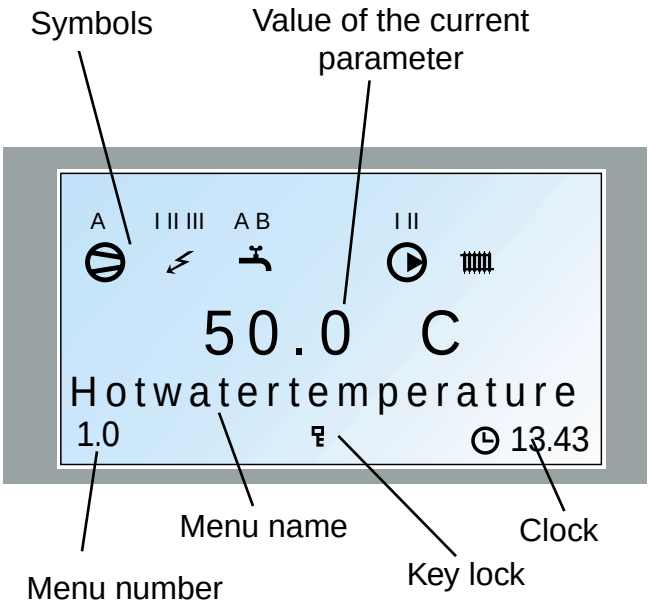
Information is presented on the display about the status of the heat pump and the electric boiler. Menu 1.0 is normally shown on the display screen. The Plus and Minus buttons and the Enter button are used to scroll through the menu system as well as to change the set value in some menus.

The Plus button is used to move forward to the next menu on the current menu level and to increase the value of the parameter in menus where this is possible.



The Minus button is used to move back to the previous menu on the current menu level and to decrease value of the parameter in menus where this is possible.

The Enter button is used to select submenus of the current menu, to permit parameters to be changed and confirm any changes to parameters. When the menu number ends with a zero this indicates there is a submenu.



Key lock

A key lock can be activated in the main menus by simultaneously pressing the Plus and the Minus buttons. The key symbol will then be shown on the display. The same procedure is used to deactivate the key lock.

Quick movement

To quickly return to the main menu from sub-menus press the following:

1. Operating mode button
2. Enter

NOTE!

Ensure the operating mode is not changed during quick movement

Changing parameters

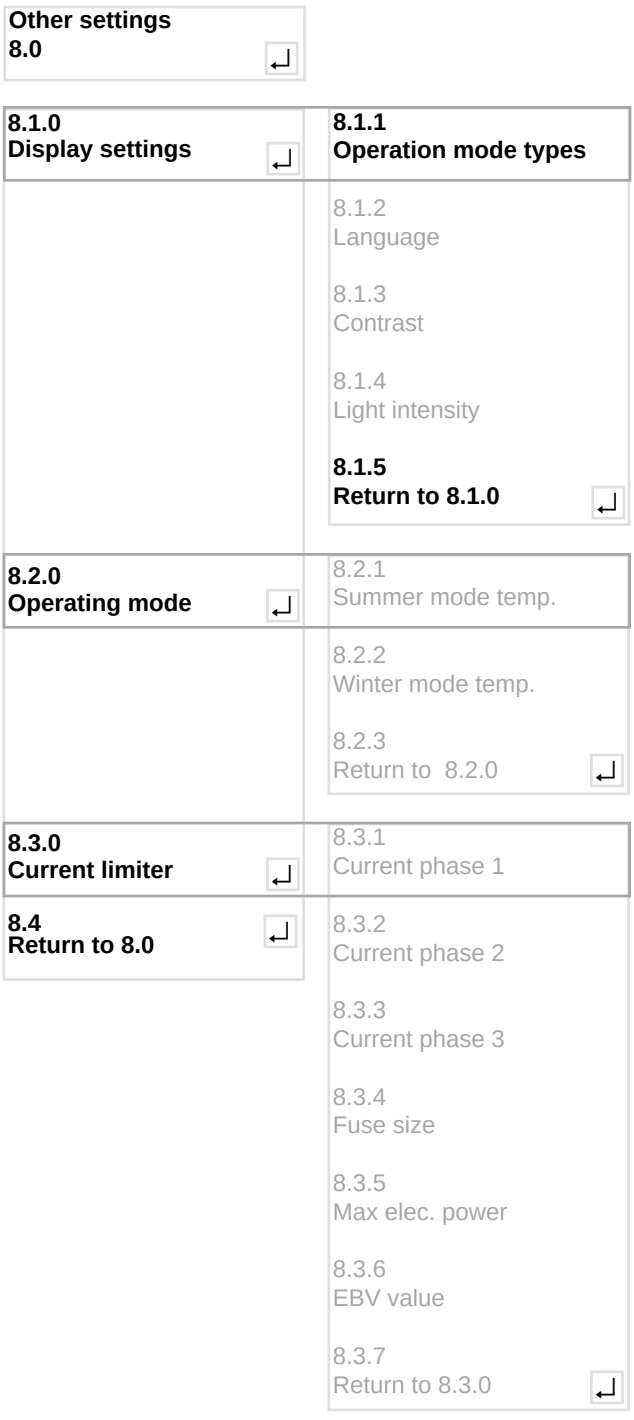
Changing a parameter (value):

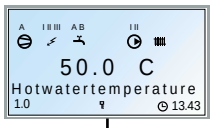
- Access the required menu.
- Press the Enter button, the numerical value starts to flash
- Increase or decrease the value with the Plus/Minus buttons.
- Confirm by pressing the Enter button.
- Menu 1.0 is automatically displayed again 30 minutes after pressing the last button.

Example

Changing the Menu type/Service mode Menu 8.1.1.

- The starting point is menu 1.0.
- Press the plus button to move to menu 8.0.
- Press the enter button to move to menu 8.1.0
- Press the enter button to move to menu 8.1.1
- Press the enter button to allow the value to be changed.
- **Change** the value using the **plus or minus button.**
- Confirm the chosen value by pressing the enter button.
- Press the minus button to move to menu 8.1.5
- Press the enter button to move to menu 8.1.0
- Press the plus button to move to menu 8.2.0
- Press the plus button to move to menu 8.3.0
- Press the plus button to move to menu 8.4
- Press the enter button to move to menu 8.0
- Press the minus button (5 times) to move to menu 1.0





Hotwatertemperature 1.0

1.1
Periodtime HW/Total
Time Heating/Set.
Time HW/Set.

1.2
Time period

1.3
MAX-time HW-period

1.4
HW-temp/Starttemp.HW

1.5
HW-temp/Stoptemp.HW

1.6
Stop Temp. XHW

1.7
Stop compressor XHW

1.8
Interval XHW

1.9
Next XHW action

1.10
HW running time

1.11.0
Pool settings

1.11.1
Pooltemperatur/inst.

1.11.2
Diff. pool/min-temp

1.11.3
Poolperiod

1.11.4
Poolpause

1.11.5
Sensor type

1.11.6
Return to 1.11.0

1.12
Return to 1.0

Flow temperature 2.0

2.1
Curve coefficient

2.2
Offset heating curve

2.3
Flow Temp./MIN

2.4
Flow Temp./MAX

2.5
External adjustment

2.6.0
Own curve definition

2.6.1
Flow temp.at +20ºC

2.6.2
Flow temp.at -20ºC

2.6.3
Set temperature

2.6.4
Flow temp at set

2.6.5
Return to 2.6.0

2.7
Return temp./MAX

2.8
Degree minutes

2.10
Return to 2.0

Outdoor temperature 4.0

4.1
Outdoor avg. temp.

4.2
Return to 4.0

Brine in-/out- temp. 5.0

5.1
Brine ret. temp/MIN

5.2
Autoreset brinealarm

5.3
Time between starts

5.4
Compr. starts at

5.5
Time to start
Status

5.6
Number of starts

5.9
Comp. acc. run time

5.11
Hot gas temp.

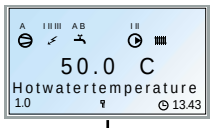
5.12
Liquide line temp.

5.13
Bulb temperature

5.14
Compressor type

5.21
Return to 5.0

* Only shown when On is selected in menu 9.2.13.3.



Clock
7.0 ↵

7.1
Date

7.2
Time

7.3.0
Temp set back time 1 ↵

7.3.1
Heating sys per. 1

7.3.2
Set back temp. +/-

7.3.3 - 7.3.9
Set time Monday - Sunday

7.3.10
Return to 7.3.0 ↵

7.4.0
Temp set back time 2 ↵

7.4.1
Heating sys per. 2

7.4.2
Set back temp. +/-

7.4.3 - 7.4.9
Set time Monday - Sunday

7.4.10
Return to 7.4.0 ↵

7.5.0
Timer XHW ↵

7.5.1
Timer Extra HW

7.5.2
Extra HW Monday - Sunday

7.5.3
Return to 7.5.0 ↵

7.7
Reset timers

7.8
Return to 7.0 ↵

Other settings
8.0 ↵

8.1.0
Display settings ↵

8.1.1
Operation mode types

8.1.2
Language

8.1.3
Contrast

8.1.4
Light intensity

8.1.5
Return to 8.1.0 ↵

8.2.0
Operating mode ↵

8.2.1
Summer mode temp.

8.2.2
Winter mode temp.

8.2.3
Return to 8.2.0 ↵

8.3.0
Current limiter ↵

8.3.1
Current phase 1

8.3.2
Current phase 2

8.3.3
Current phase 3

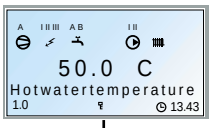
8.3.4
Fuse size

8.3.5
Max elec. power

8.3.6
EBV value

8.3.7
Return to 8.3.0 ↵

8.4
Return to 8.0 ↵



Service menues
9.0

9.1.0
Add. heat settings

9.1.1
Start BIN 3 step
Start LIN 3 step
Start BIN 7 step

9.1.2
Diff. BIN 3 step
Diff. LIN 3 step
Diff. BIN 7 step

9.1.3
Add heat run time

9.1.4
Return to 9.1.0

9.2.0
Operating mode set

9.2.1
Max HW temp

9.2.2
Flow diff HP

9.2.3
Diff HP Add

9.2.4
Electric boiler

9.2.5
System 2 Present

9.2.6
Room disp Present

9.2.7
Circ. pump 1

9.2.8
Circ. pump 2

9.2.9.0
Floor drying set

9.2.9.1
Floor drying

9.2.9.2
Numb. of days per. 1

9.2.9.3
Temp. period 1

9.2.9.4
Numb. of days per. 2

9.2.9.5
Temp. period 2

9.2.9.6
Return to 9.2.9.0

9.2.10
Pool control

9.2.11
Brine pressostat

9.2.12
Brinepump 10 days

9.2.13.0
Docking.

9.2.13.1
Docking type

9.2.13.2
Immersion heat type

9.2.13.3
Hot water

9.2.13.4
Boiler temp/act mixv

9.2.13.5
Start value OilPower

9.2.13.6
Oil burner on

9.2.13.7
Return to 9.2.13.0

9.2.14
Factory setting

9.2.15
RCU Present

9.2.16
HPAC Present

9.2.17
Return to 9.2.0

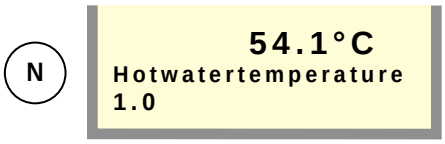
9.3
Quick start

9.4.0
TEST/Forced operat.

9.5.0 - 9.8.0
Log 1. - 4.

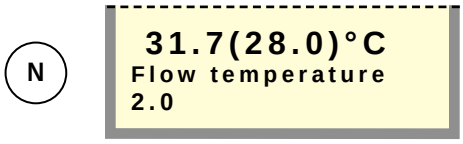
9.9
Return to 9.0

Main menus



Menu 1.0 Hotwatertemperature

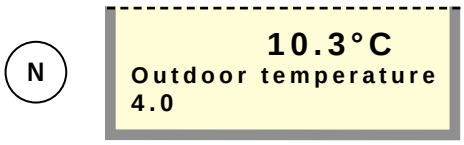
The how water temperature (88) in the outer jacket are shown here. Note that the hot water temperature at the top of the tank is usually higher.



Menu 2.0 Flow temperature

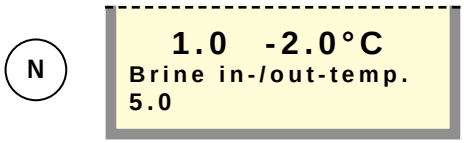
The current supply temperature (89) for the heating system is shown here with the calculated flow temperature in brackets.

Shown alternately with Hot water heating.



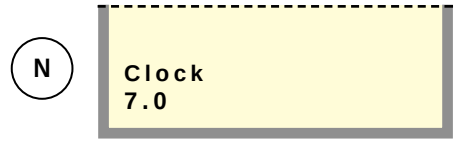
Menu 4.0 Outdoor temperature

The current outdoor temperature is shown here.



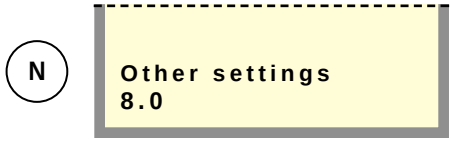
Menu 5.0 Brine in-/out-temperature

Readings regarding the temperatures and compressor are made from the submenus to this menu.



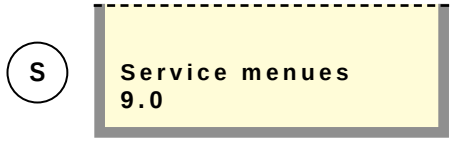
Menu 7.0 Clock

Settings regarding the date and time are made in the submenus of this menu. Even different temperature reductions and increases at selected times are set from this menu.



Menu 8.0 Other settings

Settings regarding the menu type, language, operating mode settings and load monitor reading are made in the submenus to this menu.



Menu 9.0 Service menues

This menu and its submenus are only shown on the display screen when access has been selected in menu 8.1.1.

Values can be read and various settings can be made from these submenus. NOTE! These settings should only be made by persons with the necessary expertise.

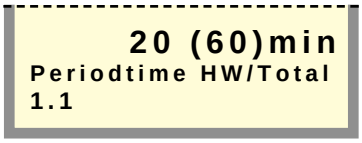
N Normal, covers the normal user's needs.

U Extended, shows all menus except the service menus.

S Service, shows all menus, returns to normal 30 minutes after the last button was pressed.

Hot water temperature

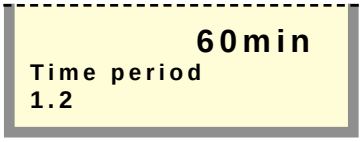
N



Menu 1.1 Periodtime HW/Total

The time of the hot water period and the time for the whole period are shown here.

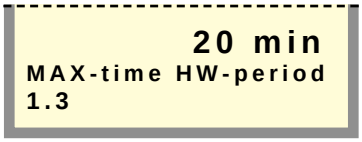
N



Menu 1.2 Time period

The length of time is set here. The value is adjustable between 5 and 60.

N



Menu 1.3 MAX-time HW-period

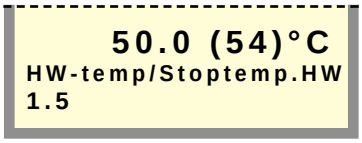
The time (menu 1.1) that the hot water should be heated in each period is selected here. The value is adjustable between 5 and 60.

N

Menu 1.4 HW-temp/Starttemp.HW

The temperature when the heat pump starts to work with the hot water heater is set here. The value is adjustable between 25 and 50.

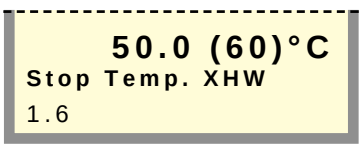
N



Menu 1.5 HW-temp/Stoptemp.HW

The temperature when the heat pump/immersion heater should stop heating the water is set here. The value is adjustable between 30 and 80.

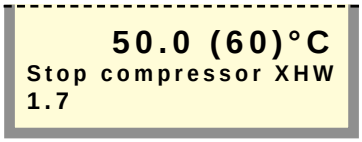
U



Menu 1.6 Stop Temp. XHW

The required stop temperature for extra hot water is set here. The value is adjustable between 40 and 70.

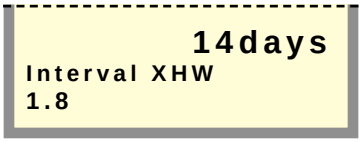
U



Menu 1.7 Stop compressor XHW

The temperature to stop the compressor for extra hot water is set here. The value is adjustable between 50 and 65.

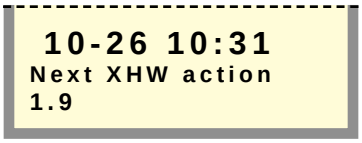
U



Menu 1.8 Interval XHW

How often the hot water temperature is increased from the normal level to the extra hot water level is shown here. The time is adjustable between 0 and 90 days. Extra hot water is shutoff when 0 is set. Extra hot water starts when the value has been confirmed.

U



Menu 1.9 Next XHW action

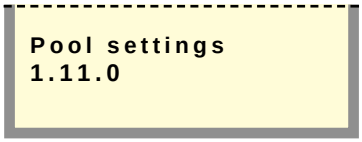
Future increases to the extra hot water level are shown here.

U

Menu 1.10 HW running time

How long hot water heating has been in progress is shown here (accumulated).

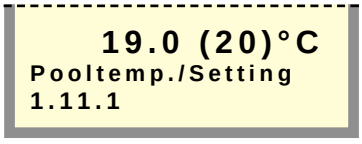
U



Menu 1.11.0 Pool settings

Pool settings are made on the submenus to this menu.

U



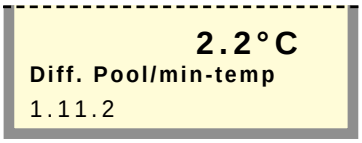
Menu 1.11.1 Pooltemp./Setting

The temperature when pool heating is stopped is stated here.

The value is adjustable between 15 and 35°C.

Hot water temperature

U

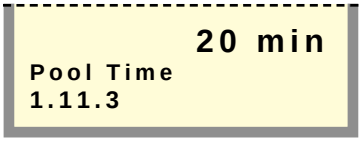


Menu 1.11.2 Diff. Pool/min-temp

The difference from the value in menu 1.11.1 when pool heating starts is stated here.

The value is adjustable between 0.5 and 3°C.

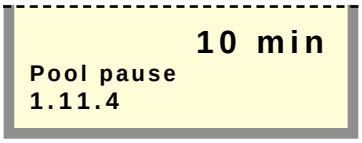
U



Menu 1.11.3 Pool Time

The maximum time that pool heating can run is stated here. The value is adjustable between 5 and 60 minutes.

U

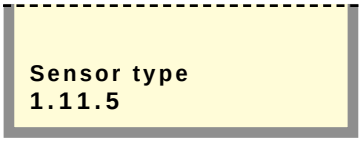


Menu 1.11.4 Pool pause

The time between pool heating is set here.

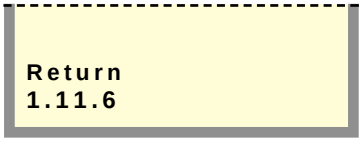
The value is adjustable between 5 and 60 minutes.

U



Menu 1.11.5 Sensor type

No function.



Menu 1.11.6 Return

Pressing the enter button returns you to menu 1.11.0

Menu 1.12 Return

Pressing the enter button returns you to menu 1.0

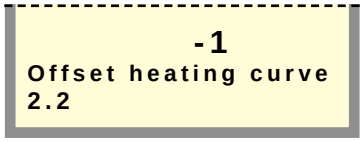
Supply temperature

N

Menu 2.1 Curve coefficient

The selected curve slope (heating curve) is shown here. The Own curve function is activated at value 0, see menu 2.6.0. The value can be set between curve 0 and 15.

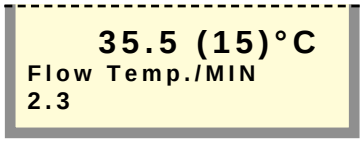
N



Menu 2.2 Offset heating curve

The selected offset heating curve is shown here. The value is adjustable between -10 and +10. NOTE! The value is changed using the Offset heating curve knob.

U

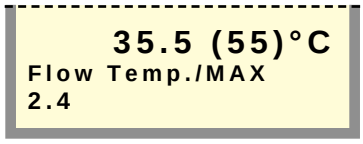


Menu 2.3 Flow Temp./MIN

The set minimum level for the supply temperature to the heating system is shown here. The value is adjustable between 10 and 65.

The calculated flow temperature never drops below the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

U

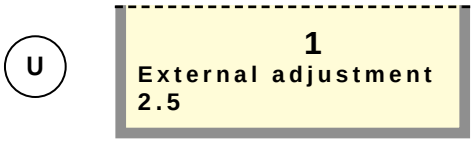


Menu 2.4 Flow Temp./MAX

The set maximum level for the supply temperature to the heating system is shown here. The value is adjustable between 10 and 65 °C

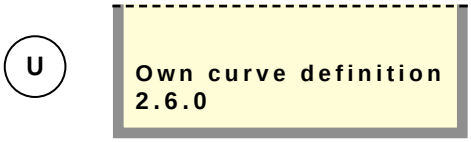
The calculated flow temperature never exceeds the set level irrespective of the outdoor temperature, curve slope or offset heating curve.

Supply temperature



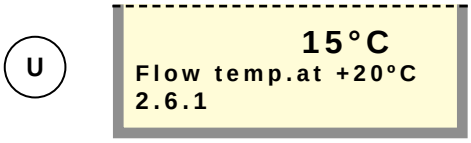
Menu 2.5 External adjustment

Connecting an external contact, see Electrical connections - External contacts, for example, a room thermostat (RT10 accessory) or a timer allows you to temporarily or periodically raise or lower the flow temperature and with that the room temperature. When the external contact is made the calculated flow temperature is changed by the number of degrees shown here. The value is adjustable between -25 and +25.



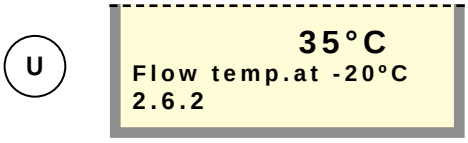
Menu 2.6.0 Own curve definition

You own curve definition is chosen here. This is an individual linear curve with one break point. You select a break point and the associated temperatures. NOTE! The Curve slope in menu 2.1 must be set to 0 to activate this function.



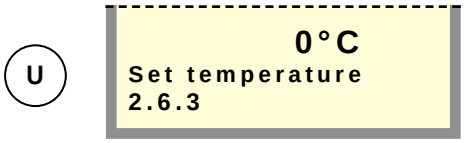
Menu 2.6.1 Flow temp.at +20ºC

The flow temperature at an outside temperature of +20 is chosen here. The value is adjustable between 0 and 60.



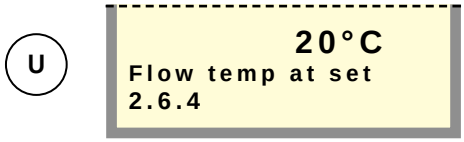
Menu 2.6.2 Flow temp.at -20ºC

The flow temperature at an outside temperature of -20 is chosen here. The value is adjustable between 0 and 60.



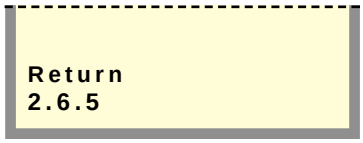
Menu 2.6.3 Set temperature

Here you select at what outside temperature the break point shall occur. The value is adjustable between 0 and 60.



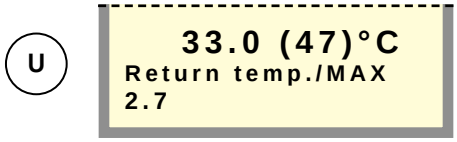
Menu 2.6.4 Flow temp at set

You set the required flow temperature for the break point here. The value can be set between curve 0 and 60.



Menu 2.6.5 Return

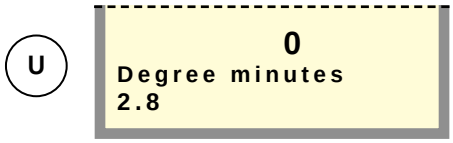
Pressing the enter button returns you to menu 2.6.



Menu 2.7 Return temp./MAX

Here the maximum return flow temperature is set for compressor operation.

The value is adjustable between 40 and 60.



Menu 2.8 Degree minutes

Current value for number of degree-minutes. For example, this value can be changed to accelerate the start of heating production. The value can be set between 100 and -800.

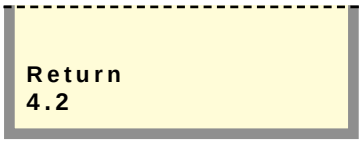
Menu 2.10 Return

Pressing the Enter button returns you to menu 2.0.

Outside temperature

Menu 4.1 Outdoor avg. temp.

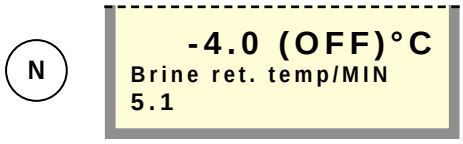
Average outdoor temperature during the last 24 hours .



Menu 4.2 Return

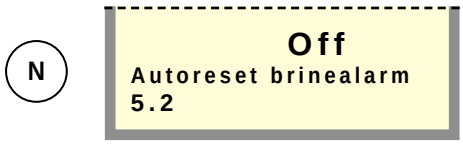
Pressing the Enter button returns you to menu 4.0.

Brine flow/return



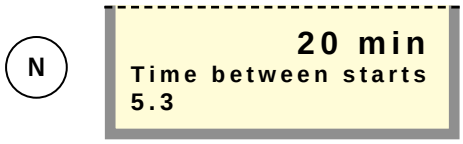
Menu 5.1 Brine ret. temp/MIN

The lowest brine temperature is set here. The value is adjustable between 12 and -11 minutes. When a lower temperature is selected OFF is shown, which means the heat pump never gives an alarm for a low brine temperature.



Menu 5.2 Autoreset brinealarm

Automatic restart after an HF alarm, when the temperature rises 3 °C above the selected alarm level (menu 5.1) for the brine return is selected here. The value is adjustable On or Off.



Menu 5.3 Time between starts

Time between compressor starts is set here. The value is adjustable between 10 and 60.

Menu 5.4 Compr. starts at

How low the degree minutes may drop before the a compressor start can take place is set here. The value is adjustable between -5 and -250.

Menu 5.5 Status

Shows the compressor status for the heat pump.

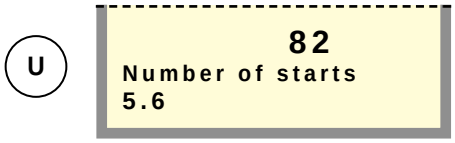
Start in XX minutes, means the compressor will start as soon as the time condition permits.

Inactive means the compressor is at a stand still.

Compr. On means the compressor is running.

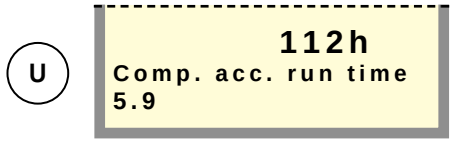
brine pump On means the brine pump is running.

Brine flow/return



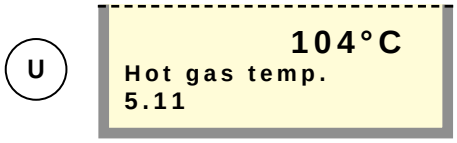
Menu 5.6 Number of starts

The accumulated number of starts with the compressor is shown here.



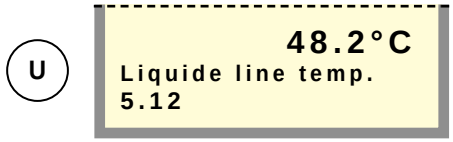
Menu 5.9 Comp. acc. run time

The accumulated time that the compressor has been in operation is shown here.



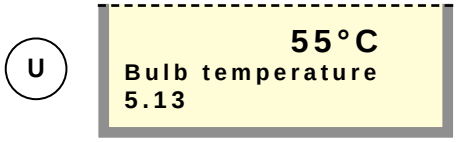
Menu 5.11 Hot gas temp.

The hot gas temperature is shown in this menu.



Menu 5.12 Liquide line Temp.

The fluid line temperature is shown in this menu.

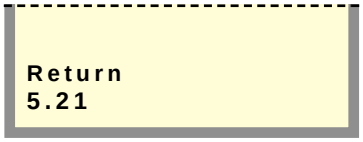


Menu 5.13 Bulb temperature

The suction gas temperature is shown in this menu.

Menu 5.14 Compressor type

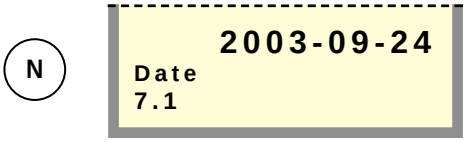
No function.



Menu 5.21 Return

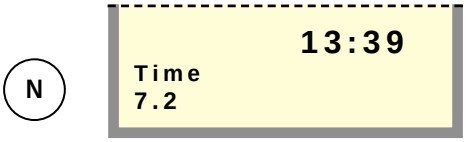
Pressing the enter button returns you to menu 5.0.

Clock



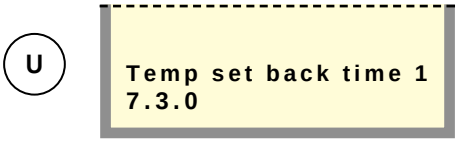
Menu 7.1 Date

The current date is set.



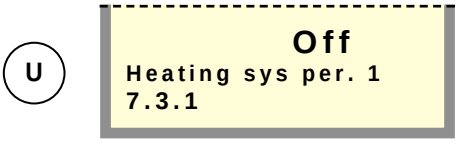
Menu 7.2 Time

Here the current time is set.



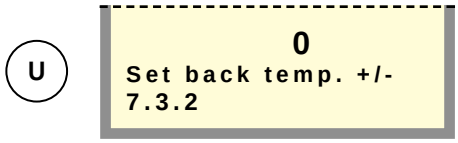
Menu 7.3.0 Day change period 1

Settings, e.g. for night reduction can be selected in the submenus to this menu.



Menu 7.3.1 Heating sys per. 1

The shunt system to be affected by day change period 1 is selected here. When shunt group 2 is installed both Shunt 1 and 2 can be selected.



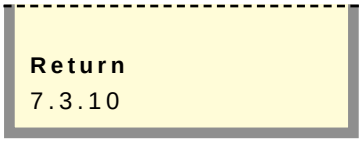
Menu 7.3.2 Set back temp. +/-

Changes to the flow temperature with a day change, e.g. night reduction are set here. The value is adjustable between -10 and 10.

Menu 7.3.3 — 7.3.9 Set Time Monday — Sunday

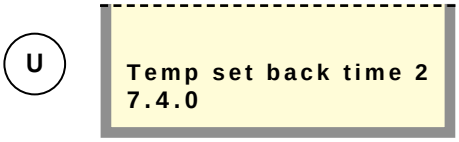
The time for the day change, e.g. night reduction, is chosen here.

Clock



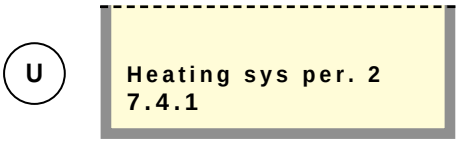
Menu 7.3.10 Return

Pressing the enter button returns you to menu 7.3.0



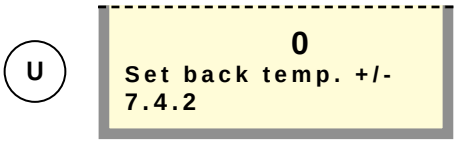
Menu 7.4.0 Temp set back time 2

Settings, e.g. for night reduction can be selected in the submenus to this menu.



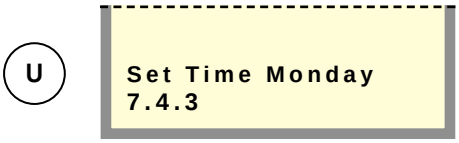
Menu 7.4.1 Heating sys per. 2

The shunt system to be affected by day change period 2 is selected here. When shunt group 2 is installed both Shunt 1 and 2 can be selected.



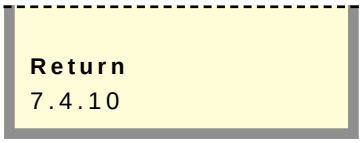
Menu 7.4.2 Set back temp. +/-

Changes to the flow temperature with a day change, e.g. night reduction are set here. The value is adjustable between -10 and 10.



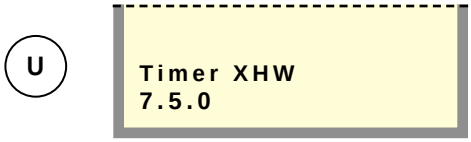
Menu 7.4.3 — 7.4.9 Set Time Monday — Sunday

The time for the day change, e.g. night reduction, is chosen here.



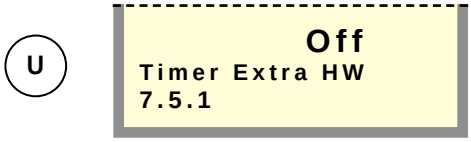
Menu 7.4.10 Return

Pressing the enter button returns you to menu 7.4.0



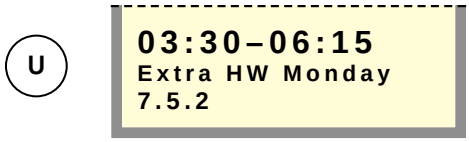
Menu 7.5.0 Timer XHW

Settings are made in the submenus of this menu when extra hot water is required on a specific day.



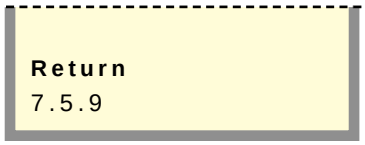
Menu 7.5.1 Timer Extra HW

You choose here whether the time setting should be On or Off.



Menu 7.5.2 — 7.5.8 Extra HW Monday — Sunday

Here you select the period for respective days when extra hot water should be activated. Hours and minutes for both start and stop are shown Equal values or the stop time before the start time means that extra hot water is not activated.

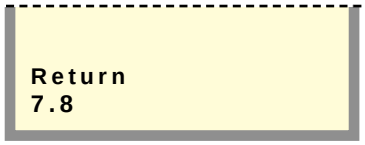


Menu 7.5.9 Return

Pressing the enter button returns you to menu 7.4.0

Menu 7.7 Reset timers

You can chose here to reset the time settings. Automatic return to Off after one minute.



Menu 7.8 Return

Pressing the Enter button returns you to menu 7.0.

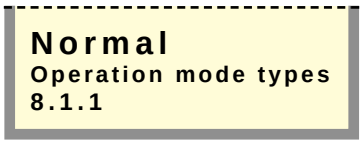
Other settings

N

Menu 8.1.0 Display settings

Settings concerning language and menu type are set on the submenus to this menu.

N



Menu 8.1.1 Operation mode types

The menu type is chosen here: Normal, extended or service.

N Normal, covers the normal user's needs.

U Extended, shows all menus except the service menus.

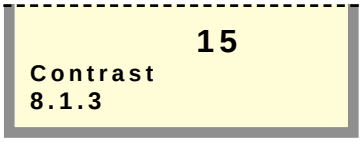
S Service, shows all menus, returns to Normal 30 minutes after the last button was pressed.

N

Menu 8.1.2 Language

Language settings are made here.

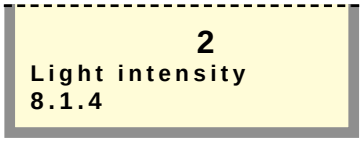
U



Menu 8.1.3 Contrast

The display's contrast is set here. The value is adjustable between 0 and 31.

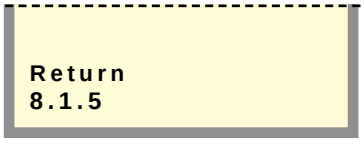
U



Menu 8.1.4 Light intensity

The light intensity in idle mode is set here. The value is adjustable between 0 and 2. Idle mode occurs 30 minutes after the last button was pressed.

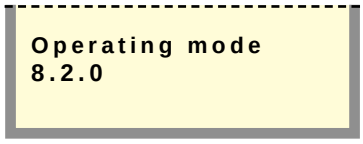
0=shutoff, 1=low, 2=average.



Menu 8.1.5 Return

Pressing the enter button returns you to menu 8.1.0

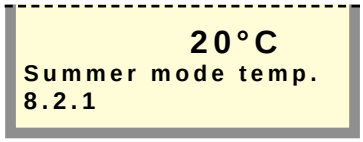
U



Menu 8.2.0 Operating mode

Settings regarding auto mode can be made in the sub-menus to this menu.

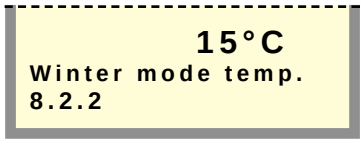
U



Menu 8.2.1 Summer mode temp.

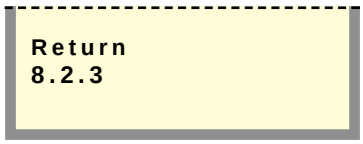
The average temperature when the heat pump is in auto mode shall switch to summer mode is chosen here. In summer mode the circulation pump and immersion heater are blocked, only hot water is produced. The value is adjustable between 0 and 30.

U



Menu 8.2.2 Winter mode temp.

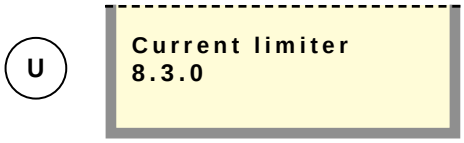
The average temperature when the heat pump is in auto mode shall switch to winter mode is chosen here. The circulation pump and immersion heater are activated. The value is adjustable between 0 and 30.



Menu 9.5.17 Return

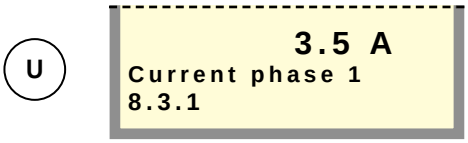
Pressing the enter button returns you to menu 8.2.0

Other settings



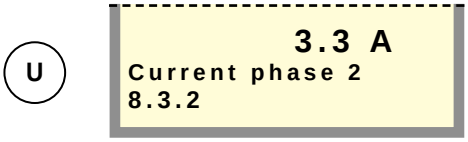
Menu 8.3.0 Current limiter

Settings and readings regarding the load monitor are set on the submenus to this menu.



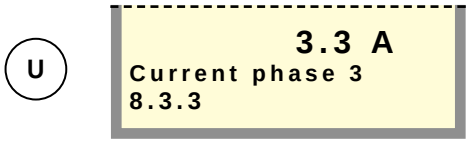
Menu 8.3.1 Current phase 1

Shows the measured current from phase 1



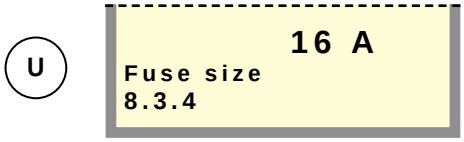
Menu 8.3.2 Current phase 2

Shows the measured current from phase 2



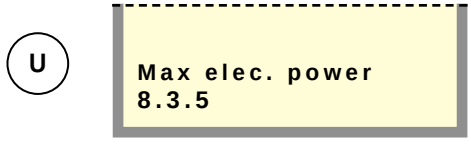
Menu 8.3.3 Current phase 3

Shows the measured current from phase 3



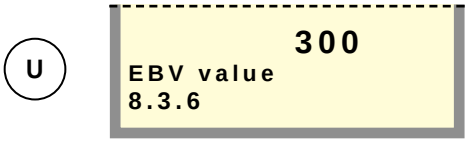
Menu 8.3.4 Fuse size

The setting selected on the load monitor card (2) is shown here knob (100).



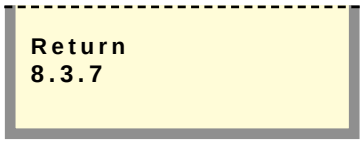
Menu 8.3.5 Max elec. power

The setting selected on the load monitor card (2) is shown here knob (101).



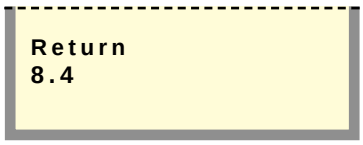
Menu 8.3.6 EBV value

The transfer value must be defined depending on the current transformers used for the load monitor card. The value is adjustable between 100 and 900 in increments of 10. The setting 300 applies for the supplied current transformers.



Menu 9.5.17 Return

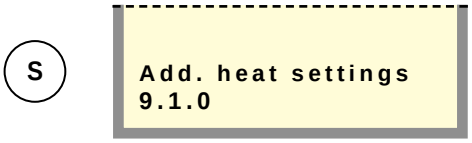
Pressing the enter button returns you to menu 8.3.0.



Menu 8.4 Return

Pressing the Enter button returns you to menu 8.0.

Settings additional heat



Menu 9.1.0 Add. heat settings

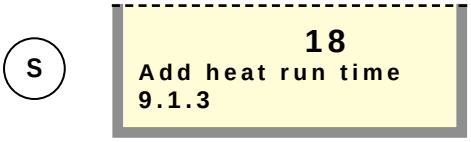
Settings regarding additional heat in the heat pump are made from the submenus in this menu.

Menu 9.1.1 Start BIN 3 step

Degree minute deficiency before additional heat is engaged. When the power step has reduced the degree minutes deficiency by 100 in relation to the set start value it is disengaged. The value is adjustable between -30 and -500.

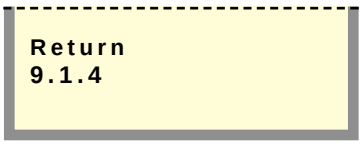
Menu 9.1.2 Diff. BIN 3 step

Difference between engaging and disengaging the electric step The value is adjustable between 0 and 100.



Menu 9.1.3 Add heat run time

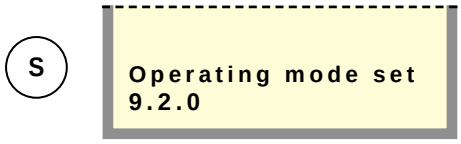
The accumulated running time for the electric module since the first start is shown.



Menu 9.5.17 Return

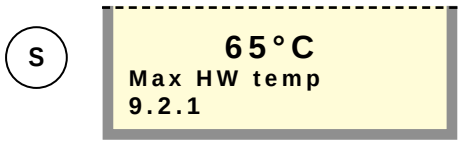
Pressing the enter button returns you to menu 9.1.0.

Operating settings



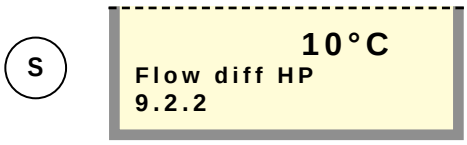
Menu 9.2.0 Operating mode set

Settings regarding additional heat, floor drying and a return to the factory settings can be made on the submenus in this menu.



Menu 9.2.1 Max HW temp

Here the maximum boiler temperature is shown. The value is selected on the load monitor card using knob (102).

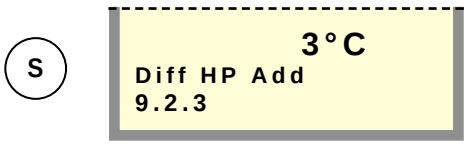


Menu 9.2.2 Flow diff HP

When the current flow temperature **deviates** from the set value compared to that calculated the heat pump is forced to stop/start irrespective of the degree minute figure.

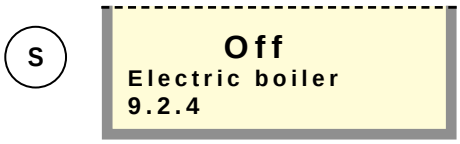
When the current flow temperature **exceeds** the calculated flow by the set value the degree minute figure is set to 1. The compressor stops when there is only a heating requirement.

When current flow temperature **falls below** the calculated flow by the set value the degree minute figure is set to -60. This means the compressor will start. When the value also fall below menu 9.2.3, the degree minute figure can be set to -400. The value is adjustable between 3 and 25 °C.



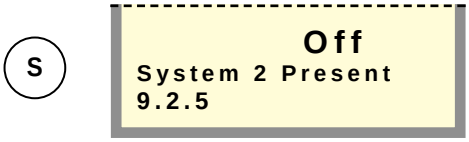
Menu 9.2.3 Diff HP Add

When the current flow temperature drops below that calculated by the set value plus the value from menu 9.2.2 the degree minute value is set to -400. This means that the additional heat can be engaged directly. The value is adjustable between 1 and 8°C.



Menu 9.2.4 Electric boiler

Electric boiler mode is activated when On is shown on the display, otherwise Off is shown. When the electric boiler mode is activated the immersion heater respective circulation pump cannot be blocked with the operating mode button. Select Off to deactivate electric boiler mode and select the required operating mode using the operating mode button.

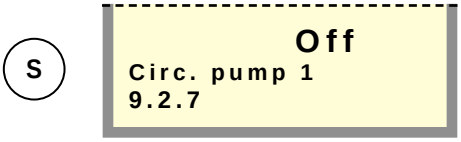


Menu 9.2.5 System 2 Present

This menu is used to select On or Off depending on whether you have shunt group 2 (accessories needed).

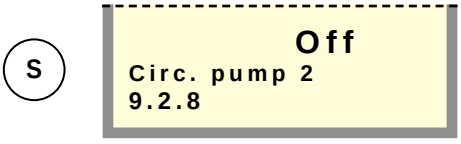
Menu 9.2.6 Room disp Present

No function



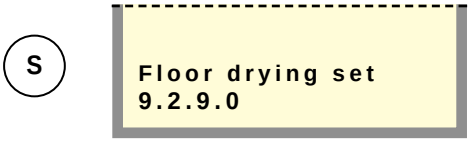
Menu 9.2.7 Circ. pump 1

You choose here whether circulation pump 1 should run constantly. The value is adjustable On or Off.



Menu 9.2.8 Circ. pump 2

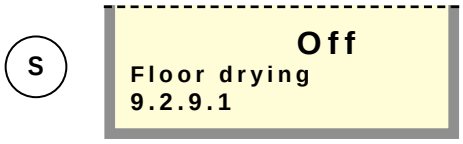
You choose here whether circulation pump 2 should run constantly. The value is adjustable On or Off.



Menu 9.2.9.0 Floor drying set

Settings for the floor drying program are made in the submenus to this menu.

Operating settings

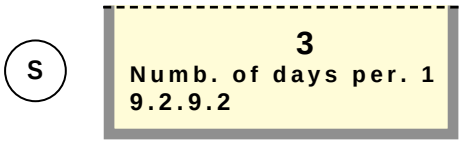


Menu 9.2.9.1 Floor drying

The floor drying program is chosen from this sub-menu. The options are Prog 1 On, Prog 2 On or Off The heat pump must be in Winter mode, selected with the operating mode button. Electric boiler mode, Menu 9.2.4 can be used together with floor drying, for example, when the heat source is not installed.

In Prog 1 On, menus 9.2.9.2 — 9.2.9.5 are shown. After time period 1 switching to time period 2 then return to normal settings.

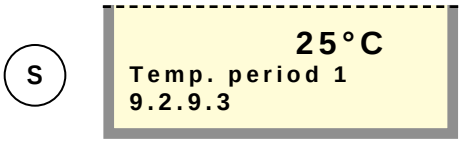
In Prog 2 On, a fixed program over 11 days follows. The flow temperature is increased from 20°C to 45°C for 4 days, it then remains constant for 3 days. The temperature then steps down to 25°C for 4 days, and then returns to the normal settings.



Menu 9.2.9.2 Numb. of days per. 1

Selection of the number of days in period 1.

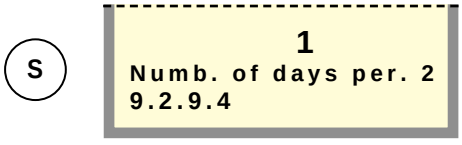
The value is adjustable between 1 to 5.



Menu 9.2.9.3 Temp. period 1

Selection of the flow temperature in period 1.

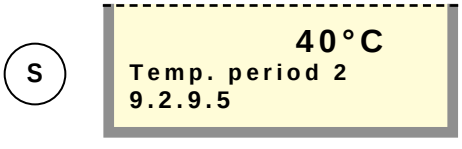
The value is adjustable between 15 and 50°C.



Menu 9.2.9.4 Numb. of days per. 2

Selection of the number of days in period 2.

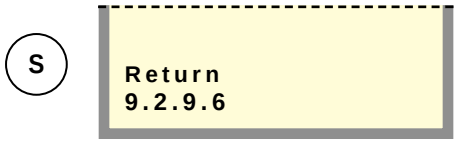
The value is adjustable between 1 to 5.



Menu 9.2.9.5 Temp. period 2

Selection of the flow temperature in period 2.

The value is adjustable between 15 and 50°C.

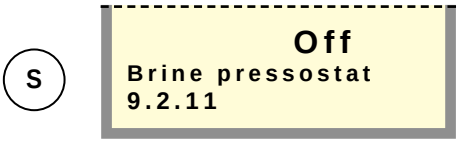


Menu 9.2.9.6 Return

Pressing the enter button returns you to menu 9.2..9.0

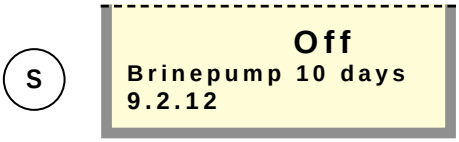
Menu 9.2.10 Pool control

Settings whether pool control should be On or Off. Basic setting is Off



Menu 9.2.11 Brine pressostat

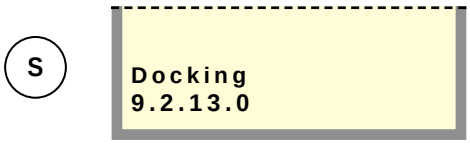
You set here whether an external an brine pressostat/load monitor is connected to the load monitor card.



Menu 9.2.12 Brinepump 10 days

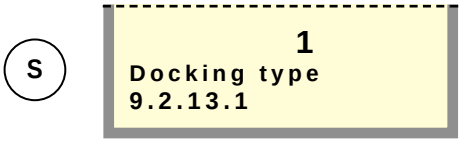
The brine pump can be active for 10 days when the installation is started. The basic setting is Off

Operating settings



Menu 9.2.13.0 Docking

Settings regarding external docking can be made in the submenus to this menu.



Menu 9.2.13.1 Docking type

?n this menu docking option 3 is selected for docking to an oil boiler and option 4 for fixed condensing.

The value is adjustable between -1 and 5.

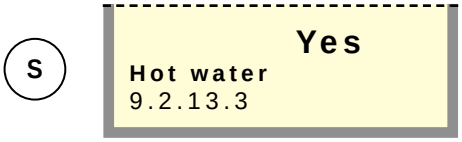
Menu 9.2.13.2 Immersion heat type

Binary 3 step: Selected when ETS-11 is connected

Linear 3 step: –

Binary 7 step: –

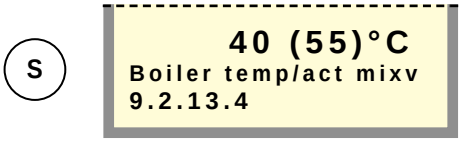
Off: Preselected



Menu 9.2.13.3 Hot water

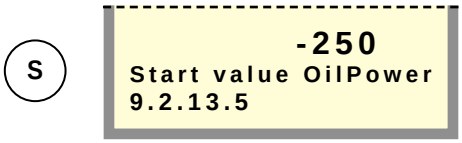
This menu is used to select whether there is a hot water heater or not. When On is selected Menu 1.0 and its sub-menus become visible.

The value is adjustable On or Off.



Menu 9.2.13.4 Boiler Temp/act mixvalve

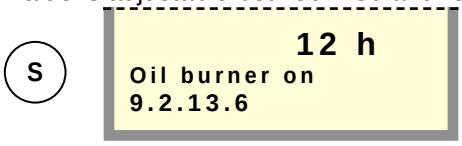
This menu shows the boiler temperature and at what temperature the oil mixing valve should start to work.



Menu 9.2.13.5 Start value OilPower

In this menu you can set the number of degree minutes when the oil supplement should start to work.

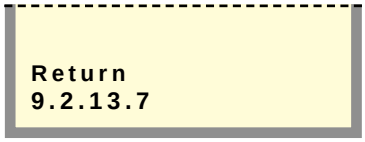
The value is adjustable between -30 and -500



Menu 9.2.13.6 Oil burner on

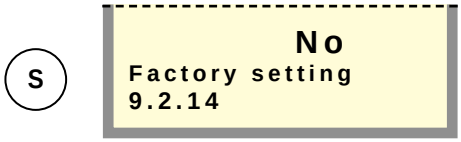
In this menu you set the running time for the oil burner.

The value can be set between 0 and 12 hours.



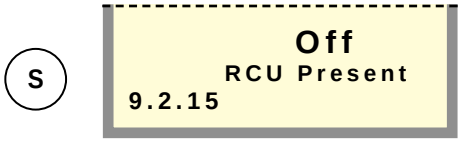
Menu 9.2.9.6 Return

Pressing the Enter button returns you to menu 9.2.13



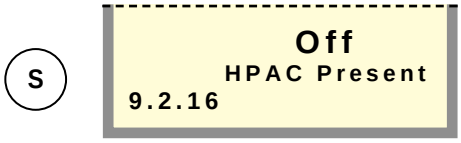
Menu 9.2.14 Factory setting

Return to the factory settings in FIGHTER 1120, Yes or No.



Menu 9.2.15 RCU Present

No function.



Menu 9.2.16 HPAC Present

Here you set whether HPAC is installed in the system of not.

Menu 9.2.17 Return

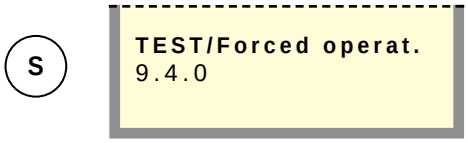
Pressing the enter button returns you to menu 9.2.0

Quick start

Menu 9.3 Quick start

FIGHTER 1120 starts within 3 minutes.

TEST Force driven operation

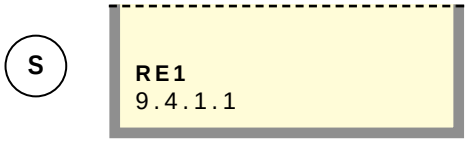


Menu 9.4.0 TEST/Forced operat.

Test of outputs, automatic return after 8 hours. Only for service personnel.

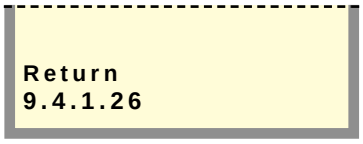
Menu 9.4.1.0 Forced operation

Selectable between On or Off.



Menu 9.4.1.1 — 9.4.1.25

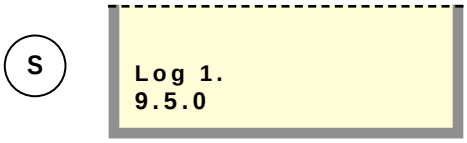
Manual test of relays, opto and AD



Menu 9.4.1.26 Return

Pressing the enter button returns you to menu 9.4.0.

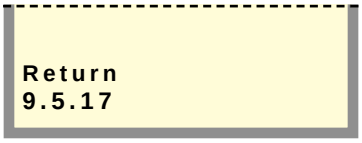
Alarm log



Menu 9.5.0 — 9.8.0 Log 1 — Log 4.

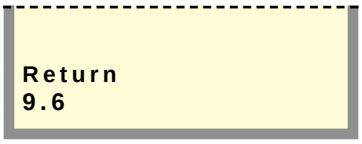
The alarm logs are shown in the submenus of this menu. Log 1 is the last alarm, log 2 the next last, etc.

Menu 9.5.1 Time
Menu 9.5.2 Alarm type
Menu 9.5.3 Charging type
Menu 9.5.4 Brine In
Menu 9.5.5 Brine Out
Menu 9.5.6 Outdoor temp.
Menu 9.5.7 Flow temp.
Menu 9.5.8 Return temp.
Menu 9.5.9 Hot water temp.
Menu 9.5.10 Hot gas temp.
Menu 9.5.11 Compr. time
Menu 9.5.12 Electric b. time
Menu 9.5.13 Relay 1-8
Menu 9.5.14 Relay 9-14
Menu 9.5.15 External input
Menu 9.5.16 Reset log



Menu 9.5.17 Return

Pressing the Enter button returns you to menu 9.5.



Menu 9.6 Return

Pressing the Enter button returns you to menu 9.0.

48 Actions with operating disturbances

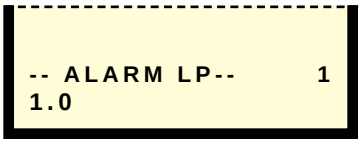
Alarm indications on the display

The background lighting on the display flashes with an alarm and the following information is shown depending on the fault. An alarm log is created with each alarm containing a number of temperatures, times and the status of outputs. The four alarms are saved on menu 9.5.0 — 9.8.0.

The following alarms stop the compressor and brine pump. The alarms can only be acknowledged by switching off the heat pump for 10 seconds and then started again. This is done using switch (8).

NOTE!

The product's serial number should always be stated with all correspondence with NIBE.
689_ _ _ _ _ _ _ _ _ _

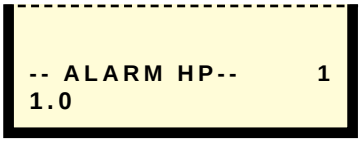


Alarm LP

This information is shown when the low pressure switch in FIGHTER 1120 has tripped. The compressor is blocked and FIGHTER 1120 switches to electric boiler mode. No hot water is produced.

This may be due to:

- Bad circulation in collector system due to inferior venting/low pressure or ice (if ice has formed the brine pump (35) will be warm).
- Brine pump (35) malfunction.
- Iced evaporator due to too low antifreeze concentration.
- Leakage in the collector circuit.



Alarm HP

This information is shown when the high pressure switch in FIGHTER 1120 has tripped. The compressor is blocked and FIGHTER 1120 switches to electric boiler mode. No hot water is produced.

This may be due to:

- No or low flow on the brine pump (16).
- Closed thermostat valves.

Brine level (accessory)

Shows that the level or pressure in the collector circuit is low. The compressor is blocked and FIGHTER 1120 switches to electric boiler mode. No hot water is produced.

This may be due to:

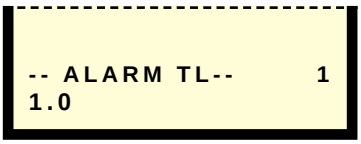
- Leakage in the collector circuit.

Alarm MP

Shows when the motor cut-out on the compressor has tripped. The compressor is blocked and FIGHTER 1120 switches to electric boiler mode. No hot water is produced.

This may be due to:

- Dropped phase due to tripped fuses
- Incorrect setting on the motor cut-out.



ALARM TL (Accessory)

Shown when the temperature limiter on the electric module has tripped. The immersion heater is blocked, any set automatic operations are disabled as the operating mode switches to spring/autumn.

NOTE! Acknowledged by pressing in the button on the temperature limiter (25) and switching off the heat pump for 10 seconds and then switching it on again. This is done using switch (8).

BRINE TEMPERATURE LOW

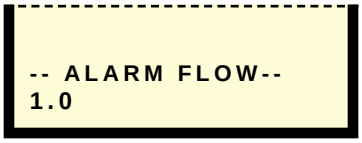
Shown when the brine return temperature is lower that the set value. Factory setting OFF. Not indicated when menu 5.2 is set to automatic return YES.

If the operating disturbance cannot be rectified by means of the above an installation engineer should be called.

Actions with operating disturbances 49

Alarm indications on the display

The following alarms are automatically reset when the temperature has increased/reduced by 2 °C



Alarm Flow

- High flow temperature 1.
- High flow temperature 2 (extra shunt group, accessory).
- High return temperature.

The following alarm stops the compressor and brine pump and can be acknowledged by switching off and switching on the heat pump after the fault has been rectified:

- Temperature sensor damaged/missing.

Hotwater sensor

This information is shown when a fault on the hot water temperature sensor has been registered. FIGHTER 1120 is force-run solely for hot water charging and automatic mode is engaged. The alarm may be due to a faulty sensors or broken sensor cable.

If the operating disturbance cannot be rectified by means of the above an installation engineer should be called.

50 Actions with operating disturbances

In the event of malfunction or operating disturbances first check the points below:

Low room temperature

Cause: Compressor and immersion heater do not heat up.

Action: Check and replace the any blown circuit and main fuses.

Cause: The compressor does not start because of a too low value set on the heating curve.

Action: Check and possibly raise Increase/reduce heat (knob on the front panel) or Curve slope.

Cause: The compressor standstills due to the internal overheating protection tripping.

Action: Automatic resetting after cooling for a few hours.

Cause: Possible earth circuit-breaker tripped.

Action: Reset the earth circuit-breaker, if the earth circuit-breaker trips repeatedly, call an electrician.

High room temperature

Cause: Incorrect setting of the Curve slope and/or Increase/reduce heat.

Action: Adjust the setting.

Low hot water temperature or no hot water

Cause: Large amount of hot water drawn off.

Action: Wait until the water heater reheats.

Cause: Compressor and/or immersion heater does not heat up.

Action: Check and replace any blown circuit and main fuses.

Cause: Too low start temperature on the CPU-unit (34).

Action: Adjust the hot water setting HWstart, see Available information and on-display settings – display 3.

Cause: Possible earth circuit-breaker tripped.

Action: Reset the earth circuit-breaker, if the earth circuit-breaker trips repeatedly, call an electrician.

NOTE!

As FIGHTER 1120 can be connected to a large number of external units even these should be checked.

Ifthe operating disturbance cannot be rectified by means of the above a installation engineer should be called.

Actions with operating disturbances 51

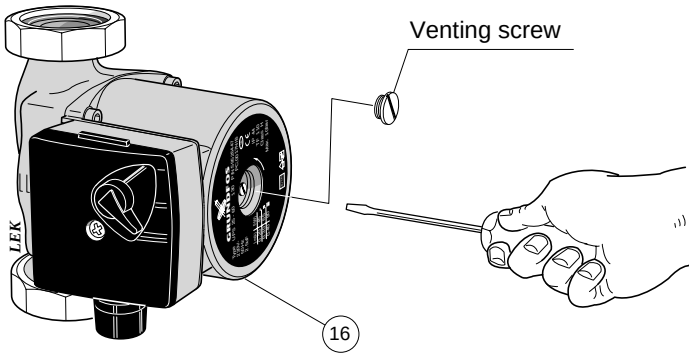
Draining, heat medium side

Close the shut-off valves in heating medium system. Now open the drain valve (76). A small amount of water runs out, however, to fully empty the heating medium side requires the connector that joins the heating medium side and the connection on the heat pump HM-Flow to be loosened a little to allow air to enter so the remaining water can run out. When the heating medium is empty the requisite service can be carried out.

Draining, brine side

When replacing the brine pump or drive side or when cleaning the pump, the shut-off valves in the collector system should be closed. The hose between the top of the evaporator and the brine pump is loosened on the evaporator. The loose hose end can now be bent down and emptied in a small bowl. Now loosen the connection on **Brine in** a little to allow air to enter so the heat pump's brine side is emptied completely. When the circuit is empty the requisite service can be carried out.

Helping the circulation pump to start



- Shut down FIGHTER 1120 by turning the switch (8) to **0**.
- Open the front cover.
- Loosen the air screw with a screwdriver. Hold a cloth around the screwdriver blade as a certain amount of water may run out.
- Insert a screwdriver and turn the pump rotor.
- Screw in the venting screw.
- Start FIGHTER 1120 and check whether the circulation pump runs.

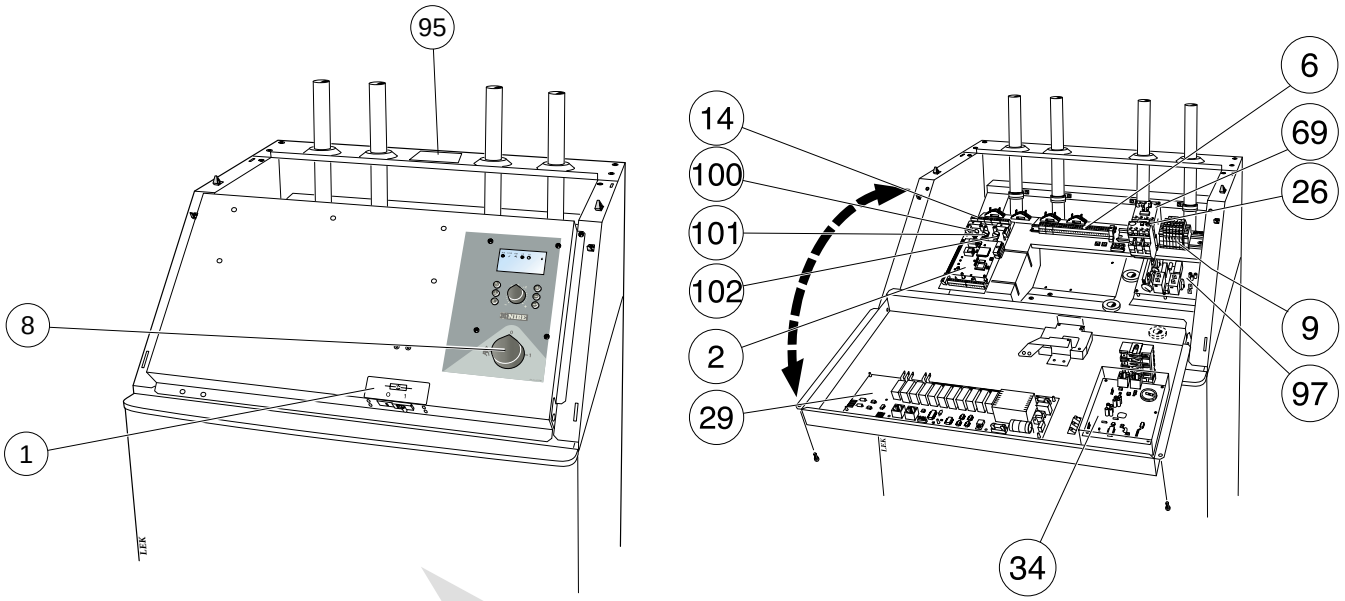
It is usually easier to start the circulation pump with FIGHTER 1120 running, switch (8) set to **1**. If helping the circulation pump to start is performed with FIGHTER 1120 running, be prepared for the screwdriver to jerk when the pump starts.

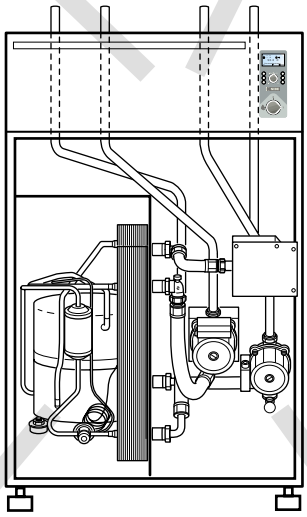
NOTE!

The product's serial number should always be stated with all correspondence with NIBE.

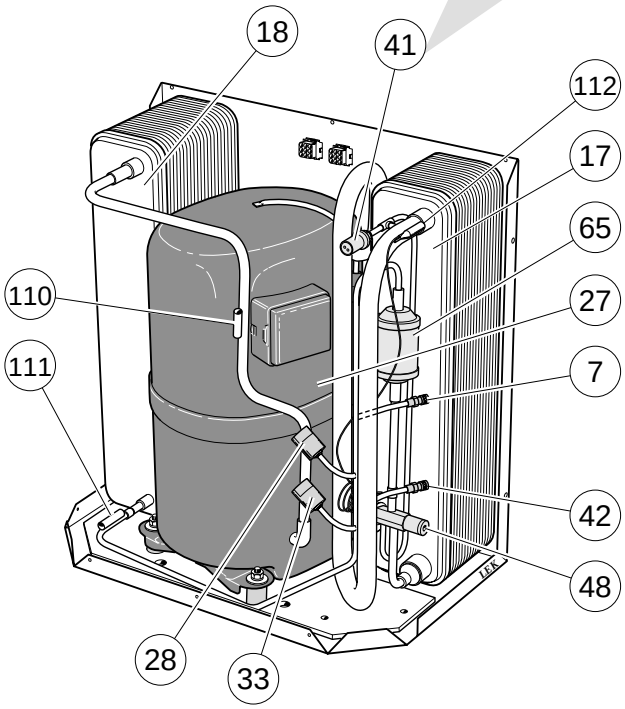
689_ _ _ _ _ _ _ _ _ _ _

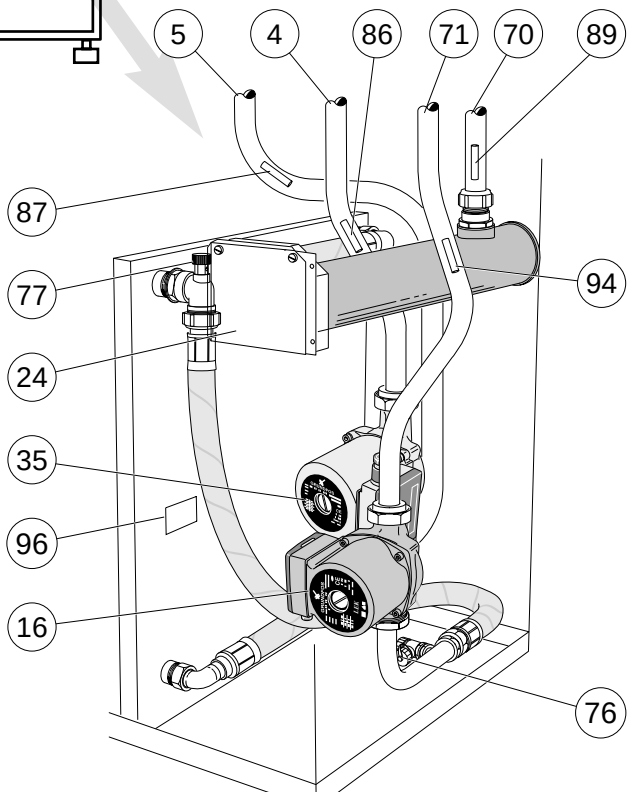
52 Component placement





The figure shows the heat pump with accessories.





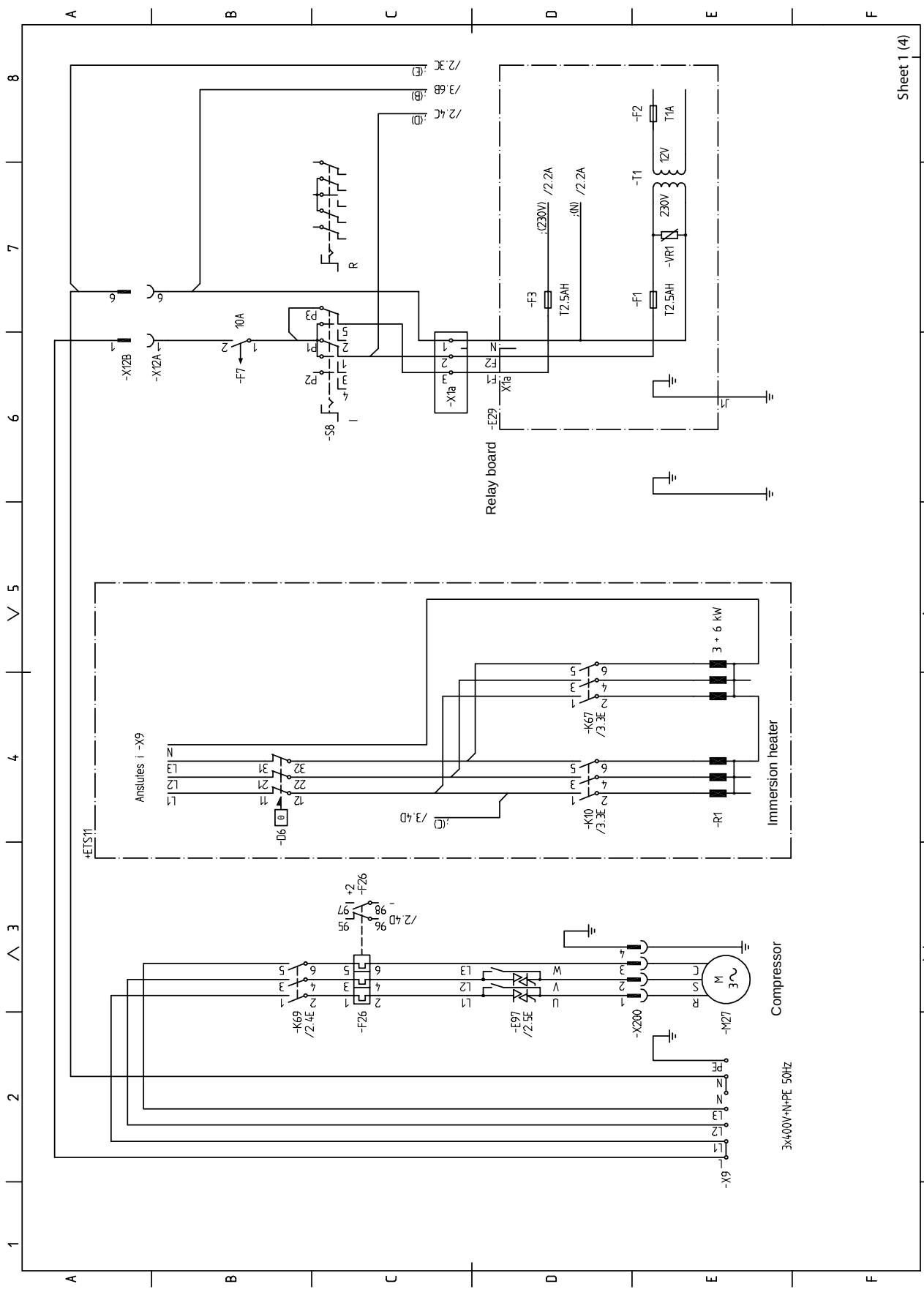
List of components

1		Miniature circuit breaker
2		Load monitor card
3		Thermostat
4		Collector connection, brine in (f)
5		Collector connection, brine out (r)
6		Terminal block
7		Service connection, high pressure
8		Switch, 1 – 0 – ⚠
9		Terminal block, incoming electricity
14		Terminal block, load monitor card
15	**	Outdoor sensor, connection
16		Heating medium pump
17		Evaporator
18		Condenser
19	*	Reversing valve
20	*	Contactor kit
24	*	Electric module 9 kW, supplied connected 6 kW
25	*	Overheat protection
26		Motor protection, including reset
27		Compressor
29		Relay card with power supply unit
33		High pressure pressostat
34		CPU-unit, control system
35		Brine pump
41		Low pressure pressostat
42		Service connection, low pressure
48		Expansion valve
52	**	Safety valve, collector side
63	**	Particle filter
65		Drying filter
69		Contactor, compressor operation
70		Connection, heating flow
71		Connection, heating return
76		Drainage for heating system
77		Venting valve, collector system
85	**	Level vessel
86		Temperature sensor, brine in
87		Temperature sensor, brine out
88		Temperature sensor, hot water
89		Temperature sensor, HM-f, heating medium flow
94		Temperature sensor HC-r, heat carrier return
95		Type plate
96		Type plate, cooling section
97		Soft-start relay
100		Knob, setting Fuse
101		Knob, setting Max electrical output
102		Knob, setting Max boiler temperature
110		Temperature sensor, hot gas.
111		Temperature sensor, fluid line temp., cooling circuit
112		Temperature sensor, suction gas temp., cooling circuit

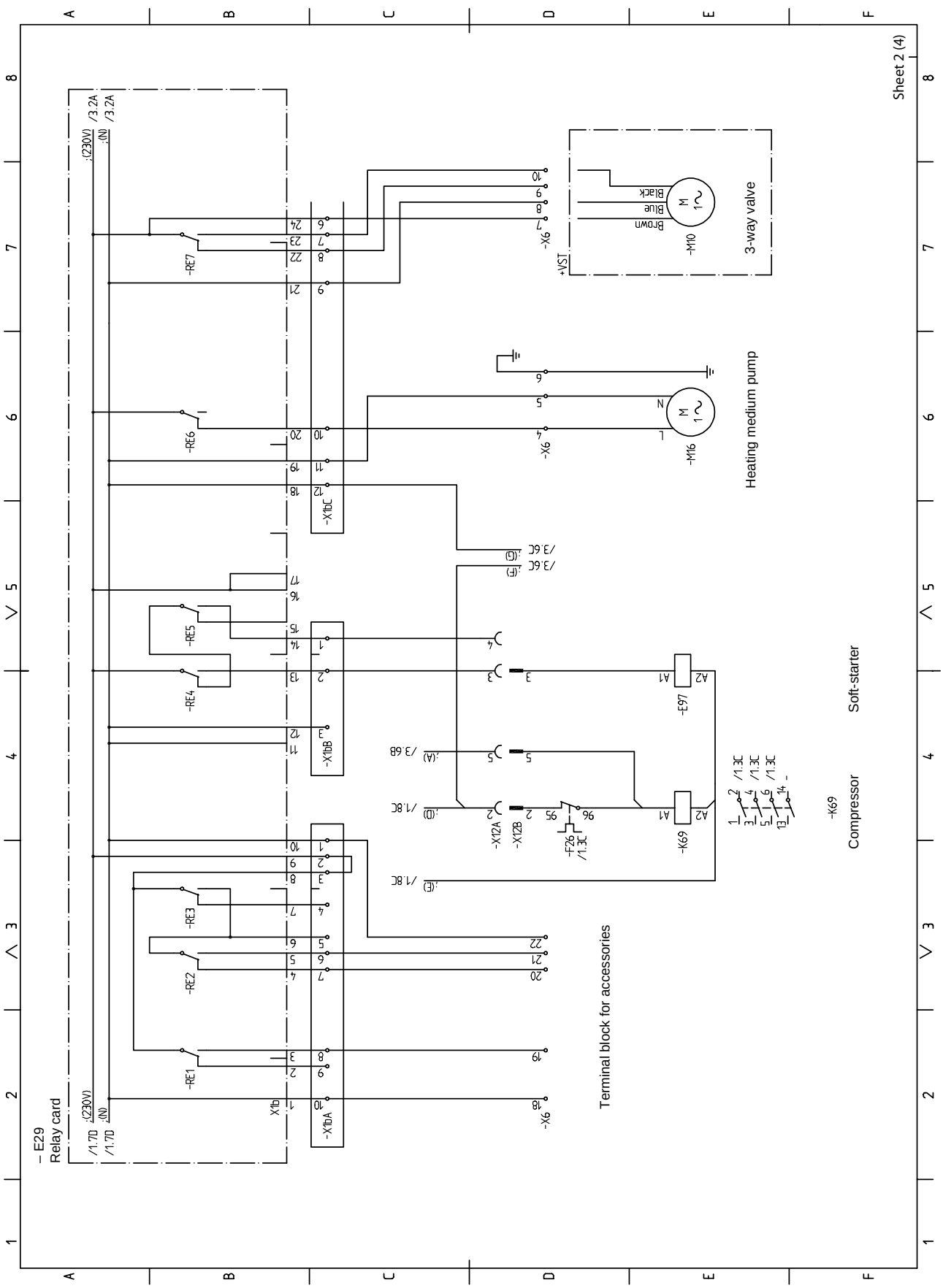
* Accessories

** Enclosed

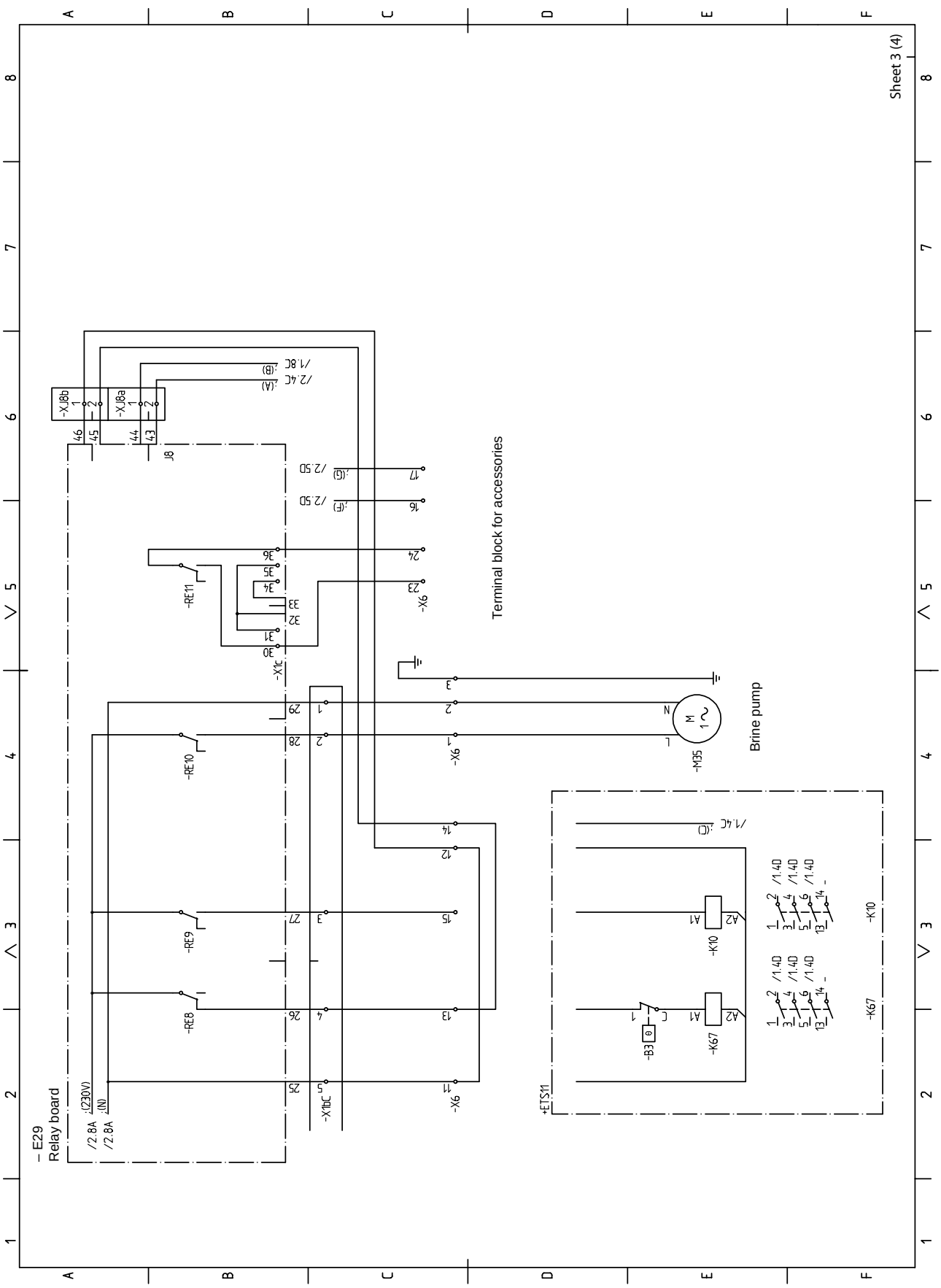
54 Wiring diagram 3 x 400 V + N



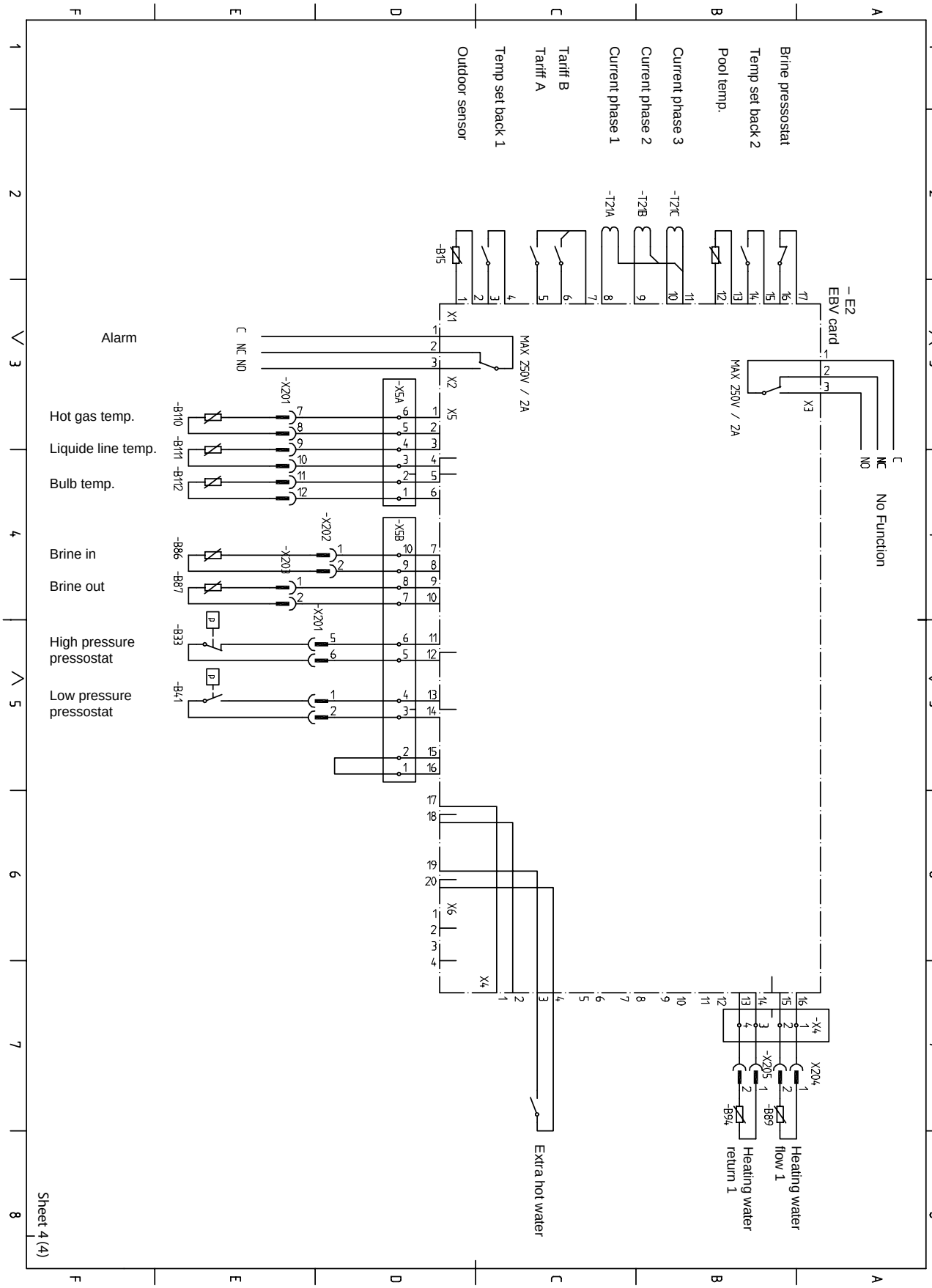
Wiring diagram 3 x 400 V + N



56 Wiring diagram 3 x 400 V + N



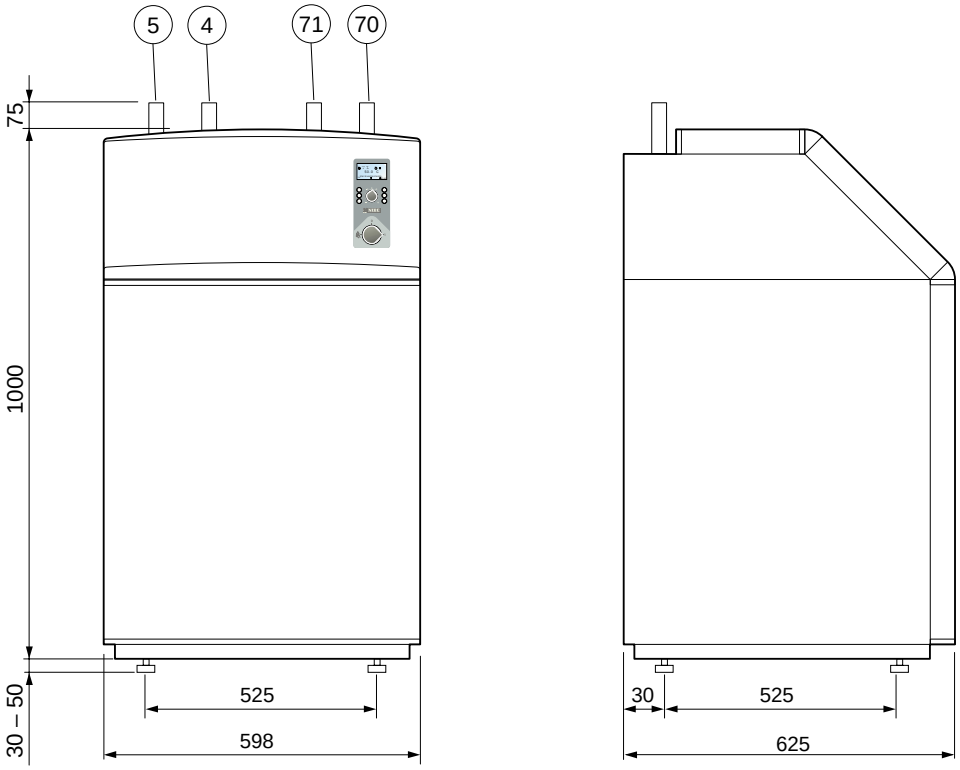
Electrical circuit diagram

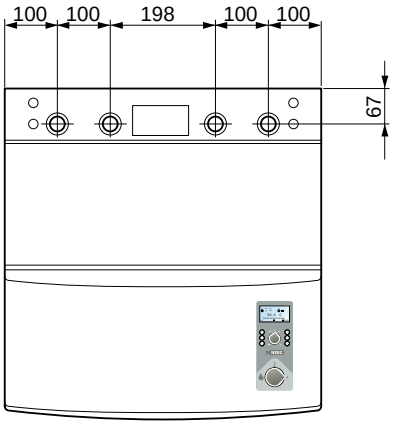


Dimensions and setting-out coordinates

Leave space free to the right of the heat pump for servicing.

An area of 800 mm is required in front of the heat pump for service work.





Technical specifications

CE IP 21

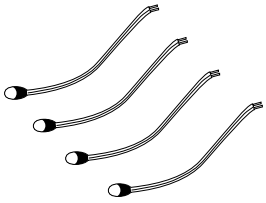
Size		5	7	8,5	10	13	15
Delivered/supplied power* at 0/35 °C **		6.0/1.3	8.8/1.9	10.3/2.2	11.7/2.5	14.6/3.1	17.0/3.7
Output/Input* at 0/50 °C **		4,8/1,5	7,1/2,2	8,5/2,5	9,9/2,9	12,6/3,6	14,8/4,3
Operating voltage	(V)	3 x 400V + N + PE 50 Hz					
Starting current	(A)	24	24	24	26	26	26
Max operating current, compressor	(A)	3,6	5,5	6,7	7,9	9,0	11,0
Fuse, HP only	(A)	10	10	10	16	16	16
Fuse (incl. imm. heater 6 kW) ***	(A)	16	16	20	20	25	25
Fuse (incl. imm. heater 9 kW) ***	(A)	20	20	25	25	25	35
Output, heat medium pump	(W)	75	75	75	170	170	170
Output, brine pump	(W)	130	170	170	250	250	250
Connection, brine ext Ø	(mm)	28	28	28	35	35	35
Connection, heating medium ext Ø	(mm)	28					
Refrigerant quantity (R407C)	(kg)	1,7	2,2	2,4	2,4	2,5	2,6
Brine flow	(l/s)	0,35	0,48	0,58	0,65	0,75	0,86
Pressure drop, evaporator	(kPa)	21	23	23	19	25	22
Available pressure, collector system	(kPa)	40	58	53	70	65	60
Max pressure, collector system	(bar)	3					
Operating temperature collector system	(°C)	-5 – +20					
Heating medium flow	(l/s)	0,13	0,18	0,22	0,26	0,31	0,36
Pressure drop, condenser	(kPa)	2,6	3,4	3,2	4,4	3,1	4,1
Max temperature (flow- /return pipe)	(°C)	60/50					
Cut-out value pressostat HP	(bar)	27					
Difference pressostat HP	(bar)	-7					
Cut-out value pressostat LP	(bar)	1,5					
Difference pressostat LP	(bar)	+1,5					
Enclosure class		IP 21					
Weight	(kg)	175	195	200	215	225	230

* Compressor output only.

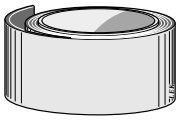
** Refers to the brine flow temperature/heat medium flow temperature in accordance with EN 255.

*** Accessories

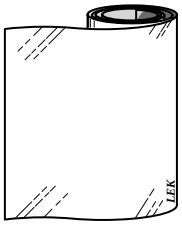
60 Enclosed kit



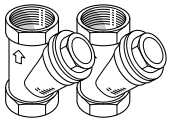
Temperature sensors with probes (hot water control or fixed condensing)
Part no 418027



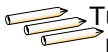
Insulation tape
Part no 025910



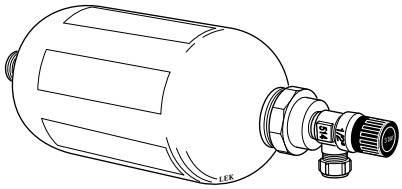
Aluminium tape
Part no 025179



Particle filter
F1120 – 4-8.5 kW
2 (R25)
F1120 – 10-15 (kW)
1 (R25)
1 R32)

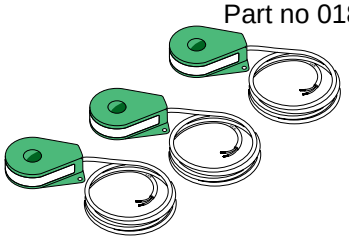


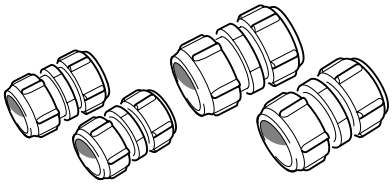
Tubes for sensors
Part no 408017



Level vessel with safety valve

Current transformer
Part no 018569





Conex connectors
F1120 – 4-8.5 kW
4 x ø28 x R25 int.) Part no 024035
F1120 – 10-15 (kW)
2 x (ø28 x R25 int.) Part no 024035
2 x (ø35 x R32 int.) Part no 424283

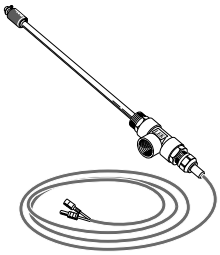
Outside sensor
Part no 018764

Accessories

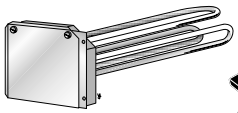
Hot water control VST 11
Part no 089 152

Reversing valve

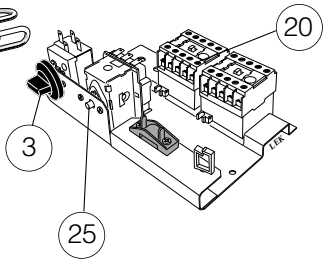
Level monitor NV 10
Part no 089 315



Electrical supplement ETS 11
Part no 089 148



Immersion heater and complete contactor kit 9 kW.

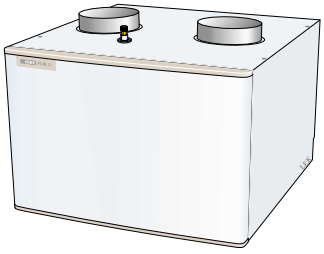


Extra shunt group

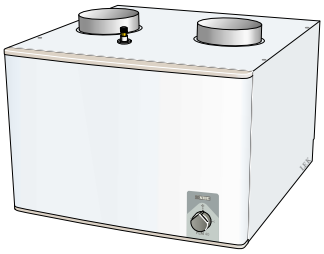
Used when there is a need of two different supply temperatures. Installed externally, but controlled from FIGHTER 1120.
- Circulation pump
- Shunt motor
- Mixing valve
- Circuit card
- Pipe fittings
- Sensor and cabling

HPAC
Part no 089 265

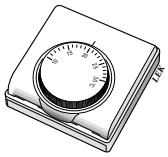
Exhaust air module FLM 30
Part no 089 268



Exhaust air module FLM 40
Part no 089 568



Room thermostat RT 10
Part no 418 366



*Adapted for controlling from Fighter 1120

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