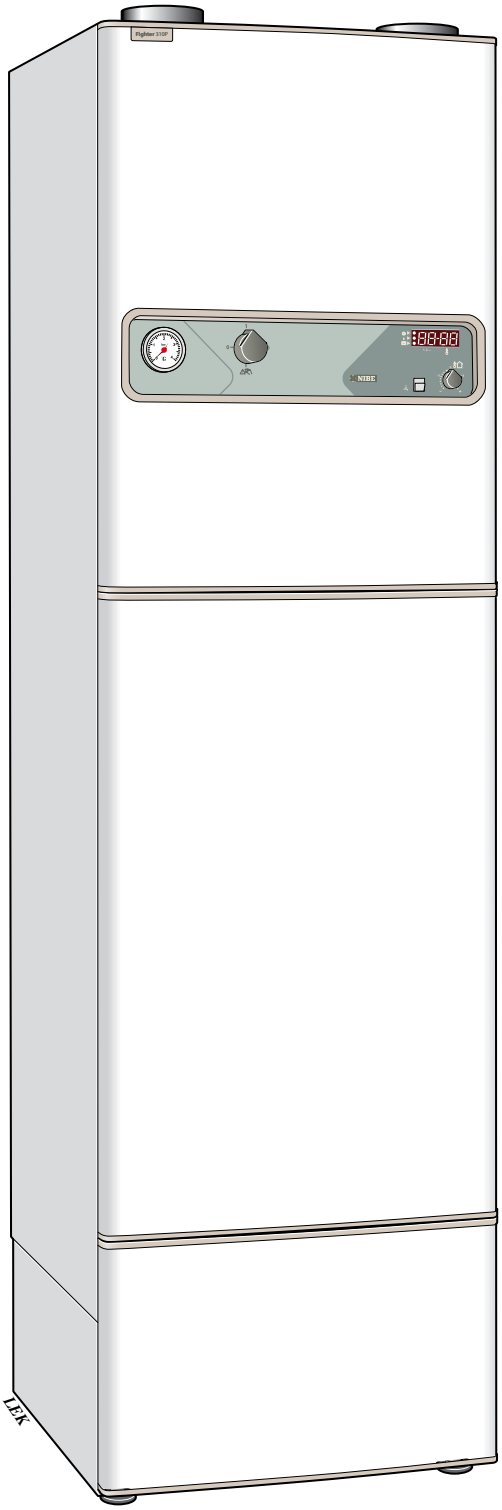
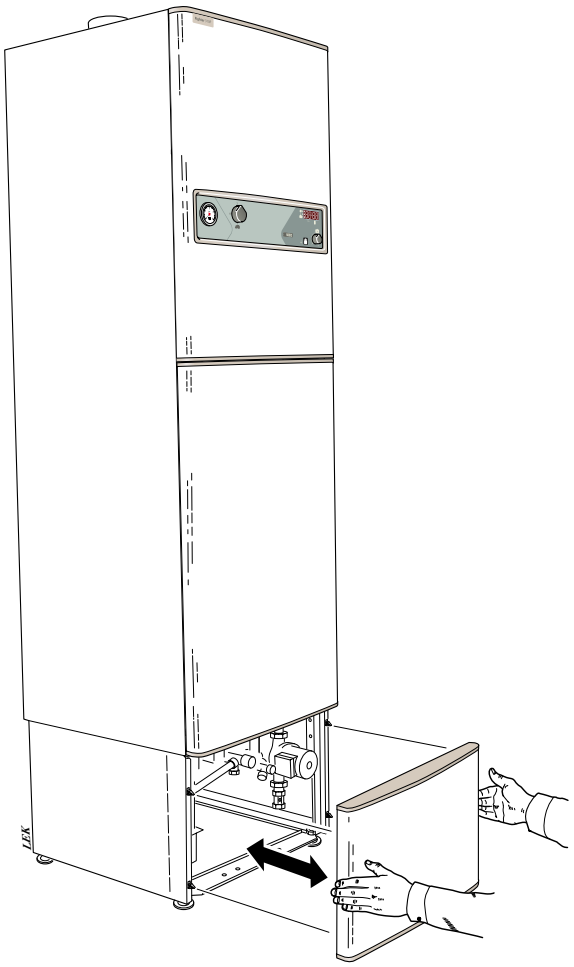
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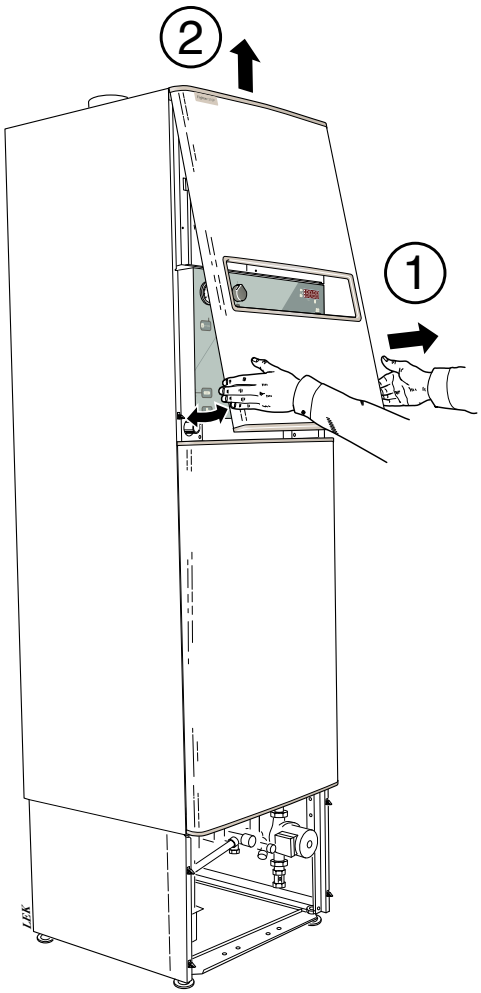
INSTALLATION AND MAINTENANCE INSTRUCTIONS

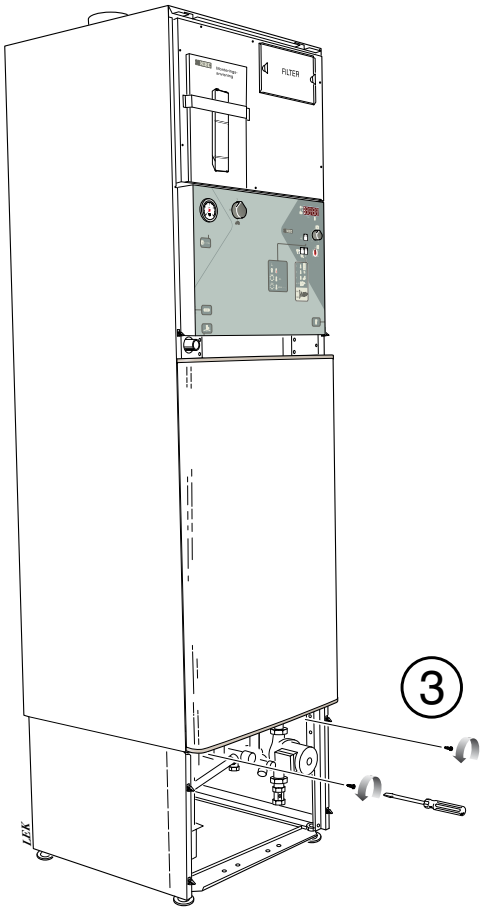
FIGHTER 310P

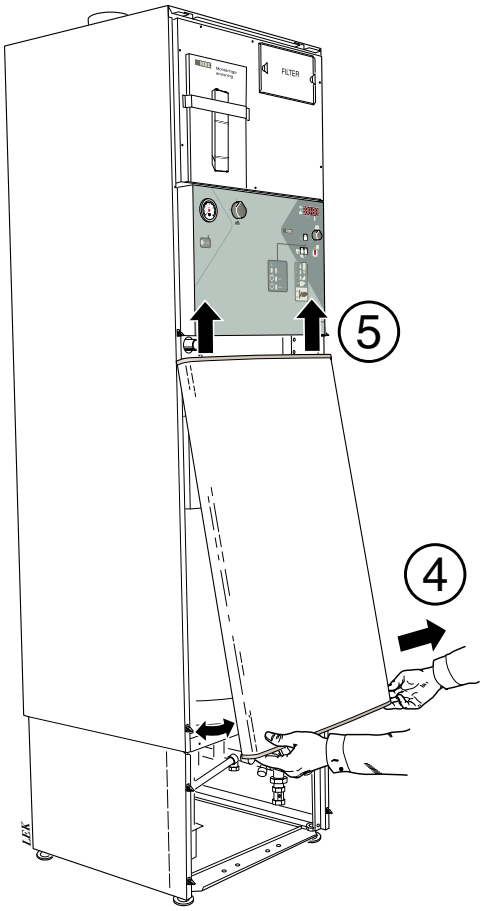


NIBE




2
1


FILTER
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FILTER
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2 General

In order to get the ultimate benefit from your heat pump FIGHTER 310P you should read through the For Home Owners section in this Installation and Maintenance Instruction".

FIGHTER 310P is an exhaust air heat pump. This means that it collects the energy in the ventilation air and uses it for hot water and room heating.

A microprocessor ensures that the heat pump always works efficiently.

FIGHTER 310P is a Swedish-made quality product which will last a long time and run reliably without unpleasant surprises.

To be filled in when the heat pump has been installed

The serial number (103), should always be stated with all correspondence with NIBE. _ _ _ _ _ _ _ _ _ _ _ _ _ _
Installation date
Installation engineers
Chosen power rating, immersion heater
Pre-pressure in the expansion tank (0.5 bar on delivery)
Circulation pump setting
Fan rating
Selected fan curve
Set damper angle
Setting "Heating curve selection"
Setting "Heating curve offset"

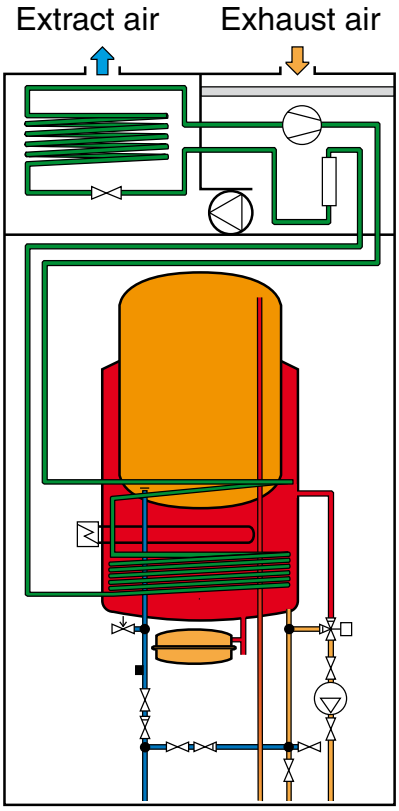
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

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

Rights to make any design or technical modifications are reserved.

System description 3

Principle of operation



FIGHTER 310P comprises an electric boiler with a copper lined water heater and a heat pump which recovers energy from the ventilation air. The recovered energy is supplied to the heat pump. The heat pump must be installed in a ventilation system intended for mechanical exhaust air.

The output of the immersion heater is max 9.0 kW (Supplied output of 8.0 kW). 13,5 kW available as an extra option.

When the exhaust air at room temperature passes through the evaporator, the refrigerant evaporates because of its low boiling point. In this way the heat in the room air is transferred to the refrigerant.

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

The warm refrigerant is fed to the condenser, which is in the boiler water. Here the refrigerant gives off its heat to the boiler water, so that its temperature drops and the refrigerant changes state from gas to liquid.

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

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

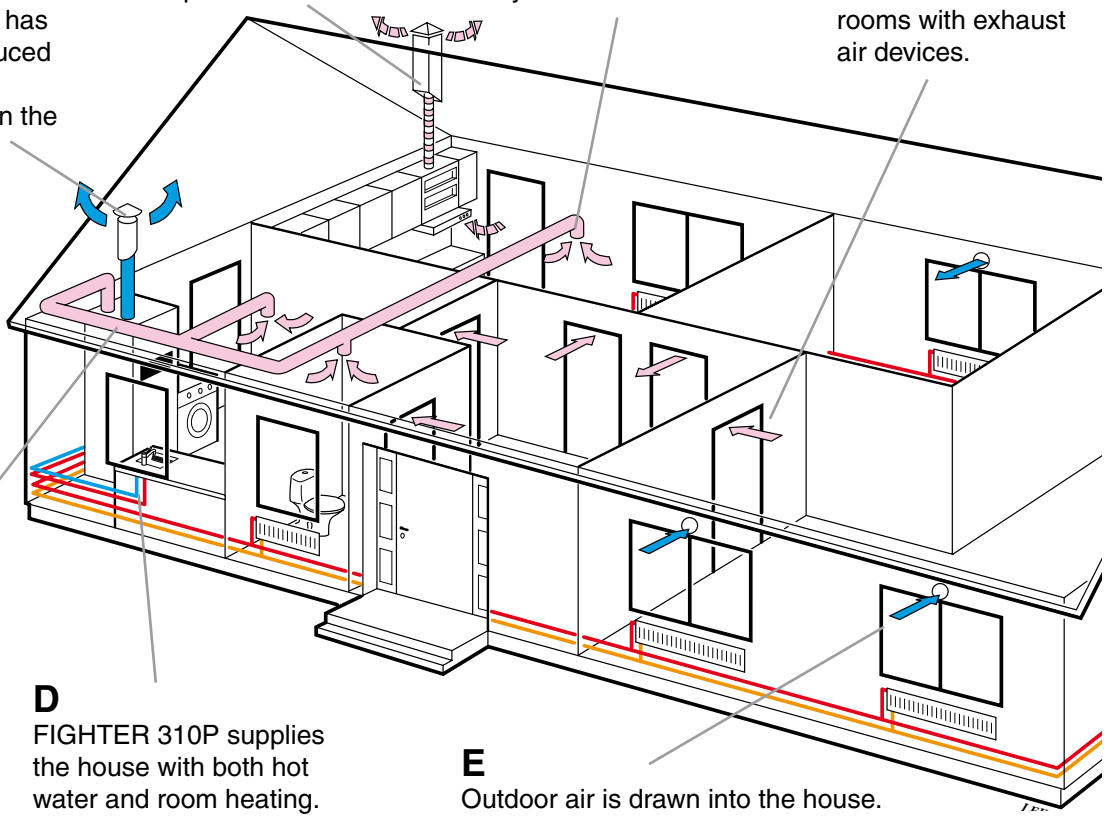
System diagram

C
When the room air has passed through the heat pump it is discharged. The temperature of the air has been significantly reduced as the heat pump has extracted the energy in the room air.

G
The air from the kitchen fan goes directly out into a separate duct.

A
The warm room air is drawn into the air duct system.

F
Air is transported from rooms with outdoor air devices to rooms with exhaust air devices.



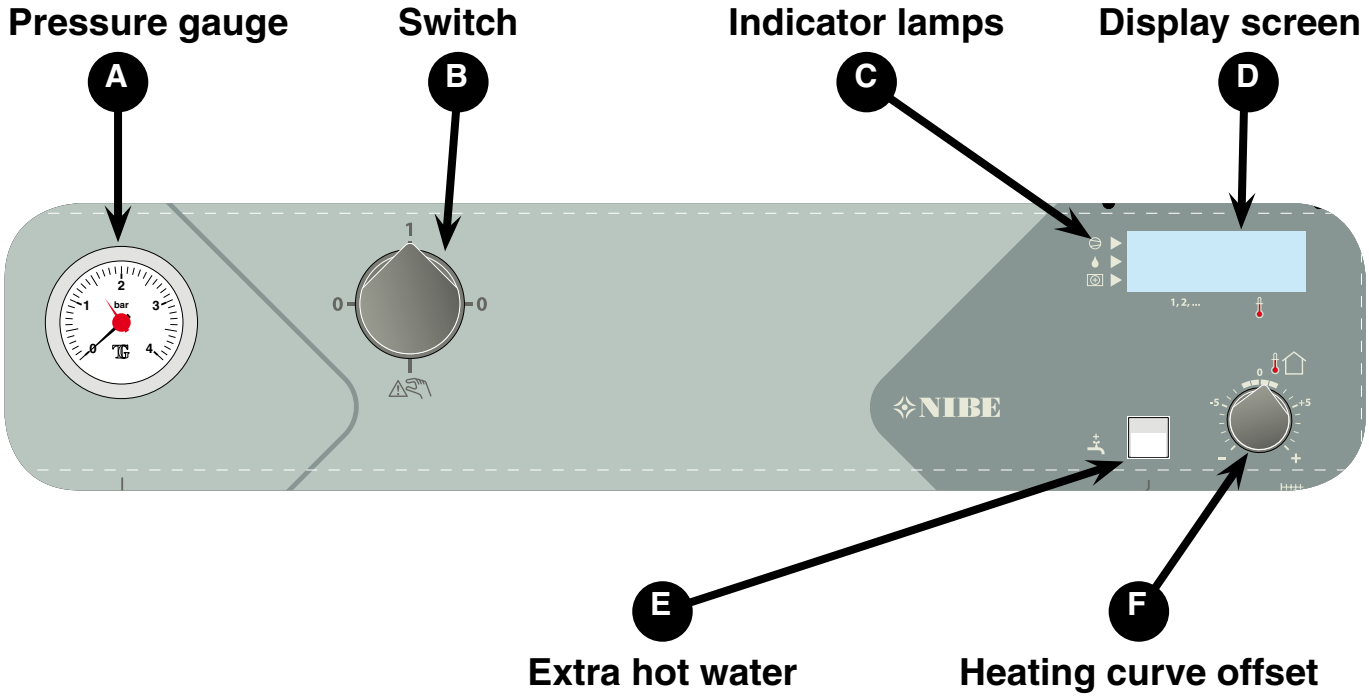
B
The warm room air is fed to FIGHTER 310P

D
FIGHTER 310P supplies the house with both hot water and room heating.

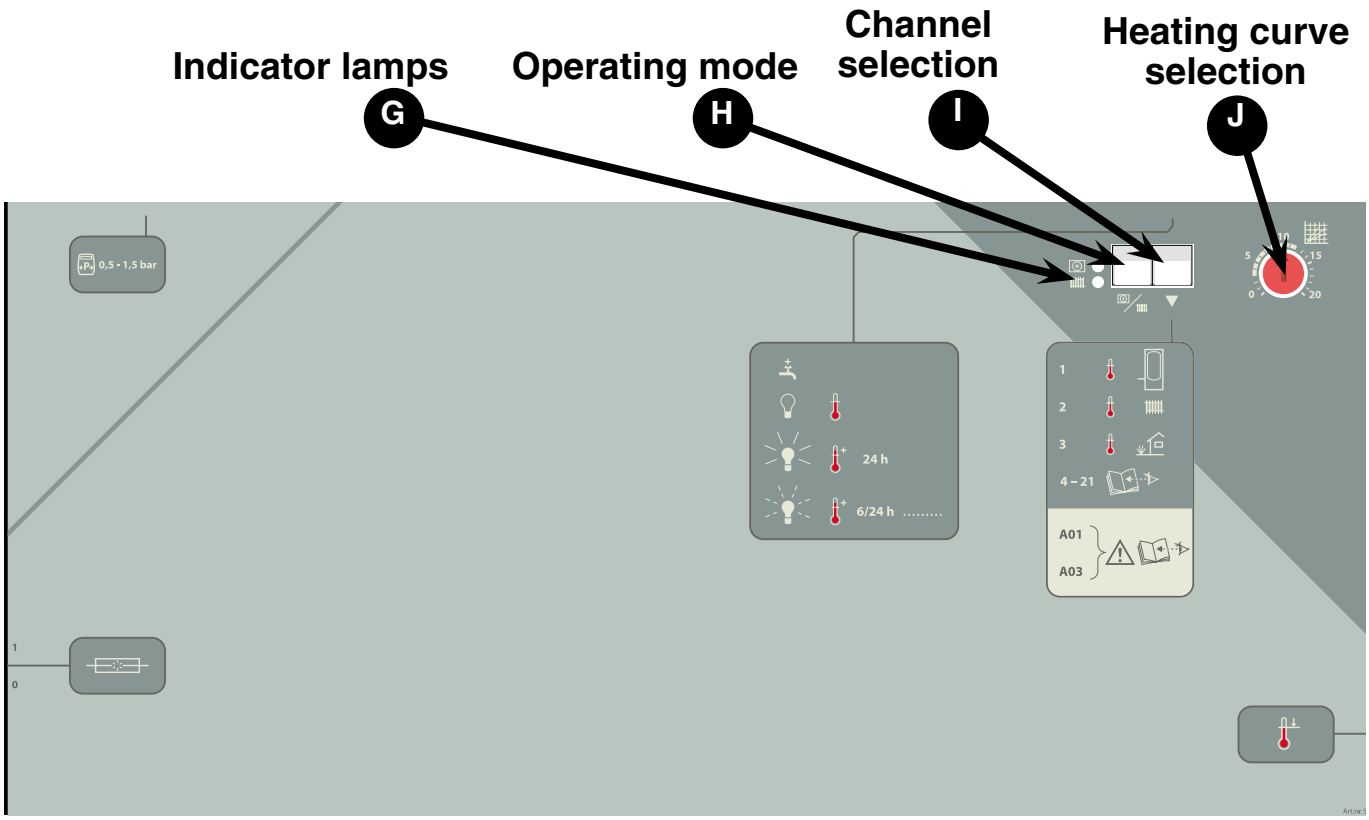
E
Outdoor air is drawn into the house.

4 Front panel

Upper (visible) part of the front panel



Frontpanelens nedre (dolda) del



Functions on the front panel

Visible functions

A Pressure gauge

Here the radiator circuit pressure is displayed. Gauge graduation is 0 - 4 bar. Normal pressure is 0.5 - 1.5 bar.

B Power switch

with 3 modes 0 - 1 - ⚠☜:

0 Heat pump off.

1 Normal mode. All control functions connected.

⚠☜ Standby. This mode is used during start up and with any operating disruptions.

C Indicator lamps



Upper lamp

Lit	Compressor is operational.
Flashing	–
Not lit	Compressor is not operational.

Centre lamp

Lit	Automatic defrosting.
Flashing	–
Not lit	Normal mode.

Lower lamp

Lit	Immersion heater is operational.
Flashing	Parts of the immersion heater are disabled by an external controller (load monitor, etc).
Not lit	Immersion heater is not operational.

D Numerical display

In normal mode the boiler temperature is displayed here. The two digits on the left indicate the “channel number” and the two on the right the reading/setting of that channel.

In the event of a malfunction, an error message is displayed alternately with channel number and value. See “Dealing with malfunctions” — “Indications on the numerical display”.

NOTE! When switching from Standby mode “⚠☜” to normal mode “1” the numerical display can remain dimmed for a brief period. This can also occur at extremely low outdoor temperatures.

E Extra hot water

Pressing the “Extra hot water” button raises the boiler temperature to about 60°C, giving increased water capacity for about 24 hours. In this mode, the built-in lamp is constantly lit.

Pressing the button again gives a permanent function which raises temperature of the hot water at regular intervals. In this mode, the built-in lamp flashes.

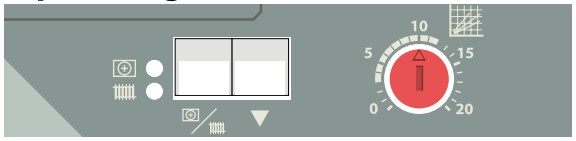
Pressing the button again resets the above functions.

F Heating curve offset

With the “Heating curve offset” button you can change the offset of the heating curve and thus the room temperature.

Hidden functions

G Operating mode indications



The two lamps next to the operating mode selector indicate the chosen operating mode. This should not be confused with the indicating lamps in the numerical display.

Uppermost lamp “Immersion heater”

Lit	The immersion heater may be connected if necessary, i.e. when the compressor cannot single handed cover the heating requirement.
Not lit	The immersion heater is disabled.

Bottom lamp “Circulation pump”

Lit	The circulation pump is operational.
Not lit	The circulation pump is not operational, however it is automatically exercised twice a day. The shunt is valve is also closed in this position.

H Operating mode

When the heat pump is started, all functions (immersion heater, circulation pump and automatic heating control system) are running.

Pressing the “Operating mode” button once disables the immersion heater.

Pressing it once more stops the circulation pump as well. Only hot water production is then obtained.

Pressing it yet again reconnects the immersion heater and the circulation pump.

I Channel selection

Use the “Channel selection” button to browse forward through the display window channels to see the required reading or setting.

Available readings/settings include:

1	Boiler temperature
2	Flow temperature
3	Outdoor temperature
5	Extract air temperature

Normally the display always shows Channel **1**. When you have browsed through the channels, channel **1** returns after a while.

J Heating curve selection

Use the “Heating curve selection” knob to set the automatic heating control system; see section “Room temperature”.

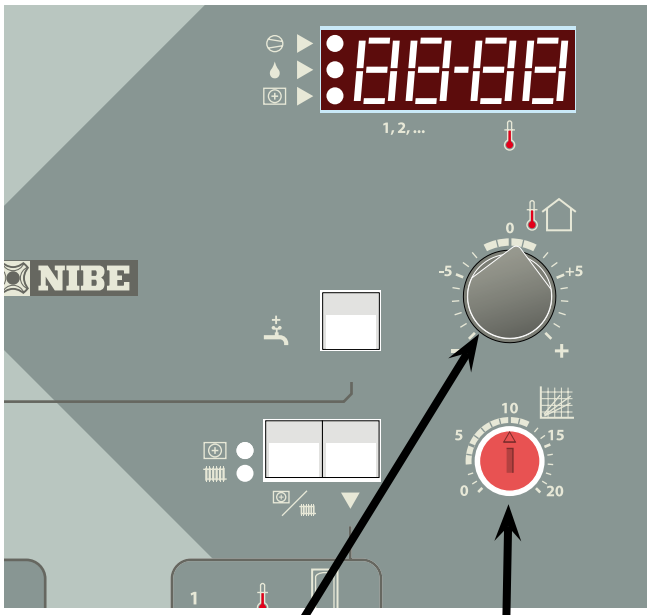
6 Room temperature

Automatic heating control system

The indoor temperature depends on several factors. During the hot season, solar radiation and heat given off by people and equipment are sufficient to keep the house warm. When it gets colder outside, the heating system must be started. The colder its gets, the hotter the radiators must be.

This adjustment is made automatically, however the basic settings must first be made on the boiler, see the section “Room temperature” “Default setting”.

Room temperature



Heating curve offset

Heating curve selection

Default setting

The basic heating is set with the “Heating curve selection” knob and with the “Heating curve offset” 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

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

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

Warm weather conditions

If the room temperature is low, increase the heating curve offset 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 respectively. One scale marking corresponds to a change of about one degree in the room temperature.

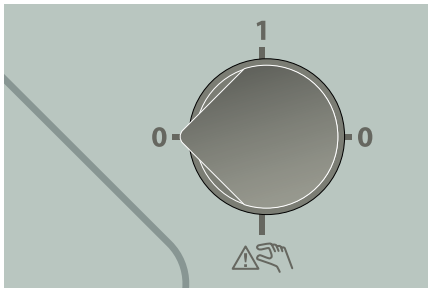
NOTE! An increase in the room temperature may be inhibited by the radiator or floor heating thermostats, if so these must be turned up.

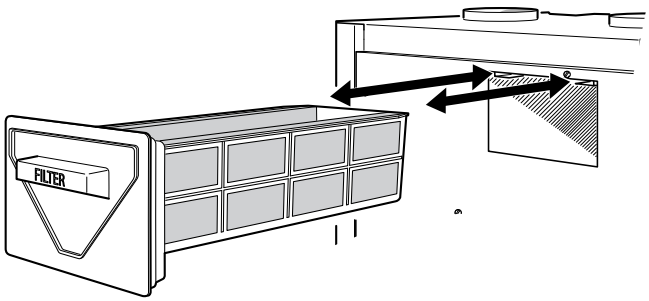
8 Maintenance routines

The heat pump and its ventilation ducting require some regular maintenance when the following points should be checked.

The numbers in brackets refer to the section “Component locations”.

Cleaning the air filter





The heat pump's air filter (63) needs to be cleaned regularly (approximately 4 times per year) by pulling it out and shaking it clean.

- Set the switch (8) to “**0**”.
- Open the upper front cover by pulling it out by the lower edge, then lifting it up.
- Pull out the filter holder (78).
- Take out the filter and shake off any dirt.

  Check that the filter is not damaged. New original filters can be ordered from NIBE.
- Assembly takes place in the reverse order.

The interval between cleaning operations varies and depends on the amount of dust in the exhaust air.

Every third month a reminder for cleaning the filter is shown in the display as “A-01”. Note that the time will be set to zero by setting the switch to "**0**".

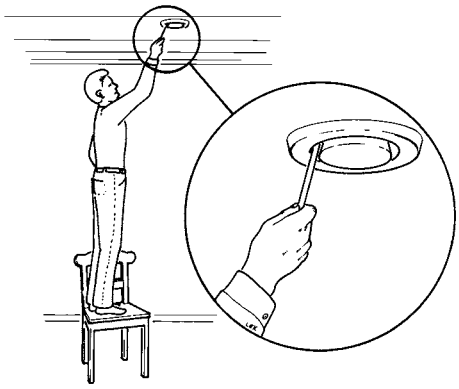
Cleaning the ventilation devices

The building’s ventilation devices should be cleaned regularly with a small brush to keep the correct ventilation.

The device settings must not be changed.

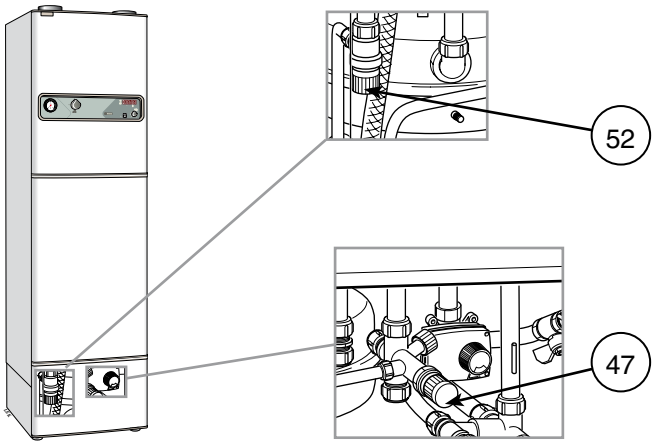
NOTE! If you take down more than one ventilation device for cleaning, do not mix them up.

Check that the ventilation opening (84) behind the lower front cover is not blocked. Clean if necessary.



Maintenance routines 9

Checking the safety valves



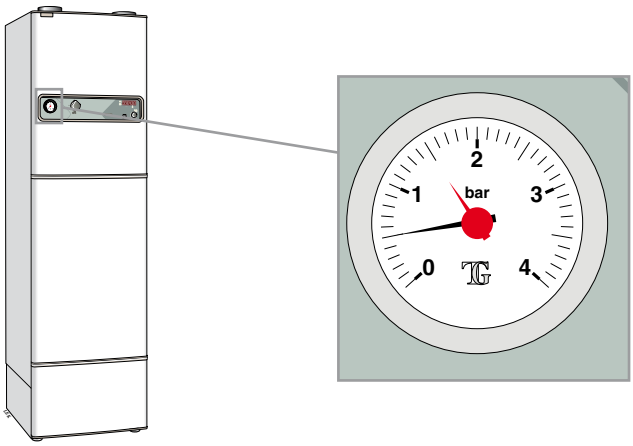
FIGHTER 310P has two safety valves, one for the heating system and one for the water heater.

The heating system safety valve (52) must be completely tight, but the hot water safety valve (47) may occasionally release some water after hot water has been used. This is because the cold water which enters the water heater expands when heated, causing the pressure to rise and the safety valve to open.

Safety valve (52) should be checked once a year, while safety valve (47) should be checked 4 times a year. Check one valve at a time as follows:

- Open the valve.
- Check that water flows through the valve.
- Close the valve.
- The heating system may need to be refilled after checking the safety valve (52), see the section “Commissioning and adjustment” “Filling of the heating system”.

Pressure gauge



The pressure gauge reading should be between the initial pressure of the expansion vessel (normally 0.5 bar) and 2.5 bar (25 mvp). See “Commissioning and adjusting”

Extract air temperature



Check that the temperature of the extract air (channels 5) is clearly lower than the room temperature when the compressor is operational, also see section “Dealing with malfunctions” ”High extract air temperature”. It is normal that the extract air temperature varies.

10 General points for the installation engineer

Transport and storage

The heat pump should be transported and stored vertically in the dry.

NOTE!

The transport guard around the compressor must be removed before starting.

Handling



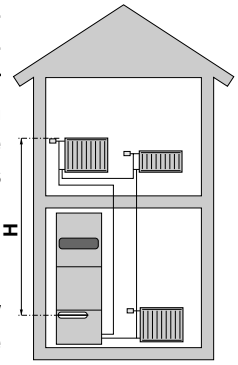
The heat pump contains highly inflammable refrigerant. Special care should be exercised during handling, installation, service, cleaning and scrapping to avoid damage to the refrigerant system and in doing so reduce the risk of leakage.

Setting up the heat pump

The heat pump should preferably be erected with its back at least 10 mm from an outside wall in a utility room or similar, to minimise noise nuisance. If this is not possible, a wall that backs on to a bedroom or some other room where noise would be a problem should be avoided. Irrespective of the placement the wall should be sound insulated. **NOTE!** The distance between the heat pump and the wall should be at least 10 mm.

Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

Maximum boiler and radiator volumes



The volume of the expansion vessel (85) is 12 litres and it is pressurised as standard to 0.5 bar (5 mvp). As a result, the maximum permitted height “H” between the vessel and the highest radiator is 5 metres; see figure.

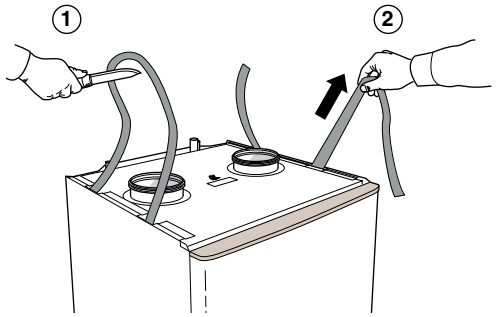
If the standard initial pressure in the pressure vessel is not high enough it can be increased by adding air via the valve in the expansion vessel. The initial pressure of the expansion vessel must be stated in the inspection document.

Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the water.

The maximum system volume excluding the boiler is 285 litres at the above initial pressure.

Lifting straps

The lifting straps on top of the heat pump should be removed before starting as these can otherwise cause increased sound levels. These are removed by first cutting with a knife and then pulling them out.

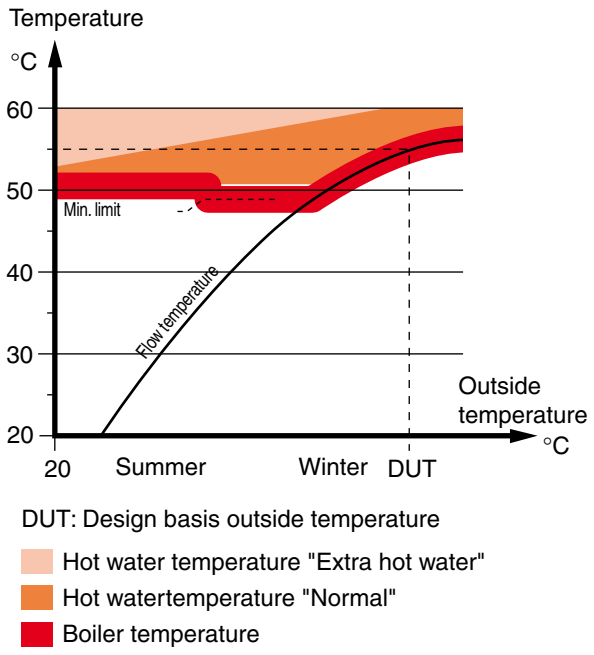


Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person. The above applies to installations with a closed expansion vessel. A new inspection must be made when changing the heat pump or the expansion vessel.

Temperatures in FIGHTER 310P

Normal temperature levels in boiler or water heater.



The temperature of the hot water in the water heater may vary between about 50 and 60 °C.

The “Extra hot water” knob (18) on the front panel is used to increase the hot water capacity.

Pipe connections

General

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

The system requires low-temperature dimensioning of the radiator circuit. At DUT, the highest recommended temperatures are 55 °C on the flow line and 45 °C on the return line.

When the circulation pump is running, the flow in the radiator circuit must not be completely stopped. In other words, in a system where the radiator flow might stop because all the thermostatic valves close, there must be a bypass valve to protect the circulation pump.

The total volume is 240 litres, with 170 litres in the water heater and 70 litres in the double-jacket space.

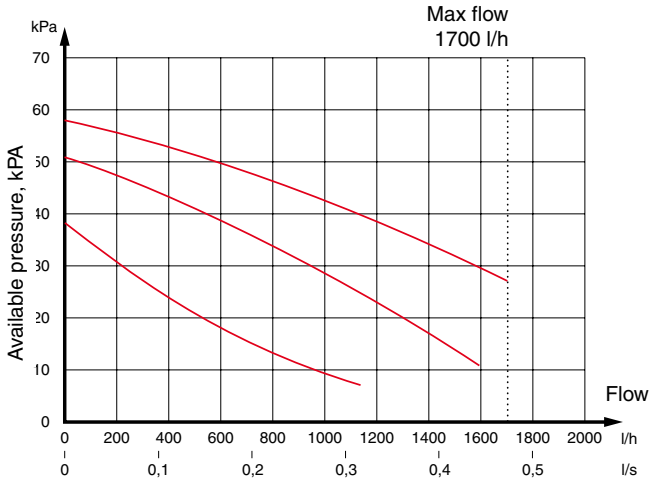
The pressure vessel in the FIGHTER 310P is approved for max 9.0 bar (0.9 MPa) in the water heater and 2.5 bar (0.25 MPa) in the double jacket space.

Overflow water from the evaporator collection tray and safety valves goes via non-pressurised collecting pipes to a drain so that hot water splashes cannot cause injury.

NOTE!

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

Pump and pressure drop diagrams



Docking

Other heat sources can be docked to the FIGHTER 310P Accessories are needed. Contact NIBE AB for information.

Tap water connection

Hot and cold water are connected to pos (74) (hot water) and (73) (cold water).

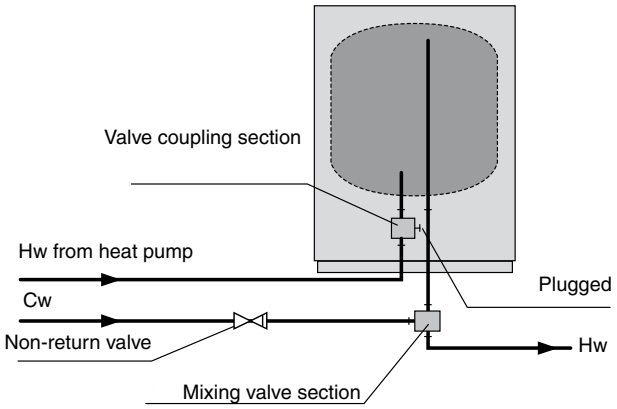
The attendant expansion vessel (107) must be connected to the hot water system.

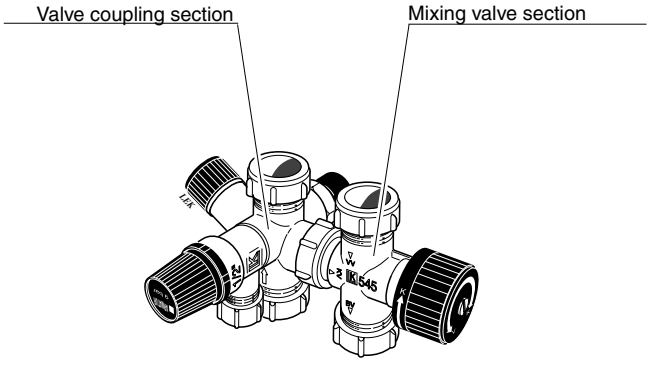
The heat pump should be supplemented with an electric water heater if a bubble pool or other significant consumer of hot water is installed.

If the heater is equipped with a valve connection Ø of 15 mm, this should be replaced with an equivalent (split) Ø 22 mm coupling.

Appropriate heaters are COMPACT 100-300 for floor-mounting and EMINENT 35-100 for wall-mounting.

1. Split the valve coupling.
2. Attach the valve coupling section to the heater's incoming cold water.
3. Attach the mixing valve section to the heater's outgoing hot water.
4. Plug the split on the valve coupling section.





12 Ventilation connection

Ventilation flow

FIGHTER 310P is connected so that all ventilation air except the kitchen fan passes the evaporator (62) in the heat pump. The lowest ventilation flow according to current standards is 0.35 l/s per m^2 floor area. For optimum heat pump performance the ventilation flow should not be less than 100 m^3/h. (28 l/s).

The heat pump's installation area should be ventilated by at least 36 m^3/h (10 l/s).

FIGHTER 310P is equipped with a ventilation opening in the base. As a result, an air flow of about 5 m^3/h (1,4 l/s) is taken directly from the room where the heat pump is installed.

Changing the ventilation capacity is described under “Electrical connection” “Setting the fan capacity”. See also "Circuit diagram". The numbering of the curves refers to the connection pins of the fan transformer.

Exhaust air duct

The kitchen flue must not be connected to FIGHTER 310P.

Adjustment

To obtain the necessary air exchange in every room of the house, the exhaust air devices must be correctly positioned and adjusted. A defective ventilation installation may lead to reduced heat pump efficiency and thus poorer operating economy, and may result in damage to the house.

Duct installation

To prevent fan noise being transferred to the exhaust air devices, it may be a good idea to install a silencer in the duct. This is especially important if there are exhaust air devices in bedrooms.

Because the heat pump contains a flammable refrigerant in the form of propane (R290), the air ducting system must be earthed. This is done by making a sound electrical connection to the exhaust air and vented air ducts with the two earthing cables supplied. The cables must then be connected to the earthing studs on top of the top cover.

Connections should be made via flexible hoses, which must be installed so that they are easy to replace. The extract air duct must be provided with diffusion-tight insulation over its entire length. Provision must be made for inspection of the duct. Make sure that there are no reductions of cross-sectional area in the form of creases, tight bends etc, since this will reduce the ventilation capacity. All joins in the ducting must be sealed and pop-riveted to prevent leakage.

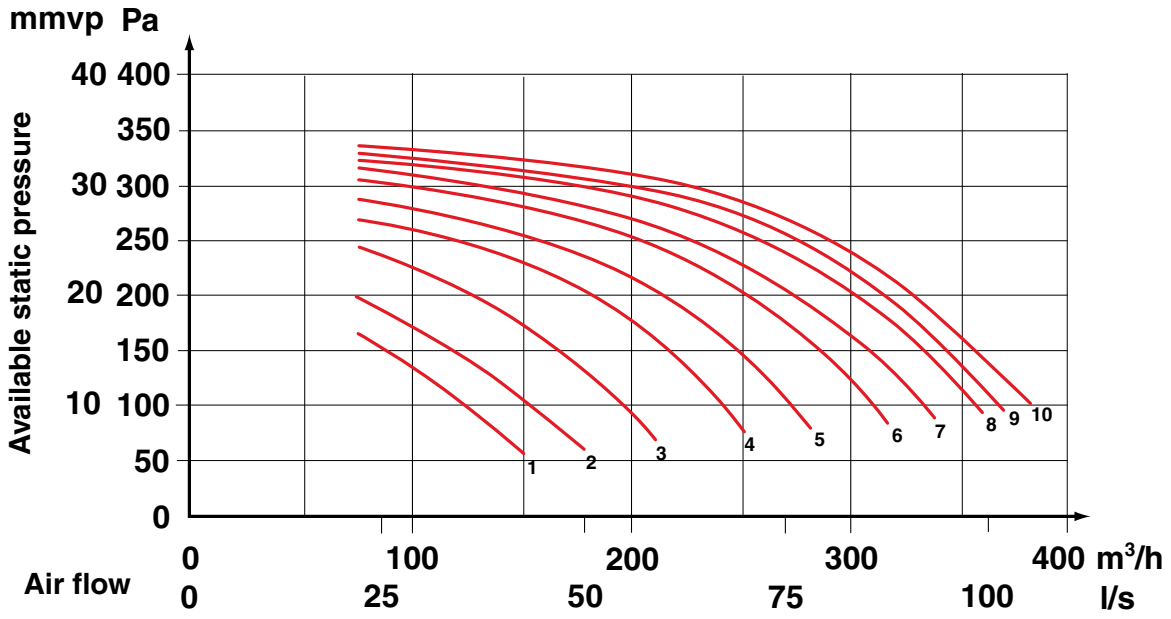
The air duct system should, at a minimum, be of air tightness class B.

NOTE!

A duct in a masonry chimney stack must not be used for extract air.

Fan diagram

The diagram below show the available ventilation capacity.



Electrical connections 13

Connection

All electrical equipment except for the outdoor sensor has been connected at the factory.

Disconnect the heat pump before insulation testing the house wiring.

NOTE!

The switch (8) must not be moved from "0" until the boiler has been filled with water. The temperature limiter, thermostat, compressor and the immersion heater can otherwise be damaged.

The heat pump must be installed via an isolator switch. The supply to the heat pump is connected to terminal (9) via a strain relief. Connection must not be carried out without the permission of the electricity supplier and under the supervision of a qualified electrician. The cable entry conduit is dimensioned for cable with a max Ø 19 mm.

The power is controlled via a contactor which is operated by a microprocessor.

The temperature limiter (6) cuts off the supply to the immersion heater if the temperature rises to between 90 and 100 °C; it can be manually reset by pressing the button on the temperature limiter.

NOTE!

Reset the temperature limiter, it may have tripped during transport.

The automatic heating control system, circulation pump (16) and its cabling, are internally fuse protected with a miniature circuit breaker (7).

NOTE!

Electrical installation and service must be carried out under the supervision of a qualified electrician. The electrical installation and wiring must conform to current regulations.

Power rating as set at the factory

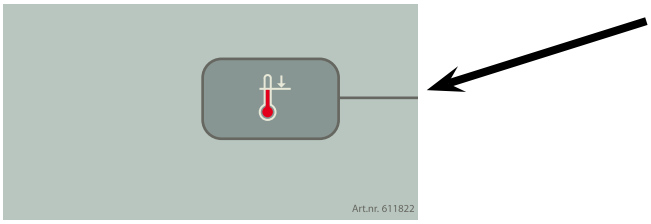
As standard the output power of the immersion heater is 9.0 kW.

The supplied output is 8.0 kW. An upgrade kit to max 13.5 kW is available as an extra option.

Switching between different power outputs is done by opening the front panel (see under "Service" — "Opening the front panel"), and moving certain cables as described under "Electrical diagram", "Changing the output".

Resetting the temperature limiter

The temperature limiter is accessible behind the top front cover and is positioned to the right of the panel.
The temperature limiter is reset by firmly pressing in its button.
Resetting the temperature limiter may only be carried out by a qualified installation engineer after checking the electrical equipment.



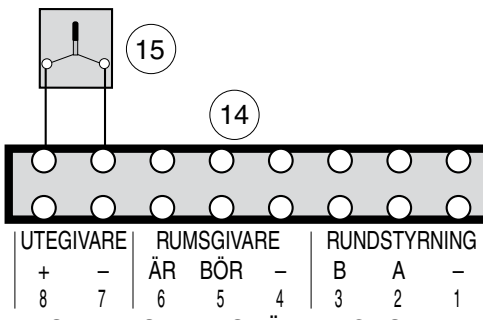
Max phase current

Immersion heater (kW)	outputMax load phase (A)	Group fuse (A)
6,0	12,4	16
8,0	13,0	16
9,0	16,7	20

Connecting the outside sensor

Install the outside sensor in shade on a wall facing north or north-west, so it is unaffected by the morning sun. The sensor is connected with two-wire cable to terminal (14) positions "7" and "8".

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

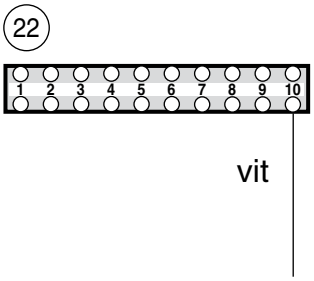


14 Electrical connections

Setting the fan capacity

The fan capacity is selected by connecting a white cable exhaust air fan to the required outlet on terminal block (22). See under “Ventilation connection” - “Fan diagram”. The fan is connected to outlet 10 on delivery.

Outlet	Voltage(V)
1	100
2	110
3	125
4	140
5	155
6	170
7	185
8	200
9	215
10	230

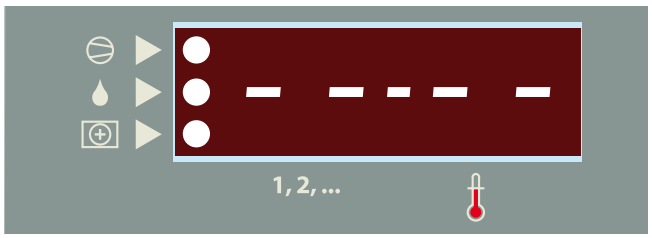


Blocking immersion heater operation

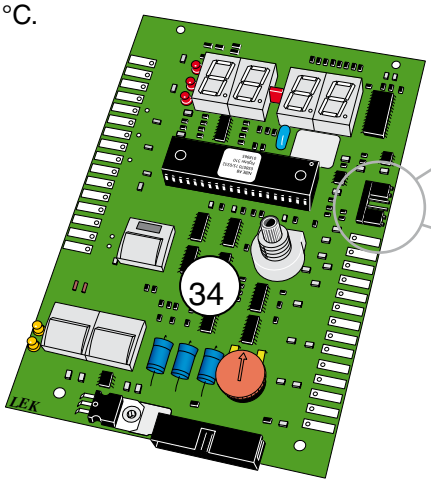
Normally the immersion heater is permitted to run even if the compressor has switched of because its stop temperature has been reached (under the condition that the immersion heater is connected via the operating mode selector). Furthermore, the flow temperature is permitted to be as high as 65 °C.

These functions can be deactivated by moving the strap from pins 1 and 2 to pins 2 and 3 as illustrated.

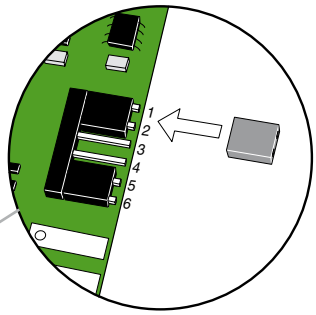
The numerical display will now show horizontal lines, otherwise vertical.



Once the strap is in position on pins 2 and 3 the immersion heater is only permitted to run when the compressor is operational (except in defrosting mode). In addition, the flow temperature is limited to maximum 60 °C.

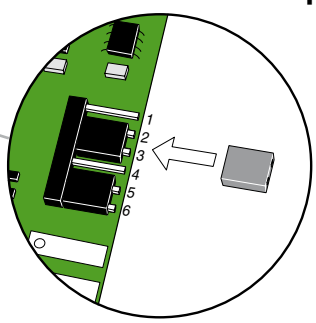


Pins 1 and 2 are strapped



Immersion heater operation (connection on delivery)

Pins 2 and 3 are strapped

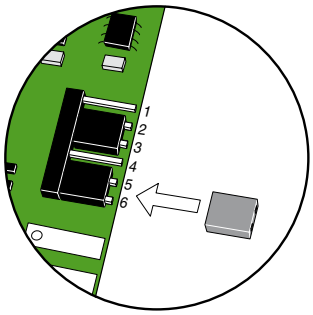


Limited immersion heater operation

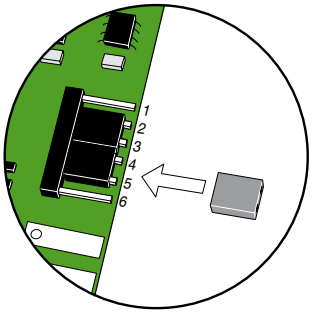
Centralised load control and load monitor

The output steps of the immersion heater can be disconnected by means of a load sensor or a centralised load control relay. This can be done either with floating make or break contacts, connected to terminal block (14). The required contact function is chosen with a jumper on the PCB (34) behind the front panel (see below). The heat pump is delivered with a strap on pins 5 and 6, which gives a make (NO) contact function. With this arrangement, an open external contact does not cause power disabling.

For break (NC) contact function, move the strap to pins 4 and 5.



Make (NO) contact function (connection on delivery)



Break (NC) contact function

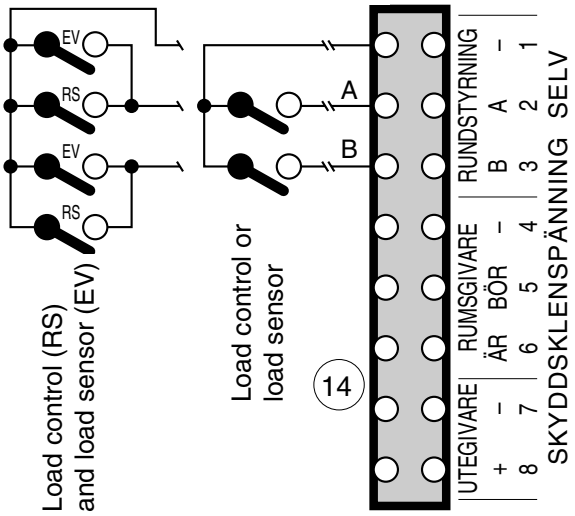
The table below describes power disabling.

Operated external contact	Disconnected power step
A *	Contactor 69 (Black group)
B	Contactors 67 and 69 (White and black group)
A + B	Contactors 10, 67 and 69 (Brown, white and black group)

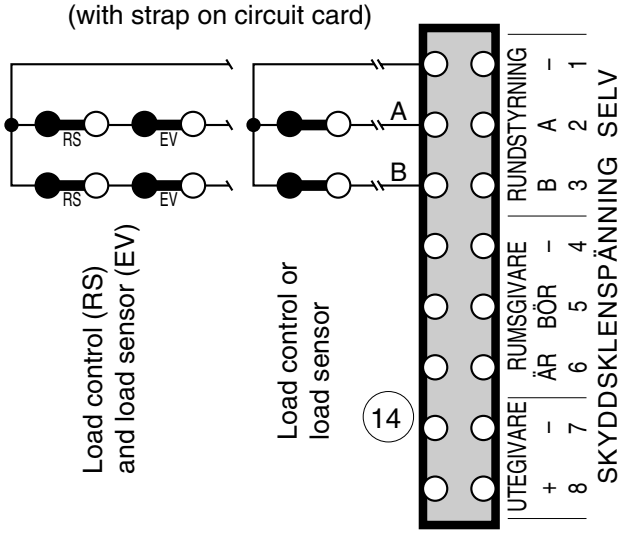
* Only with 13.5 kW immersion heater output

If both a load sensor and centralised load control are to be used, the contact functions must be the same for both (both make or both break). The contacts must be connected in parallel for make contact function and in series for break contact function.

Make contact function
(without strap on circuit card)



Breaking contact function
(with strap on circuit card)



16 Commissioning and adjusting

Preparations

Check that the switch (8) is set to "**0".**

Check that valves (44) and (50) are fully open and that the temperature limiter (6) has not tripped (press the button firmly).

Fill the condensation water hose (97) with a little water to prevent it making a noise. This done by loosening the hose which is located on the waste water pipe (98) and pouring water in the end of the hose so a water seal arises. Refit the hose.

Filling the water heater and the heating system

- The water heater is filled by first opening a hot water tap and then opening the filling valve (46) fully. This valve should then remain fully open. When water comes out of the hot water tap it can be closed.
- Open the filling valve (49). The boiler part of the heat pump and the radiator system are now filled with water.
- After a while the pressure gauge (42) will show rising pressure. When the pressure reaches 2.5 (bar) (approx. 25 mvp) a mix of air and water starts to emerge from the safety valve (52). The filling valve is then closed (49).
- Turn the safety valve (52) until the boiler pressure reaches the normal working range (0.5 - 1.5 bar).

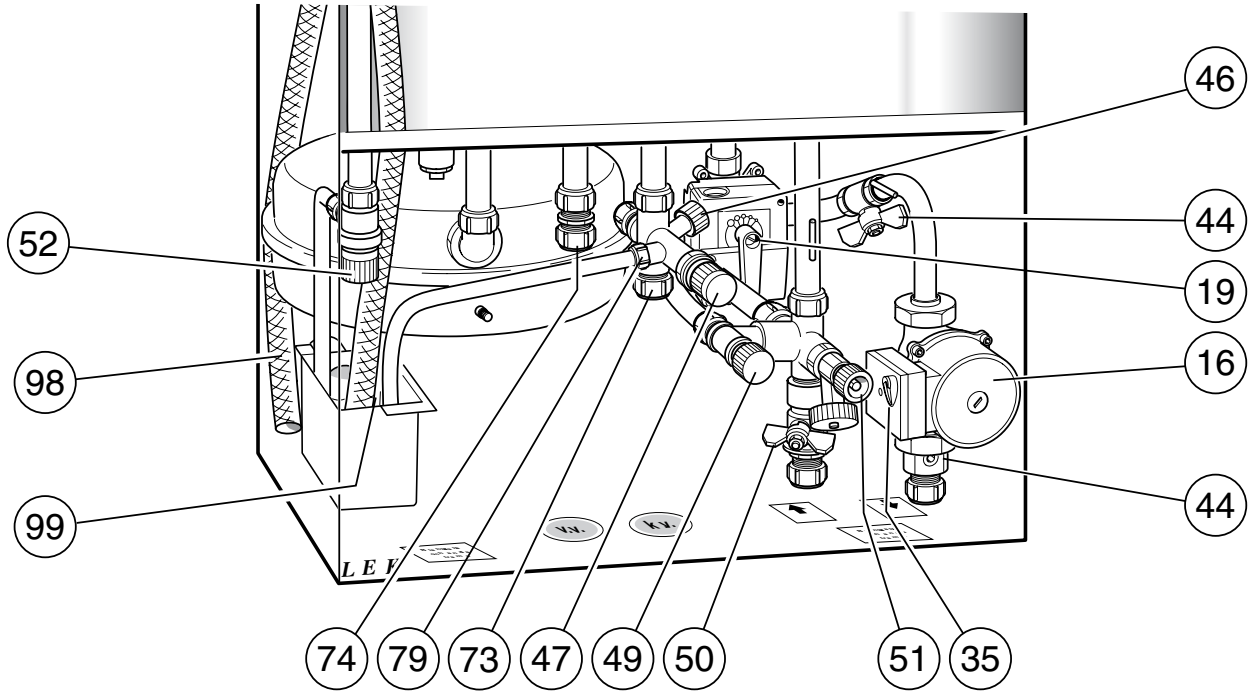
Venting the heating system

NOTE! The pipe from the container must be drained of water before the air can be removed. This means that the system is not necessarily vented, despite water emerging from the safety valve (52) when it is opened for the first time.

- Vent the heat pump through safety valve (52). The remainder of the heating system is vented by means of each venting valve.
- Keep topping up and venting until all air has been removed and the pressure is correct.

Starting

- Set the switch (8) to "⚠". In this mode the electronics are disconnected, so the display window is not lit. The thermostat (3) opens at 68 °C in this mode.
- Set the shunt (19) by hand (press the knob in and turn it).
- When the room temperature goes above 16 °C set switch (8) to "**1**". NOTE! The display may still not be lit, this comes on automatically when the boiler temperature has dropped a few degrees. The compressor has a start delay of at least 20 minutes.
- Reset the shunt (19) by hand (turn the knob until it "jumps out").
- Set the dimensioned capacity (35) on the circulation pump (16). See the section "Pipe connections" "Pump and pressure drop diagram". Make sure that the switch is not in an intermediate position.



Commissioning and adjusting 17

Setting the ventilation

Ventilation flows and fan transformer settings are given on the ventilation drawing.

- To change fan capacity, if necessary, move the exhaust air fan connection cable to the required outlet on terminal block (22). To ensure the lowest possible noise level, set the fan for the lowest possible capacity.
- Make sure that all outdoor air devices are fully open.
- Set correct ventilation flows on the exhaust air devices.

Readjustment

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. NOTE! Safety valve (52) also acts as a manual venting valve. Operate it with care, since it opens quickly. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required. See the section “Room temperature” “Setting the Automatic heating control system” and “Front panel”.

Draining the heating system

The heating water can be drained off through drain valve (51) using an R15 (1/2") hose coupling. Remove the cover (80) from the valve. Now screw on the hose coupling and open valve (51).

Open safety valve (52) to let air into the system.

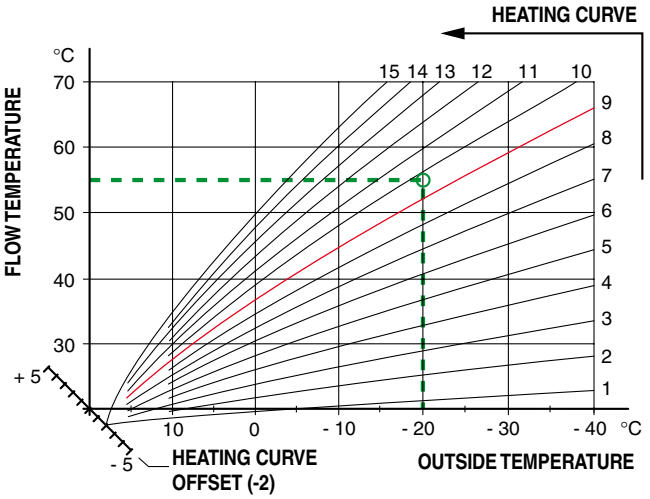
Emptying the water heater

To empty the water heater proceed as followings:

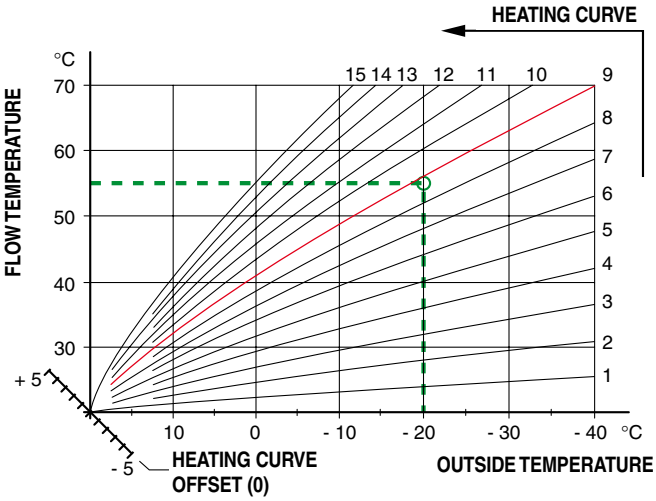
- Disconnect the overflow pipe from the drain connection (79) and connect a hose to a draining pump instead. Where no draining pump is available, the water can be released into the overflow funnel (99).
- Open the safety valve (47).
- Open a hot water tap to let air into the system. If this is not enough, undo a pipe coupling (74) on the hot water side and pull out the pipe.

18 Setting the automatic heating control system

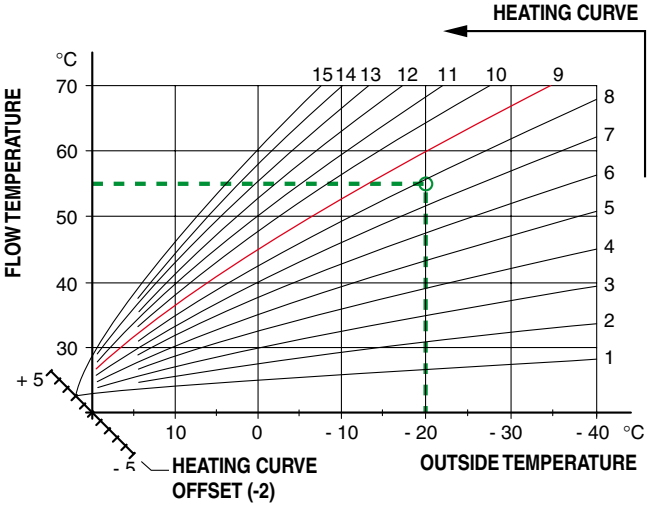
Heating curve offset -2



Heating curve offset 0



Heating curve offset +2



Setting using diagrams

FIGHTER 310P is equipped with outdoor temperature controlled automatic controls. This means the flow temperature is regulated in relation to the current outdoor temperature.

The relationship between outside temperature and flow temperature is set with the “Heating curve selection” and “Offset, heating curve” knobs.

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

Set the “Offset, heating curve” accordingly. A suitable value for floor heating is -1 and for radiator systems -2.

Also see section “Room temperature”.

Dealing with malfunctions

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

Low temperature or a lack of hot water

NOTE! The hot water capacity can be increased for 24 hours by pressing in button (18).

- Large amounts of hot water were used.
- Switch (25) not correctly set.
- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- Switch (8) set to "**0**".
- MCB (7) tripped. See the section "Dealing with malfunctions" "Resetting the miniature circuit breakers".
- Tripped temperature limiter (6). (Contact service)
- Closed or throttled filler valve (46) on the water heater.

Low or a lack of ventilation

- Defrost mode, lamp (31) constantly lit; see "Indications on the numerical display".
- Filter (63) clogged (possibly replace).
- Exhaust air device blocked or throttled down too much.
- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- MCB (7) tripped. See the section "Dealing with malfunctions" "Resetting the miniature circuit breakers".

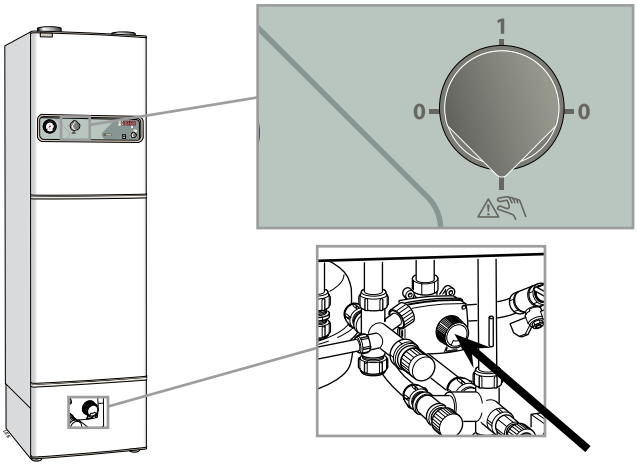
Low room temperature

- Circuit or main MCB tripped.
- Possible earth circuit-breaker tripped.
- MCB (7) tripped . See the section "Dealing with malfunctions" "Resetting the miniature circuit breakers".
- Tripped temperature limiter (6). (Contact service)
- Automatic control system settings not correct (40) .
- Circulation pump (16) stopped. See the section "Dealing with malfunctions" "Starting the pump".
- Air in boiler or system.
- Closed valve (44) and (50) in the radiator circuit.
- Initial pressure in expansion vessel too low. This is indicated by low pressure on the pressure gauge (42). Contact the installer.

High room temperature

- Automatic heating control system settings not correct.

Power switch position "⚠"



When the switch is set to " ⚠ " the compressor and electronic controls of the heat pump are off.

The fan is operational and the immersion heater is controlled by a separate thermostat.

The numerical display is off. The automatic heating control system is not operational, so manual shunt operation is required. This is performed by pressing in the shunt motor knob and then turning it to the preferred position.

NOTE!

When returning to normal mode do not forget to reset the shunt knob to its original position by turning the knob until it "jumps out".

The display can remain unlit when returning to normal mode. This is due to the boiler temperature being above the heat pump's normal working area. The display comes on when the boiler temperature drops once again to normal.

Cleaning the fan

Should abnormal noise come from the fan, this may need cleaning. Contact your installer.

If the operating disturbance cannot be rectified by means of the above an installation engineer should be called.
If necessary set the switch to " ⚠ " (manual shunt operation necessary).

20 Dealing with malfunctions

Indications on the display



Fault code A-01 on the numerical display

- Indication that the air filter needs to be cleaned (fault code is shown every third month).

When the filter has been cleaned reset the fault code by turning the heat pump off and on again.



Middle lamp lit

- Defrosting.

When there is too much ice on the evaporator, defrosting takes place. After this, the compressor starts automatically if heating is needed. Frequent defrosting is a sign of clogged ventilation or dirty filter. See the section “Maintenance routines” “Cleaning the air filter”.



Fault code A-03 on the numerical display

A high pressure or low pressure pressostat in the refrigerant circuit has tripped, see the section “Resetting pressostats”.

- **High pressure pressostat:** Settings for “Heating curve selection” and “Heating curve offset” too high (can also be seen on Channels 6 and 7 on the numerical display). Also see section “Room temperature”.
- **Low pressure pressostat:** Ventilation flow too low or not enough refrigerant.

When the cause of the fault has been put right, the fault code must be cleared from the display by switching the heat pump off and on again.



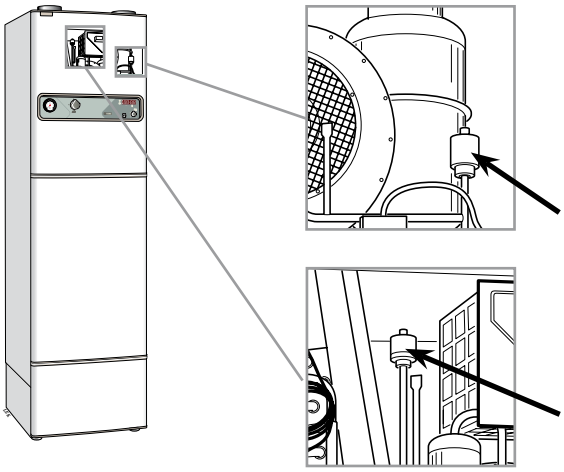
Fault code A- 011

When codes A-03 and A-01 are active at the same time, this code is displayed.

NOTE!

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

Resetting pressostats



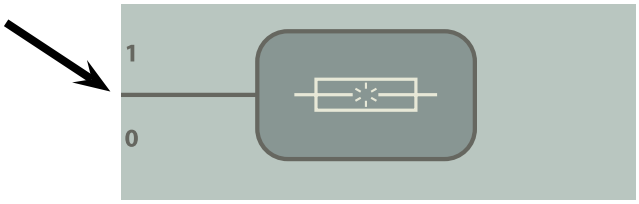
To reset a tripped pressure switch, press the button on the top of it; see diagram. The pressure switches can be reached through the filter access panel opening.

High pressure pressostat

Low pressure pressostat. This switch resets automatically so it does not have a reset button.

Dealing with malfunctions

Resetting the miniature circuit breakers



The MCB is accessible behind the upper front access panel and is located to the left of the panel.
Normal mode of the MCB is "**1**" (up).

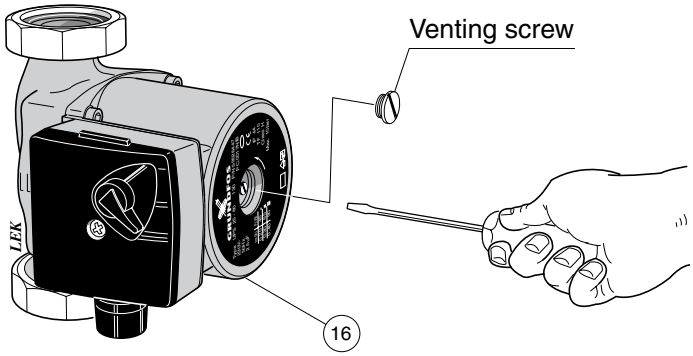
High extract air temperature



If the extract air temperature (read on channel 5) is only insignificantly lower than the room temperature at the same time as the compressor is operational, this indicates a probable fault in the refrigerant circuit or its controller. Request a service.

When the compressor is not operational the extract air temperature lies at about the same level as the room temperature.

Helping the circulation pump to start

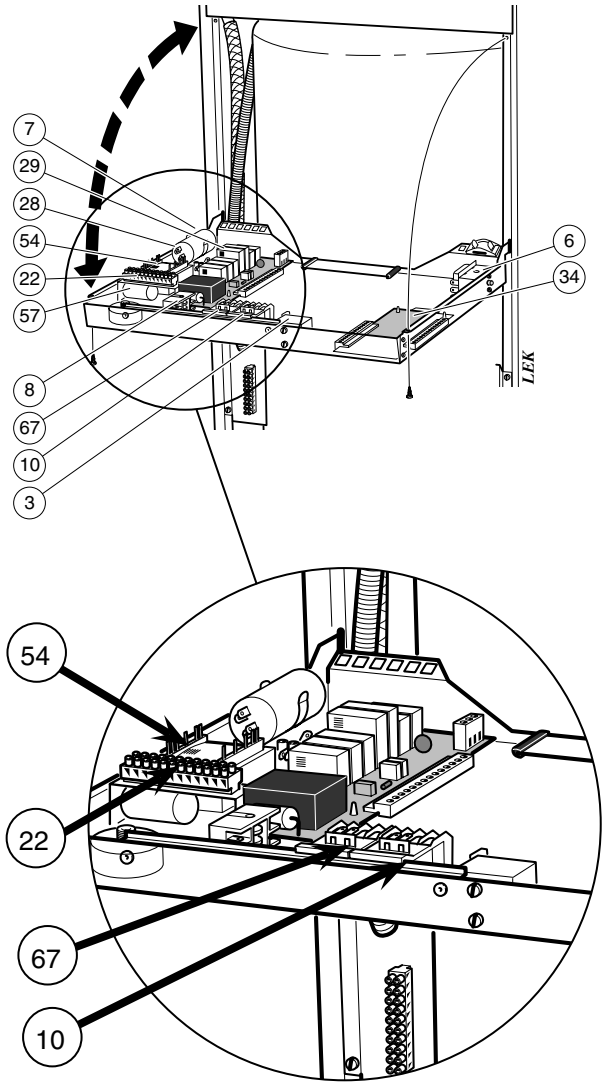


- Shut down FIGHTER 310P by turning the switch (8) to "**0**".
- Remove the lower front cover.
- Loosen the venting screw with a screwdriver. Hold a cloth around the screwdriver blade as a certain amount of water may run out.
- Insert a screwdriver and turn the pump rotor.
- Tighten the venting screw.
- Start FIGHTER 310P and check whether the circulation pump runs.

It is usually easier to start the circulation pump with FIGHTER 310P running, switch (8) set to "**1**". If helping the circulation pump to start is performed with FIGHTER 310P running, be prepared for the screwdriver to jerk when the pump starts.

Opening the front panel

To lower the front panel, unscrew the two screws at the top of the panel. The panel can then be lowered to the horizontal position (where it rests on stops on either side of the front panel).



Refrigerant system

Work on the refrigerant system must be done by authorised personnel in accordance with the relevant legislation on refrigerants, supplemented by additional requirements for flammable gas, for example, product knowledge as well as service instruction on gas systems with flammable gases.

Channel description

01 Boiler temperature

Actual value

02 Supply temperature

Actual value

03 Outside temperature

Actual value

04 Evaporation temperature

Actual value.

05 Extract air temperature

Actual value.

06 Curve slope (Heating curve selection)

07 Offset (Heating curve offset)

08 Temperature, compressor sensor

Actual value.

09 No function

Shows – –

10 Calculated flow

Set point.

Service ducts

11 Deviation flow

Actual value

12 No function

13 No function

14 Operating mode

01 = Circulation pump in operation. Compressor respective immersion heater is connected if necessary.

02 = Circulation pump in operation. Compressor is connected if necessary. Immersion heater blocked.

03 = Immersion heater and circulation pump blocked. Compressor is connected if necessary.

15 Room sensor

Set point. Shows the set room temperature. Shows – – when the room sensor is not connected.

16 Room sensor

Actual value. Shows the true room temperature. Shows – – when the room sensor is not connected.

17– 21 No function

Electrical circuit diagram

Changing the output

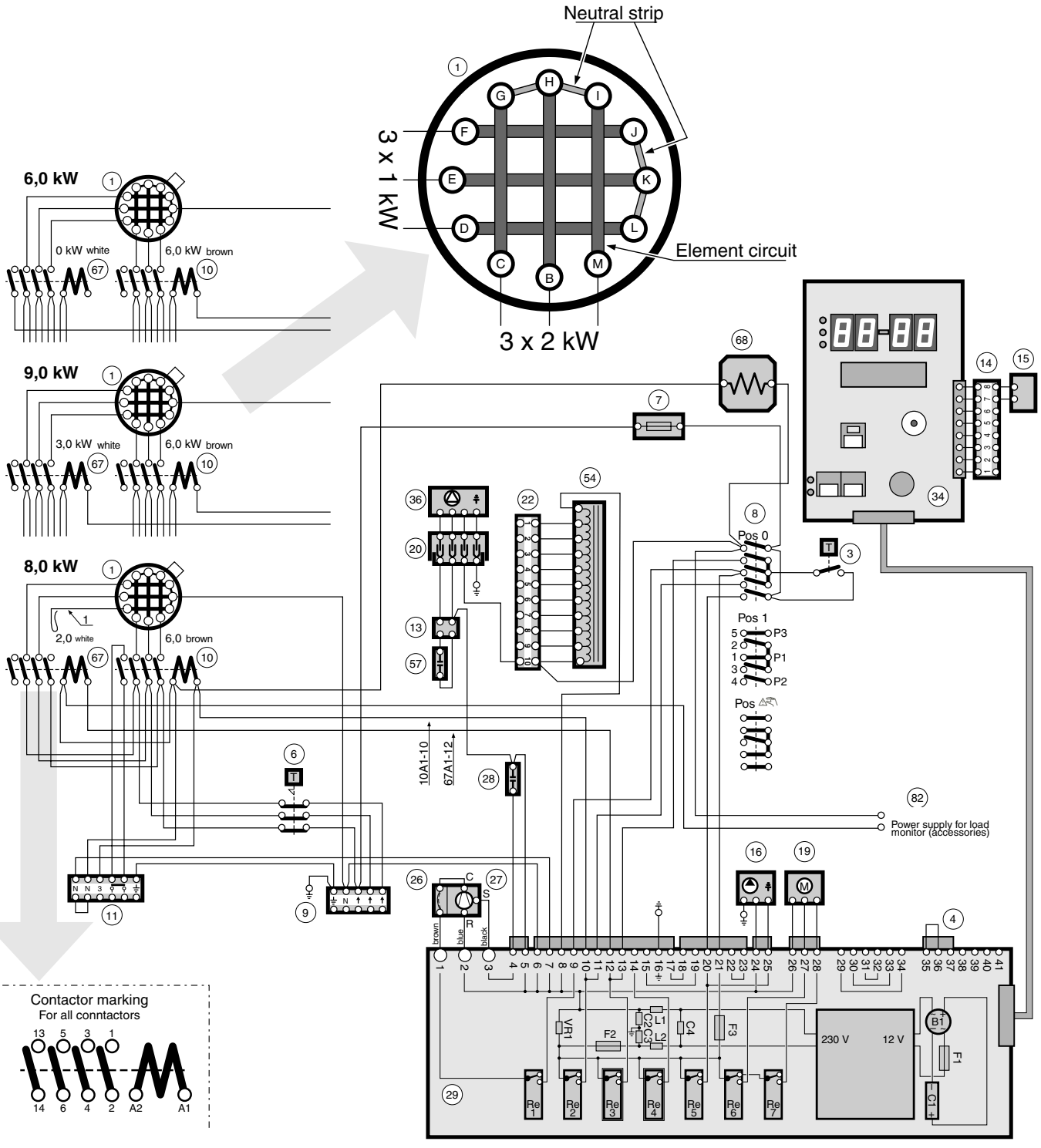
8.0 kW to 6.0 kW

Move cable “67A1-12” from position “A1” contactor (67) to the parked position, position “14”, on the same contactor, see output option “6 kW”.

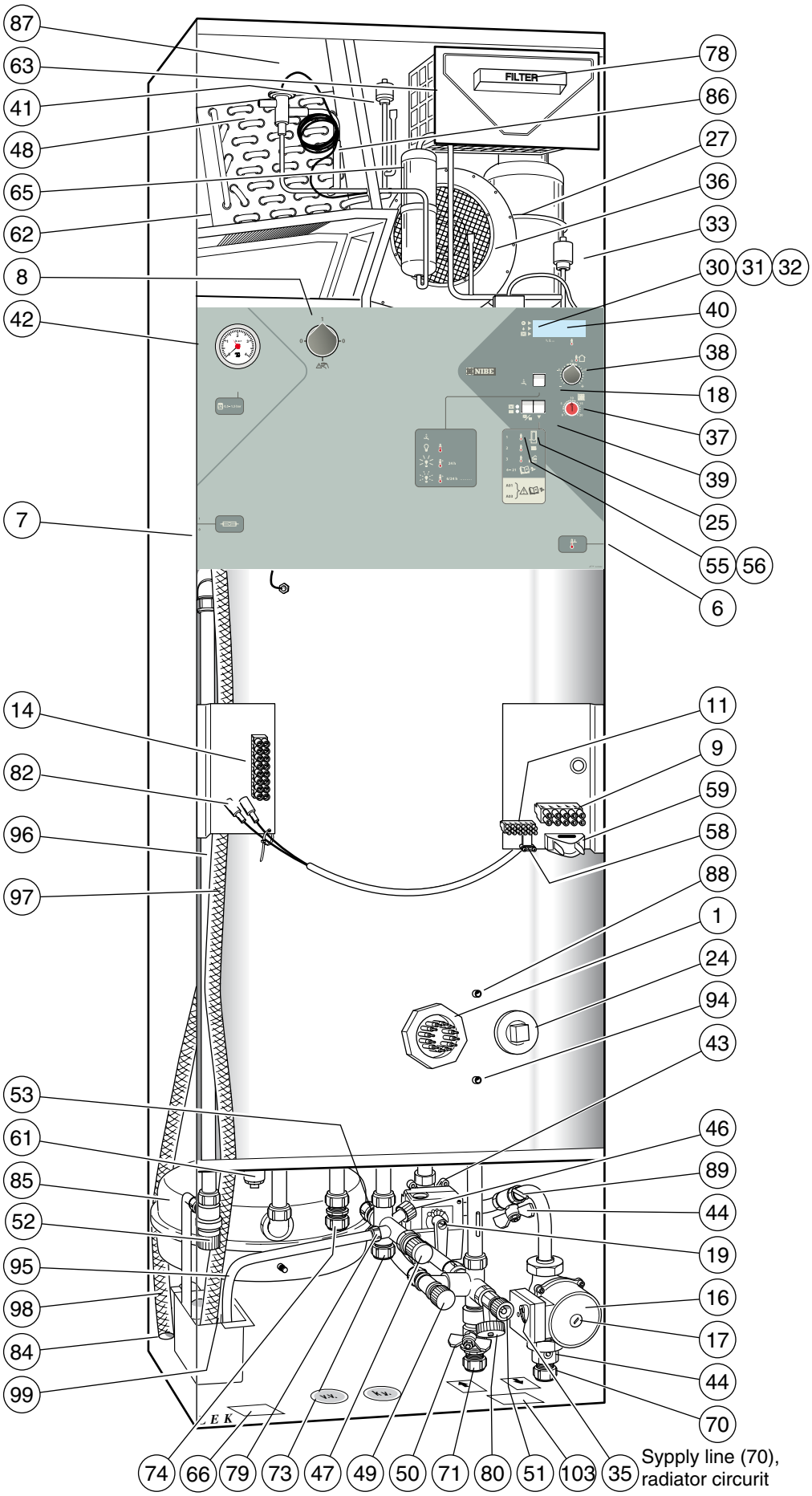
8.0 kW to 9.0 kW

Connect the clamped white cable “1” (sleeve marking) to position “1” on contactor (67), see output option ”9.0 kW”.

Contactor 10 controls step 1
Contactor 67 controls step 2



24 Component locations



Hot water (74), outlet from water heater

Cold water (73), connection

Return line (71), radiator circuit

Sypply line (70), radiator circuit

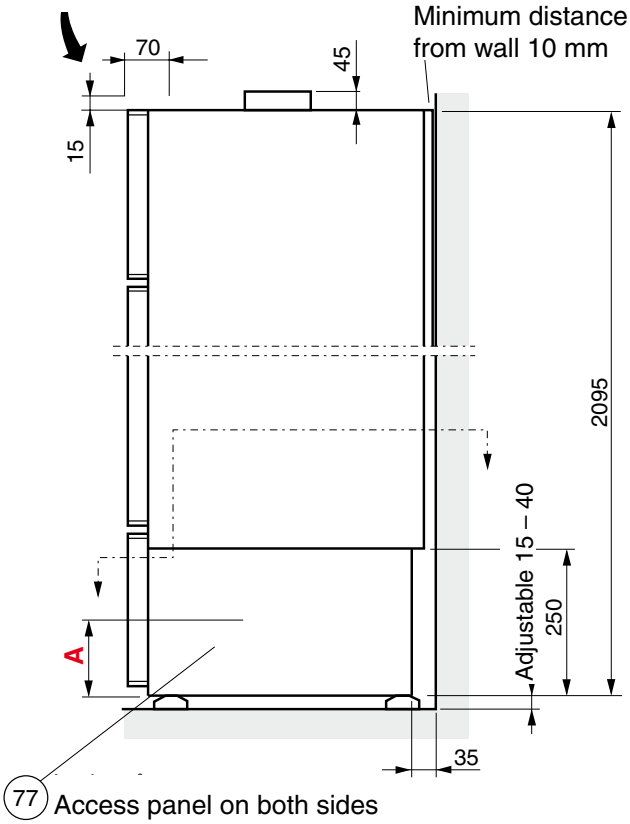
List of components

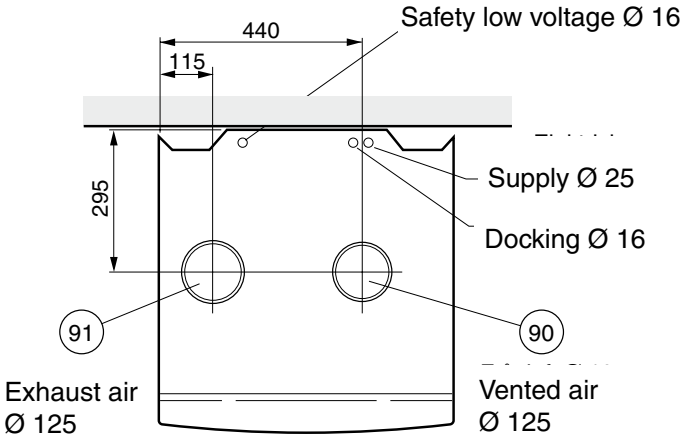
1 Immersion heater 9 kW
3 Operating thermostat, backup heating
6 Temperature limiter
7 MCB, circulation pump, automatic heating control system and compressor
8 Switch, positions 0 - 1 - ⚠
9 Terminal block, power supply
10 Contactor step 1
11 Terminal block, docking
13 Terminal block
14 Terminal block
15 Outdoor sensor
16 Circulation pump
17 Air screw, circulation pump
18 Pushbutton, “Extra hot water”
19 Shunt motor with handwheel
20 Connector, exhaust air fan
24 Space for Immersion heater 4.5 kW
25 Selector switch for operating mode
26 Motor protection, compressor
27 Compressor
28 Operating capacitor, compressor
29 Relay card with power supply unit
30 Indicator lamp, “Compressor”
31 Indicator lamp, “Defrosting”
32 Indicator lamp, “Immersion heater”
33 High pressure pressostat
34 Microprocessor card
35 Capacity setting, circulation pump
36 Fan, exhaust air
37 Knob, “Heating curve selection”
38 Knob, “Heating curve offset”
39 Pushbutton, “Channel selection”
40 Numerical display with control card behind
41 Low pressure pressostat
42 Pressure gauge, boiler
43 Shunt valve
44 Shutoff valve, pump and supply line radiator circuit
46 Filler valve, water heater
47 Safety valve, water heater
48 Expansion valve
49 Combined filling and non-return valve, heating system
50 Shutoff valve, return line radiator circuit
51 Drain valve, heating system
52 Safety valve, heating system
53 Vacuum valve (concealed)
54 Fan transformer
55 Indicator lamp, “Immersion heater”
56 Indicator lamp “Circulation pump”
57 Starter capacitor, exhaust air fan
58 Strain relief, docking cable
59 Strain relief, supply cable
60 Fan module
61 Docking connection, requires special pipe from NIBE
62 Evaporator
63 Air filter (Filter type G2)
65 Drying filter with tank
66 Rating plate
67 Contactor step 2
68 Compressor heater

		Connection	Setting out dimensions A	B	C
70	Supply line, radiator circuit	Compression ring Ø 22 mm	100	465	90
71	Return line, radiator circuit	Compression ring Ø 22 mm	130	465	190
73	Cold water connection	Compression ring Ø 22 mm	260	465	290
74	Hot water outlet from water heater	Compression ring Ø 22 mm	290	465	345
77	Side access panel, valve coupling				
78	Filter cover				
79	Drain and overflow water connection, water heater	R 15 male (with compression ring removed)			
80	Drain connection, heating system	R 15 male			
82	Electrical supply for load monitor (accessories)				
84	Ventilation opening				
85	Expansion vessel				
86	Temperature sensor, evaporator				
87	Temperature sensor, extract air (concealed)				
88	Temperature sensor, immersion heater operation				
89	Temperature sensor, supply line				
90	Ventilation connection exhaust air	Ø 125 mm	2095	295	160
91	Ventilation connection extract air	Ø 125 mm	2095	295	485
94	Temperature sensor, compressor operation				
95	Overflow pipe, safety valve water heater				
96	Overflow pipe, safety valve heating				
97	Condensation water outlet, fan box				
98	Overflow water discharge	PVC-pipe Ø 32 mm (outside diameter)			
99	Collection funnel, waste water				
103	Serial number sign				

Dimensions and setting-out coordinates

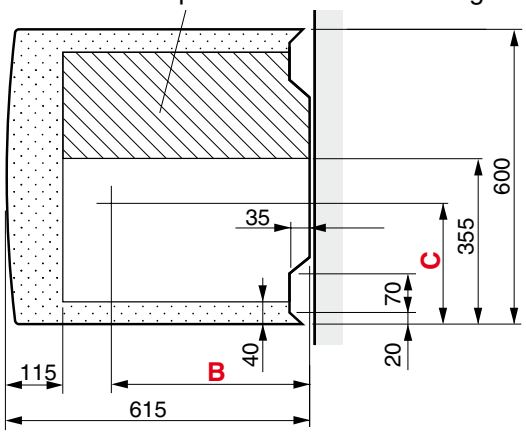
Space required for removal of upper front access panel





A clear space of 500 mm is needed in front of the heat pump for servicing.

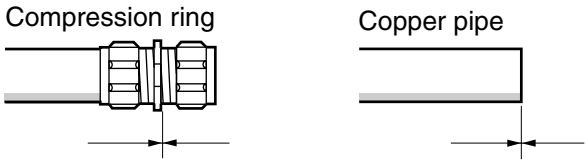
When running pipes in the hatched area, make sure there is space to facilitate servicing.



A, **B** and **C**: See "Connection" in "List of components".

Pipes must not be run from the floor in the area indicated by dots.

Measuring principle



Technical specifications

CE IP 21

Height (excl. foot: 15 - 40 mm)	2 095	mm
Required ceiling height	2 185	mm
Width	600	mm
Depth	615	mm
Weight	195	kg
Volume total	240	litres
Volume double jacket	70	litres
Volume water heater	170	litres
Supply voltage	400	V~ 3-phase + N
Output immersion heater	9,0	kW (switchable)
Driving power circulation pump	40-80	W
Rated output exhaust air fan	170	W
Rated output, compressor	550	W
Enclosure class	IP 21	
Max pressure in storage heater	0,9	MPa (9 bar)
Max pressure in double jacket volume	0,25	MPa (2.5 bar)
Breaking value, high pressure pressostat	2,45	MPa (24.5 bar)
Breaking value, low pressure pressostat	0,15	MPa (1.5 bar)
Design pressure in double jacket volume	0,25	MPa (2.5 bar)
Refrigerant volume	420	g
Refrigerant type	R290	(propane)
Cut-in temperature compressor	51	°C (Controlled by separate sensor)
Cut-out temperature compressor	54	°C
Cut-in temperature immersion heater	49 – 62	°C *(49 – 57)
Cut-out temperature immersion heater	52 – 65	°C *(52 – 60)
Sound power level**	46 – 50	dB(A)
Sound level in the boiler house***	42 – 46	dB(A)

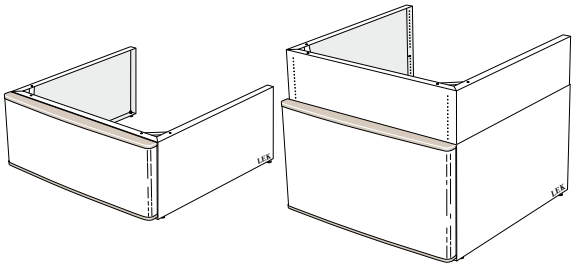
* See the section “Electrical connection” “Blocking immersion heater operation”

** A-weighted sound power level (L_{wA}). The value varies with the selected fan curve.

*** A-weighted sound pressure level (L_{pA}). The value varies with the room’s damping capacity. These values apply with a damping of 4 dB.

Top cabinet

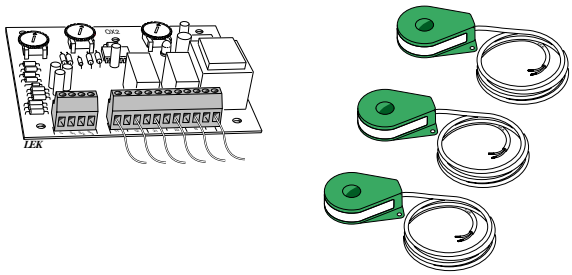
A top cabinet is available as an accessory to conceal the ventilation ducts above the heat pump.



Top cabinet 245 mm. Part no 089 424
Top cabinet 345 mm. Part no 089 426
Top cabinet 385 — 535 mm. Part no 089 428

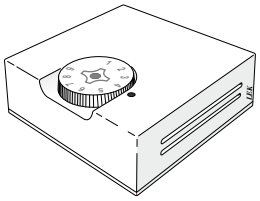
Load monitor

With temporary high current drain the load monitor disables parts of FIGHTER 310P's electrical output to protect the building's main fuses.



ROOM SENSOR RG 10

In some cases a room sensor can be used as a supplement to the ordinary automatic control system.



Docking kits

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

Upgrade kit immersion heater ES

Used to increase the immersion heater output from max 9 kW to max 13.5 kW.

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